A Framework for Creating a Sunshine Coast Water Master Plan

By
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Executive Summary  
Key Issues, Recurring Themes, and Recommended Actions

With rapid population growth on the Sunshine Coast, issues related to water consumption, drinking water quality, human effects on aquifers, and protection of aquatic species and habitat are becoming increasingly important. To provide impetus on this key issue, the Sunshine Coast Water Summit was organized. The two-day Summit brought together scientists and water management professionals to exchange knowledge with over 80 local stakeholders and to foster the development of a shared understanding on water issues.

Speaker presentations and breakout sessions allowed participants to explore different crucial areas in drinking water management and, with the help of specialist facilitators, to consider these specifically in relation to the Sunshine Coast. Throughout the meeting, the following questions were used to guide the dialogue: What do we know? What do we need to know? What is missing? What actions are needed to move forward? The overall goal of the Summit was to take the first step in identifying specific aims, objectives and actions required to develop a draft Water Management Framework for the entire Lower Sunshine Coast.

The following key issues were identified:

| Hydrology and Scientific Data Collection | Solid scientific data about local climate and hydrology is required on which to base water management decisions and planning. Partnering with university scientists is recommended to help to facilitate data collection and knowledge transfer, and provide additional funding options. There is an immediate and urgent need to develop a strategy to maintain critical flows for fish and people in Chapman Creek during the dry summer period. |
| Governance | An umbrella agency, with real authority and stable funding, is needed to oversee development of a Water Master Plan and facilitate cooperation and coordination between the many distinct water systems on the Sunshine Coast. Planning must include both short-term pressing concerns and longer-term goals. |
| Development and Demographics | Efforts must be made to reduce high rates of water consumption on the Sunshine Coast using a combination of education and universal metering. Even if water consumption by existing residents is reduced, overall water demand will continue to rise with increasing development and population growth. A regional growth strategy that incorporates water, sets maximum build-out rates, and identifies future water sources, is urgently needed. |
| Health and Safety | High arsenic levels in rural wells represent a serious health threat to local residents. Small water purveyors face serious water quality concerns, and lack access to government funding resources for required infrastructure and multibarrier treatment. |
| Natural Resource Management | There is frustration over the lack of local control over industrial activity, including logging and mining, in drinking water source watersheds. Systemic changes are needed to ensure that fisheries and watersheds receive a higher priority in management decisions. |
PRINCIPLES TO MOVE FORWARD

- We have identified pressing issues related to water management on the Sunshine Coast.
- We have developed an analytical framework to guide water management thinking and planning.
- A framework for collaborative action is needed which includes integrated governance and encompasses major stakeholders, including government, industry, scientists, and the public.
- Information is incomplete and solid unbiased science is necessary for good decision-making.
- We must act now on the basis of what we do know and pursue what we don’t know.

RECOMMENDED ACTIONS

The following have been identified as the most pressing recommended actions to move the process forward:

- Catalogue existing information, identify gaps, and formulate short- and long-term research questions and data collection strategies to provide sound scientific information to support management decisions.

- Undertake an integrated strategy to identify and obtain stable funding to support research, data collection, water management and planning activities necessary for sound water management on the Sunshine Coast.

- Collaborate with university researchers to undertake a regional water vulnerability study and climate monitoring to produce necessary scientific data to guide water planning.

- Assess summer water storage and supply options, including possibility of pumping from Construction Aggregate wells into SCRD reservoir during critical summer dry periods to increase supply.

- Continue and expand immediate conservation steps (public education, metering) to reduce high water consumption rates on the Sunshine Coast.

- Create an umbrella governing mechanism that is forward-thinking in planning for the Sunshine Coast and is guided by neutral outside consultants to work in an atmosphere of collaboration with stakeholders to create a Water Master Plan that has some long term design and is tied to a timeline.

- Develop an Action Plan for flow levels in Chapman Creek for fish during the summer. The status quo is not acceptable. Undertake a source assessment study and a low flow study of the Creek.

- Develop a regional growth strategy that incorporates water supply and consumption and sets maximum build-out rates, and includes planning for new sources of water as the population grows.

- Undertake source-to-tap risk assessment studies, including response plans. Publicize the findings and act on what is learned. Enable water providers to connect with health authorities more effectively.

- Participate in a Land and Resource Management Planning process (LRMP) to situate water management planning within a larger land and resource management framework.

- Work with industry more proactively to find solutions to water management issues.

- Institute systemic changes so that watersheds receive higher level priority in management decisions.
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Hydrology and Scientific Data Collection

Overview
There is concern about the lack of data on which to base a Sunshine Coast Water Master Plan. A central management agency with stable funding is required to collate and analyze existing and new data, maintain data in one central repository, and oversee research studies. A data collection strategy must be developed which addresses both short-term pressing needs and longer-term goals. Partnering with university scientists would help to facilitate data collection and knowledge transfer, and provide additional funding options.

The Chapman Creek system, which supplies much of the Sunshine Coast’s drinking water, is nearing the limit of its capacity during summer dry periods and will face mounting pressure with increasing population growth and climate change impacts. There is an urgent need to develop a strategy to maintain critical flows for fish and people in the short-term. Alternate supply sources must be identified and protected as soon as possible. Small water purveyors are also facing similar supply issues that must be addressed in the near future. In some cases, linking infrastructure from different systems can enhance water storage options, provide back up and emergency supplies, and provide for greater flexibility in water management.

Data Requirements
There is a need to clearly identify which types of data are required to help address both short-term needs and longer-term goals. Data collection must be carefully planned, keeping in mind water management goals and strategies. In formulating a data collection strategy for the Sunshine Coast Water Master Plan, managers should investigate what types of data are being collected in other jurisdictions and how they are being used to direct planning.

Two key sources of data relevant to water management and planning include:
- a) Climate data (especially timing of snow pack melt, temperature, and rainfall), and
- b) Hydrologic data (surface and groundwater)

The Lower Sunshine Coast does not currently have an Environment Canada weather station to collect climate data. However, one is planned for the airport in Sechelt and another is planned for the Iris Griffith Interpretive Centre in Pender Harbour. A single weather station may not be sufficient for an area the size of the Sunshine Coast. A series of smaller, more inexpensive weather stations may be preferable to fewer big, elaborate stations. Each water purveyor might wish to maintain its own weather station.

Groundwater monitoring is important to track groundwater quality and ground water level fluctuations. The BC Ministry of Environment operates a network of 163 observation wells on developed aquifers in British Columbia. However, there are no wells on the Lower Sunshine Coast that are part of this network.

Regional groundwater vulnerability mapping can help identify recharge areas and areas vulnerable to contamination and salt water intrusion. The Town of Gibsons, which relies on groundwater for approximately two thirds of its water needs, has also carried out a groundwater mapping project. A comprehensive vulnerability study undertaken by Professor Diana Allen (Simon Fraser University) in the southern Gulf Islands has yielded important information to guide planning in that region. A similar groundwater vulnerability mapping project is recommended for the entire Sunshine Coast.
Snow pack and snow melt data are especially important to track climate change impacts. The BC Ministry of Environment maintains a network of snow survey stations throughout the province. Manual snow surveys are conducted at each station eight times per year around the beginning of every month from January through June with extra measurements at mid-month in May and June. In addition, six Automatic Snow Pillows (ASP) stations relay data daily from remote sites via satellite. A manual snow survey station exists at Chapman Creek. The station was sampled from 1993 to 2003, but was inactive in 2004 and 2005. It was provisionally scheduled to be sampled four times (Feb 1, March 1, April 1, May 1) in 2006.

The Vancouver Coastal Health Authority maintains GPS location records for many water intakes on the Sunshine Coast. It would be possible to correlate this location information with existing and newly collected water quality data.

The challenge will be to bring existing information together and arrange for integrated data collection, interdisciplinary standardization, and long term funding. Standardized protocols will be necessary to ensure compatibility of data. Quality Assurance/Quality Control (QA/QC) issues will be a major concern. The fact that some existing databases do not provide a continuous record, may limit how useful they are.

Data Management

A central agency is needed to collate and analyze existing and new data, maintain data in one central repository, and oversee research studies. It is unclear which agency would take on this role, although the Sunshine Coast Regional District (SCRD) is an obvious choice. Whichever agency takes on this role would require a steady income stream to maintain activities for years. There is concern about the availability of funding resources and staffing. Identifying consistent funding streams is a top priority.

Connecting with University Scientists

Developing partnerships with scientists from British Columbian universities and colleges is a good strategy to facilitate data collection and knowledge transfer, and provide additional funding options. The Okanagan and the Gulf Island regions provide examples of successful integration of university scientists into regional water research, planning and decision-making.

A local scientific research station would help to attract scientists to come and work on the Sunshine Coast. In addition, there are already many scientists living on the Sunshine Coast that have valuable skills and experience and would be eager to participate in water research and management activities if funding were available.
Conveners’ Report DRAFT – For Public Comment

Chapman Creek Water Supply

Chapman Creek is the primary water source for SCRD drinking water supplies, providing 92% of the water supply to SCRD customers. There is broad concern about pressure on the Chapman Creek system. Many people feel that the existing system is nearing the limit of its capacity during the summer dry periods and recommended flow levels for fish are not being maintained.

Chapman Lakes Storage
Summers of 1998 and 2003

Although conservation and education programs may help to reduce water demand by SCRD customers, pressure on Chapman Creek will nonetheless intensify with increasing population growth and development on the Sunshine Coast. A plan is urgently needed to help maintain critical water flows in Chapman Creek for both fish and people over the next 10 years.

Future Water Supply Sources

Given the present and future pressures on the Chapman Creek water supply, it is essential that we identify and protect other potential aquifer and surface water sources for future use.

Aquifer water is cleaner than surface water due to natural filtration and requires less treatment. However, ground water on the Sunshine Coast is susceptible to arsenic contamination due to the nature of the geology of the Coast and is at risk of salt water intrusion in some areas. Wells on the Sunshine Coast are generally low production so would provide limited supply. Groundwater vulnerability mapping is recommended to assess storage capacity and recharge rates and identify suitable well drilling locations.

Surface water sources are more predictable than ground water, but water quality is affected by many factors and more treatment is required. The SCRD has explored other surface water source options including Rainy River, McNair Creek, Dakota Creek, Lyons Lake, Klein Lake, Langdale Creek, Carlson Creek, Clowhom Lake, and Gray Creek. However, these were deemed not to be viable options in the 20 to 50 year planning horizon.

The SCRD considers that extending the existing Chapman Creek water source would be more cost effective and reliable than undertaking new source development. The SCRD is currently considering three options: a) damming up Chapman Lake by 2 meters to increase storage capacity by 35 - 40%; b) constructing a storage lake in a gravel mining area; or c) installing a permanent pumping facility. The SCRD is currently assessing these options, and exploring long-term future water source development options for the Lower Sunshine Coast.

Some have suggested that pumping ground water from existing Construction Aggregates wells to supplement the Chapman Creek supply during the critical summer dry period is another possibility to be explored.

Steve Lee, General Manager, SCRD Infrastructure Services describes the Chapman Creek water system
Climate Change

Climate change has been identified as a force that will work to intensify summer water shortages on the Sunshine Coast in the long-term. In our region, climate change is expected to produce warmer temperatures, wetter winters and drier summers. Modeling by Paul Whitfield of Environment Canada indicates that climate change will also impact local river systems. Rain-snow hybrid rivers, like Chapman Creek, will become increasingly rainfall driven.

As snowmelt processes become less important, models indicate that there will be an increased frequency of low flow events and a shift in the timing of low flow events to summer/fall periods only.

Small Water Systems

Small water purveyors on the Sunshine Coast are also facing problems related to limited water supply and growing populations. For example, the South Pender Harbour Waterworks District currently supplies approximately 1,000 customers from McNeill Lake. The lake is approaching maximum carrying capacity and during summer dry periods, pumping may be required from an additional source at Harris Lake. As the region is experiencing rapid growth, the Improvement District will need to seek additional water supplies in the near future. Upper Haslam Creek and Harris Lake are being considered as possibilities.

Interconnecting Water Systems

Linking systems between different water purveyors can create additional storage, provide back up and emergency supplies, and provide for greater flexibility in water management. For example, in Garden Bay, the SCRD is in the process of taking over day-to-day operations and administration of the Garden Bay Waterworks District to create a new SCRD “North Pender Harbour Service Area” which includes both Garden Bay customers and Hotel Lake customers. The SCRD intends to link the infrastructure of the two systems to provide redundancy in all systems, back-up in case of repairs or emergencies, and increased capacity for fire fighting. The potential for further interconnection and collaboration between water purveyors in different watersheds on the Sunshine Coast should be investigated.
Health and Safety

Overview

Public health concerns on the Sunshine Coast are related to arsenic in wells, microbiological contamination of drinking water, and low pH of surface water supplies. Increasingly, Canadian regulatory agencies are advocating a multibarrier approach as the best method to ensure a safe drinking water supply. Small water purveyors on the Sunshine Coast are in a difficult position, without access to government funding resources for required infrastructure treatment projects. Residents and purveyors are concerned about a lack of a local control over what types of activities are permitted in local drinking water watersheds.

Arsenic

Arsenic has been identified as a major problem affecting wells on the Sunshine Coast. Elevated levels of arsenic in groundwater occur naturally in the region in areas of granitic bedrock with volcanic intrusions. Surveys by the Ministry of Health in 1994 and by University of British Columbia in 1999 indicated that many wells on the Sunshine Coast had unsafe levels of arsenic. The highest arsenic levels were detected in the Middlepoint, Secret Cove, Halfmoon Bay and Pender Harbour areas. The arsenic problem primarily affects private wells serving single households. However, the problem also occurs in some small water systems, such as the Pender Harbour High School and Keats Camp.

Arsenic is toxic and is considered a human carcinogen. It is associated with an increased risk of a variety of cancers, including tumours of the bladder, kidney, liver and lung. The Health Canada Guideline for Drinking Water Quality maximum acceptable concentration for arsenic, recently changed from 0.025 mg/L to 0.010 mg/L. Furthermore, the new guideline includes the principle of “As Low As Reasonably Achievable”, recognizing that there is no safe level of exposure to arsenic above zero.

Residents whose well water is found to contain arsenic concentrations above the drinking water guideline should use bottled water, obtain water from a safe alternate source or install efficient treatment units. Arsenic is not removed by pitcher type filtration units or boiling. There are some “point of treatment/point of use” units available for households that remove arsenic by reverse osmosis.

There is an urgent need to address the problem of arsenic in wells on the Sunshine Coast. When the new Health Canada Drinking Water Guideline takes effect, over half of the 450 wells on the Sunshine Coast monitored in the 1994 study will have water considered unsafe for drinking and there are likely even more wells with problems that were not studied.

The Vancouver Coastal Health Authority is working to educate rural residents about the problems of arsenic in drinking water and about the new Drinking Water Guidelines. They are encouraging rural residents to test their well-water annually since arsenic levels can change over time, and they are providing information about treatment options. The Health Authority is also working with land-developers to ensure comprehensive testing of water quality in wells serving new housing developments.

Homeowners in areas with high arsenic concentrations in private wells may wish to establish new small community systems. Another option is for these homeowners to link their homes to the SCRD system or other community systems. For example, a new extension of the SCRD water system to Arbutus Bay will help deal with approximately 10% of the known wells with high arsenic levels. As more rural residents opt to join the SCRD system, there will be increasing demand on the SCRD water supply.
Microbial Contamination

Untreated surface water supplies are vulnerable to microbiological contamination from a wide variety of protozoa, bacteria and intestinal viruses. All water systems that use surface water sources and have two or more hook-ups are required to treat water. The same rule applies to systems using ground water under surface water influence. The addition of chlorine is highly effective against most microorganisms. However, cysts formed by protozoa such as Cryptosporidium and Giardia can withstand chlorine. An approach that combines chlorination with sufficient filtration achieves parasite cyst removal, disinfection effectiveness, and reduction of disinfection by-products.

Drinking water purveyors are required to take bacteriological samples on a regular basis. The Vancouver Coastal Health Authority works in partnership with the purveyors to oversee sampling and provide the laboratory services. Testing results are posted on the VCHA website.

Three small water systems on the Sunshine Coast are presently facing serious water quality problems due to lack of treatment facilities. Several are currently on boil water advisories and/or under notice from the Drinking Water Officer that water quality issues must be resolved. Improving the water quality and safety in these areas is an urgent concern.

The Vancouver Coastal Health Authority is requiring all new water systems and expecting existing systems to plan towards a treatment standard of 4 log (99.99%) removal or inactivation of viruses, 3 log (99.92%) removal or inactivation of Giardia and Cryptosporidium cysts, and less than 1 NTU for turbidity.

Chapman Creek Water Treatment Facility

Historically, the Chapman Creek surface water supply received minimal treatment (chlorination) and was subject to high colour and periodic turbidity events. In 2002, the SCRD began work on a project to construct a water treatment plant for the Chapman Creek water system. The total project cost of $7 million was supported in part by a $3.8 million Canada/BC Infrastructure Grant. Construction began in 2003 and the plant opened in 2004. The treatment process at the plant includes coagulation, flocculation, DAF clarification, filtration, and chlorination.

pH

Low pH has been identified as another problem affecting drinking water on the Sunshine Coast. The pH of pure water is 7. In general, water with a pH lower than 7 is considered acidic, and with a pH greater than 7, basic. A one-unit change in pH indicates a ten-fold change in hydrogen ion concentration. Thus, small changes in pH can significantly alter the chemistry of source waters. The Health Canada Drinking Water Guidelines state that the aesthetic objective for pH in drinking water is between 6.5 and 8.5.

Low pH water is corrosive to water infrastructure (e.g., copper and lead pipes, hot water tanks, etc.). Low pH water can have indirect impacts on health by increasing levels of toxic metals in drinking water. If lead solder is used in pipes, for example, the acidity of the water can cause increased rates of lead leaching. Kidney dialysis patients are especially sensitive to pH levels in drinking water.

Low pH drinking water is a source-specific issue and is considered relatively low priority by the Health Authority in comparison to microbiological issues. Treatment of water with a neutralizer such as soda ash can help raise the pH of treated water. Running tap water in the mornings to flush out the pipes is recommended.
Multibarrier Protection

To protect public health and ensure that drinking water is kept clean, safe and reliable, Canadian government agencies are embracing a new model for water treatment that involves implementing multiple barriers throughout the drinking water system from source to tap. The four key components in the multibarrier approach include:

- Protection of drinking water sources
- Treatment of water, including disinfection and, where necessary, other treatments such as filtration, UV, coagulation, and flocculation
- Maintenance of a well-designed and operated water distribution system with a continuous flow and pressurized pipes and the presence of residual disinfectant to counter bacterial regrowth.
- Comprehensive testing and monitoring of drinking water.

In addition, the multibarrier approach includes the use of processes and tools that improve the overall management of a drinking water program, such as legislation and policies, guidelines and standards, training and education, and communication with the media and the public.

Source Protection

Source protection is identified as the critical first step in the multibarrier approach to water safety. As part of this step, land-uses that potentially cause contamination of surface or ground-water supplies should be limited or eliminated in drinking watersheds. Activities of concern include logging, mining, agriculture and road building. Sunshine Coast residents have expressed frustration at a perceived lack of protection for drinking water supplies, such as the Chapman Creek watershed, and lack of local control over what activities are permitted in drinking watersheds.

Small Water Purveyors

Some small water purveyors on the Sunshine Coast are experiencing serious problems with water quality, and three are facing boil water advisories. Because small water improvement districts are not eligible for government grants, they must finance their own expensive treatment infrastructure. Furthermore, the volunteer boards of small water systems are personally liable for issues relating to health.

Some Improvement Districts may opt to join the SCRD system. The SCRD has taken over many small systems in the past decade. For example, the users of the Garden Bay Waterworks District recently voted to amalgamate with the SCRD. Other small purveyors may opt to continue to operate independently, seeking funding from non-government sources including local industry and stakeholders, and attempting to lobby the government to change the rules.

Components of a Multibarrier Approach to Water Protection

(Canadian Council of Ministers of the Environment, 2004)
Governance

Overview
There is a need for inter-agency cooperation, coordination and planning to develop a regional water strategy that includes the many distinct water systems on the Sunshine Coast. Creation of an umbrella agency, with real authority and stable funding, is recommended to oversee development of a Sunshine Coast Water Master Plan. A governance model should be based on a foundation of sound, unbiased science and should maintain a high level of citizen participation, stakeholder involvement and sustained connection between governance, information flow and public education. An improved communications approach is needed to enhance communications between the SCRD and the general public.

Governance Model
A successful model for the management of water on the Sunshine Coast should include:

- A foundation of good knowledge about climate, hydrology, ground water, surface water, treatment costs, water use
- Decisions based on sound, unbiased science
- Planning that draws on international literature and experience, local expertise and site-specific information, and uses best practices that fit the Sunshine Coast
- A high level of citizen participation and stakeholder involvement
- Governance activities that are linked with public education to change behaviour
- Sustained connection between governance and information flow to allow for adaptability and responsiveness

Legislation
There are many different government regulations that have bearing on water management activities and decision-making. Relevant federal legislation and guidelines include the Fisheries Act, the Health Act, the Canadian Environmental Protection Act, the Canada Water Act, and the Health Canada Guidelines for Drinking Water Quality. Relevant provincial legislation includes the Drinking Water Protection Act, the Drinking Water Protection Regulation, the Groundwater Protection Regulation, the Environmental Assessment Act, and the Fish Protection Act. There are also numerous Municipal and Zoning by-laws that serve to protect drinking water.

There is a need to clearly define and fully understand all of the different acts and legislation relevant to the management and protection of water resources on the Sunshine Coast.

Integrated Governance
The Sunshine Coast includes a diversity of distinct water systems and sources of supply and includes many different water purveyors and government agencies with an interest in water management. There is a need for inter-agency cooperation, coordination and planning to develop a regional water strategy. There is also a need for clarity regarding authority in decision making at various levels of governance.

It would be helpful to create an umbrella agency, with real authority, to take the lead in developing a Sunshine Coast Water Master Plan. An example of an umbrella agency operating in another region is the Okanagan Basin Water Board/Okanagan Water Stewardship Council.

There is concern over where the funding and resources would come from to spearhead integrated water planning and management activities. There is also concern over whether the local water purveyors and governments would agree to be managed by a central authority.

Stewart Cohen speaks about water management and planning in the Okanagan
Development and Demographics

Overview
The high rate of water consumption on the Sunshine Coast is a serious concern. Local education programs should be continued and expanded, and a universal metering program should be implemented as soon as possible to reduce water demand. However, even if water consumption by existing residents is reduced, it is clear that overall water demand will continue to rise with increasing development and population growth on the Sunshine Coast. A regional growth strategy that incorporates water and sets maximum build-out rates is urgently needed. Water must be directly connected to development decisions and planning should direct growth to minimize water use.

Decreasing Water Consumption
The high rate of water consumption on the Sunshine Coast is a serious concern. According to the Town of Gibsons Water Supply Strategic Plan (2005), residential water use by SCRD customers has been estimated at 540 litres per capita per day, higher than in most communities in the Lower Mainland. However, without comprehensive water metering, the SCRD is limited in its ability to separate residential from non-residential consumption. There is some concern that focusing on increasing supply only encourages more water use. It is clear that efforts must also be made to reduce consumption.

Public Education
Local education programs aimed at increasing knowledge and changing attitudes to reduce water consumption are universally agreed to be worthwhile. Many conservation programs are already in place on the Sunshine Coast and there is broad support for continuing and expanding these existing education programs.

Education programs should target not only year-round residents, but also visiting tourists, cottage owners, and recreational property owners, because these people make use of the water resource primarily during the summer when water supplies are most limited. Programs should also focus on the needs of fish, particularly the needs of salmon in Chapman Creek. Activities based at the Chapman Creek fish hatchery play an important role in educating children and their families about these issues. Education programs should also emphasize the connections between conservation, ecosystem health and quality of life.

The 2004, SCRD per capita average daily water demand was 644 litres per customer per day, including residential, institutional, commercial and industrial customers. The SCRD is aiming to reduce this figure to meet or exceed the 1999 Canadian national average of 575 litres per customer per day. Managers estimate that conservation would free up 15-30% of both infrastructure and supply storage.

Existing Water Conservation Programs on the Sunshine Coast

<table>
<thead>
<tr>
<th>SCRD</th>
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<tr>
<td>▪ Enforced Sprinkling Timing Regulations</td>
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<td>▪ Ultra Low Flow Toilet Requirements for new buildings</td>
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<td>▪ 6 Litre Toilet Replacement Program</td>
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<td>▪ Bathroom Fixture Replacement Program</td>
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<td>▪ Water Wise Garden Award</td>
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<td>▪ Water Efficiency Assessment &amp; Awards Program for businesses and institutions</td>
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<td>▪ Water Wise Planting Information</td>
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<td>▪ Demonstration Xeriscape Gardens</td>
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<tr>
<th>Town of Gibsons</th>
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<tr>
<td>▪ Golden Lawn Award</td>
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<tr>
<td>▪ Sprinkling Timing Restrictions</td>
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<td>▪ Building/Plumbing Code Changes</td>
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<tr>
<td>▪ Reduced Irrigation in Town Parks</td>
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<tr>
<td>▪ Water Conservation Tips on Town Website</td>
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</table>
Conveners’ Report DRAFT – For Public Comment

Metering

There is concern that the ‘soft-sell’ education programs are not sufficient to reduce water consumption. In addition to education, there is strong support for universal water metering, with increasing block rates, at high cost for high water use. People feel that pricing should be used as a deterrent to high consumption, and should reflect the environmental costs of water use.

Metering has proven its effectiveness in many other jurisdictions. Water consumption rates typically fall by 18-25% following installation of meters, in part because installation of meters helps to detect leaks in systems. Implementing metering programs has a high cost (installation of residential meters ranges from $180 to $1028 per meter) but metering ultimately pays for itself. In 2005, the SCRD applied for grant funding from the British Columbia Community Water Improvement Program to support a universal metering program but was unsuccessful.

Some Water Summit participants advocated piloting a metering program in one area of the Sunshine Coast where consumption is especially high. Such a program could be used to collect data on water use and monitor the effectiveness of metering. Others felt that the effectiveness of metering had already been proven, and that we should move ahead as soon as possible with a universal metering program.

In both Gibsons and the SCRD, all new water service connections must install meters. The SCRD intends to use future water main extensions and repairs as cost-effective opportunities to install water meters on existing service connections, and will install meters on all non-metered non-residential water connections. The SCRD is planning to implement a voluntary metering program in the near future to encourage residents to switch to a metered rate.

Population Growth and Development

Even if water consumption by existing residents is reduced, overall water use will continue to rise due to increasing development and population growth on the Sunshine Coast. In fact, some people justify water use as a tactic to discourage new development (“why should I conserve if more growth is coming?”). According to figures in Official Community Plans, the population of the Sunshine Coast is expected to rise from 25,000 to 40,000 in the next 15-25 years. Expanding population and development will intensify pressure on existing water supplies and on water treatment and distribution infrastructure.

Demographics

There is a need to better understand the impact of demographics on water use and on infrastructure design. Anecdotal evidence suggests that newer developments on the Coast tend to be lower density settlements with larger yards which use more water.

The availability and costing of water can also affect demographics. For example, high water costs may limit choices for low income families. There is concern about “equitable” allocation of water, both in terms of regional availability of safe drinking water and availability for all water users (re. income, needs, etc.).

New housing projects should be used to pilot green building models and technologies for water conservation. Innovative strategies for new development could include rainwater harvesting, grey water recycling, etc.

Land Use Planning

There is concern about the lack of a coast-wide regional development strategy. It is of paramount importance that we develop a regional growth strategy that incorporates water, sets maximum build-out rates, and includes planning for new sources of water as the population grows. The strategy must be developed using solid scientific data about the water resource and the capacity of the Sunshine Coast.

Land use planning must influence and interact with water management. Water must be connected to development decisions. Planning should direct growth to minimize water use, incorporate sustainability, and preserve green space. Infrastructure can be used to direct, control and restrict growth.

It is clear that land use planning must address both short-term pressing issues (e.g., pressure on the Chapman Creek system) and longer-term requirements.
Natural Resource Management

Overview

There is concern about logging and mining in drinking water source watersheds on the Sunshine Coast, and about the lack of attention to fisheries and watershed protection in water management decisions. Some people feel that watersheds should be off-limits for industrial activity or that activities with potential effects on drinking water resources should be postponed until impacts are clear. There are differing opinions about the impacts of logging and mining in watersheds on water quality and water flows. A Land and Resource Management Planning (LRMP) process on the Sunshine Coast may yield positive results in the long term. However, action is needed immediately to deal with pressing problems. Systemic changes are needed to ensure that watersheds receive a higher priority in management decisions.

Mining

There is concern about the potential impact of mining activities on drinking water on the Sunshine Coast. In particular, there is concern about Pan Pacific Aggregates' proposed mining operations on the Sechelt Peninsula. Among the issues raised are the potential for...

- wash-water and mining byproducts to flow into water supplies
- diversion of groundwater seepage (and possibly surface water) from the headwaters of Haslam Creek, source for South Pender Harbour Waterworks District's water.
- contamination of watersheds including fish-bearing creeks and lakes on both sides of the Caren Range by dust and silt
- contamination of waters by arsenic brought up in water pumped from deep wells drilled to supply the mine with wash water
- significant water use required by washed rock processing activities

Mining company representatives assert that their mining plan to develop a carbonate rock source to produce chemical (calcium and magnesium) rock will not impact ground or surface water supplies. They state that chemical rocks are produced from limestone and dolomite and are environmentally benign. They plan to recycle water in their operations to reduce water use. Furthermore, they suggest that the large limestone pit left at the end of mining operations, which will have a capacity of 40 million cubic meters, could potentially be used as a drinking water reservoir to solve water storage problems for the Sunshine Coast.

Logging in Watersheds

There is concern over the impact of logging in watersheds on drinking water quality. The Sunshine Coast has a long history of public opposition to logging in community watersheds.

Water Summit speaker, Brian Carson, who has conducted extensive water quality studies in various Sunshine Coast rivers, argues that good logging operations do not impact water quality. He states that, “water quality and timing of flows can be preserved by well-built roads, good maintenance and sensitive harvesting.” However, other Summit participants expressed concern that it is impossible to know in advance whether an area will be well-logged or not, or profitable or not.

Brian Carson speaks about water quality and watershed management on the Coast
There is concern over provincial government control over logging in local watersheds. Some feel that the new Forest and Range Practices Act does not sufficiently protect watersheds. There is particular concern about language in the Act relating to actions to protect non-timber values (e.g., designating community watersheds, setting water quality objectives, protecting wildlife habitat). According to the new Government Actions Regulation, actions can be taken only if doing so would not “unduly reduce the supply of timber from British Columbia’s forests;” and only if the action is consistent with all other objectives, including “maintaining or enhancing an economically valuable supply of commercial timber”, and enabling logging companies to be “vigorous, efficient and world competitive”.

There is concern about the inclusion of the Chapman Creek and Gray Creek drinking watersheds in the timber harvesting area in the District of Sechelt’s community forest tenure. There is concern that the District will be forced to log within the watershed if there is not enough supply outside.

**Urban Forestry**

Forest harvesting activity includes both industrial logging and urban forestry. In the case of urban forestry, when lots are cleared for urban development they are never returned to forest. This land conversion can seriously impact water quality. According to Water Summit speaker, Brian Carson, “Conversion of forested land to residential properties is by far the biggest threat to water quality (and timing of flows) on the Sunshine Coast for the many households not hooked up to SCRD water.”

**Alder in Riparian Zones**

Over the past decades, logging in the Chapman and Gray Creek watersheds has changed the forest composition from old-growth coniferous forest, to communities with a higher proportion of broadleaved trees, particularly alder. A large portion of the riparian zones in these watersheds now consists of even-aged alder stands that are dying en masse. Because broadleaved vegetation leaches higher levels of organic acids than coniferous vegetation, the pH of runoff may be lowered, causing water quality problems.

**Fisheries**

There is concern over the lack of consideration given to fisheries and fish in water management decisions. There is an impression that the SCRD does not consider fish when applying for water licenses, since fish are not their responsibility, but rather that of higher levels of government.

Two sites of particular concern on the Sunshine Coast include Hotel Lake and Chapman Creek. In the case of Hotel Lake, concern over excessive water withdrawal from the lake led to a court challenge to block transfer of two water licenses to the SCRD. In 2005, the BC Environmental Appeals Board blocked the transfer, ruling that the SCRD would have to do more studies, including a master water plan for the Pender Harbour area, a water balance study for Hotel Lake, and studies to determine the minimum acceptable water level for Hotel Lake.

In the case of Chapman Creek, high water demand during the period of summer drought has significant impacts on flow levels. Instead of maintaining the recommended flow level for fish of 10% of the mean annual discharge, the level in Chapman Creek is less than 1% of mean annual discharge. As demands on the Chapman Creek water source continue to intensify in the coming years, the situation for fish will become more and more serious.

Fisheries should receive a higher priority in water management decisions and monitoring studies should be carried out to track the status of fish populations in rivers on Sunshine Coast.
Watershed Management

There is concern that watersheds receive low priority in management. Many community members feel that systemic changes are needed to ensure that watersheds became a more explicit part of economic decision making. Watershed management should include an interest not only in the quality and quantity of drinking water, but also an interest in the functioning of the whole watershed ecosystem, including fish, trees, wildlife and the whole ecological community. Some people feel that all industry should be excluded from drinking water source watersheds. It has been suggested that the SCRD should consider a policy of buying up land within watersheds.

The Sechelt Indian Band and the Sunshine Coast Regional District recently signed a landmark agreement to safeguard drinking water and protect Chapman and Gray Creeks. Under the agreement, the SIB and SCRD will jointly manage the watersheds which are situated within both the SIB’s territory and the SCRD’s potable water service authority. A Joint Watershed Management Advisory Committee will be formed which will make recommendations related to watershed management and laws and bylaws surrounding the watersheds. While the provincial government will still have ultimate authority over allowing or disallowing development in the watersheds, the agreement creates a powerful and influential local body which will give strong voice to community wishes.

LRMP

The Sunshine Coast has applied to enter into a Land and Resource Management Planning (LRMP) process. The proposed LRMP is an interdisciplinary, bigger picture approach that is expected to entail a very long process (more than 10 years) and provides no guarantees. Water summit participants felt that we cannot wait for the LRMP process to be complete before addressing the urgent water issues faced by the Sunshine Coast.

Industry and Government

Industry representatives have expressed frustration over the perceived poor relations between industry and local government. They wish to develop a more productive partnership and non-adversarial system of management. They have expressed a willingness to help fund the required water studies on behalf of the community, and to work with government to help solve pressing water issues on the Sunshine Coast.

Local government representatives have expressed frustration that many taxation revenues from industrial activities on the Sunshine Coast leave the local region to go to the provincial government.
Action Plan Steps

The following actions were recommended by Water Summit participants as important first steps in developing a Sunshine Coast Water Master Plan:

1. Hydrology and Scientific Data Collection

- Formulate research questions (what do we need to know in both the short-term and long term? What data must be collected?)
- Look at what data is being collected in other jurisdictions and how it is being used
- Catalogue what has been done, what data we have, and what gaps exist
- Undertake an integrated strategy to obtain funding for data collection and research
- Work with Diana Allen (Simon Fraser University) and Murray Journey (Natural Resources Canada) and include university graduate students and Capilano College students
- Develop Action Plan for flow levels in Chapman Creek for fish before the summer of 2007
- Create a research centre on the Sunshine Coast, linked to academic centres, to provide high quality data to assist decision makers

2. Health and Safety

- Increase public education to change behaviour
- Undertake research of public awareness of water issues to increase understanding of current conditions
- Enable water providers to connect with health authorities more effectively (e.g., Arsenic)
- Increase industry and staff knowledge
- Some people feel that the SCRD should take on the responsibility of providing clean water to all Sunshine Coast residents
3. Governance

- Create an umbrella governing mechanism that is forward thinking in planning for the Sunshine Coast.
- Use a neutral outside management consultant to work with stakeholders to create a Water Master Plan.
- Involve stakeholders in the form of an independent Advisory Committee to help create a Water Master Plan Terms of Reference.
- The SCRD could coordinate, set up and fund the Advisory Committee that would choose the consultancy firm.
- The consultancy group and the Advisory Committee should be independent of the SCRD and be impartial.
- The process should have some long term design and be tied to a timeline.
- Create an atmosphere of collaboration and provide clarity regarding responsibility.
- An enhanced communication strategy should be created to improve communications between the SCRD and the public.

4. Development and Demographics

- Develop a regional growth strategy.
- Revamp subdivision regulations on the Sunshine Coast (e.g., tree removal).
- Institute preconditions before people apply for Preliminary Layout Approvals (PLAs).
- Develop a better understanding of attitudes of citizens toward water conservation, and of the relationship between demographics and attitudes.
- Examine pilot bylaws for green development (e.g., University of Victoria, Ducks Unlimited).

5. Natural Resource Management

- Undertake source-to-tap risk assessment studies, including response plans. Publicize the findings and act on what is learned.
- Undertake a source assessment study of Chapman Creek.
- Apply best management practices.
- Participate in a Land and Resource Management Planning process (LRMP).
- Create a full inventory map of water resources, including wells and surface water sources, on the Sunshine Coast.
- Work with industry more proactively to find solutions to water management issues.
- Institute systemic changes so that watersheds receive higher level priority in management decisions.
Summit Description

With rapid population growth on the Sunshine Coast, issues related to water consumption, drinking water quality, human effects on aquifers, and protection of aquatic species and habitat are becoming increasingly important. At the same time, provincial legislation governing source protection and drinking water quality continues to evolve with potentially serious financial implications for water governance, particularly for small Water Improvement Districts. Locally, the water issue is widely recognized as one of the most pressing environmental concerns.

To provide impetus on this critical issue, the Sunshine Coast Water Summit was organized. The Summit brought together scientists and water management professionals to exchange knowledge with local stakeholders and to foster the development of a shared understanding on water issues.

The 2-day Summit took place on March 22 to 23, 2006. Scientists, industry professionals and representatives from local government addressed scientific and policy issues from a variety of perspectives. Best practice case studies from other regions of Canada were presented by specialists who had participated in these initiatives elsewhere to show how the collection of quality scientific information links with the decision-making and policy-forming processes. Local experts outlined the state of knowledge of the water sources currently known to be available and provided background information on the current governance and policy environment on the Sunshine Coast.

Over 80 stakeholders from the local community, including representatives of the Sechelt Nation, local, regional, provincial and federal government agencies, non-governmental organizations, and other interested parties, participated in discussions, analysis and forward planning to establish how lessons learned from case studies in other regions could be applied to the Sunshine Coast. Breakout sessions allowed participants to explore different crucial areas in drinking water management and, with the help of specialist facilitators, to consider these specifically in relation to the Sunshine Coast. Breakout topics included: Hydrology and Scientific Data Collection; Governance, Health and Safety; Development and Demographics; and Natural Resource Management.

Throughout the meeting the following questions were used to guide the dialogue:

- What do we know?
- What do we need to know?
- What is missing (data, considerations)?
- What action plan steps are needed to move forward?

The overall goal of the Summit was to take the first step in identifying specific aims, objectives and actions required to develop a draft Water Management Framework for the entire Lower Sunshine Coast.
## Agenda

### (Wednesday, Mar. 22) Science and the Decision Making Process in Water Management

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>8:00</td>
<td>Registration</td>
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<tr>
<td>9:00</td>
<td>Welcome/Opening Remarks/Agenda Overview</td>
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<tr>
<td>9:30</td>
<td>Speaker Presentations I</td>
</tr>
<tr>
<td>9:30-10:00</td>
<td>Stewart Cohen: Moving Beyond the Damage Report: An integrative approach to climate change adaptation in water resources management in the Okanagan</td>
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<tr>
<td>10:00-10:20</td>
<td>Steve Lee: The Development of the Chapman Creek Water Facility</td>
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<td>10:20</td>
<td>Q&amp;A</td>
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<td>10:40</td>
<td>Coffee</td>
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<tr>
<td>10:55</td>
<td>Speaker Presentations II</td>
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<tr>
<td>11:25-11:45</td>
<td>Brian Carson – Watershed Management and Water Quality on the Sunshine Coast</td>
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<tr>
<td>11:45</td>
<td>Q&amp;A</td>
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<tr>
<td>12:00</td>
<td>Lunch</td>
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<tr>
<td>1:00</td>
<td>Briefing on the format and objectives of Breakout Sessions</td>
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<tr>
<td>1:15</td>
<td>Breakout Session I</td>
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<tr>
<td>A: Hydrology and Scientific Data Collection</td>
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<tr>
<td>B: Governance, Health and Safety Issues in Water Management</td>
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<tr>
<td>2:15</td>
<td>Coffee</td>
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<td>2:30</td>
<td>Breakout Session II</td>
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<td>C: Development &amp; Demographics</td>
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<tr>
<td>D: Natural Resource Management (Fisheries, Forestry and Mining)</td>
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<tr>
<td>3:30</td>
<td>Report Back and Convergence</td>
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<td>4:30</td>
<td>Closing</td>
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<tr>
<td>4:45</td>
<td>Closing</td>
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### (Thursday, Mar. 23) Planning for a Sunshine Coast Water Management Framework: Investing in Stakeholder Partnerships

<table>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00</td>
<td>Arrival and Networking time</td>
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<tr>
<td>9:00</td>
<td>Speaker Presentation III</td>
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<tr>
<td>9:00-9:20</td>
<td>Paul Whitfield – The Climate System and Water in Georgia Basin</td>
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<td>9:20-9:40</td>
<td>Bob Weston – Sunshine Coast Drinking Water: The Health Issues</td>
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<tr>
<td>9:40-9:50</td>
<td>Q&amp;A</td>
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<tr>
<td>9:50</td>
<td>Breakout Session III</td>
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<tr>
<td>Breakout groups focus on the 4 topics examined on Day 1: what do we know about this topic? What do we need to know? What is missing? Generate 3 questions to take to the expert panel discussion at 10:50</td>
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<tr>
<td>10:35</td>
<td>Coffee</td>
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<tr>
<td>10:50</td>
<td>Panel Response to the questions generated in Breakout Session III</td>
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<td>12:00</td>
<td>Lunch</td>
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<tr>
<td>1:00</td>
<td>Breakout Session IV</td>
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<tr>
<td>Breakout groups develop action plans for moving forward, taking next steps together. Complete sheets on priority actions and next steps</td>
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<tr>
<td>3:00</td>
<td>Coffee – all attendees can review sheets from all breakout groups</td>
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<tr>
<td>3:30</td>
<td>Report back from breakouts; convergence in plenary (discussion block) Raise Questions and Concerns, circulate sign-up sheets</td>
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<tr>
<td>4:30</td>
<td>Next steps are summarized</td>
</tr>
</tbody>
</table>
List of Participants

Speakers and Panel Members

Diana Allen, Associate Professor & Department Chair, Department of Earth Sciences, Simon Fraser University
Brian Carson, Carson Land Resources Management Ltd.
Stewart Cohen, Adjunct Professor, Institute for Resources, Environment and Sustainability, UBC
Michael Jackson, Chair, Ruby Lake Lagoon Nature Reserve Society
Steve Lee, General Manager Infrastructure Services, Sunshine Coast Regional District
Grant McBain, Community Advisor, Pacific Region, Fisheries and Oceans Canada
Bob Weston, Chief Environmental Health Officer, Coast Garibaldi, Vancouver Coastal Health Authority
Paul Whitfield, Environment Canada, Meteorological Service

Other Water Summit Participants

Tim Adams, Drinking Water Officer, Vancouver Coastal Health Authority
Bob Anstead, Hatchery Manager, Sunshine Coast Salmonid Enhancement Society
Rick August, Fisheries Coordinator & Band Councilor, Sechelt Indian Band
Don Basham, Chair, Sunshine Coast Community Foundation
Bobbi Bennett, Administrator, South Pender Harbour Waterworks District
Jean Bennett, Dean, Sunshine Coast Campus, Capilano College
Brad Benson, Director, Sunshine Coast Water First Society
Anthony Bing, Director of Operations, AJB Investments Ltd.
Verne Bullock, Egmont Cove Property Owners Association
Karen Careless, Granthams Landing Improvement District
Adriane Carr, Leader, Green Party of British Columbia
Jennifer Carson, Water Conservation Assistant, Sunshine Coast Regional District
Anne Clemence, Pender Harbour and District Wildlife Society
Tanis Douglas, Watershed Watch Salmon Society/Fernhill Consulting
John Ellis, Pan Pacific Aggregates Ltd.
Suzan Essiembre, Administrative Assistant, Ruby Lake Lagoon Nature Reserve Society
Michelle Evelyn, Education Committee, Ruby Lake Lagoon Nature Reserve Society
Katherine Evelyn, Programme Assistant, Ruby Lake Lagoon Nature Reserve Society
John Field, Instructor, Capilano College / Director, Ruby Lake Lagoon Nature Reserve Society
Patricia Gallagher, Director, Centre for Coastal Studies, Simon Fraser University
Fred Gazely, Area F Area Planning Committee
Gordon Gray, Director Sunshine Coast Salmonid Enhancement Society
Susan Hall, Quarry Harbour
Conveners’ Report DRAFT – For Public Comment

Ken Harford, Malaspina Engineering
Joe Harrison, President, Area A Quality Water Association
Jason Herz, Resource Advisory Committee, Sunshine Coast Regional District
Douglas Holmes, Chief Administrative Officer, Sunshine Coast Regional District
Bill Hughes, Planning Forester, BC Timber Sales
Nicole Huska, Sunshine Heights Owner and Residents
Dale Jackson, Director and Secretary Ruby Lake Lagoon Nature Reserve Society
Barbara Kapelli, Area A Quality Water Association
Lois Kennedy, Sunshine Coast Resident
Angela Kroning, Moonstone Enterprises
Gillian Kydd, Nature School Coordinator, Ruby Lake Lagoon Nature Reserve Society
Helen LeBlanc, Clearwater Utilities Inc.
Ron LeBlanc, Clearwater Utilities Inc.
Louis Legal, Clean Air Society
Glenn Lewis, Sunshine Coast Botanical Garden Society
Cal Mark, Project Manager, Pan Pacific Aggregates Ltd.
Dave Marquis, Terminal Forest Products Ltd.
Elia McNutt, Sunshine Coast Springs
Ayda Mehrjou, Office of Blair Wilson, M.P.
Martin Mees, Egmont Cove Property Owners Association
Bob Milton, Director, West Porpoise Bay Community Association
Garry Nohr, Director, Sunshine Coast Regional District
Ray Parfitt, Municipal Planner, District of Sechelt
Cameron Reid, Mayor, District of Sechelt
Gail Riddell, Director, Capilano College Eldercollege Program
Tony Richmond, Elphinstone Electors Organization/OCP Review
Elise Rudland, Area B Area Planning Committee/Secretary / Sunshine Coast Community Foundation
Dianne Sanford, Moonstone Enterprises
Dagmar Schulz, Clean Air Society
Bryan Shoji, Director of Municipal Operations, Town of Gibsons
Julie Southerst, Pender Harbour and District Wildlife Society
Ken Sneddon, Sechelt Creek Contracting Ltd.
Marc Soprovich, President, Renewable Power Corporation, (McNair Creek Hydro Project)
David Stiles, Halcyon Consulting
John Termuende, Edutech Technologies Corp.
Gerry Tretick, Councillor, Town of Gibsons
Vicky Weekes, Simon Fraser University
Dion Whyte, Engineering Technologist, Sunshine Coast Regional District
Ian Williamson, School of Resource and Environmental Management, Simon Fraser University
Paul van Poppelen, Microbial Technologies
Vince Verlaan, Wellspring Facilitation and Planning, Inc.

Sunshine Coast Water Summit Report

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Additional Resources


BC Ground Water Association
http://www.bcgwa.org/

BC Ministry of Environment, Resource Information
http://www.env.gov.bc.ca/wat/

BC Ministry of Environment, Ground Water Information
http://www.env.gov.bc.ca/wat/gws/index.html

BC Ministry of Environment, Water Stewardship Division, River Forecast Centre
http://www.env.gov.bc.ca/rfc/index.htm

BC Ministry of Health, Drinking Water Program
http://www.healthservices.gov.bc.ca/protect/water.html

BC Water Inventory Data Management System
http://srmmwww.gov.bc.ca/wat/widm/index.html

Canadian Ground Water Association
http://www.cgwa.org/index.htm

Canadian Society for Hydrological Sciences
http://www.cwra.org/About_CWRA/CSHS/cshs.html

Canadian Water Resources Association
http://www.cwra.org/

Canadian Water Quality Association
http://www.cwqa.com/

Environment Canada Freshwater Website
http://www.ec.gc.ca/water/e_main.html

Environment Canada Groundwater Website

Sunshine Coast Water Summit Website

Sunshine Coast Regional District, Water
http://www.scrd.bc.ca/infrastructure_water.html

Town of Gibsons, Water
http://www.gibsons.ca/gibsonswater/

Vancouver Coastal Health Authority
http://www.healthspace.ca/vch

Water Centric Planning
http://www.waterbucket.ca/wcp/