



## **SARATOGA / SCOTCH CREEK WATER SYSTEM**

### **Water Conservation Plan**

**September 2018**

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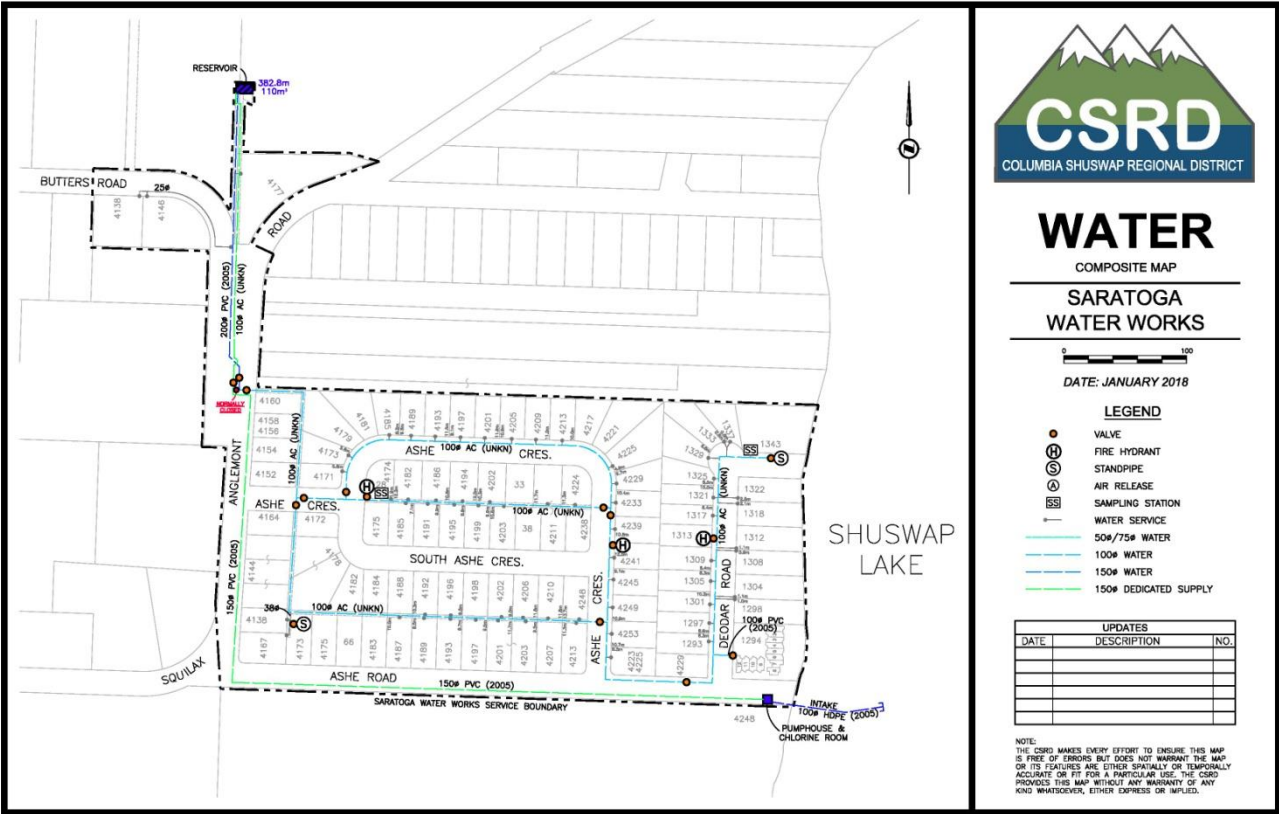
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1.0 BACKGROUND

Water conservation can have different meanings for different people. It can remind us of the possibility of collecting rainwater in small tanks for domestic use, or constructing dams and reservoirs; of recharging groundwater tables, or using lower quality water whenever possible in order to save better water. Water conservation encompasses all this. It involves reducing the demand for water by fostering water conservation habits, stopping wasteful uses, decreasing peak consumption and charging for water at the appropriate rates. It also means taking advantage of technological developments and improved management techniques, coordinating water resource planning and management with land-use planning and economic and social planning, and establishing new or updated standards and regulations. In short, water conservation means optimal water use.

Saratoga Water System

The Saratoga Water System is located in Electoral Area F of the Columbia Shuswap Regional District (CSRD) in the community of Scotch Creek on the north Shore of Shuswap Lake. The CSRD took over the operation of the Saratoga Water system in 2005.



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The key components of the CSRD's water system at Saratoga include:

- Surface water source drawn from a water intake at Shuswap Lake.
- Chlorination system and pumping facilities situated adjacent to the intake structure. Sodium Hypochlorite is used as a disinfectant, and the pumping facilities are comprised of two submersible pumps approximately 300 feet into the lake from the lakeshore pump house. Both pumps are 15hp. Water is pumped through the pumphouse / treatment facility where Ultraviolet disinfection is followed by chlorination. From there, the water continues through a dedicated main to a reservoir. From the reservoir the water flows by gravity to the Saratoga community.
- Approximately 2.5 km of 100mm Asbestos Concrete water main, along with 1.0 km of dedicated water main runs from the Shuswap Lake intake up to the Reservoir.
- One pressure zone.
- The system has one in-ground concrete reservoir, the capacity of this reservoir is approximately 90 m3.
- 3 fire hydrants within the service area.

In the summer of 2006, upgrades were completed to the Saratoga Water system that included one Trojan swift UV reactor, reservoir, dedicated main, online flow metering and online pH, temperature and chlorine monitoring.

This Water Conservation Plan has been prepared in accordance with the US Environmental Protection Agency's Water Conservation Plan Guidelines – Basic Guidelines for utilities with service populations of less than 10,000. It contains the following sections:

- Description of water conservation planning goals
- Profile of the CSRD's water system
- Identification of water conservation measures
- Review of implementation strategy

It is important to note the benefits of efficient water use with respect to the environment. All properties connected to the Saratoga system have on-site sewer systems. Ground water testing since the year 2000 has indicated there are septic effluent impacts to the groundwater within the Saratoga and Scotch Creek area. The increasing concentrations of E. coli in the groundwater are potentially indicative of septic system failures. Reduced water usage, and therefore sewage generation will help to reduce the cumulative impacts to the ground water of septic effluent.

## **2.0 DESCRIPTION OF WATER CONSERVATION PLANNING GOALS**

The CSRD strives to accomplish the following goals through implementation of a water conservation program:

- Sustainability – to ensure availability for future generations, the withdrawal of fresh water from an ecosystem should not exceed its natural replacement rate.
- Energy Conservation – water pumping and delivery consume a significant amount of energy. Reducing water use will result in a reduction in greenhouse gas emissions adversely impacting our environment.
- Habitat Conservation – Minimizing human water use helps to preserve freshwater habitats for local wildlife and migrating waterfowl.
- Reduce Operating Costs – decreased water consumption will result in reduced operating costs for items such as power and chemicals. There are environmental benefits associated with these operating efficiencies as well.
- Change Habits- encourage consumers to reduce waste by making small behavioural changes and by choosing more water efficient products. To be water efficient, users can fix leaking taps, take showers rather than baths, use a Hippo (or other product) in the toilet, and do a full load of dishes or laundry. All of these things will aid in decreasing the waste of water on an everyday basis. It is extremely important as a consumer to understand the usefulness of water efficiency and how to continually use water wisely.

## **3.0 PROFILE OF THE SARATOGA WATER SYSTEM**

Some of the key components of the Saratoga Water system were noted above in Section 1. There are additional elements which are important in gaining an understanding of the system. These are presented below:

### **3.1 Service Population**

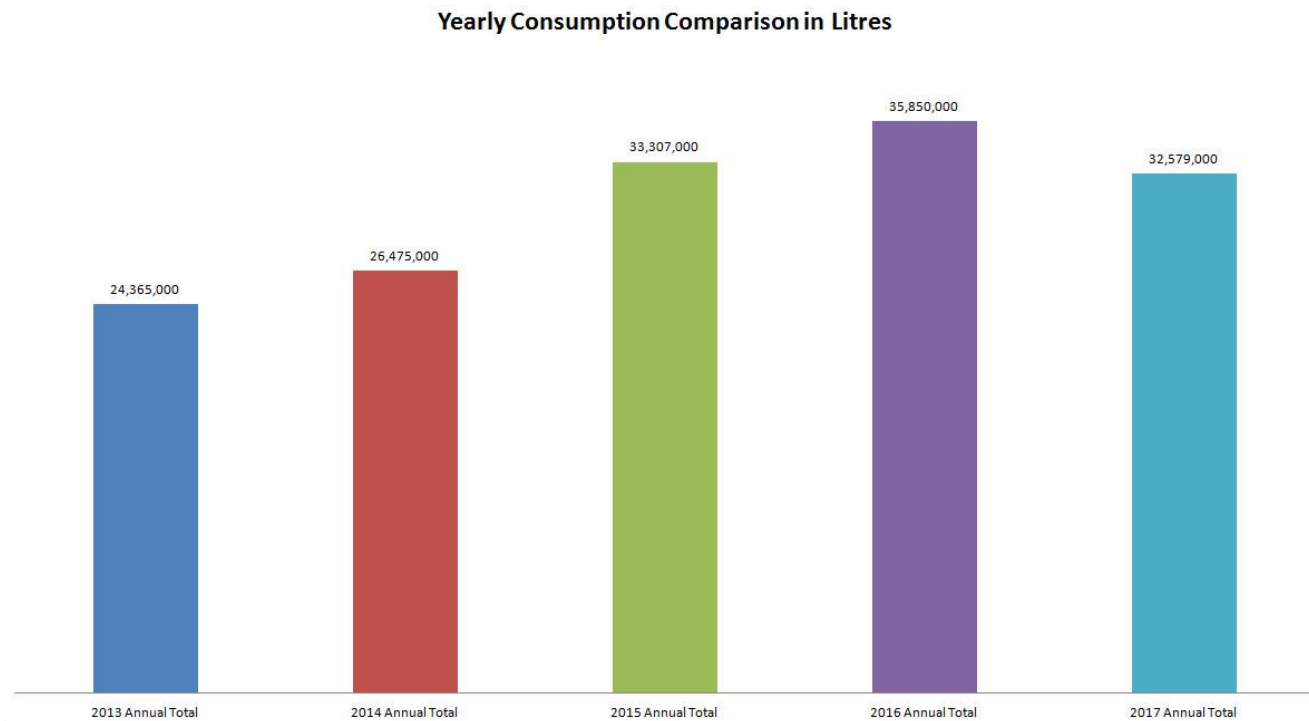
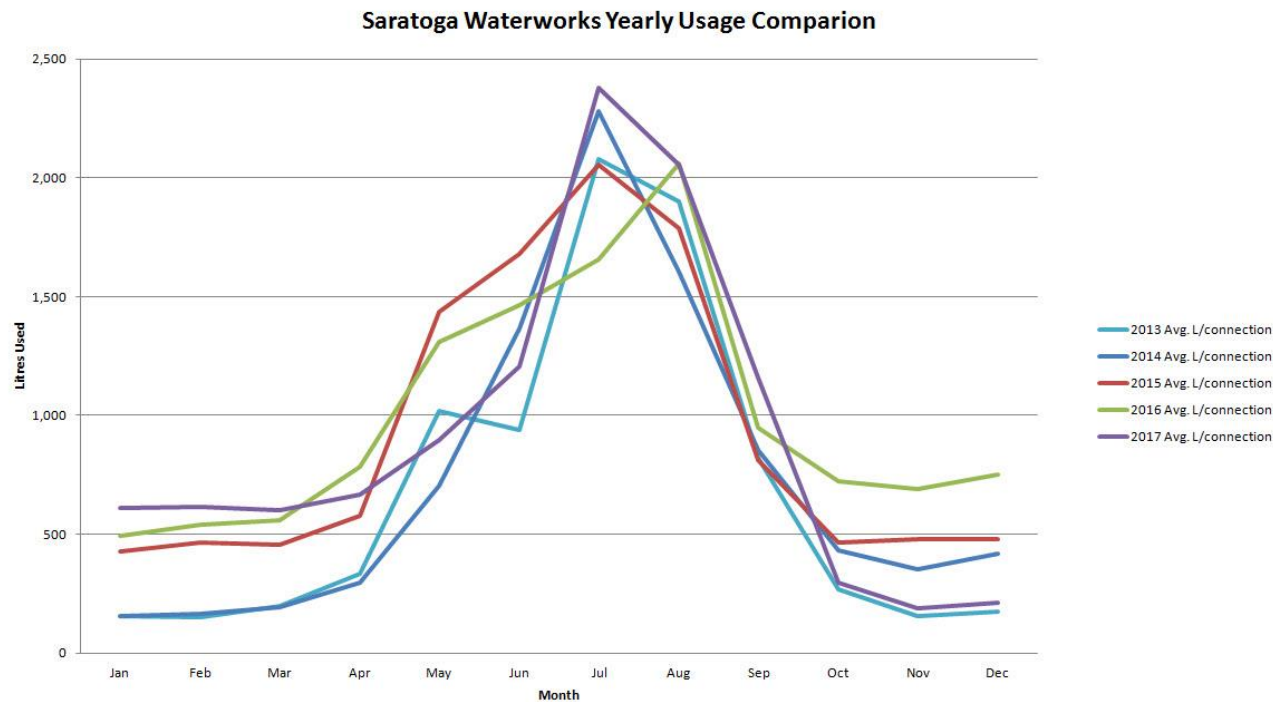
The community of Saratoga is almost exclusively residential. An estimate of the community's residential population is approx. 265, based on 102 residents and an average of 2.6 persons per residence. The dominant demographic profile at the Saratoga subdivision is retirees. There are no commercial, industrial, or institutional customers on the system.

### **3.2 Number of Connections**

There is a total of 105 residential water service connections; 102 existing residences, and 3 vacant lots.

### **3.3 Water Consumption**

The CSRD has a water flow meter at its intake and the yearly pumping total and monthly pumping total are illustrated in the following graphs.



### **3.4 Pricing – Single-Family Residences**

The CSRD currently uses a two-part pricing structure comprising an annual parcel tax of approximately \$185.00 per parcel (occupied or vacant parcel) and an annual user fee of \$521.00 (less 10% if paid prior to April 30) for each single-family residence.

### **3.5 Water Metering**

There is currently no water metering in Saratoga

## **4.0 IDENTIFICATION OF WATER CONSERVATION MEASURES**

The CSRD considered a wide range of potential measures as part of its water conservation plan, and determined the following measures are appropriate for the water system now and in the future:

### **4.1 Universal Metering Program**

The CSRD recognizes that a universal metering program is fundamental to achieving significant results in water conservation.

### **4.2 Water Accounting and Loss Control**

The CSRD conducts an annual audit of water consumption comparing the total water measured through the flow meter at the lake intake with the water consumption of the connections on the water system, taking into consideration water used for main flushing, firefighting, water breaks, and other non-account water. The non-account water loss will be compared to average industry standards, and in the event the water loss exceeds industry standards, funds will be budgeted to conduct a leak detection survey to isolate and pin point the water leaks and have them repaired. The CSRD will continue to respond immediately to water breaks and record relevant information pertinent to all leaks on the system.

### **4.3 Education**

The CSRD will add additional information to its annual water invoice to the Saratoga water customers to encourage water conservation. The CSRD will continue to distribute a brochure with the annual water bill. This brochure will provide information on tips to save water, the advantages on an underground irrigation system, sprinkling regulations, plumbing retrofits and replacements such as dual 3/6 litre flush toilets, high efficiency washing machines, conservation landscaping, etc. The CSRD also promotes conservation on our website which has a page for each of its water systems.

### **4.4 Water Restrictions and Enforcement**

Water restrictions will continue to be implemented to reduce the maximum daily demand on the system in the summer months, increase public awareness of water conservation, and conserve water. The current restrictions specify watering of landscaping is permitted from 6:00 A.M. to 10:00 A.M. and from

6:00 P.M. to 10:00 P.M., odd numbered houses sprinkle on Tuesday and Friday, even numbered houses sprinkle on Monday and Thursday. More stringent water restrictions may be imposed as required. Compliance is mandatory and is enforced through the Municipal Ticket Information bylaw which has stipulated a \$50 fine for not adhering to the sprinkling restrictions.

## 5.0 IMPLEMENTATION STRATEGY

The timing of implementation of the initial elements of the CSRD's water conservation plan is set out in the following table. In addition, required funding resources along with their sources are identified.

**Implementation of Initial Elements of Saratoga Water Conservation Plan**

Element	Timing	Funding	
		Amount	Sources
Water Restrictions	Annually		
Universal Metering Program	Ongoing		
Education Program <ul style="list-style-type: none"> <li>Enhance brochure</li> <li>Website</li> <li>Water Bill- add information</li> </ul>	Ongoing	\$1000	WS Assistant WS Assistant WS Assistant
Water Loss/Accounting- water audit	Yearly	Water Services Coordinator	CSRD
Water Reduction Targets	Reviewed yearly	Water Services Coordinator	CSRD
Leak Survey (if required)	As required	\$3,000	Saratoga Service Area Reserve Fund



**APPENDIX A**

**USEPA Water Conservation Plan Guidelines**

<https://www.epa.gov/watersense/water-conservation-plan-guidelines>

**APPENDIX B**

**Potential Water Conservation Measure table**

Measures	Tools	Applicable to Saratoga Waterworks	Present Status	Comments/Options/Recommendations
Universal Metering	• Source-water metering	n/a	New meter at lake intake	Meter accuracy should be verified periodically
	• Service – connection metering	n/a	No meters in place	Review when building inspection service is introduced, meter recommended for community golf course
	• Public – use water metering	n/a	No meters in place	Meter recommended for CSRD park
Water Accounting And Loss Control	• Account water	n/a		Requires universal metering to be effective
	• Repair known leaks	Yes	Repair when leaks are observed	Location and date of leaks are recorded
	• Analysis of non-account water	No		Relevant if revenue received from metered water
	• System audit	Yes	Annual audit	Comparison of average water use per residence with lake intake meter
	• Leak detection and repair strategy	Yes	No leak detection undertaken to date	Review when universal metering is in place
	• Automated sensors/telemetry	Yes	Alarm system monitors reservoir levels	SCADA telemetry under consideration
	• Loss prevention	Yes	Some actions in place, e.g. unidirectional flushing	Other options- proactive repair
Costing And Pricing	• Cost-of-service accounting	Yes		Annual system review
	• User charges	Yes	Parcel tax to all properties, flat user fee to users of system	Annual tax- capital cost recovery, user fee- annual operating and maintenance cost
	• Metered rates	Yes	No meters in place	Consider with building inspection
	• Cost analysis	n/a		Only 1 class of service- residential
	• Non-promotional rates	n/a	Current rate is flat	Only 1 class of service-residential

Measures	Tools	Applicable to Saratoga Waterworks	Present Status	Comments/Options/Recommendations
	• Step Water Rates	Yes	Current rate is flat	Applicable with universal metering
Measures	Tools	Applicable to Saratoga Waterworks	Present Status	Comments/Options/Recommendations
<b>Information And Education</b>	• Advisory committee	Yes	Established by CSRD Bylaw	Advisory Committee has mandate that includes water conservation
	• Understandable water bill	Yes	Current bill provides basic information only	Consider adding information related to actual cost, volumes, etc.
	• Information available	Yes	Brochure distributed annually	Brochure provided on request also
	• Informative water bill	Yes	Current bill provides basic information only	Consider adding information related to actual cost, volumes, etc.
	• Water bill inserts	Yes	Insert in annual water bill	
	• School program	No	No schools on system	
	• Public education program	Yes	Limited scope	Expand public education, post information on water conservation on CSRD website
	• Workshops	No	Not done now	
<b>Water Use Audits</b>	• Audits of large-volume users	No		
	• Large – landscape audits	n/a	Not done now	
	• Selective end-use audits	No		Only 1 class of water user
	• Independent supplies	No		

<b>Retrofits</b>	• Retrofit kits available	Yes	Not done now	Facilitate best prices on products, encourage replacement
	• Distribution of retrofit kits	Yes	Not done now	Distribution through community association could be effective
	• Targeted programs	No		Only 1 class of user

Measures	Tools	Applicable to Saratoga Waterworks	Present Status	Comments/Options/Recommendations
<b>Pressure Management</b>	• System-wide pressure management	n/a		Only 1 pressure zones in system
	• Pressure-reducing valves	n/a		
<b>Landscape Efficiency</b>	• Promotion of landscape efficiency	Yes	Not done now	If sufficient CSRD resources
	• Selective irrigation sub-metering	No		No large water users
	• Landscape planning and renovation	No		
	• Irrigation management	Yes	Not done now	Encourage underground irrigation systems
<b>Replacements and Promotions</b>	• Rebates And Incentives	Yes	Not done now	Possible if water systems amalgamate
	• Promotion Of New Technologies	Yes	Not done now	Via CSRD website, e.g. high efficiency washing machines
<b>Reuse And Recycling</b>	• Industrial Applications	No		No industrial users
	• Large-Volume Irrigation Applications	No		
	• Selective Residential Applications	No		IHA prohibits use of grey water
<b>Water Use Regulation</b>	• Water-Use Standards, Regulations, Enforcement	Yes	Sprinkling restrictions are in place annually	mandatory compliance through bylaw enforcement.
	• Requirements For Developments	No		Development is in-fill only
	• Supply-Side Technologies	No		

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Integrated Resource Management	• Demand-Side Technologies	No		
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