

Skana Water System

2019 Annual Report

CRD | Drinking Water

Introduction

This report provides a summary of the Skana Water Service for 2019 and includes a description of the service, summary of the water supply, demand and production, drinking water quality, operations highlights, capital project updates and financial report.

Service Description

The community of Skana is a rural residential development located on the north side of Mayne Island in the Southern Gulf Islands Electoral Area, originally serviced by a private water utility. In 2003, the service converted to the Capital Regional District (CRD). The Skana Water Service (Figure 1) is made up of 73 parcels encompassing a total area of approximately 19 hectares. Of the 73 parcels, 48 were customers of the water system in 2019; an increase of one from the previous year.

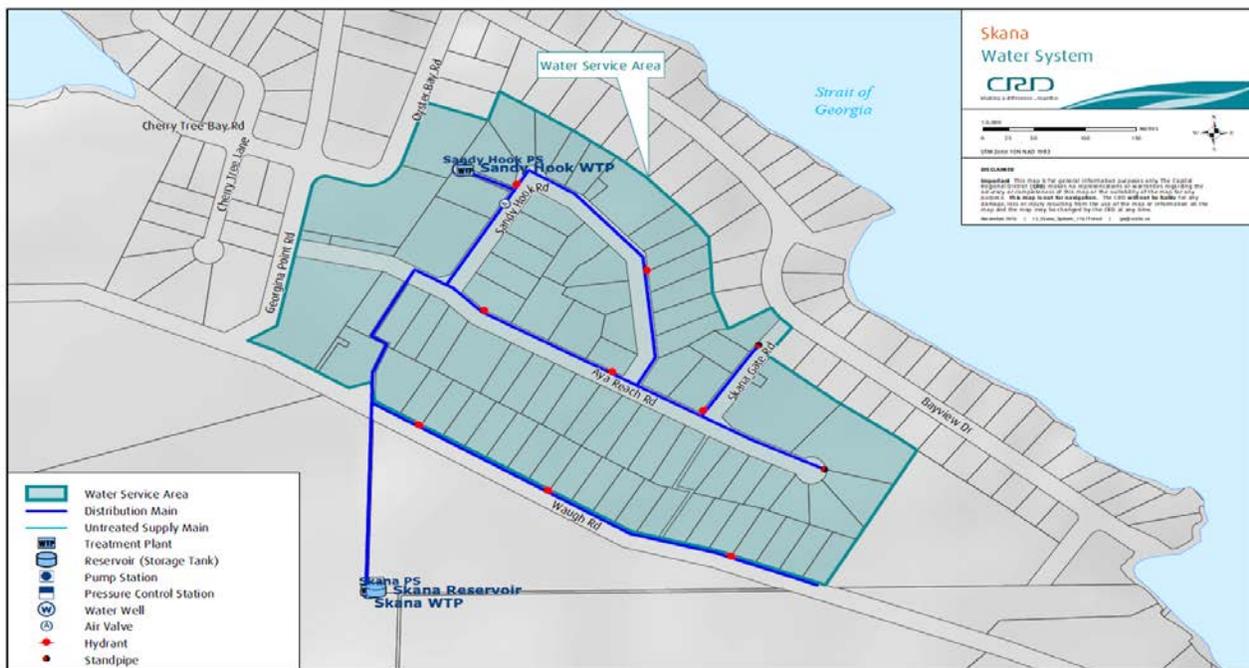


Figure 1: Map of Skana Water System.

The Skana water system is comprised of:

- Two ground water wells, related pumping and control equipment and buildings (Production Wells #8 and Well #13);
- Disinfection process equipment (ultraviolet light and chlorine at each well);
- Two steel storage tanks (total volume is 91 cubic metres);
- Distribution system (1,977 m of water mains); and,
- Other water system assets: 47 service connections and meters, 8 hydrants, 3 standpipes, 15 gate valves, 1 air release valve, SCADA system and auxiliary generator.

Water Supply

Ground water supply water levels are highlighted for 2019 in Figure 2. As of July 2018 until June of 2019 well water levels were not recorded due to well head accessibility issues. Wellhead upgrades completed in 2018 included a new cap at the top of the well which resulted in losing the access to measure the groundwater level. Resource water levels for the most part in 2019 were within normal ranges. However, a dry 2019 winter resulted in lower than normal resource water for this period. 2020 water levels will be monitored closely to see if aquifer water elevations return to normal levels.

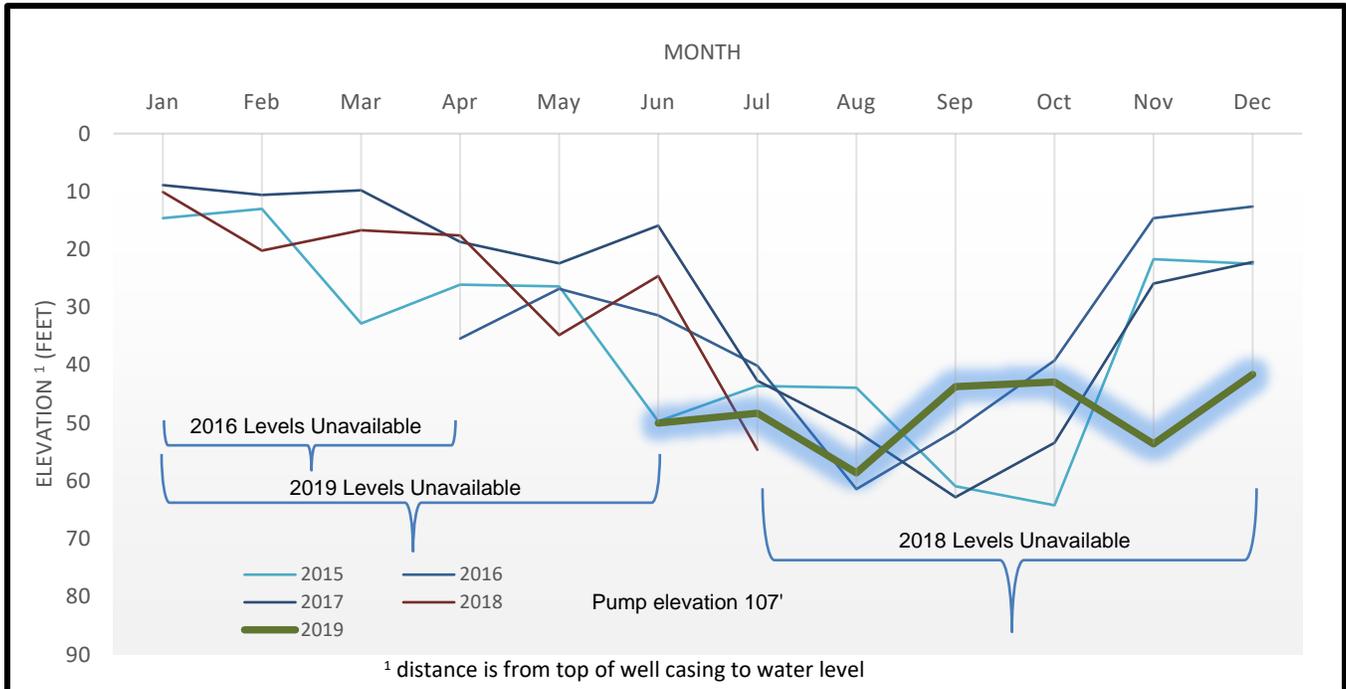


Figure 2: Skana Well #13 Ground Water Supply Monthly Water Level

Water Production and Demand

4,020 cubic meters (m³) of water was extracted (water production) from the ground water source (Well #13) in 2019; a 13% decrease from the previous year and a 3% increase from the five year average (Figure 3). Water demand (customer water billing) for the service totaled 3,017 cubic meters of water; a 12% decrease from the previous year and a 2% increase from the five year average.

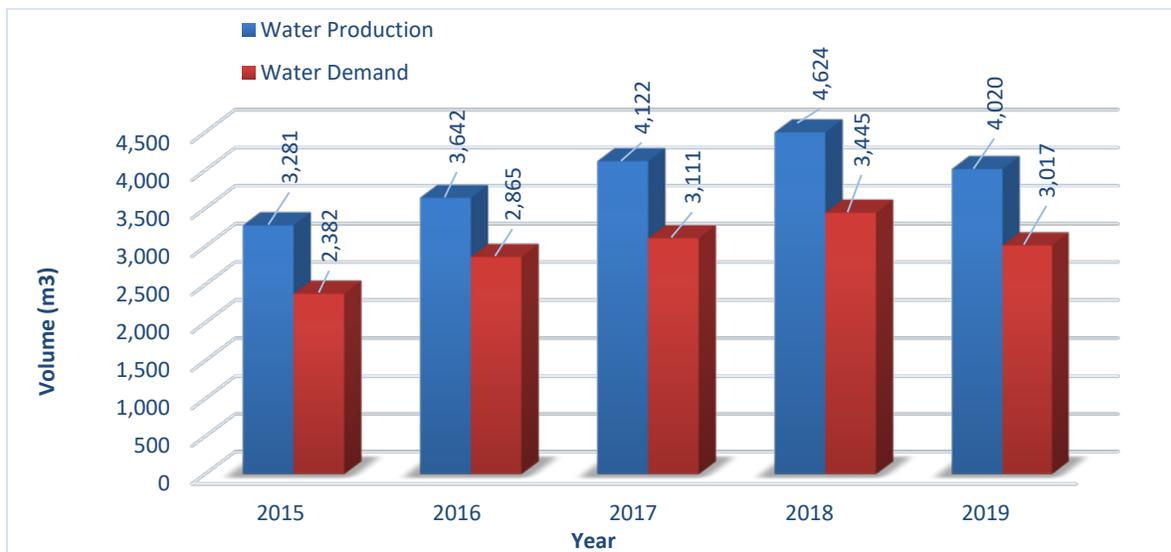


Figure 3: Skana Water Service Annual Water Production and Demand.

The difference between annual water production and annual customer water demand is referred to as non-revenue water and can include water system leaks, water system maintenance and operational use (e.g. water main flushing, filter system backwashing), potential unauthorized use and fire-fighting use.

The 2019 non-revenue water (1,003 cubic meters) represents approximately 25% of the total water production for the service area. However, approximately 600 cubic meters is attributed to operational use resulting in a non-revenue water volume of approximately 10%. This is considered to be acceptable for a small water system.

Figure 4 below illustrates the monthly water production for 2019 along with the historical water production information. The monthly water production trends are typical for small water systems such as the Skana water system. However, monthly water production during March and April of 2019 is noticeably higher compared to previous years. This is the result of increased water demand during this period.

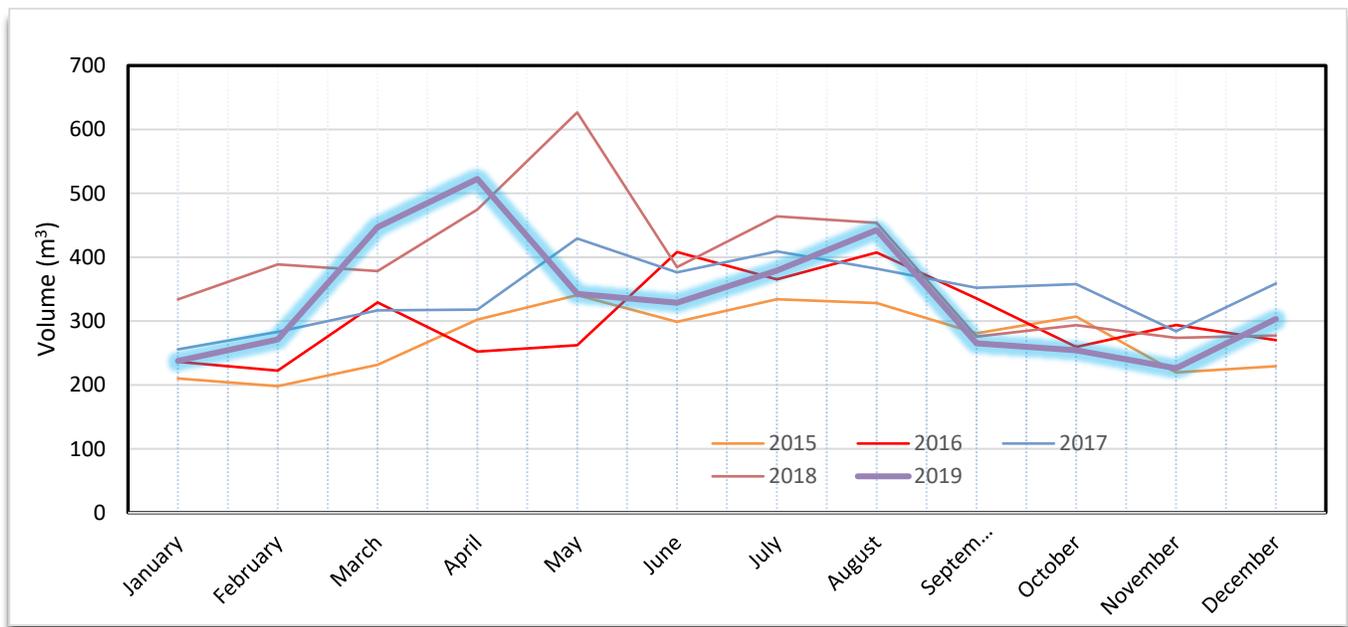


Figure 4: Skana Water Service Monthly Water Production.

Drinking Water Quality

The water quality monitoring program at Skana was carried out in 2019 based on regulatory requirements and system specific risks. Samples were collected at regular frequencies from the raw water, at the treatment plant as well as from a number of sampling stations in the distribution system. The samples were shipped for various analyses to CRD's Water Quality Lab or to external laboratories for special analyses such as disinfection by-products or metals.

The water system performed well in 2019 and consistently supplied drinking water of good quality to its customers. The Skana source water from Well #13 was of good quality and free of E.coli bacteria and for the first time in years also free of any total coliform bacteria. The source water from Well#13 exhibited low turbidity, well under 1 NTU, throughout the entire year. As Well# 13 experienced difficulties meeting daily demands at the end of August, Well# 8 was brought online for a few days until static levels in Well# 13 recovered. As typical for Well# 8, the raw water turbidity during this short period of time was elevated at 2.7 NTU with no consequences for the bacteriological safety of the treated water. The treated water supplied to the customers was of good quality and safe to drink. Total Trihalomethanes (TTHM) disinfection by-product concentrations at the 223 Skana Gate Road sampling location were slightly above the maximum acceptable concentration (MAC) listed in the Guidelines for Canadian Drinking Water Quality as a rolling annual average, but below MAC at the 537/539 Waugh Road sampling location. There is a noticeable increase in TTHM concentrations during the winter/aquifer recharge months when higher organic concentrations are registered in the raw well water. High water age during

the winter months in particular at the distant 223 Skana Gate Road location in combination of these higher organic loads are cause for the TTHM exceedance. A monthly spot flush to achieve water turnover at this part of the distribution system has been implemented to mitigate this situation.

The data below provides a summary of the water quality characteristics in 2019:

Raw Water:

- Well #13, the primary source, supplied raw water free of indicator bacteria.
- One set of samples from Well #8 was collected on August 22, 2019. No indicator bacteria were found but an elevated turbidity of 2.7 NTU, which is typical for this well.
- The median raw water turbidity was 0.17 NTU.
- The raw water was hard (hardness 94.25 mg/L CaCO₃).
- The median pH was 7.4.
- The TOC concentration in the raw water ranged from 1.3 to 1.6 mg/L with the higher concentrations recorded in the winter.

Treated Water:

- The treated water was bacteriologically safe to drink with no confirmed *E. coli* or total coliform bacteria.
- The median treated water turbidity was 0.36 NTU.
- The annual average levels of the disinfection by-products TTHM were **above** the MAC of 100 µg/L at the 223 Skana Gate Road sampling location (103 µg/L). At 537/539 Waugh Road sampling location, the annual average TTHM concentrations were 70 µg/L and therefore below the MAC.
- The free chlorine residual concentrations ranged from 0.06 to 1.31 mg/L with a median of 0.72 mg/L in the distribution system indicating satisfactory secondary disinfection.

Water quality data collected from this drinking water system can be reviewed on the CRD website:

<https://www.crd.bc.ca/about/data/drinking-water-quality-reports>

Operational Highlights

The following is a summary of the major operational issues that were addressed by CRD Integrated Water Services staff:

- April 2019 – Chlorine chemical feed pump troubleshooting and repairs.
- April 2019 – Leak detection efforts initiated due to higher than normal water production rate. No leak was found however it was determined that some residences had higher than normal water consumption during this period.
- August/September, 2019 – Operated on Well #8 for a short period during Well #13 low aquifer water levels. Well #8 requires manual operation.
- September, 2019 – Replaced the Well #13 portable standby generator

Capital Project Updates

The Capital Projects that were in progress or completed in 2019 included:

- Groundwater Study – Has been started with background information collected and a terms of reference prepared to retain a consultant to identify groundwater protection issues. This project is being undertaken in conjunction with the Water Quality Study.
- Water Quality Study – A terms of reference to retain a consultant to conduct a groundwater quality study on Well #13 has been prepared. This project is being undertaken in conjunction with the Groundwater Study and will be complete in 2020 with implications to be considered as part of the proposed works for the referendum.

Financial Report

Please refer to the attached Statement of Operations. Revenue includes parcel taxes (Transfers from Government), fixed user fees (User Charges), interest on savings (Interest Earnings), a transfer from the maintenance reserve account, and miscellaneous revenue such as late payment charges (Other Revenue).

Expenses includes all costs of providing the service. General Government Services includes budget preparation, financial management, utility billing and risk management services. CRD Labour and Operating Costs includes CRD staff time as well as the costs of equipment, tools and vehicles. Debt servicing costs are interest and principal payments on long term debt. Other Expenses includes all other costs to administer and operate the water system, including insurance, supplies, water testing and electricity.

The difference between Revenue and Expenses is reported as Net Revenue (expenses). Any transfers to or from capital or reserve accounts for the service (Transfers to Own Funds) are deducted from this amount and it is then added to any surplus or deficit carry forward from the prior year, yielding an Accumulated Surplus (or deficit) that is carried forward to the following year.

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Attachment: 2019 Financial Summary (Statement of Operations)



Making a difference...together

Integrated Water Services

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CAPITAL REGIONAL DISTRICT

SKANA WATER Statement of Operations (Unaudited) For the Year Ended December 31, 2019

	2019	2018
Revenue		
Transfers from Government	23,070	23,070
User Charges	43,440	43,711
Other revenue from own sources:		
Interest Earnings	153	244
Transfer from Operating Reserve	1,500	-
Other Revenue	2,214	525
Total Revenue	\$ 70,377	67,550
Expenses		
General Government Services	2,892	3,080
Contract for Services	13,250	10,610
CRD Labour and Operating costs	19,874	12,895
Debt Servicing Costs	8,629	10,332
Capital Purchases	3,140	-
Other Expenses	8,625	8,933
Total Expenses	\$ 56,410	45,850
Net revenue (expenses)	13,967	21,699
Transfers to own funds:		
Capital Reserve Fund	12,947	20,699
Operating Reserve Fund	1,020	1,000
Annual surplus (deficit)	-	-
Accumulated surplus, beginning of year	-	-
Accumulated surplus, end of year	\$ -	-

CAPITAL REGIONAL DISTRICT

SKANA WATER Statement of Reserve Balances (Unaudited) For the Year Ended December 31, 2019

	Capital Reserve	
	2019	2018
Beginning Balance	53,429	36,895
Transfer from Operating Budget	12,947	20,699
Transfers from Completed Projects	12,771	-
Interest Income	1,572	835
Transfer to Capital Projects	(3,677)	(5,000)
Ending Balance	77,042	53,429

	Operating Reserve	
	2019	2018
Beginning Balance	8,818	7,623
Transfer from Operating Budget	1,020	1,000
Transfer to Operating Budget	(1,500)	-
Interest Income	265	196
Ending Balance	8,604	8,818