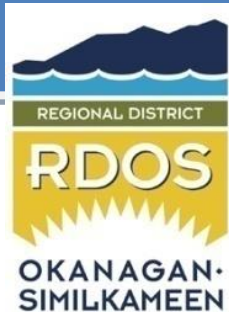
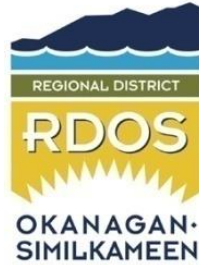


# 2021

## ANNUAL WATER QUALITY MONITORING REPORT WILLOWBROOK WATER SYSTEM



Willowbrook Well Pump Station



**2021 ANNUAL WATER QUALITY MONITORING REPORT  
WILLOWBROOK WATER SYSTEM  
WILLOWBROOK, B.C.**

Copy prepared for:  
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**1. Introduction**

As the owner and operator of the Willowbrook water system, the Regional District Okanagan-Similkameen is responsible for the following Annual Report summarizing the results from the 2021 *Water Quality Monitoring Program*. The report is a conditional requirement of the *Permit to Operate* issued by the Interior Health Authority (IHA) and the *BC Drinking Water Protection Act and Regulation*.

**2. System Description**

The Willowbrook water system is located within Electoral Area C, to the east between Oliver and Okanagan Falls. The water system consists of a shallow groundwater well, storage reservoir and a distribution system. The system supplies water to domestic and irrigation services, approximately 80 connection and provides fire protection to the community of Willowbrook. In 2020, the Interior Health Authority classified the Willowbrook well as GARP, Groundwater at Risk of Containing Pathogens, viruses only. As a result the groundwater is now treated with chlorine (sodium hypochlorite).

**3. System Classification and Operator Certifications**

**3.1. System Classification**

The *British Columbia Environmental Operators Certification Program (BC EOCP)* is responsible for the classification of potable water systems in BC. The Willowbrook distribution system remained classified as a *Small Water System (SWS)* in 2021.

**3.2. Operator Certification**

The *British Columbia Environmental Operators Certification Program (BC EOCP)* is also responsible for certification of all water system operators. Operators may hold certification(s) in the disciplines of Water Distribution and/or Water Treatment with four levels of certification achievable within each discipline. RDOS Operators annually attend courses, seminars and complete online training required to maintain their levels of certification. In addition, all operators annually continue to work on augmenting and furthering their levels of certification. All RDOS Operators are certified through the BC EOCP as indicated in the table below.

OPERATOR EOCP CERTIFICATION No.	WATER DISTRIBUTION CERTIFICATION LEVELS				WATER TREATMENT CERTIFICATION LEVELS			
	IV	III	II	I	IV	III	II	I
1162	X						X	
4194			X					
4840			X				X	
4839		X						X
6926			X					X
8761			X					X
9322		X						X

**Table 1: RDOS Operator Certifications 2021**

#### 4. Annual Water Usage

The source water for the Willowbrook water system is a shallow groundwater well. In 2021, a total of 144,262 m<sup>3</sup> of water was pumped from the Willowbrook well, a slight increase from 136,489 m<sup>3</sup> in 2020.

##### 4.1. Consumption Records

	Cubic Meters (m <sup>3</sup> )	US Gallons	Date
<b>Annual Total Usage</b>	144,262	38,109,989	
<b>Minimum Daily Flow</b>	101	266,81	March 17/21
<b>Maximum Daily Flow</b>	1,071	282,928	June 29/21

Table 2: Annual Water Consumption 2021

Both annual and monthly water consumption has been trended as shown in the following two graphs.

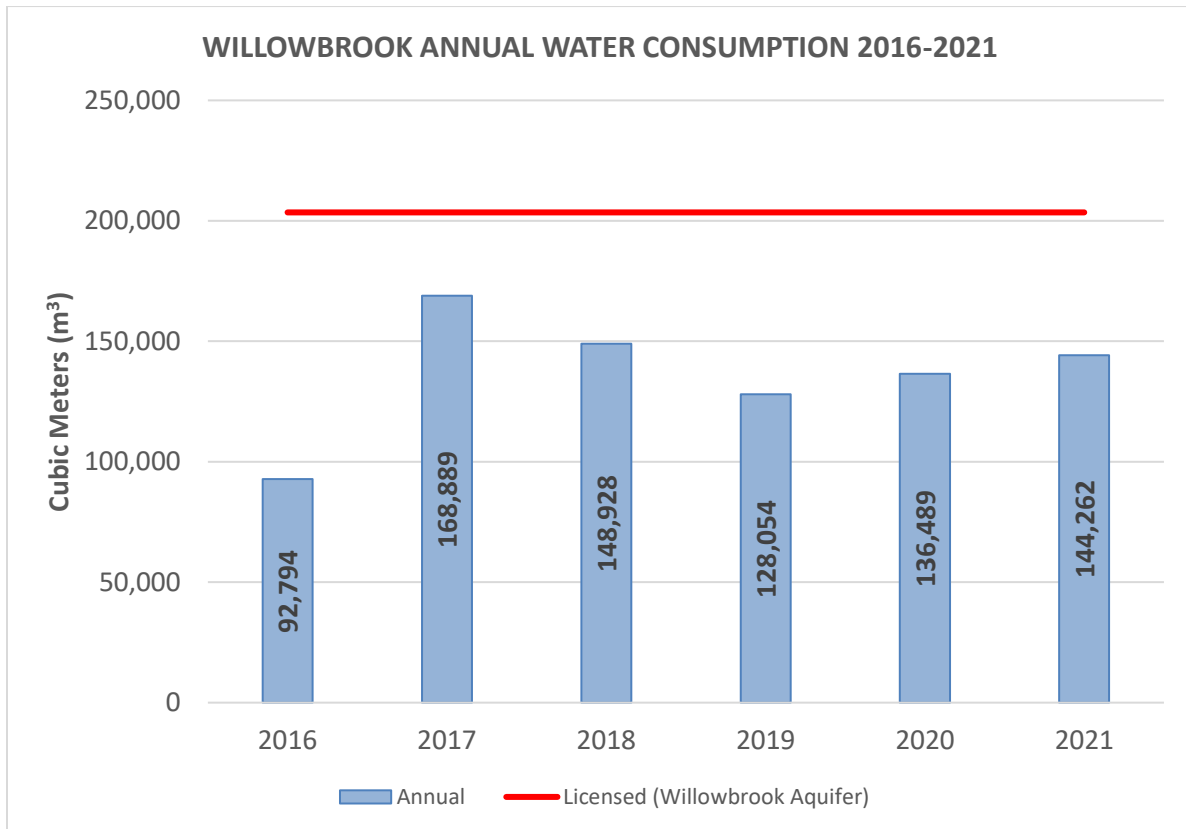


Figure 1: Annual Water Consumption 2016 to 2021

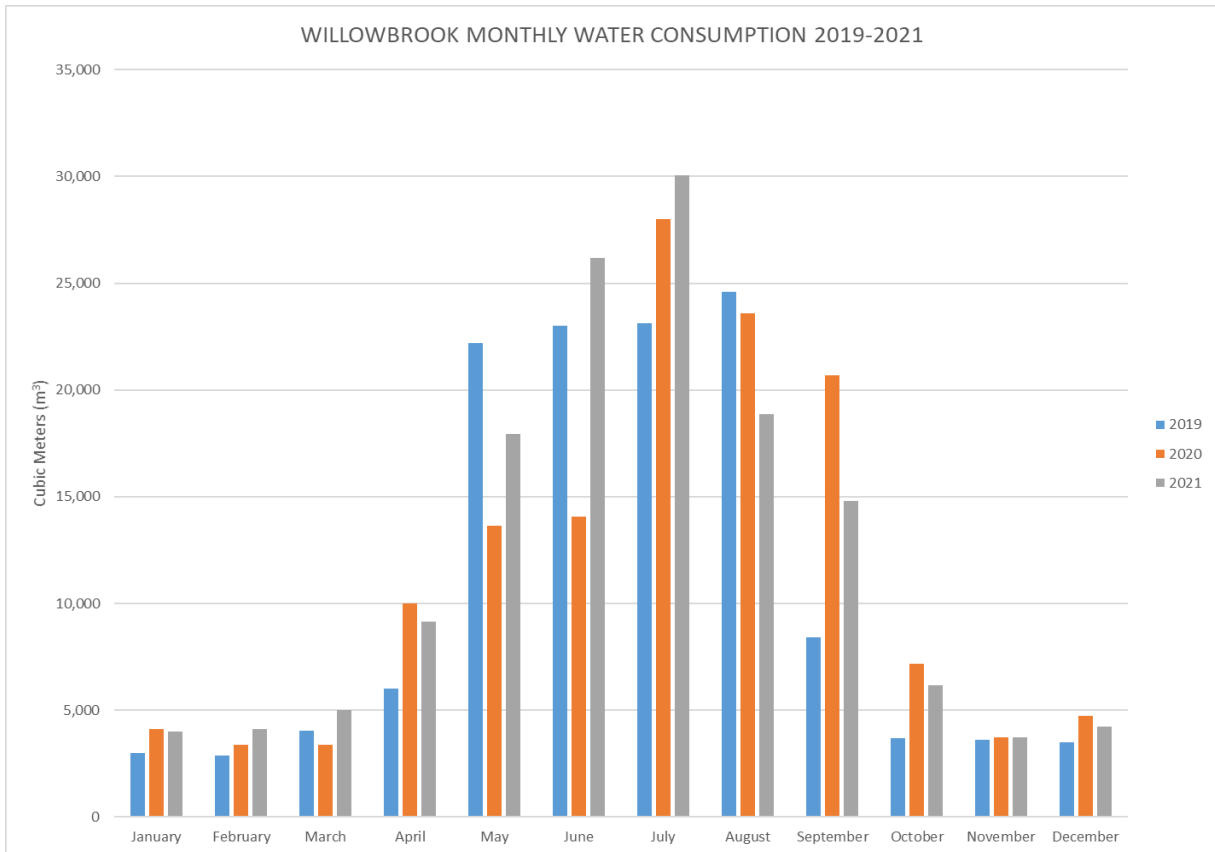


Figure 2: Monthly Water Consumption 2019 to 2021

#### 4.2. Water Conservation

The Willowbrook water system started under Stage “Normal” water restrictions in 2021. The “Heat Dome” of 2021 was present over the Okanagan from late June to mid-July. There were periods of increased water demand where the water usage was exceeding the well pump supply capacity. Additional messaging was utilized during these times encouraging residence to be cognisant of their water usage and to conserve wherever possible. By the end of July, with the heat continuing, the decision was made to move all RDOS water systems to Stage 1, which limited watering to two days per week.

### 5. Aquifer Monitoring

The aquifer that the Willowbrook well draws from is monitored continuously by the Province as part of its Groundwater Observation Network. Observation Well No. 282 is located in Willowbrook on Myers Road. The RDOS currently uses this well for monitoring the Willowbrook aquifer.

As in 2020, the measured recharge into the Willowbrook aquifer was minimal in 2021.

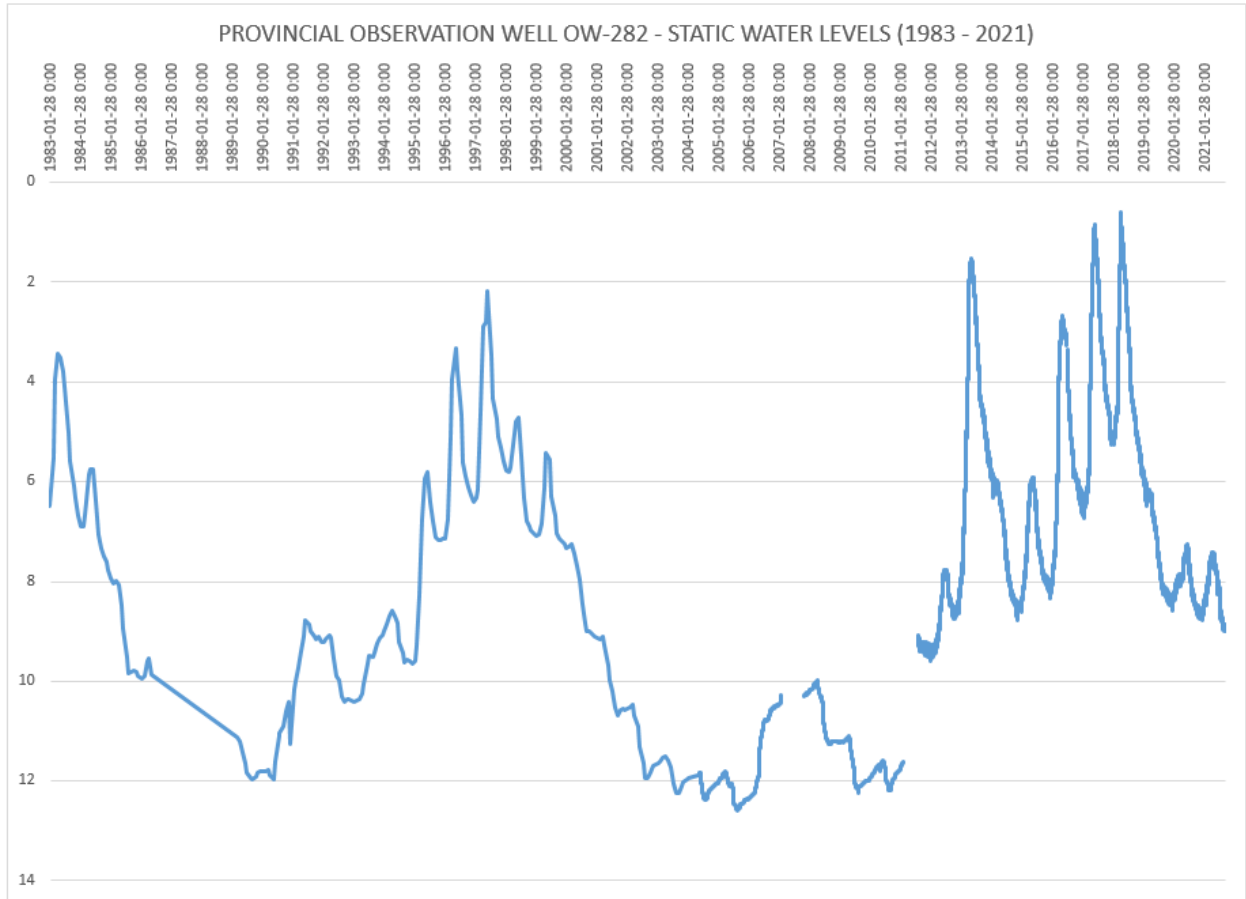


Figure 3: Willowbrook Aquifer Level



## 6. Source Water Quality Monitoring

All untreated source water quality parameters are compared to the applicable criteria set out in the *British Columbia Drinking Water Protection Act and Regulation (DWPA)*, the *Guidelines for Canadian Drinking Water Quality (GCDWQ)*, Interior Health Authority programs and Operational Guidelines (OG). The *DWPA* and *GCDWQ* define these parameters and set Aesthetic Objectives (AO) and Maximum Acceptable Concentrations (MAC).

All 2021 accredited laboratory tests were performed by Caro Analytical Services (Kelowna, B.C.)

### 6.1. Source Water Bi-Weekly Monitoring

Bi-weekly monitoring of the Willowbrook well includes bacteriological grab samples and field measured parameters using field test kits. Samples from the well were analyzed for Total Coliforms and *Escherichia coli (E.coli)*. The groundwater source is considered “raw water” as the source is now treated with chlorine. The table below summarizes the bacteriological laboratory results and the field measured parameters from the Willowbrook groundwater well.

Analyte	Unit	Average	Minimum	Maximum	Number of Results	Number of Results with Exceedances
<b>Field Results</b>						
Conductivity	µS/cm	942	878	1007	18	0
pH		7.6	7.43	7.83	18	0
Total dissolved solids	mg/L	669	623	715	18	0
Temperature	°C	9.97	7.8	11.7	19	0
Turbidity	NTU	0.22	0.06	0.74	26	0
<b>Lab Results: Microbiological</b>						
Background bacteria	CFU/100 mL	<1	<1	6	24	0
E. coli (counts)	CFU/100 mL	<1	<1	<1	27	0
Total coliforms (counts)	CFU/100 mL	<1	<1	1	27	0

**Table 3: Willowbrook Well Bi-Weekly Testing 2021 Summary**

## **6.2. Source Water Potable Water Testing**

Annually, the RDOS submits a sample of the untreated well water to an accredited lab for comprehensive potable water testing. The results of these test are compared against the *Guidelines for Canadian Drinking Water Quality*. The *GCDWQ* establishes Maximum Acceptable Concentration (MAC), Interim Maximum Allowable Concentrations (IMAC) and Aesthetic Objectives (AO) for parameters if applicable. In 2021, there were no exceedances of the guidelines in the Willowbrook groundwater well annual sample.

This comprehensive test includes physical parameters (e.g. color, turbidity, temperature, ultraviolet transmittance), chemical parameters (e.g. hardness, total metals and nutrients). Changes in these parameters may result in the need for water notifications for customers (i.e. Boil Water Notice or Water Quality Advisory) or the requirement for treatment processes to be implemented. The following tables display the results for the respective comprehensive potable water tests along with summaries of the previous three (3) years of data for comparison.

**6.2.1. Source Water General Potability Parameters 2021**

Analyte	Unit	Guideline		Willowbrook Well Sept 13, 2021 Sample
		GCDWQ MAC	GCDWQ AO	
<b>Lab Results: General</b>				
Alkalinity (total, as CaCO <sub>3</sub> )	mg/L	NG	NG	368
Total organic carbon	mg/L	NG	NG	2.53
Chloride	mg/L	NG	250	41.3
Colour	CU	NG	15	<5.0
Conductivity	µS/cm	NG	NG	959
Total cyanide	mg/L	0.2 <sup>1.1</sup>	NG	<0.0020
Fluoride	mg/L	1.5	NG	1.02
Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg	mg/L	NG	NG	405
Langelier Index		NG	NG	1.3
pH		NG	7.0 - 10.5 <sup>2.1</sup>	8.18
Total dissolved solids (computed)	mg/L	NG	500	570
Sulphate	mg/L	NG	500 <sup>2.2</sup>	103
Sulphide (total, as S)	mg/L	NG	0.047 <sup>2.3</sup>	<0.020
Turbidity	NTU	N <sup>1.2</sup>	NG	0.12
UV transmittance at 254 nm - filtered	%	NG	NG	91.7
<b>Nutrients</b>				
Ammonia (total, as N)	mg/L	NG	NG	<0.050
Nitrate (as N)	mg/L	10	NG	2.24
Nitrite (as N)	mg/L	1	NG	<0.010

See Guideline Notes in Section 6.2.3.

**Table 4: Willowbrook Well General Potability Parameters 2021**

**6.2.2. Source Water General Potability Parameter Summary 2018 to 2020**

Analyte	Unit	Average	Minimum	Maximum	Number of Results	Number of Results with Exceedances
<b>Lab Results: General</b>						
Alkalinity (total, as CaCO <sub>3</sub> )	mg/L	370	359	391	4	0
Total organic carbon	mg/L	3.69	2.59	5.37	3	0
Chloride	mg/L	38.6	27.0	49.7	4	0
Colour	CU	<5.0	<5.0	<5.0	4	0
Conductivity	µS/cm	947	848	1080	4	0
Total cyanide	mg/L	<0.0020	<0.0020	<0.0050	4	0
Fluoride	mg/L	1.05	1.00	1.16	4	0
Hardness (as CaCO <sub>3</sub> ), from total Ca/Mg	mg/L	427	359	550	4	0
Langelier Index		-1.5	-9.3	1.2	4	0
pH		8.06	7.98	8.13	4	0
Total dissolved solids (computed)	mg/L	521	275	708	4	0
Sulphate	mg/L	103.6	79.6	143	4	0
Sulphide (total, as S)	mg/L	<0.020	<0.020	<0.020	3	0
Turbidity	NTU	<0.10	<0.10	<0.10	4	0
UV transmittance at 254 nm - filtered	%	90.2	89.2	92.0	4	0
UV transmittance at 254 nm - unfiltered	%	89.0	88.0	90.1	5	0
<b>Nutrients</b>						
Ammonia (total, as N)	mg/L	0.064	<0.020	0.157	3	0
Nitrate (as N)	mg/L	2.118	0.690	4.36	4	0
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	4	0

See Guideline Notes in Section 6.2.3.

**Table 5: Willowbrook Well General Potability Parameters 2018 to 2020 Summary**

### 6.2.3. Guidelines Notes for General Potability Parameters

#### 1. Notes for Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations (GCDWQ MAC)

##### **Note 1.1 for Total cyanide:**

The MAC for free cyanide is 0.2 mg/L. A maximum of 0.2 mg/L was used, in this report, to identify exceedances for total cyanide as a means for determining the potential for exceeding the free cyanide guideline.

##### **Note 1.2 for Turbidity:**

"Waterworks systems that use a surface water source or a groundwater source under the direct influence of surface water should filter the source water to meet health-based turbidity limits, as defined for specific treatment technologies. Where possible, filtration systems should be designed and operated to reduce turbidity levels as low as possible, with a treated water turbidity target of less than 0.1 NTU at all times. Where this is not achievable, the treated water turbidity levels from individual filters should meet the requirements described in GCDWQ.

For systems that use groundwater that is not under the direct influence of surface water, which are considered less vulnerable to faecal contamination, turbidity should generally be below 1.0 NTU.

For effective operation of the distribution system, it is good practice to ensure that water entering the distribution system has turbidity levels below 1.0 NTU."

#### 2. Notes for Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives (GCDWQ AO)

##### **Note 2.1 for pH:**

The operational guideline for pH is a range of 7.0 to 10.5 in finished drinking water.

##### **Note 2.2 for Sulphate:**

There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L. Health authorities should be notified of drinking water sources containing above 500 mg/L.

##### **Note 2.3 for Sulphide (total, as S):**

The aesthetic objective for sulphide (as H<sub>2</sub>S) is 0.05 mg/L. This is equivalent to 0.047 mg/L sulphide (as S).

**6.2.4. Source Water Total Metals 2021**

Analyte	Unit	Guideline		Willowbrook Well Sept 13, 2021 Sample
		GCDWQ MAC	GCDWQ AO	
<b>Lab Results: Total Metals</b>				
Aluminum (total)	mg/L	2.9 <sup>1.1</sup>	0.100 <sup>2.1</sup>	0.0068
Antimony (total)	mg/L	0.006	NG	<0.00020
Arsenic (total)	mg/L	0.010 <sup>1.2</sup>	NG	0.0006
Barium (total)	mg/L	2.0 <sup>1.3</sup>	NG	0.0799
Boron (total)	mg/L	5	NG	<0.0500
Cadmium (total)	mg/L	0.007 <sup>1.4</sup>	NG	<0.000010
Calcium (total)	mg/L	NG	NG	87
Chromium (total)	mg/L	0.05	NG	0.00064
Cobalt (total)	mg/L	NG	NG	<0.00010
Copper (total)	mg/L	2 <sup>1.5</sup>	1	0.00492
Iron (total)	mg/L	NG	0.3	0.013
Lead (total)	mg/L	0.005 <sup>1.6</sup>	NG	<0.00020
Magnesium (total)	mg/L	NG	NG	45.6
Manganese (total)	mg/L	0.12 <sup>1.7</sup>	0.02 <sup>2.2</sup>	0.00028
Mercury (total)	mg/L	0.001	NG	<0.000010
Molybdenum (total)	mg/L	NG	NG	0.00998
Nickel (total)	mg/L	NG	NG	0.00076
Potassium (total)	mg/L	NG	NG	3.44
Selenium (total)	mg/L	0.05	NG	<0.00050
Sodium (total)	mg/L	NG	200	55.2
Strontium (total)	mg/L	7.0 <sup>1.8</sup>	NG	3.11
Uranium (total)	mg/L	0.02	NG	0.00839
Zinc (total)	mg/L	NG	5.0	0.0242

See Guideline Notes in Section 6.2.6.

**Table 6: Willowbrook Well Total Metals Potability 2021**

**6.2.5. Source Water Total Metals Summary 2018 to 2020**

Analyte	Unit	Average	Minimum	Maximum	Number of Results	Number of Results with Exceedances
<b>Total Metals</b>						
Aluminum (total)	mg/L	0.0077	<0.0050	0.0204	4	0
Antimony (total)	mg/L	<0.00020	<0.00020	<0.00020	4	0
Arsenic (total)	mg/L	0.00064	0.0005	0.00077	4	0
Barium (total)	mg/L	0.0838	0.076	0.0961	4	0
Boron (total)	mg/L	0.0524	0.0385	0.0653	4	0
Cadmium (total)	mg/L	0.000011	<0.000010	0.000019	4	0
Calcium (total)	mg/L	91.7	78.2	117	4	0
Chromium (total)	mg/L	<0.00050	<0.00050	<0.00050	4	0
Cobalt (total)	mg/L	<0.00010	<0.00010	<0.00010	4	0
Copper (total)	mg/L	0.00811	0.00602	0.0103	4	0
Iron (total)	mg/L	<0.010	<0.010	<0.010	4	0
Lead (total)	mg/L	0.00053	0.0003	0.00102	4	0
Magnesium (total)	mg/L	47.9	39.7	62.4	4	0
Manganese (total)	mg/L	0.00018	<0.00020	0.0004	4	0
Mercury (total)	mg/L	<0.000010	<0.000010	<0.000010	4	0
Molybdenum (total)	mg/L	0.01027	0.00917	0.0113	4	0
Nickel (total)	mg/L	0.0005	0.0004	0.00072	4	0
Potassium (total)	mg/L	3.52	3.09	4.06	4	0
Selenium (total)	mg/L	0.00083	<0.00050	0.00165	4	0
Sodium (total)	mg/L	55	44.7	74.1	4	0
Strontium (total)	mg/L	3.43	3.09	3.97	4	0
Uranium (total)	mg/L	0.00894	0.00796	0.0114	4	0
Zinc (total)	mg/L	0.0165	0.0116	0.0211	4	0

See Guideline Notes in Section 6.2.6.

**Table 7: Willowbrook Well Total Metals Potability 2018 to 2020 Summary**

## 6.2.6. Guideline Notes for Total Metals Potability

### 1. Notes for Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations (GCDWQ MAC)

**Note 1.1 for Aluminum (total):** The maximum acceptable concentration (MAC) for total aluminum in drinking water is 2.9 mg/L (2 900 µg/L) based on a locational running annual average of a minimum of quarterly samples taken in the distribution system. (Update March 5, 2021)

**Note 1.2 for Arsenic (total):** Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

**Note 1.3 for Barium (total):** Update January 24, 2020. The MAC was revised from 1.0 mg/L to 2.0 mg/L.

**Note 1.4 for Cadmium (total):** A maximum acceptable concentration (MAC) of 0.007 mg/L (7 µg/L) is established for total cadmium in drinking water, based on a sample of water taken at the tap. (Update July 14, 2020).

**Note 1.5 for Copper (total):** A maximum acceptable concentration (MAC) of 2 mg/L is established for total copper in drinking water, based on a sample of water taken at the tap. Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on Copper, June 2019.

**Note 1.6 for Lead (total):** The maximum acceptable concentration (MAC) for total lead in drinking water is 0.005 mg/L (5 µg/L), based on a sample of water taken at the tap and using the appropriate protocol for the type of building being sampled. Every effort should be made to maintain lead levels in drinking water as low as reasonably achievable (or ALARA). (GCDWQ: Guideline Technical Document; March, 2019)

**Note 1.7 for Manganese (total):** Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

**Note 1.8 for Strontium (total):** Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on strontium, May 2019.



**2. Notes for Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives (GCDWQ AO)**

**Note 2.1 for Aluminum (total):** The operational guidance (OG) value for total aluminum in drinking water is 0.100 mg/L (100 µg/L) to optimize water treatment and distribution system operations. This value is based on a locational running annual average. The sampling frequency required to calculate the locational running annual average will vary based on the type of treatment facility and the sampling location. (Update March 5, 2021)

**Note 2.2 for Manganese (total):** Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

## 7. Distribution System Water Quality

All treated distribution water quality parameters are compared to the applicable criteria set out in the *British Columbia Drinking Water Protection Act and Regulation (DWPA)*, the *Guidelines for Canadian Drinking Water Quality (GCDWQ)*, Interior Health Authority programs and Operational Guidelines (OG). The *DWPA* and *GCDWQ* define these parameters and set Aesthetic Objectives (AO) and Maximum Acceptable Concentrations (MAC).

All accredited laboratory tests in 2021 were performed by Caro Analytical Services (Kelowna, B.C.)

### 7.1. Distribution System Bacteriological Results

The Willowbrook distribution system has two dedicated sample stations that are alternated between bi-weekly. Samples from the distribution system were analyzed for Total Coliforms and *Escherichia coli* (*E.coli*). Schedule A of the *BC Drinking Water Protection Regulation* provides bacteriological testing criteria as given below.

#### Schedule A

#### Water Quality Standards for Potable Water (sections 2 and 9)

Parameter:	Standard:
Fecal coliform bacteria	No detectable fecal coliform bacteria per 100 ml
<i>Escherichia coli</i>	No detectable <i>Escherichia coli</i> per 100 ml
Total coliform bacteria	
(a) 1 sample in a 30 day period	No detectable total coliform bacteria per 100 ml
(b) more than 1 sample in a 30 day period	At least 90% of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform bacteria per 100 ml

In 2021, one distribution sample reported results Total Coliforms. All distribution sample had no detections for *E.coli*. The following is a summary of the bacteriological laboratory results from the treated water distribution system.

Analyte	Sampling Location	Unit	Average	Min	Max	Number of Results	Number of Results with Exceedances
<b>Lab Results: Microbiological</b>							
Background bacteria	Green Lake and Meyers Rd	CFU/100 mL	<1	<1	<1	13	0
	Green Lake Rd South	CFU/100 mL	<1	<1	1	13	0
E. coli (counts)	Green Lake and Meyers Rd	CFU/100 mL	<1	<1	<1	14	0
	Green Lake Rd South	CFU/100 mL	<1	<1	<1	14	0
Total coliforms (counts)	Green Lake and Meyers Rd	CFU/100 mL	<1	<1	<1	14	0
	Green Lake Rd South	CFU/100 mL	<1	<1	2	14	1

**Table 8: Distribution Water Bacteriological Testing 2021 Summary**

### 7.2. Distribution System Free Chlorine Residuals

The following is a summary of the free chlorine residual measurements from the distribution system. Free chlorine is measured with bacteriological samples. Free chlorine residuals are required to be maintained between 0.2 mg/L and 2.0 mg/L of free chlorine.

Analyte	Sampling Location	Unit	Average	Min	Max	Number of Results	Number of Results with Exceedances
<b>Field Results</b>							
Chlorine (free)	Green Lake and Meyers Rd	mg/L	0.52	0.22	0.68	13	0
	Green Lake Rd South	mg/L	0.59	0.42	0.82	14	0

**Table 9: Distribution Free Chlorine Residuals 2021 Summary**

### 7.3. Distribution System Water Quality Field Parameters

The following is a summary of the field parameters that are measured routinely in the distribution system.

Analyte	Sampling Location	Unit	Average	Min	Max	Number of Results	Number of Results with Exceedances
<b>Field Results</b>							
Conductivity	Green Lake and Meyers Rd	µS/cm	969	909	1068	9	0
	Green Lake Rd South	µS/cm	952	904	999	10	0
pH	Green Lake and Meyers Rd		7.55	7.5	7.63	9	0
	Green Lake Rd South		7.55	7.36	7.95	10	0
Total dissolved solids	Green Lake and Meyers Rd	mg/L	689	646	759	9	0
	Green Lake Rd South	mg/L	676	642	709	10	0
Temperature	Green Lake and Meyers Rd	°C	12.4	4.4	19.1	9	0
	Green Lake Rd South	°C	10.5	6.7	13.9	10	0
Turbidity	Green Lake and Meyers Rd	NTU	0.17	0.08	0.31	14	0
	Green Lake Rd South	NTU	0.14	0.06	0.35	13	0

**Table 10: Distribution Field Measured Parameters 2021 Summary**

### 7.4. Water Quality Complaints

None to report for 2021.

## **8. Water System Notifications**

The Interior Health Authority's team of drinking water officers are responsible for providing the oversight to ensure compliance and drinking water safety. The IHA is responsible for issuing *Permits to Operate* to drinking water systems. The Interior Health Authority has four types of water notifications to inform users of negative impacts to water quality.

### **8.1. Water Quality Advisory (WQA)**

There is some level of risk associated with consuming the drinking water but a Boil Water Notice is not needed. The risk is elevated for people with weakened immune systems, the elderly and infants and young children.

No WQAs issued for 2021.

### **8.2. Boil Water Notice (BWN)**

There are organisms in the water that can make you sick. To safely consume (swallow) the water, you must bring it to a rolling boil for at least 60 seconds, or use a safe alternate source of water.

No BWNs issued in 2021.

### **8.3. Do Not Consume (DNC)**

There are harmful chemicals or other bad things in the water that can make you sick. You cannot make the water safe by boiling. The water can make you sick if you consume (swallow) it. You cannot use the water for drinking, brushing teeth, washing/preparing/cooking food or pet's drinking water. You can bath, shower and water plants and gardens with the water.

No DNCs issued in 2021.

### **8.4. Do Not Use (DNU)**

There are known microbial, chemical or radiological contaminants in the water and that any contact with the water with the skin, lungs or eyes can be dangerous. Do not turn on your tap for any reason and do not use your water. You CANNOT make the water safe by boiling it.

No DNUs issued in 2021.

## **9. Program Updates and Status**

### **9.1. Cross Connection Control Program**

The RDOS continued work in 2021 towards implementing an official Cross Connection Control program and bylaw. On January 21, 2021 the RDOS adopted *Bylaw No 2851, 2020 Cross Connection Control*. Bylaw 2851 is a Regional bylaw that will be applicable to all RDOS owned and operated water systems.

## 9.2. Capital Works / System Additions

No items of note in 2021.

## 9.3. Emergency Response Plan

The *Emergency Response Plan* is scheduled to be updated in 2022.

## 9.4. Future System Upgrades

The RDOS's Engineering Services issued a Request for Proposals (RFP) in early 2022 for the design of a new storage reservoir for the Willowbrook water system. ECORA Engineering (Penticton, B.C.) was awarded the design of the new reservoir and have produced a Preliminary Design Report for the RDOS. The next step is for the RDOS to apply for grant funding which would cover 100% of the estimated 2 million dollars to construct the new reservoir.

## 9.5. Supervisory Control and Data Acquisition (SCADA System)

A SCADA system is an integral part of a modern water system. It is comprised of sensors, programmable controllers, communications and network devices installed at pump stations and treatment facilities. The SCADA system controls equipment such as pumps and monitors system operations while storing important data such as intake turbidity levels, pumping flow rates, and storage reservoir levels. The system also provides for efficiencies in operation and the response to system failures. This is achieved by the ability to monitor and view the system remotely through a software package along with the generation of alarms that will notify the system Operators when there is a problem or failure within a system.

In 2020 the RDOS had a consultant develop a *SCADA Master Plan*. This plan will assist with upgrades to the existing SCADA network along with providing a detailed plan on how to move forward into the future in an efficient manner.

In 2021 the RDOS implemented a new SCADA software package. This include new graphics that conformed to the specifications outlined in the *Master Plan* along with enhanced security for remote access and improved data trending capabilities.

## 9.6. System Maintenance/Upgrades

No items of note in 2021.

## 9.7. Water Quality Monitoring Program

The Water Quality Monitoring Program is scheduled to be updated in 2022.

## 10. Summary

All tested source water parameters from the Willowbrook groundwater well met the applicable criteria in 2021. All tested tread distribution water parameters also met the applicable criteria in 2021. The operation of the Willowbrook system by a team of RDOS *EOCP* certified Operators resulted in the continuous supply of high quality water to the community of Willowbrook. The RDOS continues to work on reviewing and upgrading the various programs that support facilitating the highest quality of water possible.