Okanagan Basin Water Board Meeting Agenda

DATE: Tuesday, Oct. 5, 2010

TIME: 10 a.m. to 2 p.m.

PLACE: Regional District North Okanagan
9848 Aberdeen Rd., Coldstream, B.C.

1. CALL MEETING TO ORDER

2. APPROVAL OF AGENDA

3. INTRODUCTION OF LATE ITEMS

4. ADOPTION OF MINUTES
   - 4.1 Minutes of the Regular Meeting of the Okanagan Basin Water Board of Sept. 7, 2010 at the Regional District of Okanagan-Similkameen in Penticton, B.C.

5. DELEGATIONS
   - 5.1 Urban Systems – Water Pricing Survey

6. STAFF REPORTS
   - 6.1 Executive Director Report
     - 6.1.1 Water Supply & Demand Executive Summary; Uses for Phase 2 memo; Water Supply & Demand web-page screen shot
     - 6.1.2 Westbank Demand Management Graph
   - 6.2 Water Stewardship Director Report
     - 6.2.1 Okanagan Water Pricing; Water Pricing Survey
   - 6.3 Communications and Research Coordinator Report
     - 6.3.1 Water pricing news story

7. NEW AND UNFINISHED BUSINESS
   - 7.1 Recommendation to B.C. Government re: water licencing fees
   - 7.2 Bear Creek Water Quality Report and communication with MOTCA
     - 7.2.1 Extract from Bear Creek Water Quality Report

8. CORRESPONDENCE
   - 8.1 Response from Pat Bell regarding Reservoir Lakes correspondence

9. NEXT MEETING
   - 9.1 The next regular meeting of the Okanagan Basin Water Board will be held Nov. 2, 2010. The November Okanagan Water Stewardship Council meeting will follow. Both meetinsg will be held at the Coast Capri Hotel in Kelowna.

10. ADJOURNMENT

Okanagan Basin Water Board
Regular meeting
Oct. 5, 2010
Agenda No: 4.1

MINUTES OF A REGULAR MEETING OF THE OKANAGAN BASIN WATER BOARD HELD SEPTEMBER 7, 2010, AT REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN, 101 MARTIN ST., PENTICTON, B.C.

PRESENT

Vice-Chair Rick Fairbairn	Regional District North Okanagan
Director Buffy Baumbrough	Regional District North Okanagan
Director Gyula Kiss	Regional District North Okanagan
Director James Baker	Regional District Central Okanagan
Director Doug Findlater	Regional District Central Okanagan
Director Graeme James	Regional District Central Okanagan
Director Gordon Clark	Regional District Okanagan-Similkameen
Director Bernie Bauer	Okanagan Water Stewardship Council
Director Toby Pike	Water Supply Association of BC

REGRETS

Chair Stu Wells	Regional District Okanagan-Similkameen
Director Michael Brydon	Regional District Okanagan-Similkameen
Director George Saddleman	Okanagan Nation Alliance

OBWB STAFF

Anna Warwick Sears	Executive Director
Nelson Jatel	Water Stewardship Director
Genevieve Dunbar	Office and Grants Administrator
Corinne Jackson	Communications and Research Coordinator
Melissa Tesche	Interim Office and Grants Administrator

GUESTS

Professor Louise Nelson	UBC-Okanagan
John Janmaat	UBC-Okanagan
Adrienne Skinner	UBC-Okanagan

1. CALL MEETING TO ORDER

Vice-Chair Fairbairn called the meeting to order at 10:07 a.m.

2. APPROVAL OF AGENDA

"THAT the agenda of the regular meeting of the Okanagan Basin Water Board of Sept. 7, 2010 be approved."

CARRIED

3. INTRODUCTION OF LATE ITEMS

4. ADOPTION OF MINUTES

4.1 Minutes of the Regular Meeting of the Okanagan Basin Water Board of July 6, 2010 at Regional District of North Okanagan in Coldstream.

"THAT the minutes of the regular meeting of the Okanagan Basin Water Board of July 6, 2010 at Regional District of North Okanagan in Coldstream be adopted as presented."
CARRIED

5. DELEGATIONS

5.1 Prof. Louise Nelson, UBC-Okanagan: B.C. Regional Innovation Chair in Water Resources

Prof. Nelson addressed the board and reported on the outcome of recent meetings with the three Okanagan regional districts, regarding a proposed BC Regional Innovation Chair in Water Resources and Ecosystem Management at UBC-O.

All three regional districts voted unanimously in favour of the chair and supporting it with a $500,000 contribution over five years, noted Prof. Nelson. Approval of the contribution by the OBWB Board of Directors would make the Water Board the lead organization.

Work to bring a Water Resources Chair to UBC-O began a few years ago, she added, saying the posting had to be re-advertised after no suitable candidates applied in the first request for submissions. An international search was conducted and UBC-O professor John Janmaat was chosen. While the nomination still needs to be approved by the province, Dr. Janmaat's expertise in economics, and his involvement in the OBWB's Okanagan Water Stewardship Council and with scientists at the university, will serve this position well, added Prof. Nelson.

The OBWB, she continued, will have significant input into the research conducted. A committee will be created to direct the chair and will include representation from the three Okanagan regional districts.

Dr. Janmaat also addressed directors, adding he has studied water and environmental issues in the valley and worked with OBWB staff in the past, and is looking forward to this continuing.

Dr. Warwick Sears added that the staff recommendation was initially for $250,000 in funding. However, after Regional District of Central Okanagan directors asked for and reviewed a breakdown of what the funding would look like over three or five years, they determined that $500,000 would be reasonable. As a result, the recommendation to RDOS and RDNO ended up being for $500,000.

Mr. Jatel added that an advisory committee would be created and would likely include a senior member of the UBC-O team, an OBWB staff member, and a representative of the BC Real Estate Foundation (which is providing $250,000 in funding). There would also be input from directors representing the three regional districts, perhaps OBWB directors, to ensure their voices are also heard. The committee would meet annually with the Water Resource Chair, who would report on activities and receive feedback. There may be more meetings at the beginning as the work begins, he said.

In response to Dir. Fairbairn and a question about the program's sustainability, Mr. Jatel said it's expected the province will contribute $1.25 million, the Real Estate Foundation has provided funding and then other fundraising will also occur. Some of the funds at the beginning will support the chair's salary, but these monies are part of an endowment so they are there in perpetuity, he explained.

Dir. Bauer made special note that it was the BC Water Supply Association that provided the initial $1,000 towards the Water Resource Chair.

Dr. Warwick Sears said that the committee may want the chair to look at a number of issues, but members will have to rank them and decide what are the priorities for research.

In response to questions, Ms. Adrienne Skinner, from UBC-O's Development Office, noted that funds from the Water Board will allow the university to leverage for more funding and that they can apply for funds not available to the OBWB. This will be one of six sustainability chairs in the province, she added.

"THAT the Okanagan Basin Water Board approve $500,000 in funding over five years towards a BC Regional Innovation Chair in Water Resources and Ecosystem Management at UBC-O."

CARRIED

Directors Bauer and Pike abstain.

6. STAFF REPORTS

6.1 Executive Director Report

6.1.1 Sewage Facilities Grants information package

Dr. Warwick Sears reported that she and Ms. Dunbar have been updating the guidelines for the Sewage Facilities Grants Program.

Staff turnover at local government offices has made it difficult for new employees to understand the requirements of the grant program. As such, a new guidebook is being developed and will be distributed to grant recipients. The new guide will also help the OBWB manage the program's cash flow better.

Dir. Baumbrough suggested some clarification was needed in the Terms of Reference for the grant regarding point source pollution. Dr. Warwick Sears agreed.

Dir. Findlater noted that biosolid plants are becoming more common and asked if they are eligible for a grant. Dr. Warwick Sears responded that the program is currently for sewer collection systems and treatment plants, but that the board could review this. However, there could be an issue around fairness for communities that have completed projects, like a biosolids plant, and not been eligible for funding, she cautioned.

Fairbairn: Is it the will of the board to review the program – is it outdated?

In response to Dir. Findlater and a question about the ability to review the program, Dr. Warwick Sears noted that reviewing programs is a good idea, but recommended waiting until a financial review of the program is completed. The review will look at how projects are expected to fall off over the next 20 years.

"THAT the report on the Sewage Facilities Grants program, dated Aug. 30, 2010, be received."

CARRIED

6.1.2 Water Resources Chair memo to RDNO

Dr. Warwick Sears noted that the issue was addressed following the UBC-O delegation earlier in the meeting.

6.1.3 Water Supply & Demand scenarios workshop

The summary report of the Okanagan Water Supply and Demand (OWSD) study was provided to board directors. The report will also be available on the OBWB website, they were told.

Dr. Warwick Sears reported that funding from Natural Resources Canada's Regional Adaptation Collaboratives (RAC) initiative will allow future scenarios work to be done as part of Phase 3 of the OWSD project. Proposed scenarios have been sent to various project partners and the project's management team will be discussing them Sept. 16.

Directors encouraged staff to distribute the summary report to local governments in the Okanagan. Dir. Findlater suggested staff also present the report at council meetings in the valley. Dr. Warwick Sears said this can be looked with the new scenarios being proposed, ensuring that local governments are receiving the latest information.

Phase 3, she continued, will focus on developing practical plans (e.g. Drought Management Plans).

The Water Board is posting a Request for Proposals this week for a technical study to support a valley-wide drought management plan, she added. Data from the OWSD study will be used in helping develop the plan. As a communication hub on water information in the Okanagan, the Water Board is looking to make this data available as widely as possible.

Dir. James entered the meeting at 11:20 a.m.

> *"THAT the Okanagan Basin Water Board of Directors review the Okanagan Water Supply and Demand Study Phase 2 Summary Report and provide input at the next meeting on how communities can best use the information.*
>
> *CARRIED*

In response to a question from Dir. Baker about the study's information getting out to schools and into the public arena, Dr. Warwick Sears noted that the Okanagan WaterWise website is one vehicle being used to get the information out to the public. As well, she noted, Science Opportunities for Kids developed classroom materials around the Waterscape poster a few years ago. Perhaps, with a grant, additional materials could be developed.

Dr. Warwick Sears continued with her Board Report, noting she was invited to and attended a meeting of the Similkameen Valley Planning Society which is interested in forming a water agency like the OBWB.

There was some discussion about the OBWB's Letters Patent and whether it was possible to invite the Similkameen to join the Okanagan Water Board. While it was recognized that Similkameen waters do meet the waters of the Okanagan, it was noted that there would be some challenges. The Similkameen has different issues, and there is even resistance by some to being a part of the Regional District of Okanagan-Similkameen.

It was decided that staff should create a pros and cons list for extending the OBWB to include the Similkameen if there was interest from the region, and bring it to the board for discussion.

> *"THAT the Okanagan Basin Water Board staff develop a list of reasons for and against expanding the OBWB to include the Similkameen, and present it to the board for further discussion."*
>
> *CARRIED*

6.2 Water Stewardship Director Report

Mr. Jatel reported on the next Okanagan Water Stewardship Council meeting, noting Gabor Fricska from Environment Canada is the guest speaker and will be speaking on weather and climate forecasting and how it impacts water management.

The council will also be reviewing the Sustainable Water Strategy. The review will look at what has been done to meet the various recommendations, what partners are doing, how the SWS has influenced work in the valley, and prioritize work.

Phase 1 of the Streamlined Water Use Reporting Tool project, which determined what the tool should look like, is done. The work involved meeting with water utility managers and senior government staff who would be using and managing the data. The tool was built in July. A draft version will be ready in October and it should be launched in December, Mr. Jatel said.

A Water Pricing Survey is being done in the valley. Preliminary data should be available for this week's Annual General Meeting. The survey looks at what various water providers are charging. You would think Kelowna with largest utility would have smallest rates, he noted.

Dir. Kiss responded, saying that lower rates could encourage people to use more. A discussion around the value of water is needed, he added.

Mr. Jatel said the Water Pricing study has two parts and will look at some of these questions, such as, the cost of infrastructure and the value of water. The results will be shared with local governments. It's important to understand that they determine their own water rates and infrastructure needs. However, such information will help them understand what their neighbouring water providers are doing.

The standards are quite different between the various utilities, noted Dir. Findlater, adding the District of West Kelowna's plant meets Interior Health requirements, but it has been very expensive. Other utilities in the district do not meet the same standard.

Dir. Pike said the current system creates some unique challenges. Utilities charge users based on their infrastructure costs. Those who adopt a user-pay system want a dry summer because they rely on people to use the supply to raise the funds necessary to run their operation. The role of the Water Board is to look at these dynamics and how we can create equity.

Mr. Jatel went on to report on a project to develop road signage to be erected in the valley that shows drought levels. The project is the result of a request from RDNO. Staff with B.C.'s Ministry of Environment, the River Forecast Centre and others are in support and assisting with the project.

Development of the signs is complicated since the province and local communities communicate drought levels differently. The province's levels range from "normal" to "loss of supply," whereas communities have stages that include conservation requirements, e.g. no pool filling or turf watering.

Dir. Pike added that the challenge will also be developing something that works for everyone. For example, Kelowna has five utilities and the threat to water and clients is quite different depending on the utility.

Mr. Jatel went on to note the Rain to Resource workshop being organized by the OBWB for Oct. 28 and 29 in Kelowna, and added that board directors are encouraged to participate.

The Water Board has also been invited to apply for funding through a federal innovation in agriculture production fund. Water management is considered a fit. Staff are looking at expanding the water pricing study as a possible project. Mr. Jatel requested board support for staff to apply for the grant since funding programs often have this as a requirement.

"THAT the Okanagan Basin Water Board supports and authorizes a staff funding application to Agriculture and Agri-Food Canada's Innovative Approaches Program."
CARRIED

Dirs. Bauer and Pike abstained.

6.3 Communications and Research Coordinator Report

Ms. Jackson reported that in addition to day-to-day communication initiatives, much of the summer was spent working on the Okanagan WaterWise program.

The program's website (www.okwaterwise.ca) was launched, as were Facebook and Twitter accounts. Ms. Jackson invited directors to check out the website and provide feedback. They were also encouraged to "like" Okanagan WaterWise on Facebook and "follow" on Twitter, since this is the way social media works and how word about the program is going to spread.

The water bottle banner display has also been appearing in communities up and down the valley. They have been in municipal halls during tax time, and then in recreation centres, libraries, shopping centres and at farmer's markets, to catch the attention of local residents.

Meetings were also held this summer with those working in water for local government, asking for feedback on the OkWaterWise Outreach Strategy and Action Plan. The feedback was worked into some of the writing of the website, but Ms. Jackson noted that she will also be developing an addendum to the strategy to reflect the needs expressed by communities. This will be done, she added, before moving ahead with some of the deliverables identified in the original strategy to ensure buy-in from all parts of the valley and the success of the program. A committee will also be struck to provide feedback as the program unfolds, she added.

Ms. Tesche presented the Annual Report, noting the colours used reflect the dry Okanagan and is an attempt to combat the myth of abundance. The report focuses on the partnerships that have been built and the results that have come from this and the various OBWB programs.

"THAT the 2010 Annual Report 'Growing Partnerships. Bringing Home Results.' be received."

CARRIED

In response to Dir. Fairbairn and the large amount of media coverage this summer, Ms. Jackson noted there had been a number of calls to the office about the spread of milfoil in the north end of Osoyoos Lake. As a result, from a communication's perspective, it was determined that a news release would help preempt some of these calls, as well as respond to those who wouldn't bother to call even though they had questions. A news release went out noting some of the expected causes of the outbreak and measures being taken to address it. This resulted in a number of stories being done.

Also, a news release went out regarding the OBWB's Rain to Resource workshop, which was picked up by various media outlets. And, delegations to regional districts in the valley, regarding the UBC-O research chair, attracted media attention.

7. NEW AND UNFINISHED BUSINESS

7.1 Milfoil Program Update

Ms. Tesche reported on the milfoil program this summer, noting early spring run-off and other factors resulted in a boom in weed growth, particularly in Osoyoos Lake. In response to the problems at the north end of this lake, an extra operator, who works on milfoil control in Christina Lake, was hired to help the OBWB milfoil crew address the problem.

This summer's experience in Osoyoos resulted in a number of issues. Such as, how to access the milfoil in highly developed areas, where to place the harvested material until it's ready to be removed, and how to dispose of such large quantities of the weed. The crew was able to find entry sites to access the weed beds, but it raised an interesting question. And, the Town of Osoyoos accepted some of the weeds at their landfill, but the Water Board is also collecting names of farmers who are interested in receiving the material for compost next year.

Also, at the end of August, the Water Board received a call from B.C. Ministry of Environment, concerned about reduced flow rates in the Okanagan river channel at the south end of Vaseaux Lake. The ministry believed this was caused by milfoil growth creating sandbars. As such, the OBWB entered into a Fee for Service contract with MoE to remove some of the milfoil, Ms. Tesche added.

In response to a question from directors, Ms. Dunbar noted that MoE is reporting an increase in water flow in the channel. Sand, however, was not dredged since precautions needed to be taken to protect fish flow. With salmon spawning occurring soon in the area, there was only a small window of opportunity to complete any dredging, she explained.

Staff are continuing to develop a system to track the work of the milfoil program using Geographic Information System (GIS). Ms. Tesche reported that the system will allow the Water Board to know where and when work has been done.

"THAT the report on the Milfoil Program, dated Sept. 7, 2010, be received."
CARRIED

7.2 Milfoil Program Succession Plan

Dr. Warwick Sears explained to the board that a milfoil program succession plan was developed, recognizing that two of its three employees are eligible to retire as of October 2010 and there are no trained alternates if a vacancy were to occur. As well, vacation time has been built up which needs to be addressed, she added.

The Water Board is currently budgeted to hire a seasonal employee for four-and-a-half months a year to run the harvester. It was recommended that this position be extended to six-and-a-half months until there is an opening for full employment, likely within three years. The trainee would work through the winter, rototilling, and then work occasional days in summer, explained Dr. Warwick Sears. A potential trainee has come to the attention of staff. The operator who assisted on Osoyoos Lake this summer, and who works out of Christina Lake, has indicated interest in working for the OBWB, she added.
If the Water Board can provide extensive training to a new employee now, the agency will be in a much better position should one of the current milfoil crew member retires. And, if a second spot opens up, the OBWB will have the transfer of knowledge already in place, and hiring a second person who has less experience will not be a concern.

In response to questions from the board, Dr. Warwick Sears noted that having the seasonal

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employee come in to allow current employees to take banked vacation time would be a good solution. This would not require an increase in the current budget, she said, adding funds are available as a result of the work provided on contract to MoE this summer.

"THAT the Okanagan Basin Water Board train a new milfoil employee to allow a smooth succession for anticipated staff retirements, by increasing the length of the seasonal employee contract to six-and-a-half months per year."

CARRIED

Dirs. Bauer and Pike abstained.

8. NEXT MEETING

The next regular meeting of the Okanagan Basin Water Board will be held on Oct. 5, 2010, at the Regional District of North Okanagan.

Dr. Warwick Sears noted that this was Ms. Dunbar's final board meeting before beginning her one–year maternity leave. The board wished Ms. Dunbar well.

9. ADJOURNMENT

"THAT there being no further business, the regular meeting of the Okanagan Basin Water Board of Sept. 7, 2010 be adjourned at 1:13 p.m."

CARRIED

Certified Correct:		
Chair		Executive Director

Okanagan Basin WATER BOARD
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MEMORANDUM

Okanagan Basin Water Board
Regular meeting
October 5, 2010
Agenda No: 6.1

File No. 0550.04

To: OBWB Directors

From: Anna Warwick Sears, Executive Director

Date: September 29, 2010

Subject: Executive Director Report

Rain to Resource Workshop Registration

OBWB directors will have free registration for both days of our workshop, but we will need to know in advance to ensure there is space and lunch. Please let us know by October 15th if you plan to attend.

Similkameen Water Governance

At our last OBWB meeting, directors requested that I develop a memo listing the reasons for and against opening the OBWB to members from the Similkameen. OBWB Chair Stu Wells cannot attend the OBWB October meeting, and he requested that we postpone this agenda item until November.

Sewage Facilities Program

All sewage grant recipients have been sent annual reporting templates for their OBWB sewage facilities funding. Although this will involve extra work for their accounting staff up-front, once completed there will be minimal additional work each year and much better record-keeping in the future.

Watermilfoil Control Program

The milfoil crew has been working on maintaining the machines, and preparing for the upcoming rototilling season. Depending on the approvals from Ministry of Environment fisheries staff, we may begin working in Osoyoos Lake in October. We now have a six-month employment contract with Dave Caswell, the manager of the (summer) milfoil program in Christina Lake. He will begin working with us on November 1st.

Water Supply & Demand Project Update

OBWB directors received a copy of the Phase 2 Okanagan Water Supply & Demand Project final report at the September OBWB meeting. At the meeting, directors expressed interest in further discussing the outcomes of this report. I have attached the Executive Summary of

the Summary Report, along with a memo from Brian Guy, our project manager, outlining how the results of the study can be used by Okanagan local governments.

Okanagan Water Supply & Demand Viewer

Work continues on the Okanagan Water Supply & Demand website. This website will integrate several outreach tools developed for the project – including the Information Database and the Okanagan Water Supply & Demand Viewer (the new title of the web interface that reports the results in graph and map form). All these web pages and tools should be completed and up on the web by our November meeting.

On September 16th, a meeting was held with the Phase 3 management team, followed by a workshop with the technical advisory committee to discuss which future scenarios held the highest priority. The recommendation of the workshop participants was to focus on (A) repeating the climate scenarios with two alternative models that give a wider range of possible climate futures; (B) develop a multi-year drought scenario that more closely matches the historical drought of record in the 1930s; and (C) develop a scenario that tests whether changing the capacity, location and management of upper elevation storage can compensate for climate change.

Westbank Irrigation District Demand Management

Director Doug Findlater provided the attached graph showing the response of Westbank Irrigation District customers to demand management - first implementing sprinkling regulations, then metering, and billing on metering. There was a 24% overall reduction of water use, despite a growth in connections and population.

Director Meeting Pay

There has been a request to review the rates of meeting pay for OBWB directors. The rate is set in the OBWB Governance Manual as the average of the meeting rate for the three regional districts. The OBWB meeting pay is currently $130/meeting, (Chair receives $180/meeting). The average meeting pay for the three regional districts is $136/meeting for regular directors. Additional compensation for the regional board chairs' meeting attendance is through monthly stipends.

January Meeting Cancelled

OBWB Chair Stu Wells has recommended that we cancel the January OBWB meeting because of conflicts with holidays and directors needing appropriate time to receive and review the agenda package. The first regular meeting of 2011 would be February 1st, in Kelowna.

EXECUTIVE SUMMARY

OVERVIEW

The Canadian Okanagan Basin (the Basin), in the southern interior of British Columbia, is the subject of the Okanagan Water Supply and Demand Project. Because of relatively high rates of water use, variable water supply, and the understanding that population growth and climate change could impact water supply and demand and the sustainability of aquatic ecosystems, in 2004 the Province initiated a project to investigate the supply of and demand for water in the Basin. The first Phase of the Project identified the information that could be used, and prepared a plan to complete the investigation. Phase 2 of the Project was initiated in 2007 by the Okanagan Basin Water Board in partnership with the Province; and was completed in collaboration with a large number of federal and provincial agencies and the Okanagan Nation Alliance. This report is a summary of Phase 2 of the Project.

OBJECTIVES

The objectives of Phase 2 were achieved:

- Completion of comprehensive basin-wide scientific studies on water supply and demand, updating work last completed in the early 1970s;
- Development of three sophisticated computer models for simulating water movement in the Okanagan: the Okanagan Water Demand Model (OWDM) that is used to determine water needs for various human uses, the Okanagan Basin Hydrology Model (OBHM), and the Okanagan Basin Water Accounting Model (OBWAM) - used to estimate natural streamflows and the effects of water storage and extractions on streamflows, groundwater, and lake levels; and
- Examining a few scenarios using the models to illustrate how they can be used to examine water alternatives under a changing climate, a growing population, a changing agricultural land base, continuation of the Mountain Pine Beetle epidemic, and changing water use efficiency.

The most important result of Phase 2 is the successful development of these sophisticated Okanagan-custom computer models. They are powerful state-of-the-art tools that can be used to simulate future water conditions in the Okanagan, and estimate the influence of both climate change and human decisions on water use and streamflows. These models also provide a way to determine how a water use or management decision made in one area of the Basin can affect another area of the Basin. These models will be useful to researchers, water suppliers, local, provincial, and federal government agencies, First Nations, and others with an interest in investigating the potential influences of natural events and human decisions on water resources.

In examining scenarios, the Phase 2 Project has not thoroughly investigated the full range of possible water futures, but instead has concentrated on illustrating some likely potential futures based on a limited examination. The technical work and the scenario outcomes have highlighted data and knowledge gaps, the important role (and the limitations of) demand management in adapting to climate change, the challenges facing water suppliers as they work to continue to provide reliable water supplies into the future, and the importance of proactive decision-making in securing a sustainable water future for the Okanagan.

Phase 2 has made optimal use of the existing information base. However, the information used has strengths and weaknesses. Each component of the Phase 2 work encountered data limitations that restrict the conclusions that can be drawn from that information. The findings, conclusions, and recommendations expressed in this report are appropriate for the level of information available. However, as more and better data become available to further develop the models, the precision and accuracy of the findings will be improved. The report makes specific recommendations for obtaining such additional data.

DELIVERABLES

Deliverables of the Phase 2 Okanagan Water Supply and Demand Project are:

- A User Needs Assessment Report;
- Reports on specific aspects of water supply and demand in the Okanagan: surface water, groundwater, water use, lake evaporation, and instream flow needs - these studies are reproduced in the Appendices to this Summary Report;
- The Okanagan Water Demand Model (OWDM), the Okanagan Basin Hydrology Model (OBHM), and the Okanagan Basin Water Accounting Model (OBWAM);
- The OkWater database, the Water Demand GIS database, and a series of climate datasets;
- The Okanagan Water Information Reference Library database;
- A web-based reporting tool; and
- A communication program.

ORGANIZATION OF THIS REPORT

This report is organized into five parts. Part One (Background) provides the context for the Phase 2 work. Part Two (Data and Databases) describes the datasets and databases developed during Phase 2, and summarizes the major technical studies completed during Phase 2. The technical studies provided the foundation for the models developed in Part Three, and are reproduced in their entirety in electronic form in the Appendices. Part Three (Models) summarizes the three models developed during Phase 2: the Okanagan Water

Demand Model (OWDM), the Okanagan Basin Hydrology Model (OBHM), and the Okanagan Basin Water Accounting Model (OBWAM). Part Four (Scenarios) describes the outcomes of the 15 Phase 2 scenarios. Part Five (Key Findings and Recommendations) lists the major findings and recommendations of Phase 2, and recommends next steps for subsequent phases of the Water Supply and Demand Project.

A glossary of key terms used in the text is provided in Section 21.0 and acronyms used are defined in Section 22.0.

KEY FINDINGS AND RECOMMENDATIONS

Key findings and recommendations of Phase 2 are described in Parts Two, Three, and Four of this report, and summarized in Sections 19.0 and 20.0. They are listed here.

- Climate change, population growth and other changes are likely to put increasing pressure on water supplies in the decades ahead. Future shortages are likely to occur in late summer when water supplies from surface sources are low and demands for water withdrawals and ecosystem needs are high.
- There is high seasonal and between-year variability in both water supply and water demand, and differences from place to place within the Basin; and robust decision-making must take into account this high variability.
- Groundwater is an increasingly important source of water for human needs, yet is under-regulated. Groundwater use should be regulated using the same system used to regulate surface water.
- Per capita water use in the Okanagan is relatively high, but there are opportunities to reduce water use through proven conservation measures.
- The Phase 2 results do not suggest an imminent widespread water crisis, rather that there is an opportunity to thoughtfully design and implement improved water management policies and practices within the Okanagan Basin. These policies and practices should include both supply-side and demand-side management strategies. Storing water in upland reservoirs will remain a key strategy for optimizing the use of tributary water sources.
- There is insufficient information available to optimize water management in the Basin. Additional data and information should be obtained on surface water, groundwater, climate, water withdrawals and distribution, aquatic ecosystem needs, lake evaporation, and evapotranspiration. Improved data on water supply and demand will enable improvements to the Project models.
- Additional scenarios should be examined to further explore the range of potential futures, and assist with the design of appropriate mitigation and adaptation measures.

- The key findings and recommendations contained within this report should be pursued in Phase 3 and potentially other future phases of the Okanagan Water Supply and Demand Project.

SUMMARY OF TECHNICAL COMPONENTS

Annual water balances

The overall annual water balance for the Basin, derived from information presented in several sections of the report, is shown in Figure 1. The values on the figure are annual totals, but they are averaged over time for the period 1996-2006, and across the entire area of the Basin. The figure does not indicate the variability which characterizes both water supply and demand. Decision-making must consider the seasonal variability in both supply and demand, the differences that exist from place to place within the Basin, and the annual variability of both supply and demand.

The annual average water balance for Okanagan Lake is shown in Figure 2.

Water Management and Use:

A summary of the water management and use studies completed in Phase 2 is provided in Section 6.0, and the key findings are summarized in Section 19.0. A total of 443,000 ML of water is licensed for withdrawal from surface sources for human use in the Basin. Of this total, 163,000 ML is supported by storage. Groundwater use does not require a licence. Although there are over 4,000 licences to store or use surface water in the Basin, about 95% of the withdrawal licences – by volume – are held by 57 of the largest water suppliers. Actual average annual water use in the Basin is 219,000 ML, derived from several sources (Figure 3).

The distribution of water used in the Basin is shown in Figure 4. Indoor domestic water use averages 150 L/person per day. Outdoor domestic water use averages 525 L/person per day year-round, i.e. more than 1,000 L/person per day during summer.

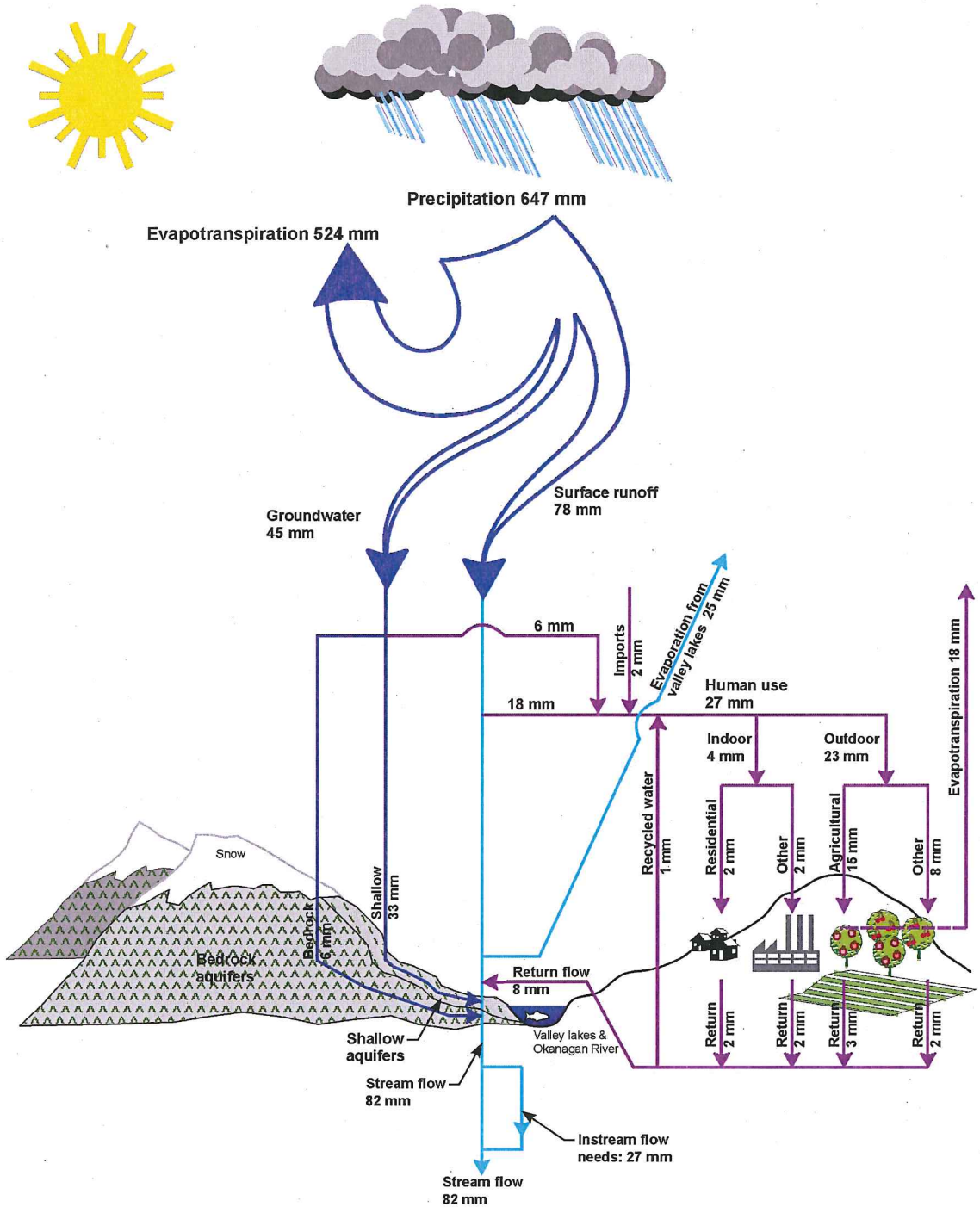

Figure 1 Average annual water balance for the Okanagan Basin.

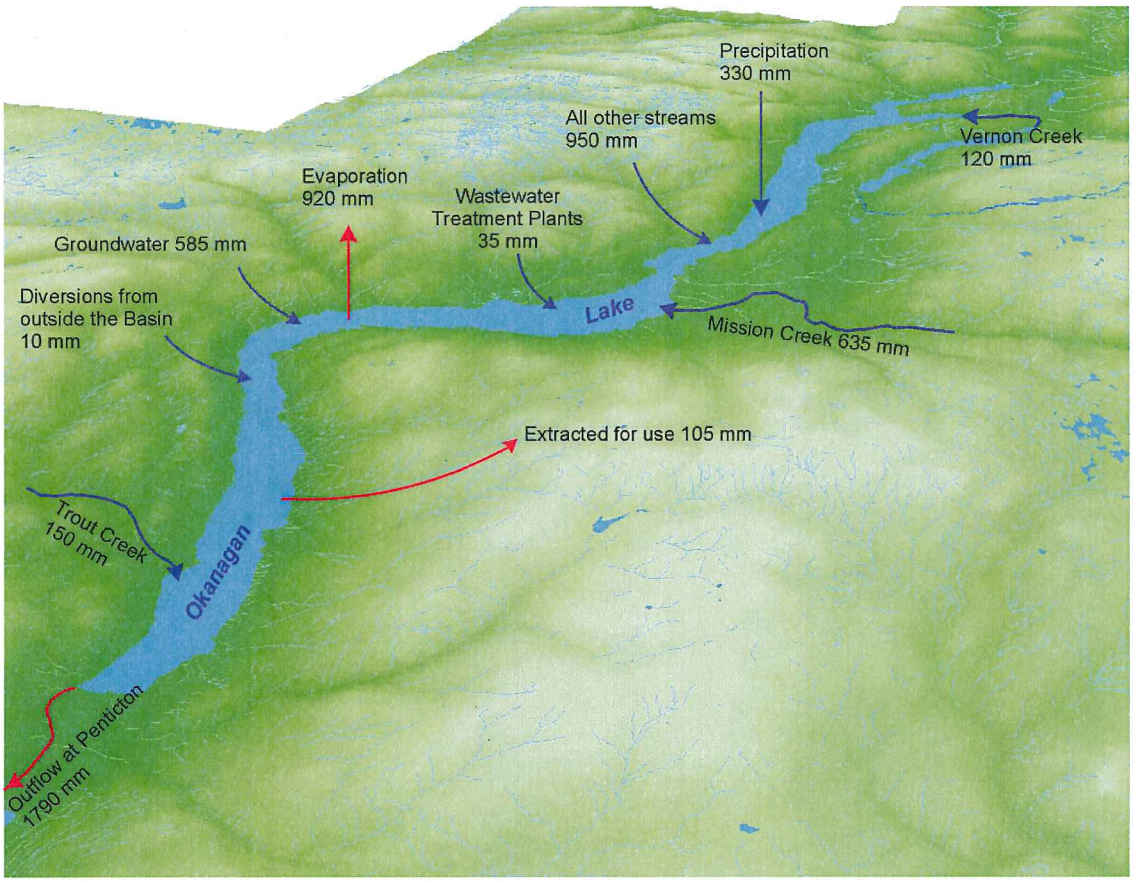

Figure 2 Average annual water balance for Okanagan Lake.

It is recommended that water suppliers measure and report their water extractions, and measure the water delivered to end-users. It is recommended that water conservation measures in all water use sectors continue to be expanded and adopted throughout the Basin, and that water suppliers should preserve their opportunities to expand storage in upland reservoirs.

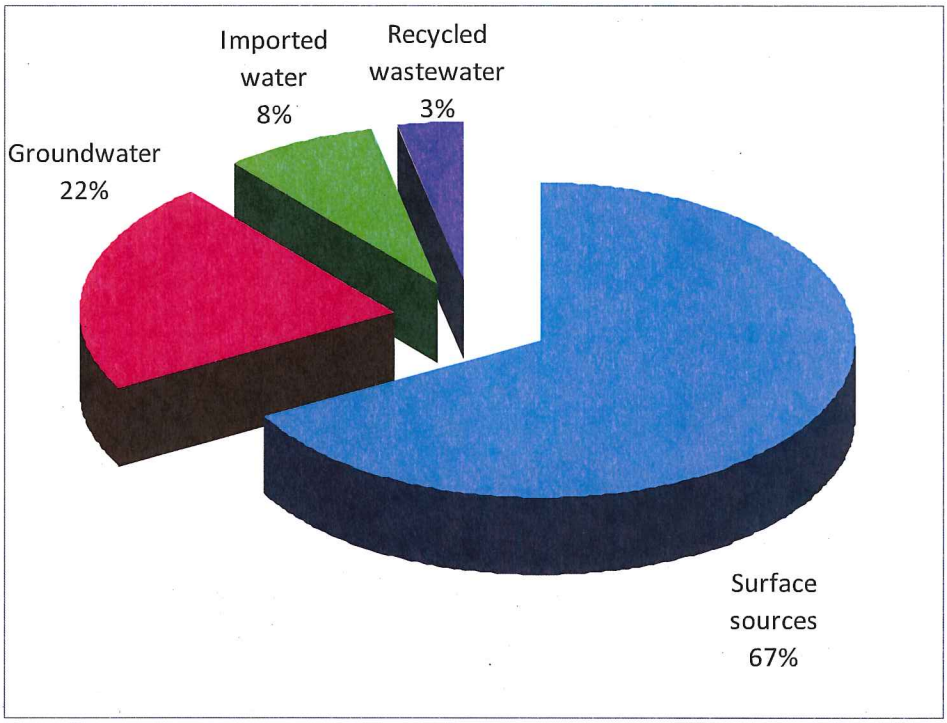

Figure 3 Distribution of total water use in the Okanagan Basin by source (based on data for 1996 to 2006).

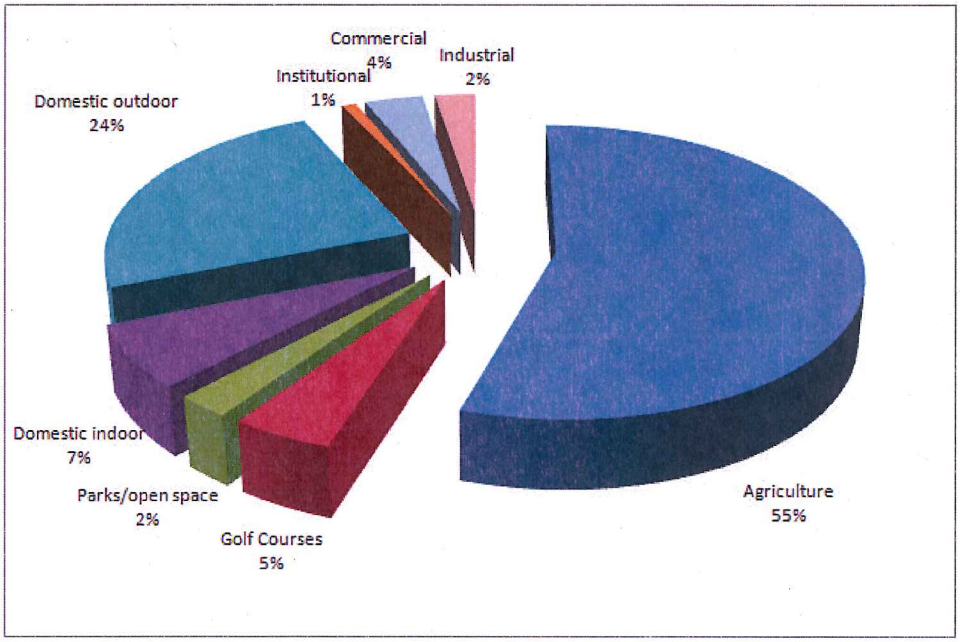

Figure 4 Distribution of water use amongst water users.

Groundwater

The groundwater studies undertaken during Phase 2 are summarized in Section 7.0. Because of minimal regulation of groundwater use, there is relatively little information on the hydrogeology and groundwater resources of the Okanagan Basin. A conceptual model of groundwater storage and flow was developed, in which most of the groundwater activity takes place in 79 distinct shallow unconsolidated aquifers, located primarily along the lower elevation valley bottoms. Estimates of groundwater discharge to Okanagan Lake vary over a wide range, which reflects the uncertainty and relative absence of information needed to make these estimates.

Additional hydrogeological characterization should be completed, and more data on groundwater extraction and on surface/groundwater interactions should be obtained. This information is needed to more adequately understand Okanagan groundwater resources. Groundwater use should be regulated using the same system used to regulate surface water.

Lake Evaporation

Section 8.0 of the report describes the investigation of lake evaporation conducted for Phase 2. The Penman-Monteith model was chosen for estimating evaporation from Okanagan Lakes, but due to a lack of direct measurements, the accuracy of the evaporation estimates is given within a fairly broad range. It is recommended that direct measurements of lake evaporation be obtained so that evaporation can be modelled with greater precision.

Surface Water Hydrology

Section 9.0 documents the studies of surface streamflow conducted during Phase 2. Several methods were used to estimate natural streamflows in tributary streams. The results were used to calibrate the Okanagan Basin Hydrology Model (OBHM). Runoff (the streamflow generated per unit of land surface area) increases from south to north, from west to east, and with elevation. About 83% of the total streamflow in the Basin enters Okanagan Lake, and areas downstream of the Lake (south of Penticton) generate only 17% of the total runoff in the Basin. Mission Creek is the largest tributary, producing 28% of the flow in the Basin, and Trout and Vernon Creeks each produce about 7% of the Basin flow. Streamflow is highly seasonal, with 86% of the streamflow generated from melting of the winter snowpack between March and July, and only 14% occurring in the other 7 months of the year.

It is recommended that additional streamflow monitoring stations be installed throughout the Basin, particularly downstream of the major storage reservoirs. Surface-groundwater interactions on the major alluvial fans in the valley bottom should be investigated to advance our understanding and improve our ability to model streamflow and groundwater discharges

to the main valley lakes and Okanagan River, and our understanding of ecosystem needs during low flow periods of the year.

Instream Flow Assessment

Desk-top methods were used in this study to identify minimum instream flow regimes in Okanagan tributaries that provide (a) minimal and (b) optimal protection for aquatic populations (Section 10.0). However, these estimates are not accurate enough to describe actual instream flow needs in individual tributaries. The work demonstrated that such desk-top methods must be supported by field-based assessments to more reliably determine instream flows needed to protect aquatic ecosystems. It is recommended that an acceptable level of risk to aquatic populations be determined in advance, then site-specific studies be completed to identify the appropriate minimum instream flows.

Scenario Results

Three custom computer models for simulating water supply and demand in the Okanagan: the Okanagan Water Demand Model (OWDM), the Okanagan Basin Hydrology Model (OBHM), and the Okanagan Basin Water Accounting Model (OBWAM) were developed and used to examine 15 potential future water supply and demand conditions. The Phase 2 work did not attempt to examine all possible futures, but rather focussed on some reasonably possible outcomes to illustrate the usefulness of the models and the scenario-running process. The models are described in Part Three of the report (Sections 13.0 through 16.0). Part Four (Sections 17.0 and 18.0) summarizes the 15 scenarios examined during Phase 2.

The Phase 2 scenarios suggest that air temperatures across the Basin will increase in future. Snowpacks will decline and melt earlier, and spring snowmelt will generate smaller amounts of runoff. The summer low flow period will likely become extended, threatening both aquatic ecosystems and human demands for water. As noted earlier, water suppliers dependent on stored water in upland reservoirs for human and environmental use later in summer should protect their opportunities to expand storage. In successive drought years, Okanagan Lake could drop below its normal operating range, and threaten the ability to release water to Okanagan River. The scenarios suggest that a significant reduction in the impacts of climate change and population growth can be achieved through proven water conservation measures.

Additional scenarios should be examined to more fully explore the range of possible changes that could occur in response to the key drivers of change: climate, population, expansion of the agricultural land base, changes to the upland forest, and use of water conservation measures.

Despite the achievement of developing three custom computer models for simulating water supply and demand in the Okanagan Basin, there is substantial room for improvement in all three models using more and better scientific data (for all the water balance components, including climate), and more and better information on existing water management practices.

NEXT STEPS

It is important to communicate Phase 2 results to stakeholders and the public within the Basin, and to extend the scientific and modelling work completed in Phase 2. Accordingly, a proposed Phase 3 work program has been developed, which can be subdivided into four components:

- Communication with stakeholders;
- Maintaining the databases and models, and using them to examine other scenarios;
- Turning results into specific policy recommendations; and
- Updating and improving the data and models.

These four programs are described in Section 20.0 of this Summary Report.

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

Date:	Sept. 15, 2010	**File:**	2008-8200.050
To:	Anna Warwick-Sears		
From:	Brian Guy		
Project:	Phase 2 Okanagan Water Supply and Demand Project		
Subject:	Uses for Phase 2 work		

MEMO

Anna:

As requested, I have prepared a brief memo that lists some of the ways in which various agencies could make use of the Phase 2 work.

Results of Technical Studies:

The technical studies (appended to and summarized within the Phase 2 Summary Report) provide a detailed and current assessment of water supply and demand in every sub-basin within the Okanagan Basin. This work has not been done since 1974 (36 years). It represents state of the art knowledge of groundwater, surface water, and water management. These studies generated some very useful results. They also identified data gaps and limitations, and provided recommendations for improving the information. Some of these findings and recommendations have already been acted upon, such as the recommendation for recording and reporting water use. Others can be acted upon in the short term as well, such the recommendations for more and better streamflow records, and more and better climate and lake evaporation data. The groundwater study identified areas vulnerable to groundwater extraction, which can be used to assist local planners. The key findings and the recommendations are summarized in Sections 19 and 20 of the Summary Report. Local, provincial, and federal agencies (including water suppliers) should review the Phase 2 work that falls within their jurisdictions and carefully consider the relevant recommendations contained within the Summary Report and its technical Appendices. The Phase 3 Working Group should also be guided by these findings and recommendations.

Phase 2 Models and Scenarios:

The technical work and the models developed in Phase 2 provide a current picture, which is as clear as the available data allows, of the state of water supply and demand over the 1996-2006 period at 81 sub-basins within the Okanagan Basin. The OWDM and the OBHM/OBWAM model outcomes (weekly values of supply and demand) are recorded in the OkWater database, and can be extracted and used by anyone with a login id and password to the database. Graphical representations are available via the web-tool.

The few scenarios that we ran are very useful at providing general indicators of future conditions. They are mostly useful to illustrate a reasonably likely set of outcomes, because we deliberately chose to examine the factors that we know are important in determining water supply and demand, and we chose middle-of-the-road assumptions to run those models (like the CGCM2 A2 climate model). The outcomes are useful for education and public outreach purposes. In addition, some decision-making can be based on the Phase 2 scenario outcomes. Careful consideration of Figure 18.6 in the Summary report allows a quantitative comparison of the impacts of each Phase 2 scenario - for example it illustrates how effective a valley-wide water use efficiency program could be, or the impact of the difference between the two assumed population growth rates, or the effect of irrigating all possible agricultural land. To support more rigorous decision-making by governments or others, I suggest examining a fuller range of possible futures during Phase 3.

Recommendations for improvements to the models themselves are provided in Section 20 of the Summary Report. The Phase 3 Working Group should consider these recommendations as it prioritizes work to be completed in Phase 3 and beyond.

Web-tool and Summary Report:

The web-tool will be useful for illustrating current conditions and a reasonably likely (but not an exhaustive) range of future conditions. This tool is intended to be helpful in reaching out to the public and other primarily non-technical audiences by illustrating complex outcomes in easily understood ways. The Summary Report can be used as the basis to design a brochure or one or more one-page summaries of the key Phase 2 information for the public or other non-technical audiences.

Specific examples of the use of the Phase 2 results are presented in the attached Table 1.

Table 1. Potential uses of the information compiled under the Okanagan Water Supply and Demand Project

No.	Who could benefit from the Okanagan Water Supply and Demand Project (OWSDP) Phase 2 information?	What could be supported by the OWSDP information?	Typical questions that could be answered	Where is the detailed information?	How could the information be used?
1	BC Ministry of Environment, Licensing and Allocation	Water licensing decisions	-How much water do we currently use?	-Appendix C: Okanagan Water Management and Use Report; -Appendix I1: Okanagan Water Demand Model Summary Report -Appendix I2: Irrigation Water Demand Model – Technical Description -Appendix I3: Residential, Industrial, Commercial, and Institutional Water Use Report -Digital information is stored within the Okanagan Water Database (refer to Appendix K for description)	Current estimates of actual water based on the best available information have been developed for the Basin. These estimates have been organized geographically by "water use area", which is equivalent to distribution areas serviced by the water suppliers. Water use has also been tallied for larger geographic areas (e.g., north, central, and south Okanagan), and for the Basin overall. These estimates can be compared with volumes currently allocated.
			-How much water do we have?	-Appendix G: Okanagan Hydrology State of the Basin Report -Digital information is stored within the Okanagan Water Database (refer to Appendix K for description)	Current estimates of the natural water supply in the Basin have been developed on a tributary by tributary basis. An 11-year record of weekly natural streamflows is available for each of 72 tributaries in the Basin. These data provide baseline information useful in licensing decisions.
			-How much water should we maintain in streams to protect aquatic life?	-Appendix H: Okanagan Instream Flow Needs Assessment Report	IFNs have been developed for each of the main tributaries in the Basin, which can be used when evaluating the potential for future allocation.
			What will the future be like?	-Appendix J: Okanagan Basin Water Accounting Model	The results from modeling current conditions and a number of potential future scenarios are provided. This report illustrates current conditions and the effects of a changing climate and changes in land use on water supply and demand. Future allocation decisions should consider future scenarios such as these. Since the number of scenarios currently modeled is not exhaustive, additional future scenarios should be also considered; this would be accomplished by additional runs of the Okanagan Basin Water Accounting Model.
2	BC Ministry of Environment, Water Management	Assessment of the natural loss of water in the Basin	-How much water do we lose by evaporation from the valley lakes?	-Appendix F1: Lake Evaporation Summary Report	Current estimates of lake evaporation from valley-bottom lakes are provided. This is a significant loss that is accounted for in lake management.
3	Local and regional governments	Long-term development planning	-Do we have enough water (surface and groundwater) to support a specific development in the valley?	-Appendix C: Okanagan Water Management and Use Report; -Appendix G: Okanagan Hydrology State of the Basin Report -Appendix D: Okanagan Groundwater State of the Basin Report -Digital information is stored within the Okanagan Water Database (refer to Appendix K for description)	The information provided in Appendix G provides an indication of the current natural surface water supply in the Basin in 72 tributary basins. Natural groundwater resources throughout the Basin are also described in Appendix D. Estimates of the current demand for water are presented in Appendix C. Note that water supply estimates reflect the quantities of water available in specific tributaries or aquifers. Water use estimates were developed geographically for "water use areas", which are equivalent to water suppliers' distribution areas. With knowledge of the source of water supplying the "water use areas", water extraction rates were also identified, which can be directly compared with the natural water supply.
			-Is our Basin-wide water supply in jeopardy now or in the future? -Where do we need to be particularly cautious?	-Appendix J: Okanagan Basin Water Accounting Model	The results from modeling current conditions and a number of potential future scenarios are provided. This report illustrates the effects of a changing climate along with changes in land use on water supply and demand. Additional OBWAM model runs can be made to assess specific future scenarios. Relatively "water-poor areas" could thereby be identified and appropriate measures put in place to avoid or mitigate water supply issues.
			-Should we look into further	-Appendix D: Okanagan Groundwater	Basin-wide investigations of groundwater resources are presented based on the best available information and estimates of

			developing groundwater resources?	State of the Basin Report -Appendix E: Okanagan Conceptual Groundwater Model Report	aquifer locations and gross water yields.
			-Will development impact the aquatic environment?	-Appendix H: Okanagan Instream Flow Needs Assessment Report	The INF report can help identify sensitive streams that should be avoided or at least approached cautiously during development.
			-Where can I find background reports?	-Appendix L: Okanagan Water Information Reference Library Database files	Appendix L identifies the process by which all supporting background reports used in the OBWSDP were catalogued and stored. Access to the database is available through the Okanagan Water Board Website at http://www.obwb.ca/obwrid/
4	Local, regional, provincial governments	Environmental protection – fisheries and aquatic habitat	-What streams are currently vulnerable to low (no) flow conditions?	-Appendix C: Okanagan Water Management and Use Report; -Appendix G: Okanagan Hydrology State of the Basin Report -Appendix H: Okanagan Instream Flow Needs Assessment Report -Digital information is stored within the Okanagan Water Database (refer to Appendix K for description)	Streams currently under pressure from over extraction can be identified based on the information presented in Appendices C, G, and H. This information can support the planning of additional flow monitoring stations and guide where enforcement of current water licenses could be focused. Public outreach and pollution prevention programs could also focus on such creeks.
			-What streams could be vulnerable in the future?	-Appendix J: Okanagan Basin Water Accounting Model -Appendix H: Okanagan Instream Flow Needs Assessment Report	The results from the modeling current conditions and a number of potential future scenarios are provided in Appendix J. This provides an example of what can be expected in future.
4	Local, regional, provincial governments	Assessment of upland development proposals	-How might the water supply be affected by upland development?	-Okanagan Basin Water Accounting Model and Okanagan Basin Hydrology Model -Appendix J: Okanagan Basin Water Accounting Model	The OBWAM and the supporting Okanagan Basin Hydrology Model are useful tools that could permit the assessment of the impact of upland development proposals or other change to the forest cover on water supply. This may include ski resort (expansion), cabins, golf courses, forestry, and mining. Note however that these are sophisticated computer models that require considerable expertise to operate.
5	Local, regional, provincial governments	Identification of additional upland storage	-Which tributaries could support additional development of upland storage?	-Appendix C: Okanagan Water Management and Use Report; -Appendix G: Okanagan Hydrology State of the Basin Report -Appendix J: Okanagan Basin Water Accounting Model	The up-to-date information on water supply, water use, IFNs can help identify where additional storage opportunities may exist. They may also help identify where inter-basin diversions are possible.
6	Local, regional, provincial governments	Assessment of the effects of a shift in agricultural activities affect the Basin	-What will be the effect of developing and irrigating all agricultural lands in the Basin -What will be the effect of moving from orchards to vineyards in terms of water use?	-Appendix I1: Okanagan Water Demand Model Summary Report -Appendix I2: Irrigation Water Demand Model – Technical Description -Appendix J: Okanagan Basin Water Accounting Model -Appendix O: Okanagan Water Demand Scenario Modeling Report -Digital information is stored within the Okanagan Water Database (refer to	The Okanagan Water Demand Model and the Okanagan Basin Water Accounting Model are powerful tools to evaluate water use (and supply) as a result of changes to the area irrigated, type of crop, type of irrigation method, and other factors. Water demands for the current conditions and selected future conditions were identified in Appendix I, J, and O. Additional model runs for specific scenarios are possible.

				Appendix K for description)	
7	Local, regional, provincial governments	Assessment of the downstream effects of forestry or other forest disturbances	-How might the water supply be affected by forest development in the uplands? -How might beetle-kill and/or fire affect the Okanagan's water supply?	-Appendix J: Okanagan Basin Water Accounting Model -Digital information is stored within the Okanagan Water Database (refer to Appendix K for description)	Forested uplands in the Basin are the source areas for the water used in the Basin. The Okanagan Basin Water Accounting Model and supporting Okanagan Basin Hydrology Model permit an evaluation on the effects of forest harvesting, forest fire, beetle-kill or other loss of the forest canopy (e.g. mining) on water supply. This information may interest forestry researchers (e.g. Rita Winkler) as well as water purveyors who are interested in source protection and who could be directly impacted. Note however that these are sophisticated computer models that require considerable expertise to operate.
8	Local, regional, provincial governments	Assessment of infrastructure design	-Will design peak flows change in the future? -Are bridges and culverts at risk in future? -How might lake levels change on Okanagan Lake?	-Appendix J: Okanagan Basin Water Accounting Model -Digital information is stored within the Okanagan Water Database (refer to Appendix K for description)	The information provided Appendix J can support whether an assessment of design conditions for infrastructure (e.g. culverts, bridges, docks, wharves, water intakes) should be made in light of potentially changing future conditions.
9	Local, regional, provincial governments	Assessment of lake levels	-Should valley lakes be managed differently in the future?	-Appendix J: Okanagan Basin Water Accounting Model -Digital information is stored within the Okanagan Water Database (refer to Appendix K for description)	The information presented in Appendix J sheds light on potential future water levels assuming current management practices. This will provide some food for thought for Provincial Water Management for how the lakes might be managed in future (e.g. perhaps greater drawdown), which could affect docks, bridges, boaters, and other recreational activities.
10	Local, regional, provincial governments	Assessment the feasibility of Okanagan River restoration	-How might future conditions affect the efforts to reestablish oxbows on the Okanagan River?	-Appendix J: Okanagan Basin Water Accounting Model -Digital information is stored within the Okanagan Water Database (refer to Appendix K for description)	Appendix J provides an indication of possible changes to not only tributaries but the mainstem Okanagan River. This could affect restoration efforts and design.
11	Local – Water Suppliers	Water supply engineering	-How much water do we currently have available from a specific source? -How much do we use? -How much more water could be potentially extracted	-Appendix C: Okanagan Water Management and Use Report; -Appendix D: Okanagan Groundwater State of the Basin Report -Appendix G: Okanagan Hydrology State of the Basin Report -Digital information is stored within the Okanagan Water Database (refer to Appendix K for description)	There is considerable up-to-date baseline information provided in Appendices C, D, G that is available. All water suppliers should be aware of this information in order to avoid any duplication of effort in future in their specific areas.
12	Public	General public concern	-How much water do we have now and in the future? -How much do we use now and in the future? -Where are the problem areas in the Basin? -Where do we get our water from and what is the proportion by streams, lakes and groundwater?	-Online web reporting tool.	The online web reporting tool, which queries a selection of the data stored in the Okanagan Water Database, will be accessible to technical experts and the public. It will provide a quick means to review a selection of the key findings of the study.

OKANAGAN BASIN
Water Supply & Demand Project

What's New?

After three years of intense study, the Okanagan Basin Water Board and B.C. Ministry of Environment have unveiled the results of the Okanagan Water Supply and Demand Study.

For the last three years, the OBWB and its partners have been conducting studies on urban and agriculture water use, groundwater, and stream flows.

"When you stand back and look at the results, ultimately they point to the need for conservation."
- Anna Warwick Sears, OBWB Executive Director.

"The Okanagan is a very dry place. We have less fresh water available per person in the Okanagan Basin than anywhere else in Canada. And yet, the average Okanagan resident uses more than two times as much water as the average Canadian."

Videos:

The Okanagan Basin

There are many compelling reasons to study water supply and demand in the Okanagan Basin:

- Everyone needs water
- Our communities are connected by the lakes
- Our economy is affected by shortages or pollution
- We can only use what is replenished

About the Project

The Okanagan Water Supply and Demand project is the most advanced water resource assessment ever conducted in Canada, using the latest models and computer technology to estimate Okanagan water availability, taking into account climate change and population growth.

The Project includes studies on groundwater, stream flows, environmental water needs, and water use - balancing water supplies and water demands through a computer accounting model.

The Okanagan Water Supply and Demand project is seeking answers to these questions:

- Is our water over-allocated?
- How do we protect groundwater?
- How will we share during shortages?
- How do we reduce risks to water quality?
- How can we be more water efficient?
- How much water do we have?
- What does the future hold?

Why Study the Okanagan Basin?
The Okanagan has the lowest per person water supply in Canada, with a growing population that is vulnerable to climate change. Our economy, and in particular, major industries such as agriculture and tourism, depend on the health of our water resources.

The last comprehensive water assessment in the Okanagan was completed in 1974. Since then, population growth has outstripped all predictions and our water management technologies have greatly improved.

Project Results
In 2005, the first phase of the project identified what data and information were available.

Overview
Project Results
Water Usage in the Okanagan
Climate Change Scenarios
Implications for the Future

Search the Okanagan Water Resource Information Database

Keyword Search:

Sort by:
- (•) Title
- ( ) Author
- ( ) Date

Order:
- (•) Ascending
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By Topic:

- Agriculture
- Conservation
- Demand
- Drought
- Groundwater
- Hydrology
- Licensing
- Metering
- Quality
- Supply
- Water Budgets

Agenda No: 6.1.2

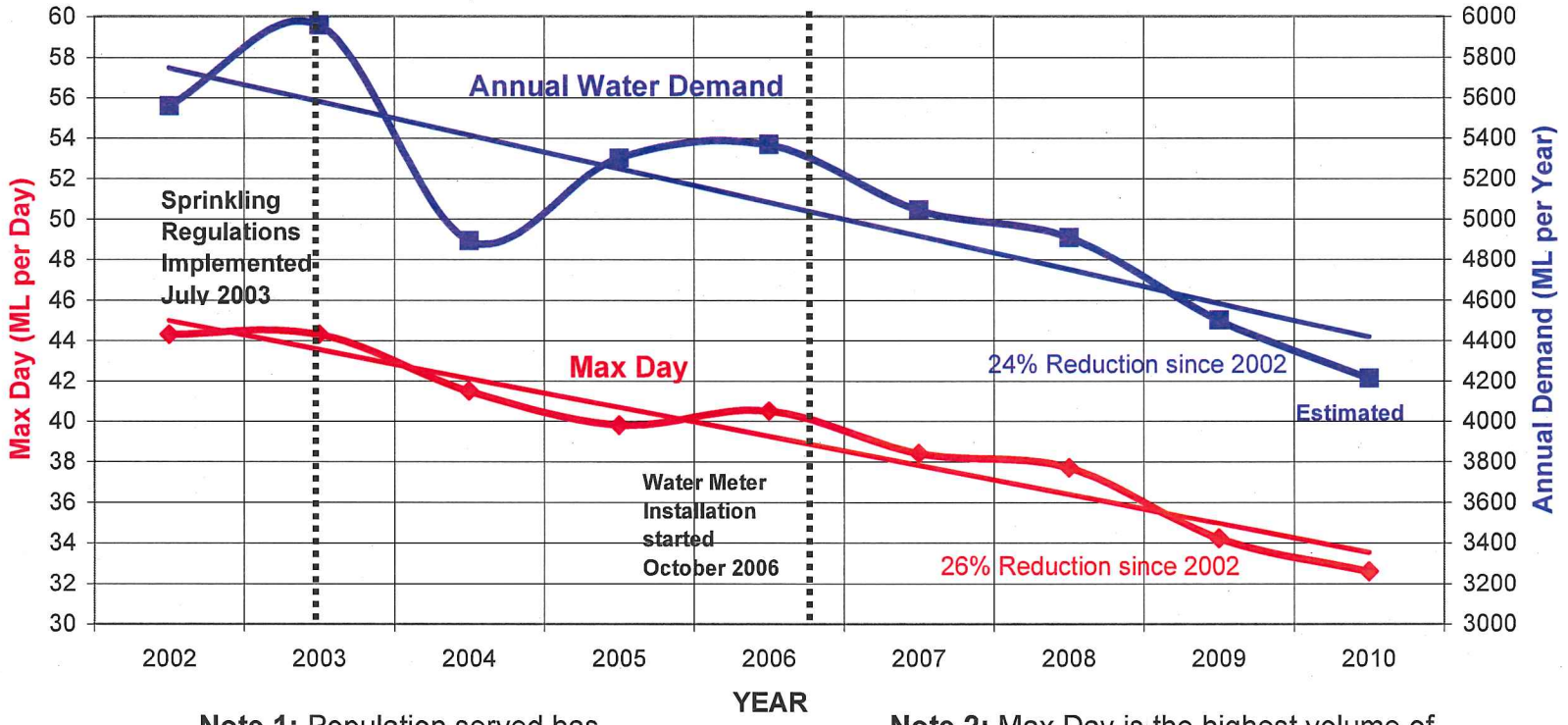
Regular: ☑ In-Camera: ☐

Date: Oct. 5 2010

OBWB

Westbank Irrigation District

Decrease in Water Consumption from 2002 - 2010



Note 1: Population served has grown by 18.5% since 2002.

Note 2: Max Day is the highest volume of water treated in any day of the year.

Okanagan Basin
WATER BOARD
Science. Management. Governance.

1450 KLO Road, Kelowna, BC V1W 3Z4
P 250.469.6271 F 250.762.7011
www.obwb.ca

MEMORANDUM

Okanagan Basin Water Board
Regular meeting
Oct. 5, 2010
Agenda No: 6.2

File No. 0550.04

To: Board of Directors

From: Nelson R. Jatel, Water Stewardship Director

Date: September 29, 2010

Subject: Water Stewardship Director's Report

This memo provides an update on some of the ongoing activities of the OBWB's Water Management Program.

1.0 WATER STEWARDSHIP COUNCIL, TECHNICAL ADVISORY COMMITTEE

The next Stewardship Council meeting will be in Kelowna (Coast Capri Hotel) on October 14th from 12:30 – 4:00pm. The council will be electing their chair and identifying priority issues for the next 18 month term.

The schedule for the remaining council meetings in 2010 is:

- Tuesday, November 2nd (joint council and board meeting)
- Thursday, December 9th

The council has started a progress review of the Sustainable Water Strategy (2008) and will have a progress report developed for early 2011.

All Board members are welcome and encouraged to attend monthly council meetings.

2.0 PROJECT UPDATES

2.1. Streamlined Water Use Reporting Tool

The Streamlined Water User Reporting Tool (SWURT) – Okanagan Pilot project is continuing to move ahead smoothly. This month our consultants have been focused on operationalizing the web-based software platform and have been developing the interfaces between FarmWest climate data for use in the user dashboard and the BC Government's BC Electronic Identification.

Additional Environment Canada funding ($18,100) has been secured to develop improved reporting capabilities of the tool, further benefiting local water utilities who report their monthly water use through the web-based tool.

The SWURT project is a partnership between the OBWB and senior levels of government to record monthly water use by large volume water users (surface and groundwater) in the Okanagan watershed. This information is critically important to support drought planning and provide improved supply and demand modeling for the Okanagan Basin.

2.2. Water usage and pricing survey project

See attached memo.

2.3. Drought Communication: Development of a drought road sign standard for the Okanagan

"Government will require all users to cut back their water use in times of drought or where stream health is threatened." BC Living Water Smart Plan (2008)

A graphic designer has been working with the steering committee's recommendations and suggestions to develop a sign prototype. Figure 1 is a preliminary design sample.

This pilot project is intended to support an ongoing communication strategy that will be delivered in partnership between the BC Government and local governments to help communicate annual drought levels. The project steering committee will be meeting in October to review preliminary sign designs and provide further input. It is anticipated that the sign standard pilot will be ready for implementation in 2011.

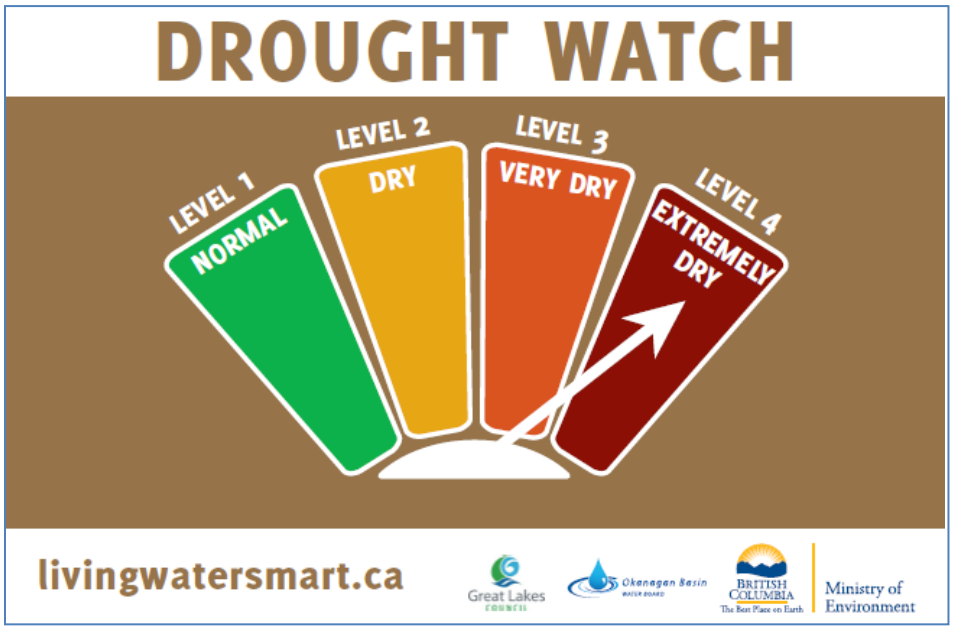


Figure 1. Example of drought level signage for use in the Okanagan Basin.

2.4. From Rain to Resources: Managing stormwater in a changing climate workshop

The OBWB in partnership with the BC Water and Wastewater Association will be hosting our rainwater workshop, October 28-29 in Kelowna. Board members are encouraged to register and participate.

From Rain to Resource 2010

Registration costs for Board and Water Stewardship Council members interested in participating will be covered in the workshop budget.

For more information or to register online visit: http://www.bcwwa.org/seminars/RtoR.htm

3.0 FUNDING OPPORTUNITIES

3.1. Agriculture and Agri-Food Canada (AAFC) Growing Forward: Innovative Approaches Program: Request for Proposal (submission deadline – October 1,2010)

As directed by the board last month, staff will be submitting a funding proposal to AAFC's Innovative Approaches Program titled: *Managing agri-environmental drought challenges using economic instruments: Investigation of Okanagan Agricultural Water Reserve policy, a versatile water demand tool.*

This project is a collaborative effort led by the OBWB. The steering committee team members include leading experts in their respective agricultural economics, policy development and law disciplines and include: Dr. John Janmaat (UBC Okanagan), Diane Dupont (Brock University), and Deborah Curran (University of Victoria).

Table 1. Summary of anticipated results and funding program objectives.

Anticipated Result	IAP Objectives
1. Investigate the implementation of an Agricultural Water Reserve in the Okanagan, BC.	Investigate policy and/or program options with the potential to achieve agri-environmental objectives and enhance the sector's competitiveness
2. Build on the Global Alliance on Climate Change: application of market tools (i.e. water pricing) to manage agri-environmental challenges due to drought conditions.	Build on current agri-environmental policies and programs by adapting and/or developing new approaches to better address critical gaps and/or persistent agri-environmental challenges
3. Study report on a contingent valuation (willingness to pay) survey to provide a valuation of irrigated agricultural land (food security, regional aesthetics, habitat, within the context of the semi-arid Okanagan landscape. 4. Study report on a choice experiment exploring the various attributes (landscapes of various forms) investigating the premium water rates for residential water over what agricultural water prices. 5. Develop a Water Pricing Policy Toolkit	Develop versatile prototypes/tools that can be utilized by the broader agri-environmental policy community to address current and emerging agri-environmental challenges and opportunities

This AAFC program was designed to investigate innovative mechanisms, tools and approaches not used extensively or tested in Canada that better enable the sector to improve its environmental performance, address agri-environmental challenges and opportunities, and enhance its competitiveness now and in the future. Outcomes will contribute to future agri-environmental policy and programming approaches.

Water Stewardship Council

Technical Advisory Committee of the Okanagan Basin Water Board

Council Members (2009-10):

o Interior Health	**Rob Birtles**
o UBC Okanagan	**Bernie Bauer (chair)**
o Okanagan Collaborative Conservation Program	**Carolina Restrepo-Tamayo**
o BC Fruit Growers Association	**Lorraine Bennest**
o Environment Canada	**Alan Boreham/ Daniel Millar**
o Okanagan Nation Alliance	**Gwen Bridge/ Howie Wright**
o BC Agriculture Council	**Hans Buchler**
o MOE, Water Stewardship Division	**Ken Cunningham**
o OCEOLA Fish and Game Club	**Lorne Davies / Aron Chatten**
o Agriculture and Agri-Food Canada	**Doug Edwards / Kirby Rietze**
o BC Groundwater Association	**Doug Geller**
o Canadian Water Resource Association	**Brian Guy**
o BC Cattlemen's Association	**Lee Hesketh**
o Water Supply Association	**Bob Hrasko**
o Regional District of North Okanagan	**Anna Page / Anthony Kittel**
o Community Futures	**Don Main**
o MOE - Fish and Wildlife Science	**Steve Matthews**
o Osoyoos Lake Water Quality Society	**Mark McKenney**
o Agriculture Canada PARC / PFRA	**Denise Neilsen**
o Urban Development Institute	**Bal Poonian**
o CORD Environmental Advisory Committee	**Chris Radford**
o Shuswap Okanagan Forestry Association	**Kerry Rouck**
o Regional District of Okanagan-Similkameen	**Jillian Tamblyn**
o Ministry of Agriculture and Lands	**Ted van der Gulik (vice-chair)**
o City of Kelowna Water Conservation program	**Mark Watt / Don Degen**
o Okanagan College	**Douglas MacLeod**

Membership

The Okanagan Water Stewardship Council is a broad-based advisory body, representing a range of water stakeholder groups and local sources of technical expertise. Council members are nominated for 18-month terms by their respective organizations, and these nominations are ratified by the OBWB.

For more information visit
www.obwb.ca or www.okwaterwise.ca.

Or contact:
Nelson R. Jatel, water stewardship director
nelson.jatel@obwb.ca
(250) 469-6295

Regular Monthly Meeting Highlights – September 2010

Excerpts from Council Member Reports:*

- The Osoyoos Lake Water Quality Society is working with Lake Country Environmental Society to create a report card for the public on our watersheds.
- BC Ground Water Association is meeting with MoE staff next week to discuss changes with pump installers. There is concern about the amount of geothermal drilling occurring.
- The International Joint Water Commission has its Annual General Meeting Sept. 28 at 7:30 p.m. at the Old Depot in Oroville.
- B.C. Ministry of Agriculture is working to have its irrigation certification program and design manual ready by winter.
- UBC-O was busy with the B.C. Water Symposium, Aug 30-Sept 1.
- The focus for Ministry of Environment this summer was on drought management. They have also been developing water management plans, and determining water flow needs, on various creeks. Some 100,000 sockeye are expected in the Okanagan River and near Oliver which hasn't been seen since recording began in the 1930s. The run is expected to peak October 15.
- Regional District of North Okanagan has been working with City of Vernon, planning a Rivers Day event, Sept 26 at Kin Beach.
- There is a new pest [*spotted wing drosophila*] fruitgrowers are battling this year – a worm that attacks soft fruit. One way to address it is to refrigerate the fruit or eat it right away.
- The UBC-O's Water Resource Chair will support a better understanding of water in the valley.
- The June CWRA conference in Vancouver included a look at the Okanagan Water Supply and Demand Study.
- Two large utilities are being amalgamated into the District of West Kelowna, the Lakeview ID and Westbank ID (which began in 1922 and is one of the first in B.C.).
- The Water Supply Association has their AGM in Osoyoos Oct. 21 and 22. The BC Water and Waste Association annual conference is scheduled to be held April 16 to 20 in Kelowna.
- The City of Kelowna has been working on filtration deferral and a Water Protection Plan with Interior Health and has been working with Kelowna's Joint Water Committee to create water drinking standards.

* For full report summary see attached Council Meeting Minutes (June 10).

Presentations & Policy Review:

Topic: ***Climate Forecasting***
Gabor Fricska from Environment Canada, Kelowna office

Recommendations / Action: Develop Progress Report for SWS.

Okanagan Basin
WATER BOARD
Science. Management. Governance.

1450 KLO Road, Kelowna, BC V1W 3Z4
P 250.469.6271 F 250.762.7011
www.obwb.ca

MEMORANDUM

Okanagan Basin Water Board
Regular meeting
Oct. 5, 2010
Agenda No: 6.2.1

File No. 0550.04

To: Board of Directors

From: Nelson R. Jatel, Water Stewardship Director

Date: September 29, 2010

Subject: Okanagan Water Pricing Study – Phase 1 Results

At the request of the OBWB, a water pricing survey was developed. It was conducted by Urban Systems and Discovery Research. The OBWB requested the development of a survey of Okanagan water utilities be conducted in order to: (1) support a baseline study of water pricing in the Okanagan, and (2) identify water pricing policies in use. Questions that are to be addressed in this short project include:

1. How do Okanagan water rates compare with other jurisdictions in BC, Washington, Canada and globally?
2. What pricing policies (flat rate, block rate, etc.) are Okanagan water utilities using?
3. How many water utilities have developed water conservation policies? Can they provide an electronic copy?
4. What are the projected capital costs for water utilities over the next planning horizon (10 years)?
5. What further water economic studies would be useful to support local water utilities manage their systems?

The 2010 OBWB water pricing survey asked Okanagan water suppliers the water prices charged for residential, agricultural and institutional water use. The survey instrument was developed and designed by Urban Systems Ltd and Discovery Research. This project was identified in our Sustainable Water Strategy as a priority project to be considered by the board.

The final report developed by Urban Systems (attached) provides an overview of the survey design and results.

Highlights from the report include:

- Over 50 different pricing formulas were reported by Okanagan utilities;
- Revenue collected per cubic meter varies significantly between ($0.15 and $1.20); and
- Respondents indicated that 64% of all connections in the Okanagan were metered.

As requested, the Urban System report identifies areas of future study for consideration in Phase II of the water pricing study. This project provides a useful baseline of water pricing information.

#304 - 1353 Ellis Street, Kelowna BC V1Y 1Z9
Telephone: 250-762-2517

URBANSYSTEMS.

MEMORANDUM

date:	September 29, 2010
to:	Nelson Jatel, Water Stewardship Coordinator
from:	Ehren Lee, P.Eng.
file #:	2508.0001.01 – C1
subject:	**OKANAGAN BASIN WATER BOARD – WATER PRICING SURVEY**

The Okanagan Basin Water Board (OBWB) engaged Urban Systems Ltd to develop a survey which explored the various methods used in the Basin for collecting water revenues. Discovery Research of Vernon, BC completed the survey through interviews with utilities in the sample group. The information was interpreted by Urban Systems Ltd. and the salient outcomes of the analyses are presented in this document.

In essence, this is a water cost-revenue assessment in the Okanagan Basin. The themes that emerge from the study can be used to guide pricing policies in the future.

This document is divided into three key sections:

1) ***Survey Design***
   - A preamble into the wording and type of questions used in the survey.
2) ***Survey Results***
   - A brief synopsis of the feedback received from the 20 respondents on salient water-value topics
3) ***Conclusions and Recommendations***
   - A brief collection of options for further investigation.

SURVEY DESIGN

Background

The following four questions were used as a starting point for developing the scope and survey questions for this assignment:

1) What pricing policies (flat rate, block rate, etc.) are Okanagan water utilities using?
2) How many water utilities have developed water conservation policies? Can they provide an electronic copy?
3) What are the projected capital costs for water utilities over the next planning horizon (5 years)?
4) What further water economic studies would be useful to support local water utilities manage their systems?

A fifth question relating to pricing benchmarking was also tabled for discussion. Ultimately, the information collected from this survey will enable future benchmarking including pricing policies between the Okanagan, throughout BC, Washington, in other arid or semi-arid environments, and beyond.

Adapting the Survey to the Local Utility Context

The survey was developed with recognition that administration, costing, and pricing in each utility varies. Accordingly, the survey was designed to build a baseline of information whereby themes would emerge and definitive comparisons could be made.

For example, utility managers often encounter graphs that depict the price of water per cubic meter in different countries cross-referenced to the average water use per person. Often, the relationship is inversely proportional in that water use is higher where the cost is relatively low. To most, this isn't surprising.

For this survey, asking for the 'water price' would not have yielded the most useful information. This is primarily due to the complexity and variety of cost recovery mechanisms used (e.g. tolls, capital charges, taxes). Ultimately, the survey was designed to arrive at the total revenue collected for the utility. Therefore, when total revenue is compared to the overall water use in cubic meters, a utility manager can arrive at a quasi 'price per cubic meter' indicator.

Survey Set-Up

The survey was comprised of four categories, based on the type of data. These categories include:

1) ***Sample Group and Water Use***
   Statistics regarding the volume of water supplied to user groups of all connection types.

2) ***Utility Management***
   Local policy or utility management techniques that may influence pricing, cost, or water use, e.g. water conservation bylaws.

3) ***Utility Expenditures***
   Statistics regarding the apparent cost of operating, maintaining, replacing, and expanding the system.

4) ***Water Revenue and Pricing Policies***
   Statistics regarding the methods used to collect revenue.

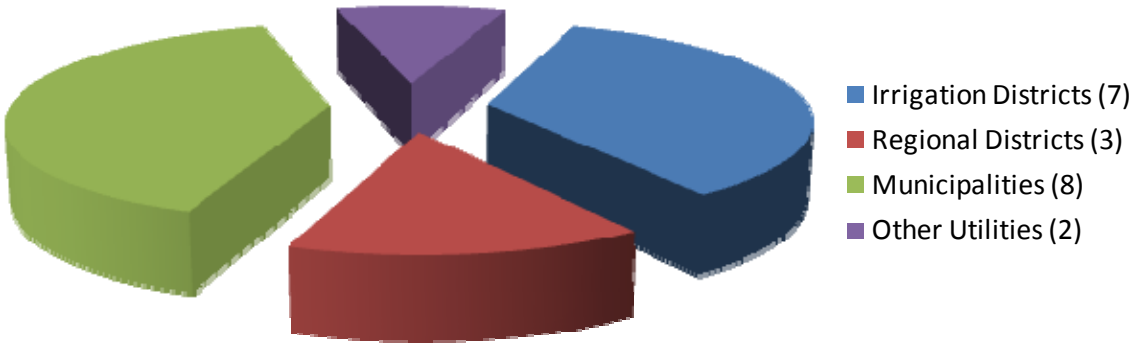
A copy of the survey is located in ***Appendix A*** for reference throughout this memo.

SURVEY RESULTS

Sample Group and Water Use

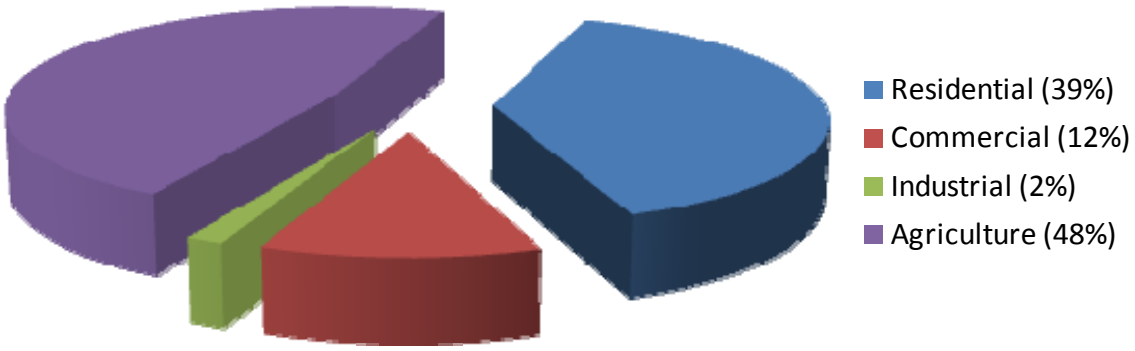
- Surveys were distributed to 22 utilities and 20 responses were received. The sample group was comprised of a mix of regional district, irrigation, and municipal utilities, as illustrated in ***Figure 1***.

Figure 1: Utility Type Breakdown – Sample Group



- Water demand per connection was examined to allow for an opportunity to compare the sample group to Basin water use trends i.e. determine if the sample group was representative. ***Figure 2*** illustrates the water use breakdown for the sample group.

Figure 2: Water Use Breakdown – Sample Group



Utility Management

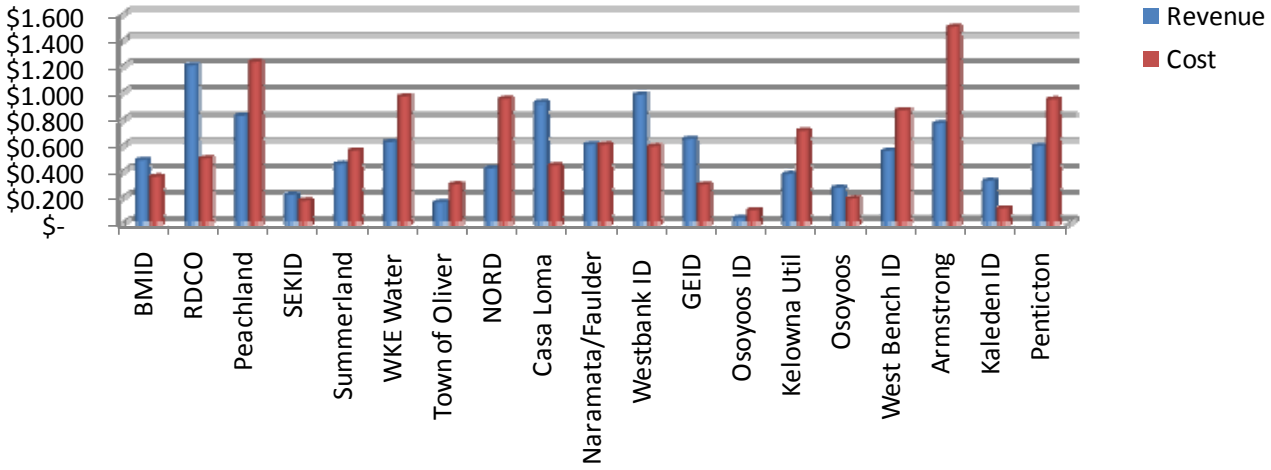
- The overwhelming majority of connections from the sample group are equipped with water meters. At the lower end, 64% of residential customers are metered, whereas 98% of industrial customers are metered, at the high end. Over 70% of agriculture connections are metered.

- 40% of the respondents have a water conservation pricing policy.
- In general, utilities are not building reserves for specific purposes (e.g. capital replacement).
- 67% of respondents have developed an estimate for losses in the system. The average leakage percentage was 4.7% which is likely underestimated.
- There are no stated subsidies in the sample group. For example, there are no low-income assistance subsidies.
- For most utilities that have relatively high agriculture water use, water meters are used to inform agriculture customers of water use, instead of for volumetric pricing. However, volumetric surcharging tends to occur when water use exceeds the annual allotment. In some cases, it is reported that water supply will be shut-off instead of the surcharge.

Utility Expenditures

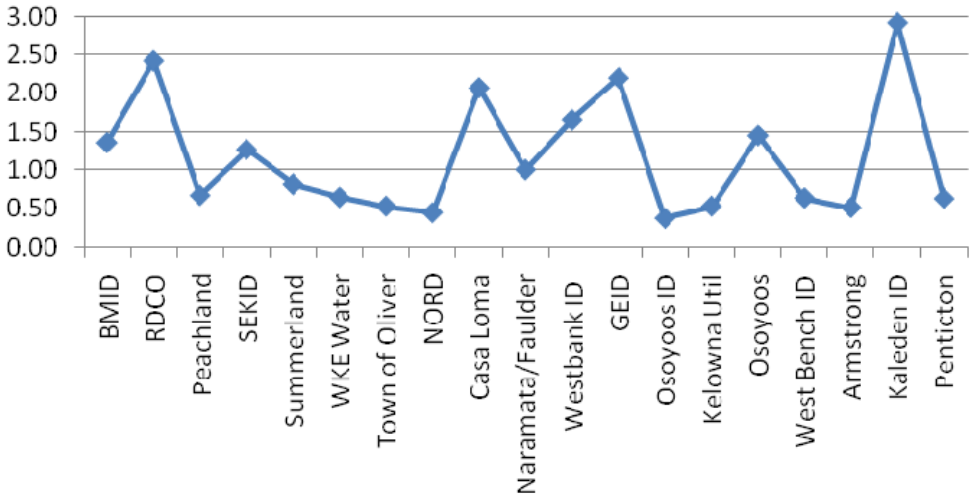
- Comparing costs (operation and capital) amongst utilities should be done over longer terms to get a true representation of total expenditures (e.g. using 10 year rolling averages). This is primarily due to the variability of capital projects from year to year.
- 65% of respondents were able to provide a replacement value for water assets i.e. their entire water system.
- Operating costs per cubic meter range from $0.089 to $0.614 per cubic meter. The average cost per cubic meters is $0.32. If utilities were employing a consistent, full-cost accounting system, the cost to supply water per cubic meter throughout the Basin may not be as variable. This likely suggests that utilities are not consistent in their approach to cost accounting.
- 95% of communities reported that they separate utility costs into ‘fixed’ and ‘variable’ categories. It is important to separate the costs that are water use related (variable) and non-water use related (fixed) in developing water rates. On average amongst the respondents, fixed and variable costs are split 63% and 37%, respectively.
- The total of operating + capital costs were rarely similar to revenue collected per cubic meter, as illustrated in ***Figure 3*** and ***Figure 4***. These indicators reinforce the challenge utilities face in maintaining stable water utility rates when considering the dynamic nature of costs related to community growth, asset deterioration, water availability, and other factors.

Figure 3: Comparison of Revenue vs. Operating + Capital Costs



- ***Figure 4*** illustrates the variability between cost and revenue in 2009. This is due to many factors and reinforces the challenge that utilities face in ensuring financial stability of the utility.

Figure 4: Utility Revenue vs. Cost Ratio



Water Revenue and Pricing Policies

- One utility utilizes over 50 different pricing formulas for the various types of user on the system.

- One utility increased water rates to account for the introduction of the new municipal accounting protocol well known as “Tangible Capital Assets” or PSAB 3150 (Public Service Accounting Board).

- Revenue collected ($) per cubic meter varies significantly between a range of $0.15 to $1.20. The average revenue collected per cubic meter by the utilities is about $0.565.

- ***Figure 5*** illustrates the percentage breakdown for the four common methods for collecting water revenue: grants, taxes, tolls, and user rates. Each utility is essentially free to decide which method and by what percentage to use of any of the four methods. ***Figure 6*** illustrates the variability of the percentage breakdown for each of the respondents. The variability in cost recovery mechanisms makes it difficult to compare water 'pricing' from utility to utility.

Figure 5: Makeup of Toll % Per Utility

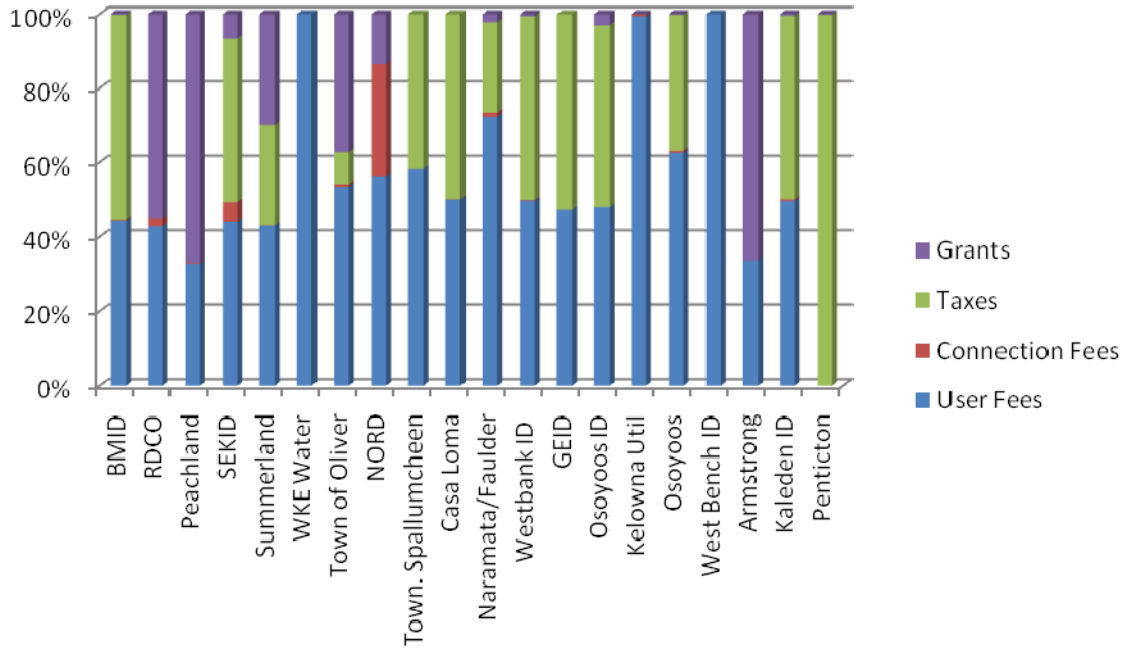
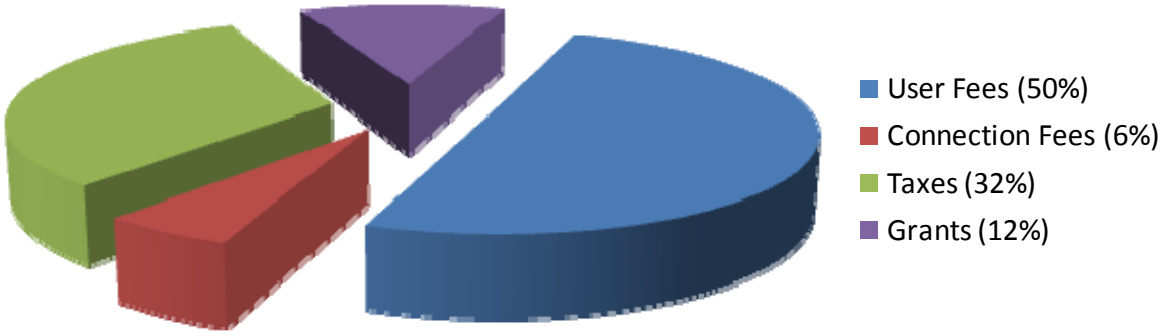


Figure 6: Toll Type Breakdown



- For utilities that are eligible for senior government funding, grants constituted 18% of overall revenue in 2008 and 2009. This level is expected to decrease rapidly in 2011.

- While 64% of all connections are metered, water utilities have not implemented volumetric pricing to the degree that could be possible with the degree of metering in place. ***Table 1*** summarizes the types of volumetric rates of the sample group (n=20), which of the rates are uniform or incline, and the total.

Table 1: Volumetric Rate Results

Residential			Agricultural			Industrial			Commercial		
Uniform	**Incline**	**Total**	**Uniform**	**Incline**	**Total**	**Uniform**	**Incline**	**Total**	**Uniform**	**Incline**	**Total**
2	3	**5**	2	3	**5**	2	3	**5**	8	1	**9**

- 65% of respondents have agriculture water rates. Of the 13 respondents, 23% utilize volumetric pricing (as a part or the entire user rate).

- Most agriculture water rates are based on land base and a designated water allotment. In most cases, when a customer exceeds their allotment, a volumetric surcharge is applied (based on volumetric use).

- The differences between agriculture pricing policies (e.g. land size and allotment influences) prevented a straight forward comparison between utilities on the price of agriculture user rates.

- The link between water use and pricing for agriculture is not as obvious as it may be for residential and commercial customers. For example, hitting the 'pockets' of residential consumers is an effective way to reduce non-essential water use habits. For agriculture customers however, water use can be considered a necessity; up to a point. This notion is exemplified by the demand management techniques employed by the sample group. In other words information, education, operations tools, and crop/equipment automation are seen as essential techniques for managing agricultural water use. Water pricing is also a factor in managing agriculture water use, but it is one of a list of factors that is much longer than for residential and commercial connections.

Appendix B includes a summary of the survey feedback compiled by Discovery Research.

CONCLUSIONS AND RECOMMENDATIONS

The OBWB may consider additional consideration or investigations into the following topics:

- To recognize that there are multiple cost recovery mechanisms (user fees, taxes, connection fees, development cost charges, etc) to pay for water services. And, that at least initially, the most useful

comparison between utilities is based on revenue collected per cubic meter, instead of rates specified in existing policies or bylaws.

- To work with utilities that already employ water meters in order to develop a list of tools that will assist them in transitioning from flat rate structures to volumetric based pricing. Based on survey respondents, over 64% of the sample group is poised for volumetric pricing (simply, because meters are installed and actual water demands are available).

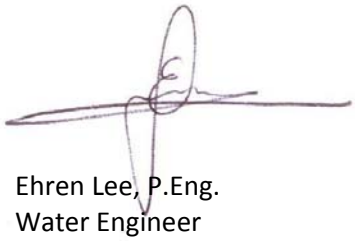
- To recognize that water conservation pricing policies may be better implemented for residential and commercial customers after volumetric based pricing has been introduced.

- To recognize that the link between agriculture water pricing and water conservation is not as straightforward as with residential and commercial customers. Further, that education, operations tools, and automation may be better suited to reducing water use with agriculture and industrial customers (initially) than through the use of pricing policies. Water pricing is a factor in managing agriculture water use, but it is one of a list of factors that is much longer than for residential and commercial connections.

- To recognize that infrastructure investment planning (the next phase of tangible capital asset reporting) is a key step in understanding true cost of service delivery. This is a key step in a long-term process of communicating the value of water to Basin residents.

Sincerely,

URBAN SYSTEMS LTD.



Ehren Lee, P.Eng.
Water Engineer

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Appendix A

SURVEY

OBWB Potable Water – Usage & Pricing Survey

Thank you for agreeing to complete this important survey for the Okanagan Basin Water Board. Please fill in the requested information below, send back the completed survey within the next **3 days**. Thank you for your participation!

CURRENT SYSTEM – Total Demand:

1. Total volume of water delivered in 2009? **[Please include the unit of measure you are using.]**
TOTAL: (Quantity)_____Q1_1_____

2. Total volume of water delivered, to each connection type?
Res: (Quantity)_____Q2_1_____
Com: (Quantity)_____Q2_2_____
Indus: (Quantity)_____Q2_3_____
Agric: (Quantity)_____Q2_4_____ Total Q2_5

3. Estimate for leakage in 2009? (%)_Q3___ **[AS A % OF TOTAL WATER DELIVERED]**

4. Total number of service connections, by type?
Res: (Number)____Q4_1_____
Com: (Number)____ Q4_2_____
Indus: (Number)_____ Q4_3_____
Agric: (Number)_____ Q4_4_____
TOTAL: _____ Q4_5____

5. Do you have any metered connections? If so, what percentage of service connections are metered, by type of connection? **[INCLUDING 0% OR 100%, WHERE APPLICABLE]**
Res: (%)__Q5_1____ metered
Com: (%)__Q5_2____ metered
Indus: (%)__Q5_3____ metered
Agric: (%)__Q5_4____ metered

6. Is there a common/standard grade of water supply or are there different grades?
[1] Common/standard grade; **[IF COMMON GRADE, "WHAT GRADE IS THAT?"]** **Q6_1**
- [ ] Filtered Q6_2_1
- [ ] Chlorinated Q6_2_2
- [ ] UV (ultraviolet) treated Q6_2_3
- [ ] "Other" (Please specify):

_____Q6_2oth_____

[2] Different grades

7. Do you have a water conservation pricing policy? [1] Yes [2] No

CURRENT SYSTEM – Total Expenditures:

8. In your Five Year Capital Plan, what is the total value of water infrastructure projects? (if no official Five Year Capital Plan, then "the total 5-year expenditures from FY 2009/10 thru to 2013/14 for water infrastructure?") ($) _____Q8_____

9. For each of the past two years (2008 and 2009), what were the total amounts for capital expenditures and for operating expenditures?

2008 ($)_____Q9_1_____ capital expenditures
($)_____Q9_2_____ operating expenditures

2009 ($)_____Q9_3_____ capital expenditures
($)_____Q9_4_____ operating expenditures

10. For 2009 operating expenditures, what is the % mix of fixed costs and variable costs?
[Total = 100%] (%)__Q10_1___ Percent that are Fixed costs
(%)__Q10_2___ Percent that are Variable costs (related to water use)

11. What is the "replacement value" of your water infrastructure? ($) _____Q11_____ _____

11a. Is the "replacement value" an estimated figure or a calculated figure? ☐ an estimated figure
Q11_a ☐ a calculated figure

TOTAL REVENUES – Water Rates:

12. For 2009, the total dollar amount of user fees, by type of connection?
Res: ($)_____Q12_1_____
Com: ($)_____Q12_2_____
Indus: ($)_____Q12_3_____
Agric: ($)_____Q12_4_____
TOTAL: _____ Q12_5_____

13. For 2009, the total dollar amount of connection fees, by type of connection?
Res: ($)_____Q13_1_____
Com: ($)_____Q13_2_____
Indus: ($)_____Q13_3_____
Agric: ($)_____Q13_4_____
TOTAL: _____ Q13_5_____

14. Are the user fees flat rates or metered rates for each type of connection?
And what is (are) the rate(s)?

IF FLAT, FILL IN RATE per time period ($ per month, per quarter, per year, etc.)	**IF METERED, FILL IN RATE per unit of measure ($ per acre foot, per cubic meter, per litre, etc.)**
Res: flat ($Q14_1_per_____)	… or metered ($Q14m_1per_____)
Com: flat ($Q14_2_per_____)	… or metered ($Q14m_2per_____)
Indus: flat ($Q14_3_per_____)	… or metered ($Q14m_3per_____)
Agric: flat ($Q14_4_per_____)	… or metered ($Q14m_4per_____)

15. Have you increased rates in 2009 to account for depreciation of tangible capital assets (TCA)?
☐ No Q15_1
☐ Yes, user rates ….. **[IF YES]** By what percent? (%)__Q15_2___
☐ Yes, connection rates … **[IF YES]** By what percent? (%)_Q15_3___

TOTAL REVENUES – Taxes & Subsidies:

16. For 2009, what were the total water-related taxes or tolls collected? **[CHECK ONE BOX ONLY]**
Q16_1 ($)___Q16_2_____ (or)
☐ (%)_Q16_3__ **[IF % of total taxes/tolls, ENTER total taxes/tolls]** ($)__Q16_4__
☐ ZERO … There were **NO** taxes collected for water-related services (or)
☐ Taxes/tolls were collected, but **UNABLE** to break out water-related amount

17. For each of the past two years (2008 and 2009), what were the total grants or subsidies awarded to "potable water" projects? (e.g., from Federal or Provincial government or another source)
2008 ($)_____Q17_1_____
2009 ($)_____Q17_2_____

18. Are there any stated subsidies for any types of connection; and if so, what is the stated subsidy amount for that type of connection? **[CHECK THIS BOX IF NO STATED SUBSIDIES]** ☐ .
Q18_1 thru 4 … and Q18m_1 thru 4

[IF YES, FILL IN THE AMOUNT OF THE "STATED SUBSIDY", WHERE APPLICABLE]

Res:	flat ($_____per_____)	… or metered ($_____per_____)
Com:	flat ($_____per_____)	… or metered ($_____per_____)
Indus:	flat ($_____per_____)	… or metered ($_____per_____)
Agric:	flat ($_____per_____)	… or metered ($_____per_____)

19. What is the total amount of your "**current**" water reserve fund?
($)_____Q19_____

20. And do you have a "**targeted**" water reserve fund amount you would like to have? If so, what?
[CHECK ONE BOX ONLY]
- ☐ "**No**", do not have a "targeted" amount Q20_1
- ☐ "Yes" - ($)_____Q20_2_____ a dollar amount (or)
- ☐ "Yes" - (%)__Q20_3__% of the asset value of the water system

21. Overall, how often do you transfer budget funds between "general operating" funds and "water utility" funds"? Q21
- ☐ Always
- ☐ Often/frequently
- ☐ Sometimes/occasionally
- ☐ Seldom/infrequently
- ☐ Never

22. Lastly, are there any other economic studies that would be useful to help improve the management of your water utility?
- ☐ No
- ☐ Yes **[USE SPACE BELOW – PLEASE BE SPECIFIC]** **Q22**

_____

_____

23. That completes the survey – do you have any other comments?
- ☐ No
- ☐ Yes **[USE SPACE BELOW – PLEASE BE SPECIFIC]** **Q23**

_____

_____

Thank you very much for your help.

Within the next three (3) days:
- **Please scan & email this back to me – EMAIL << jmusgrav@vip.net >>**
- **Or, fax the completed survey back to Discovery – FAX (250) 503-2189**
- **Or, phone me and I'll record your survey answers – PH (250) 498 4574**

Thanks!

Appendix B

SURVEY RESULTS SUMMARY (DISCOVERY RESEARCH)

DISCOVERY RESEARCH
Tel: (250) 503-2181 Fax: (250) 503-2189
www.discoveryresearch.ca

Okanagan Basin Water Board Telephone Survey: N=20 Detailed Tables

- *Results - Total*
- *Results – by Water Volume Delivered*
- *Results – by Type of Water Connection (where applicable)*

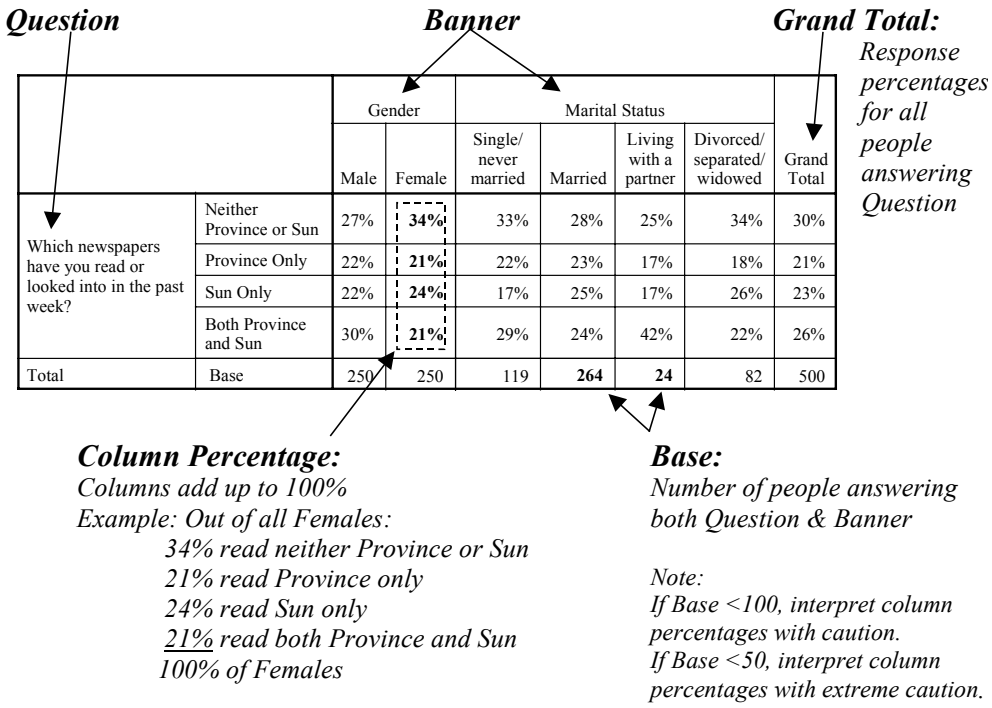
Prepared for: **OBWB**

Prepared by: **Discovery Research**

Date: **September 2010**

How to Read Detailed Tables:

Banner Legend:



Detailed Tables:

Water Volume:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
Total volume of water delivered in 2009, in Mega Litres (ML)	Less than 10,000	**55%**	100%	
	More than 10,000	**45%**		100%
Total	Base	**20**	**11**	**9**
"Total volume of water delivered in 2009, in Mega Litres (ML)"	Maximum	**925125**	7287	925125
	Mean	**53165**	2042	115648
	Median	**5895**	1394	13523
	Minimum	**27**	27	10215

Water Volume by Type of Connection:

		"Total volume delivered to Residential-ML"	"Total volume delivered to Commercial-ML"	"Total volume delivered to Industrial-ML"	"Total volume delivered to Agricultural-ML"
Total	Maximum	**61675**	**6994**	**762**	**863450**
	Mean	**6985**	**1065**	**359**	**82959**
	Median	**2761**	**173**	**161**	**4200**
	Minimum	**27**	**54**	**27**	**88**
	Base	**15**	**10**	**5**	**11**

Leakage:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
Estimate for leakage in 2009 (%)?	1-5%	**69%**	86%	50%
	6-10%	**31%**	14%	50%
Total	Base	**13**	**7**	**6**
"Estimate for leakage in 2009 (%)?"	Maximum	**10%**	10%	10%
	Mean	**5%**	4%	5%
	Median	**5%**	4%	6%
	Minimum	**1%**	1%	1%

Service Connections:

		"Total number of Residential service connections"	"Total number of Commercial service connections"	"Total number of Industrial service connections"	"Total number of Agricultural service connections"	"Total number of service connections"
Total	Maximum	**21077**	**9000**	**160**	**1927**	**23846**
	Mean	**3813**	**629**	**14**	**316**	**4772**
	Median	**1991**	**32**	**0**	**65**	**2213**
	Minimum	**0**	**0**	**0**	**0**	**41**
	Base	**20**	**20**	**20**	**20**	**20**

Metered Connections:

		"Percentage of Residential service connections that are metered"	"Percentage of Commercial service connections that are metered"	"Percentage of Industrial service connections that are metered"	"Percentage of Agricultural service connections that are metered"
Total	Maximum	**100%**	**100%**	**100%**	**100%**
	Mean	**44%**	**59%**	**83%**	**49%**
	Median	**20%**	**100%**	**100%**	**43%**
	Minimum	**0%**	**0%**	**0%**	**0%**
	Base	**19**	**14**	**6**	**16**

Water grade:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
"Is there a common or standard grade of water supply or are there different grades?"	Common, standard grade	**70%**	91%	44%
	Different grades	**30%**	9%	56%
Total	Base	**20**	**11**	**9**

Water Treatment:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
How is your potable water treated?	Chlorinated	**95%**	100%	89%
	UV - ultraviolet treated	**35%**	36%	33%
	Filtered	**15%**	9%	22%
	Other-Chemical	**5%**		11%
Total	Responses	**30**	**16**	**14**
	Base	**20**	**11**	**9**

Column percentages may exceed 100% because multiple responses given

Conservation Policy:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
"Do you have a water conservation pricing policy"	Yes	**40%**	36%	44%
	No	**60%**	64%	56%
Total	Base	**20**	**11**	**9**

Infrastructure Projects:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
In your Five Year Capital Plan, what is the total value of water infrastructure projects?	<$5 million	**61%**	78%	44%
	$5+ million	**39%**	22%	56%
Total	Base	**18**	**9**	**9**
"In your Five Year Capital Plan, what is the total value of water infrastructure projects?"	Maximum $	**75000000**	14000000	75000000
	Mean $	**11357193**	3765127	18949259
	Median $	**3284687**	1739000	8694200
	Minimum $	**0**	0	430000

Capital Expenditures:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
2008 total capital expenditures	<$5 million	**95%**	100%	89%
	$5+ million	**5%**		11%
Total	Base	**20**	**11**	**9**
"2008 total capital expenditures"	Maximum $	**7454202**	1495013	7454202
	Mean $	**1268265**	329301	2415889
	Median $	**528989**	207056	1985658
	Minimum $	**0**	0	10000

Capital Expenditures:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
2009 total capital expenditures	<$5 million	**85%**	100%	67%
	$5+ million	**15%**		33%
Total	Base	**20**	**11**	**9**
"2009 total capital expenditures"	Maximum $	**24741000**	4293099	24741000
	Mean $	**2853341**	666739	5525855
	Median $	**217019**	55000	2500000
	Minimum $	**0**	0	110000

Operating Expenditures:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
2008 total operating expenditures	<$5 million	**90%**	100%	78%
	$5+ million	**10%**		22%
Total	Base	**20**	**11**	**9**
"2008 total operating expenditures"	Maximum $	**9044000**	2823000	9044000
	Mean $	**1856675**	773252	3180858
	Median $	**955725**	607988	2300000
	Minimum $	**64348**	64348	150000

Operating Expenditures:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
2009 total operating expenditures	<$5 million	**90%**	100%	78%
	$5+ million	**10%**		22%
Total	Base	**20**	**11**	**9**
"2009 total operating expenditures"	Maximum $	**8426000**	2349000	8426000
	Mean $	**1940411**	773932	3366108
	Median $	**1230805**	550771	2300000
	Minimum $	**66956**	66956	150000

Fixed Costs:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
Percentage of operating expenditures that are fixed costs (%)	0-50%	**22%**	18%	29%
	51-100%	**78%**	82%	71%
Total	Base	**18**	**11**	**7**
"Percentage of operating expenditures that are fixed costs (%)"	Maximum	**90%**	83%	90%
	Mean	**63%**	63%	63%
	Median	**68%**	70%	65%
	Minimum	**15%**	15%	25%

Variable Costs:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
Percentage of operating expenditures that are variable costs (%)	0-50%	**78%**	82%	71%
	51-100%	**22%**	18%	29%
Total	Base	**18**	**11**	**7**
"Percentage of operating expenditures that are variable costs (%)"	Maximum	**85%**	85%	75%
	Mean	**37%**	37%	37%
	Median	**33%**	30%	35%
	Minimum	**10%**	17%	10%

Replacement Value:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
What is the replacement value of your water infrastructure? ($millions)	<$50 million	**57%**	71%	43%
	$50+ million	**43%**	29%	57%
Total	Base	**14**	**7**	**7**
"What is the replacement value of your water infrastructure? ($millions)"	Maximum $	**664**	90	664
	Mean $	**111**	34	188
	Median $	**35**	25	105
	Minimum $	**6**	6	8

Replacement Value Estimated or Calculated:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
"Is the replacement value an estimated figure or a calculated figure?"	An estimated figure	**36%**	43%	29%
	A calculated figure	**64%**	57%	71%
Total	Base	**14**	**7**	**7**

User Fees:

		"2009 Residential user fees"	"2009 Commercial user fees"	"2009 Industrial user fees"	"2009 Agricultural user fees"	"2009 Total user fees"
Total	Maximum $	5466000	205000	130000	669471	6137170
	Mean $	1255315	55682	28770	174610	1529009
	Median $	694772	24226	890	59217	826386
	Minimum $	33971	0	0	0	33971
	Base	17	13	7	14	18

Connection Fees:

		"2009 Residential connection fees"	"2009 Commercial connection fees"	"2009 Industrial connection fees"	"2009 Agricultural connection fees"	"2009 Total connection fees ($)"
Total	Maximum $	2340000	88000	66000	611000	3105000
	Mean $	193464	9370	9429	61311	197422
	Median $	2682	0	0	0	7000
	Minimum $	0	0	0	0	0
	Base	13	10	7	10	17

Rates Increased for 2009 for TCA:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
"Have you increased rates in 2009 to account for depreciation of tangible capital assets (TCA)?"	No	95%	91%	100%
	Yes, user rates by 2%	5%	9%	
Total	Base	20	11	9

Taxes and Tolls:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
For 2009, what were the total water-related taxes or tolls collected?	<$1 million	**50%**	80%	29%
	$1+ million	**50%**	20%	71%
Total	Base	**12**	**5**	**7**
"$ amount"	Maximum $	**6243002**	2175436	6243002
	Mean $	**1399082**	616350	1958177
	Median $	**648157**	283555	1026000
	Minimum $	**68020**	68020	160000

2008: Grants and Subsidies:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
For 2008, what were the total grants or subsidies awarded to 'potable water' projects? (e.g., from Federal or Provincial government or another source)	<$50k	**70%**	73%	67%
	$50k+	**30%**	27%	33%
Total	Base	**20**	**11**	**9**
"For 2008, what were the total grants or subsidies awarded to 'potable water' projects? (e.g., from Federal or Provincial government or another source)"	Maximum $	**3199056**	2300000	3199056
	Mean $	**338496**	280169	409783
	Median $	**9000**	0	15000
	Minimum $	**0**	0	0

2009: Grants and Subsidies:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
For 2009, what were the total grants or subsidies awarded to 'potable water' projects? (e.g., from Federal or Provincial government or another source)	<$50k	**70%**	64%	78%
	$50k+	**30%**	36%	22%
Total	Base	**20**	**11**	**9**
"For 2009, what were the total grants or subsidies awarded to 'potable water' projects? (e.g., from Federal or Provincial government or another source)"	Maximum $	**2800000**	2800000	2614000
	Mean $	**622853**	703667	524081
	Median $	**7383**	20000	5265
	Minimum $	**0**	0	0

Water Reserve Fund:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
What is the total amount of your CURRENT water reserve fund?	<$500k	**40%**	55%	22%
	$500k+	**60%**	45%	78%
Total	Base	**20**	**11**	**9**
"What is the total amount of your CURRENT water reserve fund?"	Maximum $	**12000000**	3926626	12000000
	Mean $	**2256359**	1164914	3590347
	Median $	**1134205**	448500	2731378
	Minimum $	**0**	40000	0

Target Water Reserve Fund:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
"And do you have a targeted water reserve fund amount you would like to have?"	No - don't have a target amount	**75%**	82%	67%
	Yes -$2 million	**10%**	18%	
	Yes -10% of water system asset value	**5%**		11%
	Yes - $100K	**5%**		11%
	Yes - $490K	**5%**		11%
Total	Base	**20**	**11**	**9**

Transfer of Budget Funds:

		Total	Total volume delivered (ML)	
			<10,000	10,000+
"Overall, how often do you transfer budget funds between general operating funds and water utility funds?"	Always	**10%**	18%	
	Often, frequently	**15%**	9%	22%
	Sometimes, occassionally	**5%**	9%	
	Seldom, frequently	**15%**		33%
	Never	**55%**	64%	44%
Total	Base	**20**	**11**	**9**

Verbatim Comments:

Question 22:

"Lastly, are there any other economic studies that would be useful to help improve the management of your water utility?"

- 1.Most of our costs are for hydro. Any studies on how to minimize pumping costs? 2. How to recruit volunteers
- Aquifer study
- Brief on water costs in other jurisdictions
- Economic feasibility & risk analysis of WWTP Effluent for Reuse Applications

Question 23:

"Any Other Comments?"

- 1. Be careful, other factors are important than just numbers; 2. Drought effects may change some of this; 3. Using water on a per meter basis may be detrimental to agriculture in long run; 4. The question of how to assess the value of water is important.
- Armstrong is looking at a universal residential water metering program.
- Needs to be a glossary and examples to help complete the form; … the idea of a reply in 3 days is a bit hopeful considering holidays, let alone work load
- Review surveys with purveyors to review terminology for better clarification
- The time estimate of 20 min is very inaccurate. … more notice/time allotments to complete. … more clarification on terms such as 'operating' I.e. does this include admin, debt servicing etc. … Also define/prescribe fixed vs. variable costs.
- Will be applying for a rate increase this year and increasing the percentage that goes to our RRTF. … Part of our reserve funds are a Deferred Capacity Fund and are the area that the utility services is built out so will make application to transfer these funds to the RRTF.

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MEMORANDUM

Okanagan Basin Water Board
Regular meeting
Oct. 5, 2010
Agenda No: 6.3

File No. 0550.04

To: OBWB Directors

From: Corinne Jackson

Date: September 28, 2010

Subject: Communications and Research Coordinator Report

Water Board Annual General Meeting

The OBWB's second Annual General Meeting was a great success. This event encourages transparency and is an important opportunity for the Water Board to communicate out to the public on OBWB activities during the past year and speak to the year ahead.

I believe tying the meeting in with a celebration of our 40th anniversary, and the UBC-O Water Resources Chair funding announcement helped ensure media attention. Discussions are already underway to ensure another successful AGM next year.

Mobilizing Climate Action

Last week, LiveSmart BC held a "Small Steps – Big Leaps: Mobilizing Climate Action in the Thomson Okanagan" event at UBC-O. The workshops drew a great mix of elected officials, local government staff (many working in sustainability and on regional growth strategies), business representatives, students, non-profit groups – all with an interest in helping their communities address climate change. The workshops provided an interesting perspective on engaging the public, and helping change attitudes and behaviours.

Grand Opening of Un-H2O Demonstration Garden

The Okanagan Xeriscape Association held the grand opening of its Un-H2O Demonstration Garden on Sept. 24, located on Gordon Drive outside Kelowna's H2O Adventure and Fitness Centre. The garden was funded in part with an OBWB Water Conservation and Quality Improvement Grant. Support was also provided by the City of Kelowna and Environment Canada.

The 4,000 square foot garden is laid out in five theme areas: a Mediterranean Garden, two Rock Gardens, a Butterfly Garden, a Native Plant Garden and an Ornamental Grass Garden. The garden is intended to inspire people to create their own xeriscapes. To that end, a brochure is available for visitors to the garden, encouraging people to make note of the plants they are interested in planting at home.

Chair Stu Wells spoke on behalf of the Water Board, and photos were taken to be put up on Okanagan WaterWise's Facebook page. They can be viewed at http://www.facebook.com/pages/Kelowna-BC/Okanagan-WaterWise/135451886485677.

The opening was also attended by Kelowna Mayor Sharon Shepherd, Kelowna-Lake Country MP Ron Cannan. A number of media outlets were also on hand.

Watersmart Innovations Conference

I will be attending the WaterSmart Innovations Conference and Exposition October 6-8 in Las Vegas. This conference is dubbed "the world's pre-eminent urban water efficiency conference," and includes sessions throughout the three days aimed at marketing and outreach, as well as education. There are also several other tracks including "Conservation and Incentive Programs," "Landscapes," and "Code and Policy."

In addition to workshops there is a poster session and an exhibit hall, showcasing water conservation tools, but also agencies doing interesting work in water conservation education. I'm looking forward to attending the conference with a view to learning what works and what doesn't in encouraging the public to adopt water conservation and protection behaviours here in the Okanagan.

The conference is put on by the Southern Nevada Water Authority in partnership with the U.S. Environmental Protection Agency's WaterSense Program, American Water Works Association, California Urban Water Conservation Council, and many others.

I will be reporting back on the conference at our next board meeting.

Below, please find a listing of sessions I will be attending.

Your Session Schedule:
Wednesday 9:15 am - 10:05 am - Opening session
Wednesday 10:15 am - Exhibit hall opens
Wednesday 11 am - 12 pm - Poster session
Wednesday 1:00pm - 1:30pm - Water Conservation in the K-12 Institutional Sector: Denver Water's Project to Conserve Water and Engage Students
Wednesday 1:35pm - 2:05pm - Understanding Consumer Water Conservation Awareness and Motivating Water-Saving Behaviors
Wednesday 2:35pm - 3:05pm - From Report to Reality: One Agency's Delayed Success Story
Wednesday 3:10pm - 3:40pm - The City of Hamilton's Youth Education Programming
Wednesday 3:45pm - 4:15pm - Water: Do More with Less - A Community Outreach Program
Thursday 9:30am - 10:00am - Challenges in Achieving Water Management Certification
Thursday 10:05am - 10:35am - How to Promote Collaboration Between Landscape Contractors and Water Agencies
Thursday 10:40am - 11:10am - Seizing an Opportunity: A School Retrofit Effort
Thursday 11:15am - 11:45am - Community-Based Social Marketing: Getting Started in Your Community
Thursday 12 pm - 1:30 pm - Keynote luncheon
Thursday 2:00pm - 2:30pm - City of Portland's Water House: A Case Study for Urban Water Conservation & Infill Design
Thursday 2:35pm - 3:05pm - WaterSense®: Driving the Market for Innovative Irrigation Technologies
Thursday 3:10pm - 3:40pm - Prices, Programs, and Persuasion: What Induces Demand-Side Water Conservation?
Thursday 3:45pm - 4:15pm - Lessons Learned; Selling Conservation Without a Crisis
Friday 9:00am - 9:30am - Outreach, Water Efficient Landscaping, and Conservation Incentive Programs
Friday 9:35am - 10:05am - Engaging Market Actors to Support Water Conservation - Perspectives from the Field

Friday 10:10am - 10:40am - Evaluating the Water Use Trends of Thornton's Water Saving Champions
Friday 10:45am - 11:15am - Water Conservation "Full Coverage" Education
Friday 1-5 p.m. – Tour of the Hoover Dam

Update on other communication activities

As requested by the board, local governments have been provided with copies of the OWSD Phase 2 - Summary Report along with information on next steps in the project.

We assisted a local photographer connect with others in the valley, including media, to promote an online photo exhibit as part of World/BC Rivers Day, Sept. 26. The exhibit includes information, taken from the OWSD study, regarding water use in the valley and the need for protection. It can be viewed at http://okanaganwater.shawwebspace.ca.

A media advisory and news release were sent out regarding the Water Board's Sept. 10 Annual General Meeting. A news release was also disseminated Sept. 28 regarding the "From Rain to Resource: Managing Stormwater in a Changing Climate," workshop, being co-hosted by the OBWB and BC Water and Waste Association Oct. 28 and 29, in Kelowna.

Finally, please find attached, a copy of an interesting CBC news piece about the need to increase the price of water to stop waste.

Summary of Recent Media

Aug. 31	"RDOS board supports Chair in water resource management," *Keremeos Review*
Aug. 31	"Thinking about water -- the source of all life," *Similkameen Spotlight*
Aug. 31	"Water planning workshop a hopeful first step," *Keremeos Review*
Sept. 1	"Planning for water shortages," *Kelowna Daily Courier*
Sept. 2	"UBCO crowd learns land claims complicate water planning," *Kelowna Capital News*
Sept. 2	"Water research taps into NORD funding," *Vernon Morning Star*
Sept. 10	"Money for UBCO chair," *Kelowna Capital News*
Sept. 10	"Okanagan Basin Water Board to fund programming at UBCO," *AM1150, SunFM, Silk FM*
Sept. 10	"Water Board celebrates 40 years," *Q103.1, Power 104*
Sept. 10	"Water Management in the Okanagan in last 40 years," *CHBC News*
Sept. 11	"OBWB marks 40 years," *Vernon Morning Star*
Sept. 11	"Water board looks to future in reviewing year just past," *Kelowna Daily Courier*
Sept. 14	"Green-Cents program saves money for businesses," *Keremeos Review*
Sept. 17	"Letter to Ed. - A precious resource not to be wasted," *Kelowna Capital News*
Sept. 24	"Taking the pressure off watering," *Kelowna Capital News*
Sept. 24	"'UN-H20 Garden' on public display," *AM 1150, SunFM, Silk FM*
Sept. 26	"Dought-smart plants getting a lot of attention," *Kelowna Daily Courier*
Sept 29	"Status of water in the Okanagan," *AM 1150*

Summary of Upcoming Presentations

Oct. 6	Gaining Ground Conference Panel (Vancouver) - Dr. Warwick Sears
Oct. 21-24	Waterlution: Canadian Water Innovation Lab 2010 (Exshaw, Alta.) - Mr. Jatel

Recently Delivered Presentations

Sept. 1 BC Water Science Symposium Panel (Kelowna) - Dr. Warwick Sears

Sept. 26 Organic Okanagan Festival (Kelowna): Water for Agriculture in the Okanagan - Dr. Warwick Sears

cbc.ca

Hike water prices to stop waste: expert

Former UN official calls for incentive to use water sensibly

Last Updated: Friday, September 10, 2010 | 11:43 AM ET
The Associated Press

The former UN climate chief who has advocated putting a price on carbon emissions says water also should carry an appropriate cost.

Water should be priced higher to avoid waste, a climate expert told a water seminar. (istock)

In a world where supplies of fresh water are shrinking, countries, companies and individuals should be aware of the value of water, Yvo de Boer told a water seminar in Brussels, Belgium, on Thursday.

It takes 75 litres of water to make a glass of beer; 2,700 litres to manufacture a T-shirt and 16,000 litres to produce a kilogram of beef.

At the same time, UN figures show, about 2.5 billion people, nearly half the Earth's population, have no access to sanitation, de Boer said.

"Part of the reason we are seeing so much wastage of water in a number of countries is because water is inadequately priced," he said. Few countries have economic incentives to use water sensibly.

Water supplies are becoming less reliable in many places around the world while the global population and food demands are growing, de Boer said. As local climates change, scientists say water shortages will become more severe in some of the poorest countries, which could lead to mass migrations and international conflict.

Former UN climate chief Yvo de Boer now advises companies on how to make their operations more sustainable. (Anja Niedringhaus/Associated Press)

De Boer, who resigned as head of the UN climate change secretariat in July, is now a consultant for KPMG, advising companies on making their operations more sustainable.

Calculating the input of water in the production process — a product's water footprint — should become standard practice, he said.

"There are parts of the world where perhaps water footprinting will be more important than carbon footprinting," he said.

De Boer did not say how the price of water should be set, although he thinks it should be determined according to local conditions. He recalled seeing a sign over a toilet in a Middle Eastern country that said, "When you flush, remember a litre of water costs more than a litre of petrol."

Read more: http://www.cbc.ca/world/story/2010/09/10/con-water-cost.html#ixzz0zhyd5RmS

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MEMORANDUM

Okanagan Basin Water Board
Regular meeting
Oct. 5, 2010
Agenda No: 7.1

File No. 0550.04

To: OBWB Board of Directors

From: Nelson R. Jatel, Water Stewardship Director and
Anna Warwick Sears, Executive Director

Date: September 29, 2010

Subject: Recommendation to BC Government – Water licensing fees

Many of the most important water initiatives in the Okanagan – including groundwater regulation, stream flow monitoring, water quality testing and regulatory activities, have been hampered by the lack of provincial government resources. During discussions with the technical advisory committee and B.C. Ministry of Environment staff involved in the Water Act Modernization process, lack of funding was seen as the key obstacle to progress. Given the changes underway, this is a good time for OBWB to advocate for a change in the way the province funds its water stewardship programs.

The Problem

It is likely to become more difficult for B.C. to meet its water management goals. The provincial government allocates about $17 million or 0.04% of tax revenues for water resource management through general revenue to the Ministry of Environment. In contrast, health care accounts for about 40% of the B.C. budget and is expected to rise to 44% by 2020. With an aging population, budget allocation for water management is likely to decrease. However, with climate change and population growth, water resource management needs increased and sustained revenues.

The Opportunity: Water Rents for Water Stewardship

Water licenses, both from water users and power producers, generate almost $388 million per year (Table 1), which are assigned to general revenue.

Table 1. Water license revenues realized by the BC government in 2008.

General Rentals	$ 6.6 million
Local Authorities	$ 1.1 million
Power generation	$ 380.0 million
Total	**$ 387.7 million**

"User pay" is a well-accepted and conservative fiscal policy. It is appropriate that fees generated by the operation of a service go to the maintenance of that service. If a portion of water rents are directed to a water stewardship fund, they will provide a long-term stable source of funding while having minimal impact on the overall revenue stream. Water licence rentals could be pooled at the

provincial level to meet water management needs of all communities. Precedent for such directed funding already exists in B.C. (see Sustainable Environment Fund, below).

For Consideration

This initiative is likely to be better accepted by government if it is linked to a revenue increase. Local water utilities have told us that provincial water license rents are a very small percentage of water utility overhead costs, and have even publicly recommended that they be increased. If there is certainty that the increased water rents are targeted in ways that directly benefit water users, there are likely to be minimal complaints. To balance the impact on independent, small-scale licence holders, water rents could be graduated depending on licence type: public or private, withdrawals or in-stream use. Increasing water rents will also provide a water conservation price signal, and reinforce policy directions established by Living Water Smart.

The provincial government is committed to "ensure our water stays healthy and secure.[1]" and recognizes its strategic value to the environment, society and the economy. The challenge for water management in the province, in the face of increasing health care costs, is the need to be able to adequately finance the Ministry of Environment staff, hydrometric monitoring and project funds required to ensure that water resources are protected to meet current and future generation's needs.

Recommendation:

1. The OBWB submit a letter to the B.C. Government recommending that: *The principle of cost recovery be applied to meeting the Living Water Smart goals for water management whereby a portion of water rents be directed to the Water Stewardship branch and support: water management, hydrometric monitoring and enforcement of water regulations.*
2. *That OBWB study the benefits and impacts of increased water rents for Okanagan water users.*

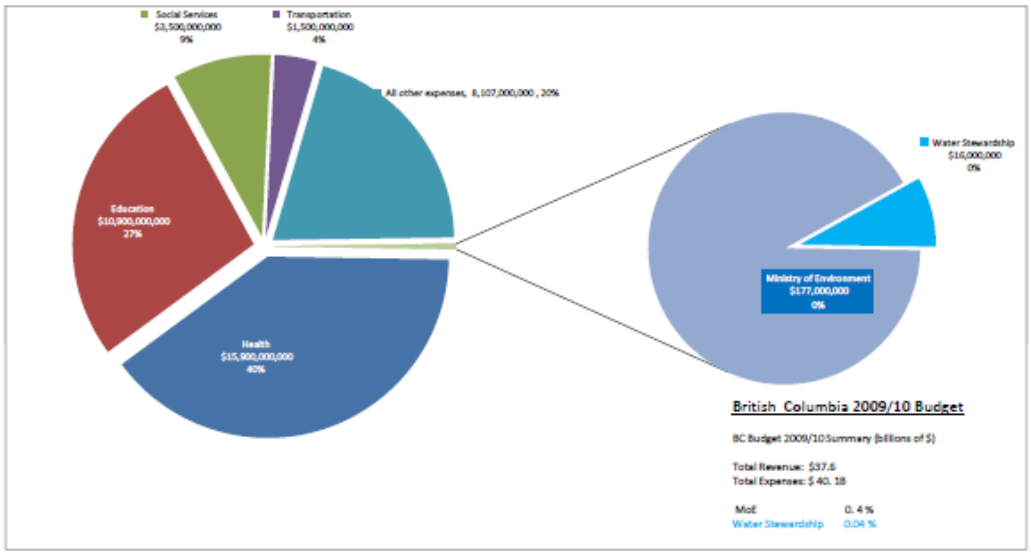

Figure 1. Breakdown of 2009/10 BC Government budget for water management

[1] Living Water Smart. British Columbia's Water Plan

Sustainable Environment Fund

The Sustainable Environment Fund is a special B.C. Government financial account dedicated to supporting provincial environmental protection and renewal initiatives.

The fund was created to assist in directing money collected through government environmental levies and waste permit fees toward a variety of provincial environmental protection programs.

Revenue from the fund comes primarily from a combination of environmental levies on the sale of new lead acid batteries and waste permit fees charged to companies for disposing of treated waste into the environment.

In addition to financing the province-wide transportation incentive program for recycling lead-acid batteries, the Sustainable Environment Fund supports a wide variety of provincial environmental protection programs. These include developing and monitoring industry product stewardship programs, climate change initiatives, air and water quality monitoring and reporting, integrated pesticide management, regulating industrial and municipal wastes and discharges, inspections, and preventing and responding to environmental emergencies.

The Sustainable Environment Fund is administered by the Ministry of Environment. Treasury Board sets the overall revenues and expenditures for the fund each year during the government budget process. The fund's overall budget is announced during the Minister of Finance and Corporate Relations' budget speech.

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MEMORANDUM

Okanagan Basin Water Board
Regular meeting
October 5, 2010
Agenda No: 7.2

File No. 0550.04

To: OBWB Directors

From: Anna Warwick Sears, Executive Director

Date: September 29, 2010

Subject: Bear Creek Report

John Glaspie, Recreation Officer for the Ministry of Tourism, Culture and the Arts (MOTCA), Okanagan District, brought to my attention a report, recently completed by Summit Environmental, regarding the improvements to water quality as a result of the trail building efforts. I have attached the introduction and conclusion to the report, and can provide a full copy to any director who is interested.

This seems like an appropriate time for the OBWB to consider a letter to MOTCA encouraging them to follow through and carry on with the recommendations given in the report. Apparently a good start has been initiated, but more work is still needed. For example, from a quick skim we noted:

- "On two visits, fresh motorcycle or ATV tracks were noted in the riparian area."
- "On at least one occasion, cattle were noted beyond the fencing established to control creek access."
- "The 2009 water quality monitoring period in Bald Range Creek was not representative of typical summer-fall conditions because of the lower than normal precipitation, and the lower than normal recreational activity and the increased presence of fire fighters because of the Terrace Mountain wildfire."

I have also included two photos emailed to me; one of the new bridge constructed by the Trail Riders group, and the other of damage from logging roads.

MOTCA is encouraging us to post the report on our website, to help bring attention to their work and update the material we have posted in the past (casts a negative light on the work). They are trying to secure additional funding for further work, and a letter from OBWB would likely assist these efforts.

Recommendation: *That the OBWB pass a resolution encouraging MOTCA to continue their work to improve water quality and to follow up on the recommendations of the water quality monitoring report.*

Agenda No: 7.2.1

Regular: ☑ In-Camera: ☐

Date: Oct. 5, 2010

OBWB

Bald Range Creek 2009 Water Quality Monitoring Report

SUMMIT ENVIRONMENTAL CONSULTANTS INC.

A Member of the Associated Engineering Group of Companies

Ministry of Tourism, Culture and the Arts

Okanagan District

March 8, 2010

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

The Ministry of Tourism, Culture and the Arts (MTCA) is responsible for the management of outdoor recreation on Crown lands in British Columbia. The area near Bald Range Creek, about 10 km northwest of Kelowna (Figure 1.1), has been used for at least 20 years by off-road motorcycle riders who take advantage of the challenging terrain, resource road access, and easy proximity to Kelowna and other Okanagan Valley population centres. The area also is used to range cattle and to support forest harvest.

Bald Range Creek is a tributary of Lambly Creek, which is classified as a Community Watershed because it is the source of water for the Lakeview Irrigation District (LID). In 2001, the Okanagan Shuswap Land and Resource Management Plan (LRMP) confirmed the Bald Range Creek area as a preferred location for off-road motorized recreation (Okanagan - Shuswap LRMP, Process Support Team 2001). The Bear Creek Recreation Area was established as a provincial recreation site in July 2007. Since then, MTCA has been developing the area by constructing trails, bridges and parking lots, and installing barrier fences and signage. Additional information on the site history, trail network, related infrastructure, and environmental management practices is outlined in Appendix A.

With the growth in recreational activity, concerns have been raised about potential effects of recreational use in the watershed on water quality, particularly because the Lambly Creek watershed provides water for domestic use. Monitoring completed by LID has found coliform bacteria counts in water samples from Bald Range Creek that significantly exceed Canadian Drinking Water Guidelines. There are concerns that not only is there a direct effect on water quality from human use, but that the motorcycle trails create favourable conditions for wildlife, cattle, horses and dogs to reach the creek or riparian zones, and thereby increase the risk of fecal contamination. MTCA has responded to these concerns by installing fencing to restrict human and domestic animal access and electing to implement a water quality and sediment source monitoring regime to supplement the on-going work of LID (see Section 4.0).

In spring 2009 MTCA contracted Summit Environmental Consultants Ltd. (Summit) to conduct a water quality monitoring program in the Bald Range Creek Watershed. It builds on previous work by LID

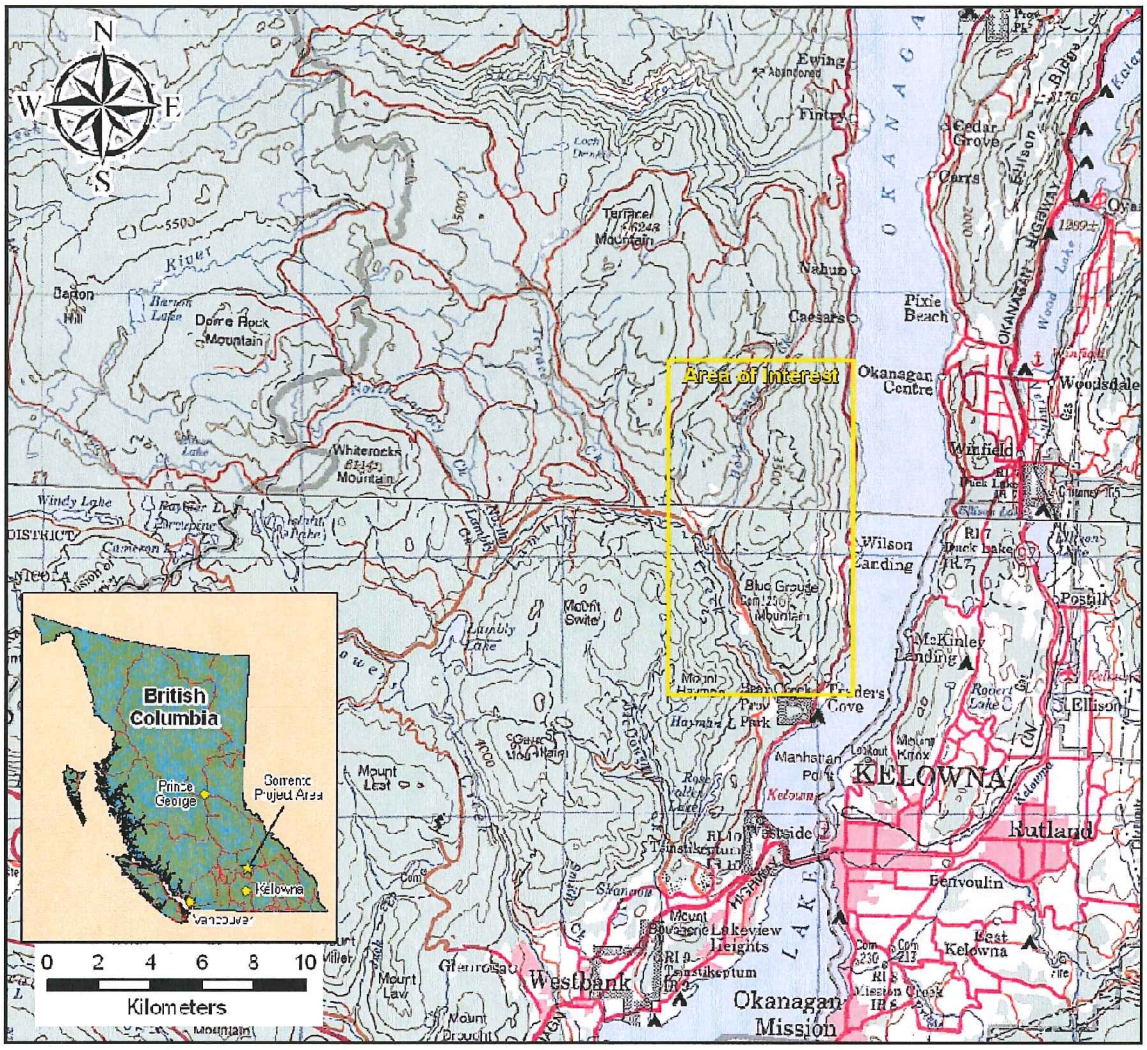

Figure 1.1 Study area location.

and the B.C. Ministry of Environment (MOE) by including bacterial source tracking[1] in the analyses, and measuring other water quality parameters that may help interpret the bacteriological results. This report presents the results of the 2009 monitoring program and makes recommendations for future monitoring.

1.2 PROJECT OBJECTIVES

The general objective of this study is to expand on current understanding of water quality conditions in Bald Range Creek (the "creek") and possible linkages to recreational activities and variations in water conditions.

The specific objectives were outlined in the proposal to MTCA in our letter of June 18, 2009:

1. Review and summarize previous water quality reports for the creek;
2. Establish three sampling sites on the creek, including one near the creek confluence with Lambly Creek in about the same location as previous sampling (Figure 1.2; Appendix B, Photos 1-6);
3. Obtain water samples on 10 occasions between July and October 2009 (the original plan for 14 occasions was constrained by forest fire conditions);
4. Analyze the samples for fecal coliform bacteria, *Escherichia coli* (*E. coli*), suspended sediment, nutrients, and routine water quality variables;
5. Measure water temperature, conductivity, pH, dissolved oxygen and turbidity with field instruments and estimate streamflow at the time of water sampling;
6. For a sub-set of the samples, determine the origin of any *E. coli* through genetic analysis, differentiating between human, cattle, horse, dog and wildlife sources;
7. Summarize and analyze the collected data, including comparison with applicable guidelines, such as the Canadian Drinking Water Guidelines (CDWG) values; and
8. Prepare a summary report with recommendations for on-going monitoring by MTCA after 2009.

[1] Bacterial source tracking identifies the probable sources of fecal pollution by comparing phenotypic (cellular form) or genotypic (DNA) profiles of sample *E. coli* with reference *E. coli* from known sources.

The recommended elements of the 2010 effectiveness evaluation monitoring program are:

- Utilize the same five sites as in 2009.
- Carry out a water quality sampling program during the middle and latter parts of the freshet when sediment mobilized from upslope sources would be expected to be transported in the channel. Weekly samples should be obtained for 6 weeks from early May to mid-June.
- Complete a second round of weekly samples over a 6-week period spanning late August to early September to assess conditions when recreational use has been high and the water relatively warm.
- The suite of laboratory parameters can be reduced to fecal coliforms, *E. coli*, TSS, turbidity, and specific conductivity. As in 2009, field instruments should be used to measure water temperature, pH, conductivity, dissolved oxygen, and turbidity at the time of sampling.
- Bacteria samples should be sent for Bacteria Source Tracking analyses on three occasions during the freshet round of sampling to supplement the 2009 data, which were collected in late summer and fall. If funds are available, additional BST analyses should also be completed on samples from the second round to assess whether the 2009 results are atypical.
- Consider installing a continuous turbidity probe in Bald Range Creek to document the frequency and duration of high turbidity events, since high bacteria counts have been linked to high turbidity. Commercially available turbidity probes also provide a continuous record of water temperature and conductivity, which can also assist in interpreting coliform bacteria data. The station would need to be installed in a location that presents a low risk of vandalism, and which could be maintained regularly in conjunction with data downloading (e.g. every 2 weeks).
- The water sampling program should be augmented with regular field assessments to document the effectiveness of the fencing and other measures implemented by MTCA at reducing human and domestic access to sensitive areas.

The results of the 2010 program should be reported out at the end of the year. The utility of continuing with effectiveness evaluation monitoring can be assessed at that time.

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Agenda No: 8.1

Regular: ☑ In-Camera: ☐

Date: Oct. 5, 2010

OBWB

BRITISH COLUMBIA
The Best Place on Earth

File: 280-30
Ref: 168146

September 15, 2010

Stu Wells, Chair
Okanagan Basin Water Board
1450 KLO Rd
Kelowna BC V1W 3Z4

Dear Mr. Wells:

Thank you for your letter of July 23, 2010, requesting a permanent moratorium on the sale of lease lots on reservoir lakes in the Okanagan.

Staff of the Integrated Land Management Bureau are continuing work on this complex issue and will be providing me with further details once they are available. I will be pleased to respond in greater depth once I have an opportunity to review the information they collect.

Again, thank you for writing. Your patience is appreciated.

Sincerely,

Pat Bell

Pat Bell
Minister

Ministry of Forests and Range and Minister Responsible for the Integrated Land Management Bureau

Office of the Minister

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