



CEDAR HEIGHTS WATER SYSTEM

Water Conservation Plan

February 2018

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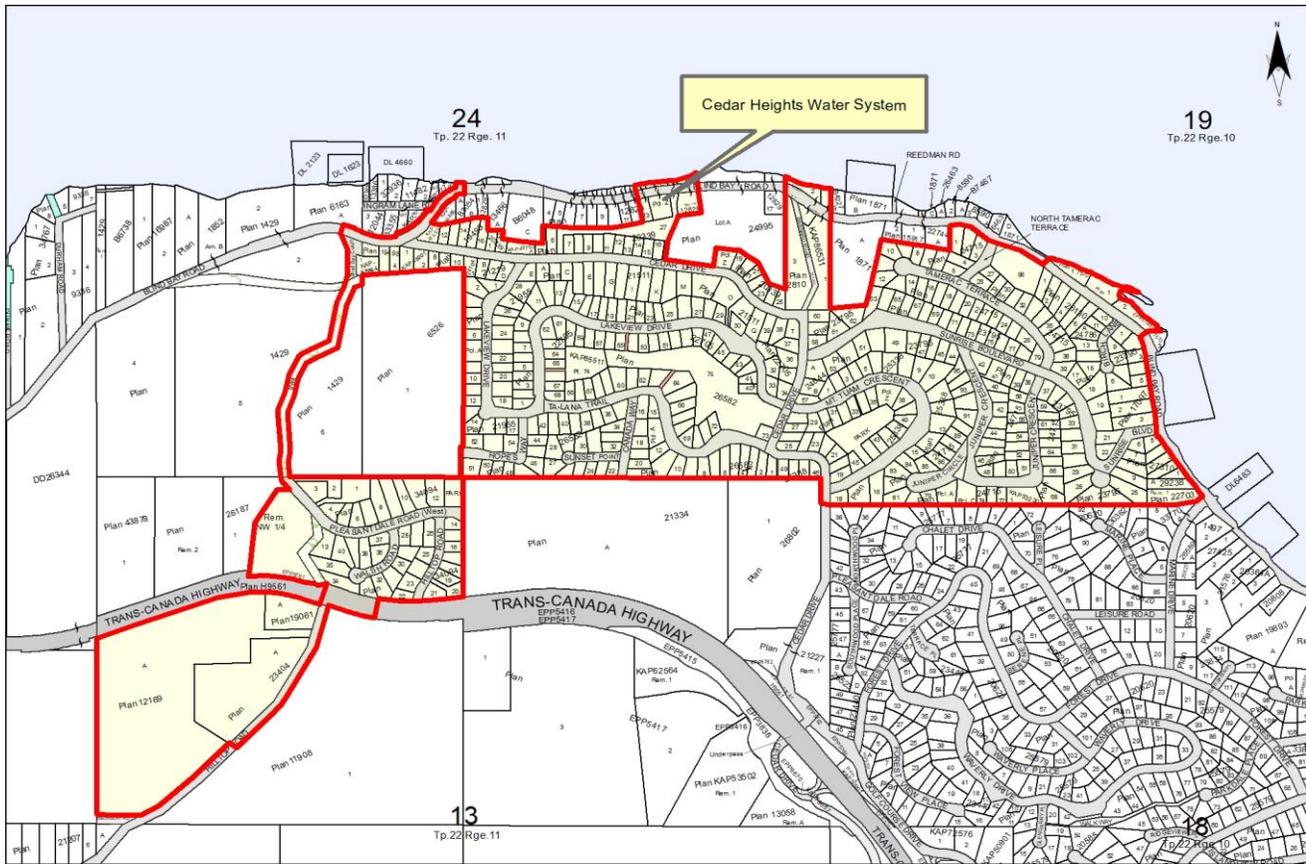
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1.0 BACKGROUND

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.



Cedar Heights Water System

The Cedar Heights Water System is located in Electoral Area C of the Columbia Shuswap Regional District (CSRD) in the Blind Bay area between Shuswap Lake Estates and Sorrento. The CSRD took over the operation of the Cedar Heights Water system in 1987.

The key components of the CSR D's water system at Cedar Heights 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 gas is used as a disinfectant, and the pumping facilities are comprised of two submersible pumps approximately 200 feet into the lake from the lakeshore pump house. One pump is 15hp and the other is 10hp. Water is pumped into a 30,285 litre holding tank (wet well) underneath the lakeshore pump house. From there, two 75hp pumps move the water up to the Canada Way Reservoir. At the Canada Way Reservoir there are two 15hp pumps that push the water up to the reservoir below the Trans-Canada Highway and to a booster station at the end of Hopes Way, which pumps to the Hilltop Road reservoir.
- Approximately 9.7 km of 150mm and 200mm water main, along with 590 metres of dedicated water main runs from the Shuswap Lake intake up to the Canada Way Reservoir.
- Three pressure zones.
- An in-ground concrete reservoir at Canada Way with a booster pump station built on top, the capacity of this reservoir is approximately 340,000 litres.
- An in-ground concrete reservoir just below the Trans-Canada Highway with a capacity of approximately 265,000 litres.
- An in-ground concrete reservoir on Hilltop Road with a capacity of approximately 341,000 litres.
- 34 fire hydrants within the service area.

In the summer of 2007, upgrades were completed to the Cedar Heights Water system that included two R-Can/Municipal Sterilight UV reactors, online flow metering and online pH, temperature and chlorine monitoring. In the fall of 2009, a universal metering program was completed for all connections and in the fall of 2017, the Lakeview Heights Subdivision was connected to the Cedar Heights system, which added the Hopes Way Booster Station and Hilltop Road Reservoir.

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 CSR D'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 Cedar Heights 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 Sorrento and Blind Bay 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 CEDAR HEIGHTS WATER SYSTEM

Some of the key components of the Cedar Heights 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:

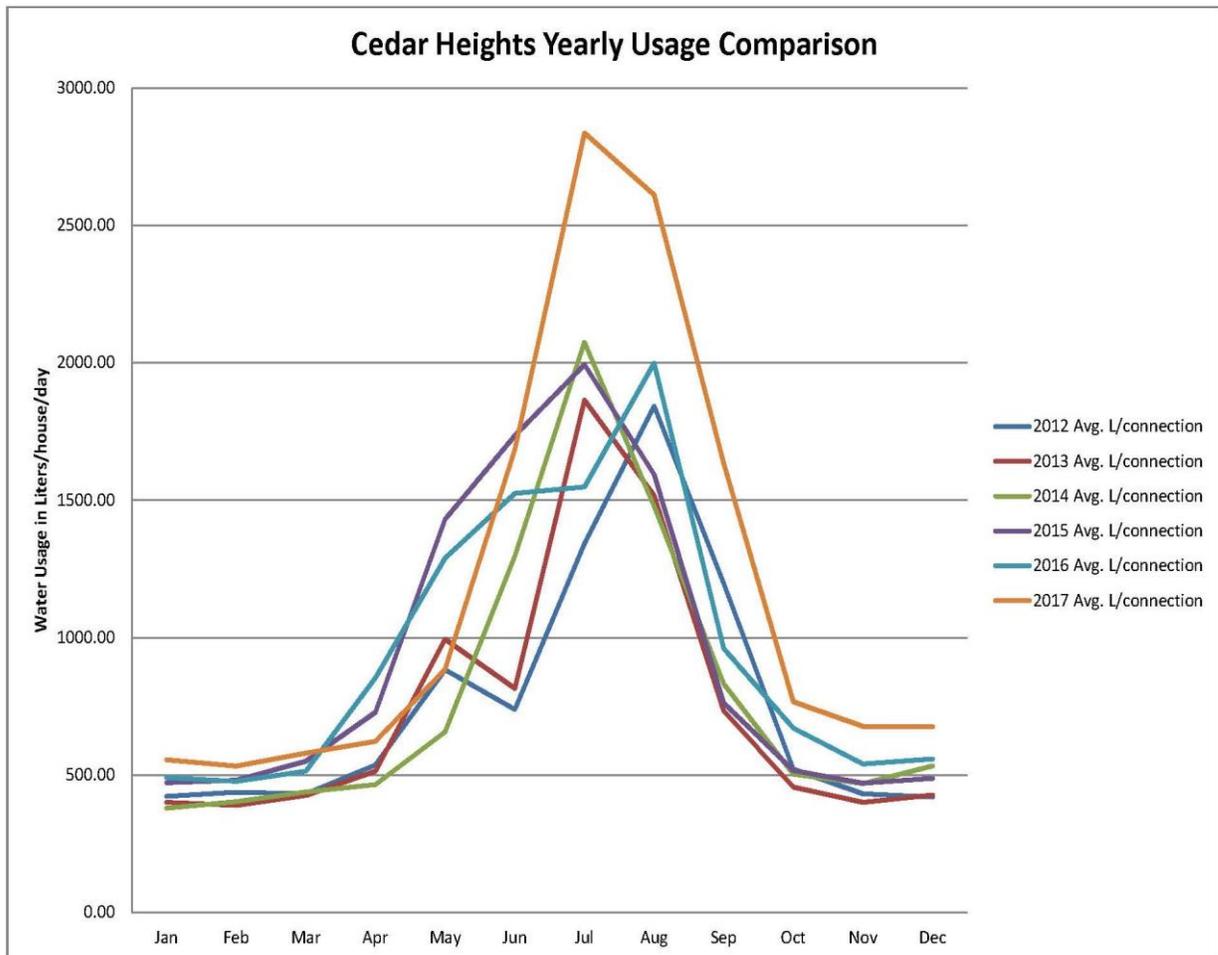
3.1 Service Population

The community of Cedar Heights is almost exclusively residential. An estimate of the community's residential population is approx. 1003, based on 386 residents and an average of 2.6 persons per residence. The dominant demographic profile at the Cedar Heights subdivision is retirees. There is a community hall and a small community golf course that are also connected to the Cedar Heights Water System. There are no commercial, industrial, or institutional customers on the system.

3.2 Number of Connections

There is a total of 507 residential water service connections; 386 existing residences, 119 vacant lots, and connection of the community hall and the small golf course.

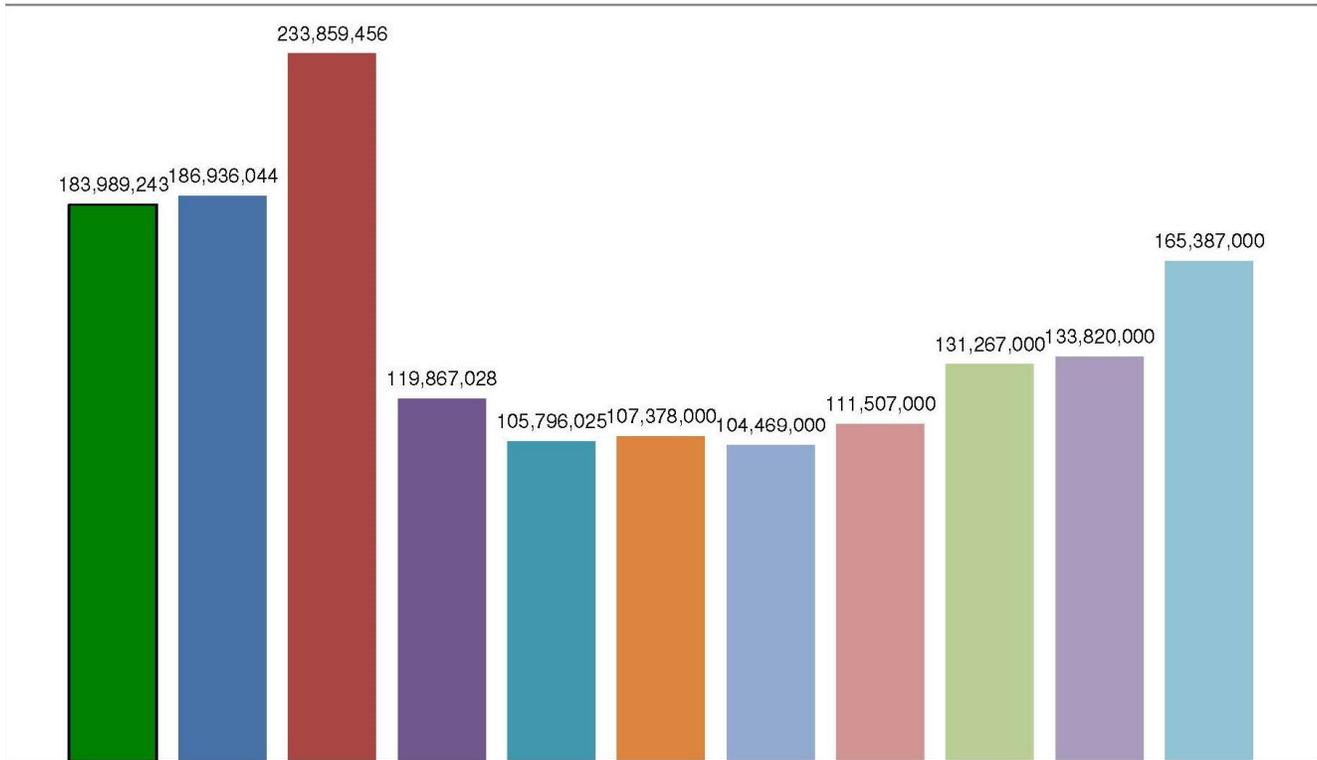
3.3 Water Consumption



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.

Yearly Total Consumption Comparison in Litres

■ 2007 Annual Total ■ 2008 Annual Total ■ 2009 Annual Total ■ 2010 Annual Total ■ 2011 Annual Total ■ 2012 Annual Total
■ 2013 Annual Total ■ 2014 Annual Total ■ 2015 Annual Total ■ 2016 Annual Total ■ 2017 Annual Total



3.4 Pricing – Single-Family Residences

The CSRD currently uses a two-part pricing structure comprising an annual parcel tax of approximately \$150.00 per parcel (occupied or vacant parcel) and an annual user fee of \$234.00 (less 10% if paid prior to April 30) for each single-family residence. The community hall pays the same user fee of \$234.00 and the golf course pays an annual fee of \$312.00, the 10% discount also applies.

3.5 Water Metering

Universal metering was implemented in 2009/2010.

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. Universal metering was completed in 2010.

4.2 Water Accounting and Loss Control

The CSRD has universal metering including water meters at the Community Hall, the Community Hall golf course, CSRD Park located in Cedar Heights to monitor their water use. 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, fire fighting, 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 Cedar Heights 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 Cedar Heights Water Conservation Plan

Element	Timing	Funding	
		Amount	Sources
Water Restrictions	Annually		
Universal Metering Program Review once building inspection occurs	completed		
Education Program <ul style="list-style-type: none"> • Enhance brochure • Website • Water Bill- add information 	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
Install Water Meters Community Hall, Golf Course, and CSRD Park	completed	\$5000	Cedar Heights Service area reserve fund
Leak Survey (if required)	As required	\$3,000	Cedar Heights Service area reserve fund

APPENDIX A

USEPA Water Conservation Plan Guidelines

APPENDIX B

Potential Water Conservation Measure table

Measures	Tools	Applicable to Cedar Heights Waterworks	Present Status	Comments/Options/Recommendations
Universal Metering	• Source-water metering	Yes	New meter at lake intake	Meter accuracy should be verified periodically
	• Service – connection metering	Yes	No meters in place	Review when building inspection service is introduced, meter recommended for community golf course
	• Public – use water metering	Yes	No meters in place	Meter recommended for CSRD park
Water Accounting And Loss Control	• Account water	No		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	No		Only 1 class of service- residential
	• Non-promotional rates	No	Current rate is flat	Only 1 class of service-residential

Measures	Tools	Applicable to Cedar Heights Waterworks	Present Status	Comments/Options/Recommendations
	<ul style="list-style-type: none"> • Step Water Rates 	Yes	Current rate is flat	Applicable with universal metering

Measures	Tools	Applicable to Cedar Heights Waterworks	Present Status	Comments/Options/Recommendations
Information And Education	<ul style="list-style-type: none"> • Advisory committee 	Yes	Established by CSRD Bylaw	Advisory Committee has mandate that includes water conservation
	<ul style="list-style-type: none"> • Understandable water bill 	Yes	Current bill provides basic information only	Consider adding information related to actual cost, volumes, etc.
	<ul style="list-style-type: none"> • Information available 	Yes	Brochure distributed annually	Brochure provided on request also
	<ul style="list-style-type: none"> • Informative water bill 	Yes	Current bill provides basic information only	Consider adding information related to actual cost, volumes, etc.
	<ul style="list-style-type: none"> • Water bill inserts 	Yes	Insert in annual water bill	
	<ul style="list-style-type: none"> • School program 	No	No schools on system	
	<ul style="list-style-type: none"> • Public education program 	Yes	Limited scope	Expand public education, post information on water conservation on CSRD website
	<ul style="list-style-type: none"> • Workshops 	No	Not done now	
Water Use Audits	<ul style="list-style-type: none"> • Audits of large-volume users 	No		
	<ul style="list-style-type: none"> • Large – landscape audits 	Yes	Not done now	Community golf course a candidate
	<ul style="list-style-type: none"> • Selective end-use audits 	No		Only 1 class of water user
	<ul style="list-style-type: none"> • Independent supplies 	No		
Retrofits	<ul style="list-style-type: none"> • 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 Cedar Heights Waterworks	Present Status	Comments/Options/Recommendations
Pressure Management	• System-wide pressure management	Yes		2 pressure zones in system
	• Pressure-reducing valves	Yes		
Landscape Efficiency	• 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
Replacements and Promotions	• 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
Reuse And Recycling	• Industrial Applications	No		No industrial users
	• Large-Volume Irrigation Applications	No		
	• Selective Residential Applications	No		IHA prohibits use of grey water
Water Use Regulation	• Water-Use Standards, Regulations, Enforcement	Yes	Sprinkling restrictions are in place annually	Voluntary compliance, evaluate more rigorous enforcement
	• Requirements For Developments	No		Development is in-fill only
Integrated Resource Management	• Supply-Side Technologies	No		
	• Demand-Side Technologies	No		