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Benefits of the Capital Regional District Water Conservation Program

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A decorative graphic at the bottom of the page consisting of several overlapping, wavy bands in various shades of teal and light blue, creating a sense of movement and water.

Evolution of Water Conservation in the CRD

Water conservation has been an integral part of the Capital Regional District's future water supply since 1994, when a key recommendation was enacted from the *1994 Long Term Water Supply Plan* to develop and implement a water conservation program. Recommendations for the scale of water conservation programs are examined in an annual review of the growth in water demand and water usage trends in the *5-year Strategic Plans for Water Management*.

The enactment of the *1997 Capital Regional Water Supply and Sooke Hills Protection Act and Regulation* confirmed that the Water Conservation Program would remain an integral part of the management of the water supply system.

Although outdoor watering schedules were in place since 1992, they were piecemeal from municipality to municipality and enforcement was practically non-existent (Appendix A). Recommendations from the *1999 Strategic Plan for Water Management* saw a Water Conservation Bylaw established in 2001, which introduced the administration and enforcement of the Water Conservation Bylaw region-wide. In May of 2001, the Water Advisory Committee (WAC) officially defined the term Water Conservation. The *1999 Strategic Plan for Water Management* also provided technical direction for the development and management of the water supply, transmission system, water conservation program and water supply catchment lands.

"That the Water Advisory Committee adopt the American Water Works Association's definition of water efficiency, namely: "Water Conservation can be defined as practices, policies, techniques and technologies that improve the efficiency of water use. Increased efficiency expands the use of the water resource, freeing up water supplies for other uses, such as population growth, new industry, and environmental conservation. Water conservation programs emphasize lasting day-to-day improvements in water use efficiency."

Between 2000 and 2004, the residential Water Conservation Program expanded to include a successful campaign to reduce indoor water use by offering rebates to replace residential toilets, shower fixtures and washing machines with more efficient models. During the same period outdoor water efficiency was also encouraged with rebates for irrigation system controllers and rain shut-off devices. These residential rebate programs were discontinued in 2009, as the requirement of efficient indoor fixtures became standard use in part to provincial codes requiring the installation of 6 litre or dual-flush toilets in all new residential building and renovation projects.

In 2004, it was also determined that the level of funding for water conservation programs at the time was justified due to the effectiveness of the program in reducing per capita water demand and deferring the need for expensive capital costs associated with expansion of the water supply. Since

the timing of expansion of the supply would depend, in part, on the success of the Water Conservation programs, funding for an Industrial, Commercial & Institutional (ICI sector) program was established in 2006.

The overall goal of the Water Conservation programs continues to be deferring the expansion of the water supply for 50 years. The current (2012) approach to water conservation is to use an “adaptive” approach that adjusts resources and targets programs in response to trends in water use. Program budgets were reduced in 2011 and a further 25% reduction in 2013.

The key strategies and actions from the *2012 Strategic Plan for the Greater Victoria Water Supply System Management* associated with addressing changes in water usage trends are:

- Continue to put a priority on reducing outdoor water use and make this part of a larger strategic priority for water conservation in the Greater Victoria Water Supply System.
- Continue to monitor public attitudes and behaviour relating to indoor and outdoor water use and water conservation.
- There is a continued need for education and communication on regional climate, water requirements of lawns and horticultural plantings, water-wise landscaping and gardening techniques, and efficient irrigation.
- There may be a need to target initiatives at developers and specific types of outdoor water users such as institutions, parks and recreation departments, and agriculture.
- Expand the capability for the Water Conservation Program to act as a resource centre for the latest research, ideas, strategies, approaches, technologies and examples relating to trends in water use and the efficient use of water in the residential sector. Other factors, such as water-use-related requirements in subdivisions, new technologies and approaches to water use in commercial and multi-family residential buildings, and the potential for expansion of local agriculture and horticulture need to be considered.
- Enhance relationships and communication with water users, professional and technical associations, and community stakeholders to improve understanding of opportunities and barriers relating to improving the efficiency of water use.
- Continue research and analyses, to facilitate the development of business cases for new or enhanced water conservation initiatives in the short term and proposals for new initiatives to respond to predicted increases in water use.

- There is also a continued need to track research and federal, provincial, regional, municipal and institutional, commercial and industrial approaches to water use and efficiency. Additional summer water savings may require new initiatives and additional resources.
- Expand water audits of businesses and institutions in the ICI sector and enhance the capability to follow up on these audits to encourage implementation of identified measures for reducing water use.

What Makes Up a Water Conservation Program?

CRD's overall Water Conservation Program comprises both residential and Industrial, Commercial & Institutional focused initiatives. All water conservation initiatives can be characterized as a "measure" or a "delivery mechanism". Programs are a combination of measures and delivery mechanisms.

The following are explanatory definitions for organizing initiatives:

An efficiency measure – is a technology (e.g. water-efficient plumbing fixture) or a management practice (e.g. turf reduction) which results in the more efficient use of water.

A delivery mechanism - is the vehicle that is used to encourage or ensure implementation of measures by customers (e.g. rebates, audits, social marketing).

A water conservation program - is a measure, along with the appropriate marketing approaches and delivery mechanisms (e.g. the Toilet Replacement Rebate Program).

The residential program is focused on the following areas:

Education/Outreach

- Youth Education Program
- Educational booths and attendance at community events
- Drinking Water Cart
- Presentations to local organizations and community groups
- Media advertising and feature articles on water conservation and the Water Conservation Bylaw
- Efficient Outdoor Water Use Educational Workshops
- Print materials on water conserving indoor & outdoor topics
- Multi-residential Audit Guide

- Residential Water Conservation maintains a website presence
- Promotional items such as: water bylaw information magnets, dye tablets/shower bags
- Responds to public inquiries

Research

CRD undertakes a regular survey (every 4 years) of residential water use since 1999. In addition, CRD conducts other research & development projects to keep up to date on new water conservation developments.

Administer the Water Conservation Bylaw 3061

Water Conservation's role is to enhance the effectiveness of the Bylaw through education and awareness. The Water Conservation program administers the Water Conservation Bylaw and works closely with Bylaw Enforcement.

Environmental Outreach Assistants

Water Conservation staff interview, select, train and supervise summer personnel to serve as environmental ambassadors in the region and to assist in the numerous Environmental Partnerships community outreach events and Water Conservation Bylaw administration and education.

Partnerships/Professional Training

CRD has established numerous partnerships with organizations across the Region. The goal of these partnerships is to improve understanding of opportunities and barriers relating to improving the efficiency of water use. CRD financially supports professional training in organizations such as IIABC, BCLNA and CANARM. Water Conservation has fostered numerous partnerships, such as the Horticulture Centre of the Pacific, Swan Lake Nature Sanctuary and Canadian Home Builders Association, to name a few.

Environmental Partnerships

In addition to the core function of water conservation, staff manages the coordinated community outreach events for the department.

The Industrial, Commercial and Institutional (ICI) initiatives include:

- ICI Water Audits
- Administering Once Through Cooling Rebates
- Updating the Retail Water Database
- Educational Information

Benefits of Water Conservation in the CRD

1. Prolonging the lifespan of current supply: Deferring costly infrastructure expansion

Water conservation efforts in the CRD have played a major role in huge infrastructure cost savings. The Sooke Lake Reservoir offers some of the best drinking water in the world and prolonging the use of this source for as long as possible ensures both the continuation of high quality drinking water and deferring the development of an additional supply (Leech River Watershed) until 2050 or beyond. Deferring this expansion means tremendous cost savings to all residents, as readying the Leech River Watershed system for operation will cost \$100 + million for a water treatment plant and approximately \$3 million a year to operate. In addition, due to the success of water conservation efforts, the estimated capital cost of the core area wastewater treatment plant has been reduced by \$185 million plus \$4.5 million per year to operate.

2. Lower Water System Operating and Maintenance Costs

Reducing water use is an effective way to reduce chemical (chlorine) use for water disinfection and lower energy use for UV lamps and water distribution (pump stations). This directly reduces operation and maintenance expenses.

3. Contributes to high Water Quality

Conserving water not only helps to maintain a constant supply of drinking water but also helps ensure better drinking water quality. During the hot summer months, lower levels in the reservoir results in more shoreline and sediments being exposed. A higher water level keeps the water cooler and helps meet key water quality goals and criteria, thus contributing to reliable water quality. (Appendix B)

4. Pricing & Value

A recent article in the Times Colonist sums up the CRD's water efficiency efforts. "Water efficiency practices have demonstrated a significant return on investment for residents in the region. Without

these reductions in water usage, we all would likely be paying substantially more for the high quality drinking water that we enjoy.” (Appendix C).

Not only is high quality drinking water available to residents and businesses in the CRD 24 hours a day, 7 days a week; this water comes at a reasonable rate. CRD Integrated Water Services is the bulk (wholesale) water supplier to the 349,000 consumers in the Greater Victoria Drinking Water Supply System and the retail water supplier in the Westshore Communities and Sooke. As the wholesaler of water, the CRD doesn’t send retail customers a water bill, except in the Western communities. Water billing comes from individual municipalities (Oak Bay, Victoria, etc.). CRD Integrated Water Services does not make a profit from the sale of drinking water, and charges only as much to its wholesale customers as to cover the cost of infrastructure improvements, operations and maintenance. About 40% of any water retail bill issued comes from the wholesale rate.

5. Defense Against Drought

Between 1967 and 2002, weather records at the Sooke Lake Reservoir show an increase in the magnitude and frequency of dry years, which may foreshadow increases in future periodic summer droughts. In the short term, conserving the water we have minimizes the effects of water shortages and helps build a better defense against future drought years.¹ Sooke Lake Reservoir contains high-quality, naturally clean water, so by reducing water consumption, the long-term supply of high quality drinking water will be ensured.

6. Regional Sustainability Strategy Policy Options – Water Conservation

Water management is an integral part of resource management in the *Regional Sustainability Strategy*. In the Resource Management Policy brief² the target for Water Management is to “minimize water consumption through ongoing sustainability and efficiency measures and application of reduce, reuse and recycle practices. Ensure sufficient measures are in place to protect the existing water supplies. Ensure water efficiency and water conservation performance is considered in relation to per capita targets and increase public education efforts in order to further conserve drinking water.”

¹ Defense Against Drought

<http://www.watershedsentinel.ca/content/climate-change-impacts-water>

² Resource Management - RSS Policy Options Series, Fall, 2010

http://sustainability.crd.bc.ca/media/1269/resource_management_policy_brief_small.pdf

7. Energy Use and Carbon Footprint

CRD's water-use cycle is very similar to other large urban areas including: water treatment and distribution, and wastewater treatment, collection and end use, all of which involve energy use. These energy uses include:

- Indirect energy – energy to pump and treat water (UV lamps) and wastewater.
- Direct energy – residential and ICI customer hot water end-uses, such as showering, clothes/dish washing, hand washing and other ICI process uses.
- Manufacturer energy - energy required to manufacture and transport chemicals used in water treatment.

Water conservation reduces the energy required to accomplish all these uses which helps in reducing greenhouse gas emissions, conserving fuel resources and protecting our source water. Efficient water use helps to meet the goals of the *CRD's Strategic Climate Action Plan*.

8. Climate Change Impacts

In 2012, the CRD was part of a research project with the Pacific Climate Impacts Consortium (PCIC), ICLEI Canada³ and a handful of nearby local governments to develop a regional climate model for the Georgia Basin. The goal of this research was to provide a greater understanding of what we can expect to see when it comes to climate-related impacts in 2050 and 2080.

Highlights from the findings include:

- Extreme temperatures (32°C to 35°C) are projected to occur almost four times as often in the future in the CRD.
- The amount of precipitation falling during very wet days is projected to increase by 20%; with precipitation during extremely wet days projected to increase by 25% in the CRD.
- More extreme precipitation events (with 3-hour duration) are projected to occur on average three and a half times as often in the future, in the CRD.
- There will be fewer Heating Degree Days and a substantial increase in Cooling Degree Days in the CRD.

Rising temperatures combined with severe weather events and no increase in precipitation may well lead to increased irrigation, putting extra strain on the water supply.

³ Climate Change Impacts

<https://www.crd.bc.ca/about/what-we-do/sustainability/climate-change-indicators>

9. Saving the Health of Aquatic Systems

Water efficiency and conservation contributes to a healthy watershed, which allows stewardship of the water supply lands to include compatible secondary values, such as biodiversity, fish and fish habitat, cultural and historic resources and aesthetic and scenic values. The water collected in the Deception reservoir is dedicated to the fishing and cultural agreement with the T'Souke First Nations.

10. It is important to our residents and Fosters good Customer Relations

CRD has undertaken a regular survey (every 4 years) of residential water use since 1999. Over the 15 years that these surveys⁴ have been conducted, a majority of residents (in the 80% + range) have consistently said that water efficiency both indoors and outdoors, is important or very important to them. The same survey shows that the Water Conservation Bylaw is also strongly supported by an equal majority of residents.

Water conservation programs help the CRD manage demand and foster good customer relations. This is particularly true for customers who are concerned for the environment and wish to reduce their water and energy bills through reduced water consumption. Water conservation also increases residents' knowledge and value of their local drinking water supply, including the processes and strategies to ensure long-term adequate supplies of safe, clean drinking water.

11. Saving Money

The connection between water and energy use is not well understood by many residents. Much of the water used in homes is heated before use so water conservation not only reduces water bills but also reduces energy use which saves households money, thereby increasing disposable household incomes. This synergy between water and energy also applies to the ICI sector. Potential opportunities to save water in business facilities also exists and often simple, cost-effective actions can result in energy and water savings resulting in significant economic benefits.

Conserving water allows the CRD to plan for more efficient use of the water resources in the future. If our current supply is depleted through non-conserving behaviours, there will not be water for future generations to use, meaning the CRD will need to move to new sources to produce clean, fresh water, which will ultimately be at the rate payers' expense.

12. Reduce hydraulic loads on treatment plants

Water conservation can reduce hydraulic loads and improve the treatment process on wastewater treatment plants and onsite sewage systems; plus, it can reduce pollutant discharge to the environment.

APPENDICES

- A History of Watering Schedules
- B Article excerpt – Times Colonist – *So Where Does Our Drinking Water Come From?* May 2014
- C Article - Times Colonist – *Water Efficiency Saves you Money, Protects Our Environment and Builds Healthy Communities.* Feb 2012

APPENDIX A

HISTORY OF WATERING SCHEDULES

- 1992 August 10 to October 2 – Mandatory watering schedules were approved by resolution for the Western Communities and Sooke and the other municipalities were requested to implement similar restrictions. Stage 2 Lawn watering was restricted to one-inch once per week according to house number. No enforcement. Should not be considered as Stage 1.
- 1993 February 26 to August 27 – Stage 1 voluntary restrictions that included lawn watering twice per week, discontinuance of washing sidewalks, parking lots, turn off fountains that do not recycle water, etc. Enforcement was by the municipalities except in the Western Communities where the GVWD¹ enforced it.
- 1994 No restrictions.
- 1995 Stage 1 voluntary restrictions from June 3 to July 21 (see 1993 for extent of restrictions & enforcement), and July 22 to August 18 Stage 2 restrictions which reduced lawn watering to once per week between 4 a.m. and 9 a.m. and 7 p.m. and 10 p.m.
- 1996-1998 No restrictions.
- 1999 June 10 to September 30 – Stage 1 restrictions in effect that limited lawn watering to two days per week between certain hours. No enforcement.
- 2000 Restrictions were in effect from June 1 to September 30. Stage 1 restrictions limit lawn watering to two days per week. No enforcement.
- 2001-2002 Stage 3 Water Conservation Bylaw (no lawn watering) April 2, 2001 to December 18, 2001 and Stage 2 watering schedule in effect from December 18, 2001 to January 8, 2002. Prior to 2001 there was no concerted effort to administer or enforce the Water Conservation Bylaw region wide.
- 2002 Stage 1 Water Conservation Bylaw from July 1, 2002 to September 30, 2002 (delayed from June 1 to July 1 to permit lowering of Sooke Lake Reservoir to accommodate dam construction work).
- 2003 Stage 1 Water Conservation Bylaw from May 1 to September 30, 2003. The bylaw was amended to put in place annual watering schedules from May 1 each year.
- 2004 Stage 1 Water Conservation Bylaw from May 1 to September 30, 2004.
- 2005 Stage 1 Water Conservation Bylaw from May 1 to September 30, 2005. The township of Sidney rescinded its Watering Bylaw so that CRD could then administer and enforce the CRD Water Conservation Bylaw.
- 2006-2009** Stage 1 Water Conservation Bylaw from May 1 to September 30.
- 2009 CRD enlisted to enforce the Water Conservation Bylaw in Colwood as of Oct 1, 2009.
- 2010-2014** Stage 1 Water Conservation Bylaw from May 1 to September 30.

¹ Greater Victoria Water District (GVWD) until 1997 when it became the Water Services Department within the CRD.

Capital Regional District

Water Efficiency Saves You Money, Protects Our Environment and Builds Healthy Communities

As the rain falls from the sky, and our reservoir level rises, questions begin to surface about the summer watering schedule and water rates. The Capital Regional District's (CRD) Integrated Water Services division manages the supply, treatment and delivery of bulk (wholesale) drinking water to its municipal customers in the Greater Victoria Drinking Water System. Every glass of refreshing tap water you pour comes from the local Sooke Reservoir.



In 2007, the CRD acquired the Leech River Watershed. This essential investment was made to ensure that as our community continues to grow, we can continue to have access to fresh, clean water. With this \$65 million investment in infrastructure, an increase in water rates was required. This increase now ensures that the future supply of water for our region will be provided cost effectively.

Currently the average annual household water use charge is just over \$11 per month. This charge covers the expenses associated with disinfecting, delivering and protecting the water supply; as well as ensuring funds are available for renewing our infrastructure as it reaches the ends of its useful life. The CRD does not profit from the sale of water; you may notice a different water rate on your water bill than noted above due to municipal infrastructure and operations, delivery and administration costs.

Even with the additional water supply, water conservation remains important not only for reducing water bills, but also for protecting the supply of some of the best drinking water in the world. Water conservation isn't just about using less, it's about using water as efficiently as possible. Sooke Reservoir is fed by a pristine, protected watershed, which means our water is naturally clean and clear, and requires little treatment. By actively reducing your water consumption, you are helping to keep our current Sooke Reservoir water supply secure, ensuring

quality water delivered to your tap year round. In the hot summer months, the reservoir is affected by lower water levels. With these reduced water levels, a greater amount of land area is exposed, increasing the likelihood of exposed sediments. Stabilizing water levels through efficient water use helps contribute to reliable water quality.

Another benefit of reducing water consumption is keeping demand levels within the available supply of the Sooke Reservoir. Over the past 10 years, consumption has lessened enough to result in a delay in opening the Leech River Watershed from 2012 to past 2050. The cost savings for residents has been huge as getting this watershed system operating will cost \$100+ million for a water treatment plant and an estimated \$3 million per year to operate. In addition, due to the success of our conservation efforts, the estimated capital cost of the core area wastewater treatment plant has been reduced by \$185 million. Water efficiency practices have demonstrated a significant return on investment for residents in the region. Without these reductions in water use, we all would likely be paying substantially more for the high quality drinking water that we enjoy today.

Using water efficiently, saves money, protects our environment and helps build healthy communities. To find out more about the true value of our local water and more tips on water conservation visit www.crd.bc.ca/water.

APPENDIX C

So where does our drinking water come from?

(Excerpt)

Jeff Bell / Times Colonist

May 16, 2014 05:19 PM



A photo of the North Basin (the Northern most section of the Sooke Lake reservoir (Greater Victoria's primary water supply) Photograph By ADRIAN LAM, Times Colonist

Greater Victoria's water supply was assured for future generations in 2007 with a monumental deal that increased the size of the watershed by 79 per cent.

It cost about \$65 million, but the Capital Regional District looked into its crystal ball and decided to pay TimberWest for 8,791 hectares around the Leech River, even though it might not be needed for almost 50 years. That goes with about 10,000 hectares of existing watershed land next door.

"There was a significant decision made by the Regional Water Supply Commission to make this purchase, much like the decision our predecessors made 100 years ago to secure Sooke Lake as the water-supply area," said Ted Robbins, CRD integrated water services general manager.

"There's a lot of work underway, even now, to start rehabilitating the Leech River area. Of course, it was actively logged under its private ownership."

Another tract in the same vicinity was bought by the CRD in 2010 — 837 hectares for which \$3.14 million was paid to Western Forest Products. The deal was part of a bigger arrangement that also included the acquisition of parkland.

A tunnel linking the Leech River to the Sooke Lake Reservoir was built in the 1980s in anticipation of water demands, but intake and outlet facilities have yet to be put in.

Since the purchases, the biggest question about the Leech River land has been whether to close it to the public now or to wait. CRD staff recommended stopping public access in a report last fall, but the document was tabled for consideration some time this year.

Sidney Coun. Mervyn Lougher-Goodey, who chairs the Regional Water Supply Commission, said there are some “complexities” involved in the issue and it is still under review. Access to the Leech is already controlled by gates and other restrictions. As well, the only way in is through privately owned forestry land.

Since the Leech area has been 95 per cent logged and has approximately 385 kilometres of roads, there is not a lot of wilderness to preserve. The idea is to give nature a chance to regenerate the land, leading to improved quality of the water it produces.

One advantage of ending public access would be to reduce the risk of forest fires, as keeping the watershed intact means protecting the forest.

“The risk of wildfire is probably our biggest concern in the water-supply area,” Robbins said. “Should there be a fire that gets out of control, there’s the potential to cause extensive damage to the point where all the ash and sediment that would be generated would end up on Sooke Lake Reservoir.

“That would probably put us in a situation, if there was an extreme event, where we could not supply water.”

Annette Constabel, senior manager of watershed protection, said the greatest fire-prevention efforts are concentrated from April to October. Those include ground patrols, especially during the summer.

“We have aerial patrols through the summer, as well, looking for lightning strikes, that kind of thing,” Robbins said. “We look particularly up in the Leech water-supply area. In the summertime, there’s lots of recreational activities up there; people are in there camping and whatnot.”

Constabel said the last time a fire breached the watershed boundaries was a relatively minor incursion in 2006, but she said a large forest fire at Shawnigan Lake in 2012 drew close scrutiny from watershed crews.

“Every year there’s fires around us,” she said.

Summer also brings water restrictions for the public, something that draws complaints if the level of Sooke Lake stays relatively high. But Robbins pointed out that maintaining levels via restrictions helps complete an arrangement with the T’Souke First Nation to release water to the Goldstream, Sooke and Charters rivers to help fish habitat.

“By maintaining a high level in the Sooke Lake Reservoir and the Goldstream Reservoir, we’re able to provide those flows and meet our agreement.”

Lougher-Goodey added that the deeper and colder the reservoir water is, the better the quality.

Stage One water restrictions begin as a matter of policy every May 1 and run until Sept. 30. That means lawns can be watered two days a week between from 4 and 10 a.m. and 7 and 10 p.m.

Lougher-Goodey said he has an irrigation system in his yard and waters strictly within the set hours.

"I've got the greenest lawn on my street. You can have a very nice lawn and garden within those restrictions."

Robbins noted that the winter of 2013-14 was a strange one for precipitation and its effect on water storage. The reservoir is often full by December, but not this past one after the driest October-December on record.

"In January, we were sitting at 75 per cent," Robbins said. "Then we had some rain events, one in the middle of January and one in March."

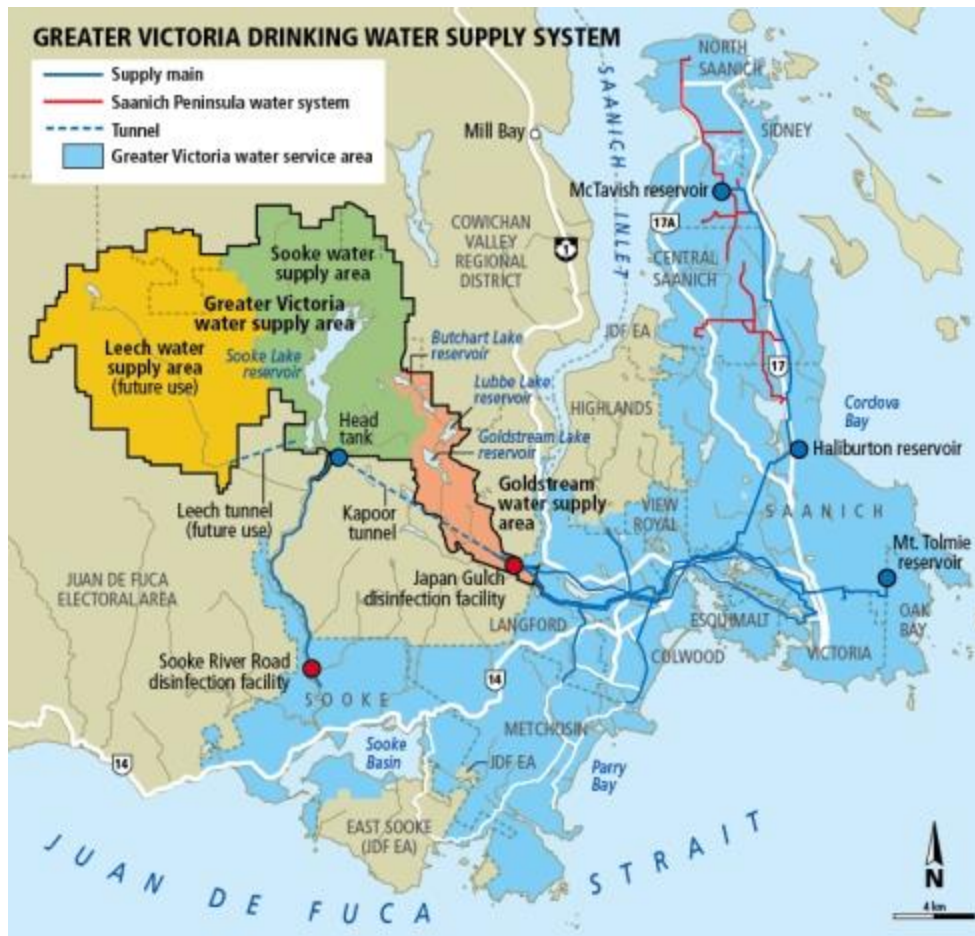
The reservoir was full for the last part of the winter and has remained at about 100 per cent into May. Capacity was increased by almost 80 per cent when the Sooke Reservoir dam was raised six metres — an expansion project that cost \$23 million, including the cost of land-clearing.

A new project in the works is a \$6-million to \$8-million venture to replace the aging chlorine/ammonia disinfection portion of the water-supply system, located next to the ultraviolet-disinfection plant near the main watershed entrance.

"Currently, we're operating a system which operates on chlorine gas and ammonia gas," Robbins said. "The equipment is nearing the end of its service life.

"We're looking at changing that process to a liquid chlorine-and-ammonia process."

Construction could start by late this year or early next year.



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