Town of Oliver

CANADA'S WINE CAPITAL

2024 Drinking Water Quality Annual Report

EXECUTIVE SUMMARY

The Town of Oliver (Town) operates an extensive Municipal and Rural water system that consists of eight ground water wells, a surface water source, and four domestic water reservoirs. The water system covers the Town itself and a substantial portion of area 'C' of the Regional District of Okanagan-Similkameen. The Town provides domestic water to approximately 2,408 residential and 174 commercial/ industrial connections, which all have water meters to record consumption.

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1.0 INTRODUCTION

The *British Columbia Drinking Water Protection Act* (BCDWPA) requires that each municipal government that supplies or distributes domestic drinking water must provide a water quality report that is reviewed by the local drinking water officer (Interior Health Authority) and published for public access.

The legislation in British Columbia outlines the responsibilities of an owner or a water supply system in the areas of source protection, construction and plan approvals, treatment, monitoring, emergency response planning, and reporting requirements. These responsibilities are outline in the following provincial legislation:

- Drinking Water Protection Act (DWPA)

- Drinking Water Protection Regulation (DWPR)

- Water Act

- Ground Water Protection Regulation (GWPR)

This report has been prepared for the community of the Town of Oliver (Town) and in accordance with the requirement in the DWPA (Section 15(b)). This report fulfills this requirement.

2.0 WATER SYSTEM OVERVIEW

The Town's water system is broken down into seven individual systems, which over time have been inter-connected to provide a more sustainable water supply system. Each system is defined, or known by, the area and the wells that support it:

- System 1 – also referred to as Rural North – Buchanan Road Pumphouse
- System 2 & 2B – Black Sage Area – Black Sage and Miller Road Pumphouse
- Municipal System – also referred to as System 3 – Rockcliffe and Tucelnuit Pumphouses
- System 4 - 7 – also referred to as Rural South – Miller Road Pumphouse

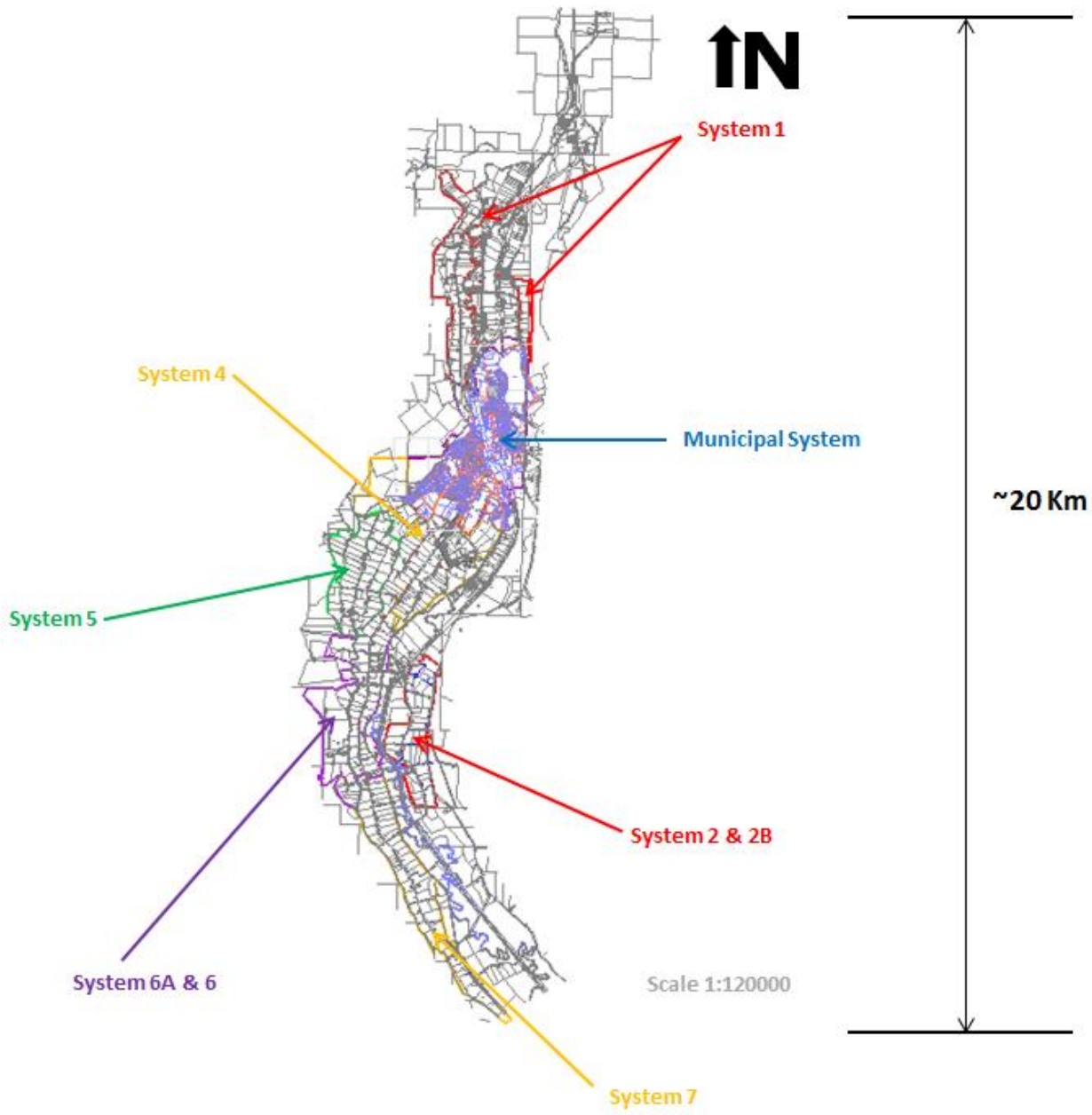

Figure 1: Town of Oliver's 7 Water System Overview

As of 2014, the Town uses groundwater for all its domestic water connections. Each system is twinned for domestic and irrigation distribution mains except for System 2 (Black Sage). This system is groundwater only for both domestic and irrigation supplies, and there are no current plans to complete the twinning of System 2.

As part of the water distribution system, the Town maintains approximately 120 kilometres of water main. The distribution system consists of Asbestos Concrete (AC), Polyvinyl Chloride (PVC), Cast Iron (CI), and High-Density Polyethylene (HDPE) material, with pipe sizes ranging from 50mm to 750mm in diameter.

The age of the water mains ranges from new to approximately 80 years old. The age of the pipe does not necessarily reflect the need to replace it as the various material types and installation conditions make for different average life expectancies. Normal operating pressures range from 60psi to 120psi for standard pressurized services.

2.1 DOMESTIC SYSTEM

The domestic water system storage capacity is 1,025,000 US gallons (US GAL) (3880 cubic metres (m^3)) between four reservoirs. Existing Municipal reservoirs consist of a 360,000 US GAL (1360m^3) reservoir and a newer (constructed in 2010) 500,000 US GAL (2470m^3) reservoir. The other two reservoirs still in use are in System 6 & 6A; Miller reservoir at 150,000 US gallons (568m^3) and Munckhof reservoir at 15,000 US gallons (57m^3).

2.1.1 SYSTEM 1 DOMESTIC

System 1, also known as "Rural North," supplies domestic water to approximately 168 accounts. System 1 has a domestic main that runs approximately 4.5km from the edge of town N. to the end of Sportsman Bowl Road. Buchanan pump station, which is located adjacent to 1748 Buchanan Road and near the east side of the Okanagan River, supplies domestic ground water to System 1 and into Municipal System. Buchanan pump station has one domestic ground water pump with a total 125 horsepower (hp) that has a pumping capacity of 1,000 gallons per minute (GPM).

2.1.2 SYSTEM 2 & 2B DOMESTIC

System 2, also known as "Black Sage" area, supplies domestic and irrigation water to approximately 53 accounts. System 2 is unique, having been separated into two areas, System 2, and 2B. System 2B, along with every other system, is twinned. Whereas System 2 is the only system that does not have separate water sources for both irrigation and domestic water. System 2 and 2B have two domestic pump stations within its boundary, Black Sage pump station, and Miller Well pump station. The Black Sage pump station is located approximately 154m W. from Ryegrass Road between Miller Road and Watters Road. The Black Sage well supplies groundwater to both domestic and irrigation services in System 2 and 2B utilizing three pumps with a total 240hp, and a pumping capacity of 2,600gpm. The Miller Well,

located on the west end of Miller Road, approximately 67m E. of the Okanagan River, supplements up to 500gpm of domestic groundwater to System 2 and 2B during the peak demand season, along with Systems 4 through 7, via Miller reservoir.

2.1.3 MUNICIPAL SYSTEM DOMESTIC

The Municipal System, also known as System 3, supplies domestic groundwater to approximately 2400 accounts. The Municipal System utilizes two pump stations, and one booster station to supply its users within the Town boundary, Rockcliffe pump station, Tucelnuit pump station, and the Airport Booster station. Rockcliffe is located between the parcels of 781 and 715 Skagit Avenue. Rockcliffe has one pump at 150hp, and a pumping capacity of 1,500gpm. Tucelnuit pump station is located on the SE corner of Merlot Avenue, and Lakeside Drive, W of the Tucelnuit Elementary School. Tucelnuit utilizes two pumps having a total pumping capacity of 1,750gpm. The Airport Booster station is located on the NE corner of the intersection of Airport Street, and Road 1. The Airport Booster is typically set to supply water from within the Municipal boundaries to the rural area south but can also be used to intake water from the rural area south and supply the Municipal System depending on demands or if there was a maintenance malfunction of another pump.

2.1.4 SYSTEM 4 - 7 DOMESTIC

System 4 - 7, also known as “Rural South,” supplies domestic ground water to approximately 523 accounts. The Systems utilizes the Miller Well pump station, 6A Domestic Booster station, and the Airport Booster station. Miller Well pump station also aids in supplementing supply of domestic groundwater to System 2 during peak demands and fills the Miller Reservoir. The Miller Well pump has 125hp, and a pumping capacity of 1,000gpm. Munckhof Domestic Booster feeds Munckhof Reservoir, while the Airport Booster has the option to alternate between the Municipal System and Rural South to have a continuous loop in the system, and so that each pump is working in its most efficient phase.

3.0 WATER QUALITY, SAMPLING, AND MONITORING PROGRAM

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 Allowable Concentrations (MAC).

All 2024 accredited laboratory tests were performed by Caro Analytical Services (Kelowna, B.C.).

The Town works closely with Caro to monitor drinking water quality in accordance with the *BCDWPA*, and *Guidelines for Canadian Drinking Water Quality (GCDWQ)*. The Town's staff submits weekly samples from various sampling sites throughout the domestic system for bacteriological testing for Total Coliforms, and E-Coli Bacteria. In conjunction with these submittals, the Town also conducts their own in-house 'presence/absence' tests. The Town also monitors the Nitrate levels in the drinking water sampling six times a year in February, April, June, August, October, and December. In 2024, the Town was requested by Interior Health Authority to increase sampling, including test stations, wells sites and start sampling for Trihalomethanes "THMs" and Haloacetic Acids "HAAs". Once a year, the Town commences a full spectrum test on the domestic water system. The full spectrum analyzes all physical parameters and characteristics of the Town's drinking water. The water results are then compared to the *GCDWQ* to ensure compliance. Summarized in Appendix A: 2024 Weekly Water Sampling Result Table.

There are nine test stations located in the Municipal boundaries. The Rural Area north of Town has three test station and there are six testing sites (excluding wells) south of Town. When any sample result shows the presence of Total Coliform or E-Coli, the Interior Health Environmental Health Officer is consulted, standard protocols are initiated with a flushing of the contaminated system and resampling of water where contamination was located. Resampling occurs immediately for lab testing and in-house 'presence/absence' samples are also taken to identify coliforms.

The Town had source water sample come back positive for Total coliforms at the location:

- 4 hits at Black sage well at start up on May 9th.
- 5 hits at Rockcliffe well on August 6th.
- 1 hit at Buchanan well on September 3rd.
- 5 hits at Rockcliffe well on September 3rd.
- 4 hits at Black sage well on October 1st.

3.1 DISTRIBUTION WATER QUALITY PARAMETERS

The following tables 1.0 & 2.0 are summaries of the parameters that were measured routinely in the distribution system: conductivity, pH, Temperature, Turbidity and free chlorine (free chlorine residuals are required to be maintained between 0.2 mg/L and 2.0 mg/L). There are eighteen sample sites throughout the distribution system. Typically, five (5) were monitored on a weekly basis in conjunction with the bacteriological sampling.

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
Escherichia coli	No detectable *Escherichia coli* 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

Figure 2: Schedule A of the BC Drinking Water Protection Regulation

In 2024, all distribution samples had no detections for Total Coliforms and E.coli. The following is a summary of the laboratory bacteriological and field results from the treated water distribution system.

Parameter	Sampling Location	Unit	Average	Min	Max	Number of Samples	Number of Samples with Exceedances
Lab Results							
Background bacteria	Rural North	CFU/100mL	<1	<1	<1	37	0
	Municipal	CFU/100mL	<1	<1	<1	72	0
	Rural South	CFU/100mL	<1	<1	>200	69	0
Total Coliforms (Count)	Rural North	CFU/100mL	<1	<1	<1	37	0
	Municipal	CFU/100mL	<1	<1	<1	72	0
	Rural South	CFU/100mL	<1	<1	<1	69	0
E. Coli	Rural North	CFU/100mL	<1	<1	<1	37	0
	Municipal	CFU/100mL	<1	<1	<1	72	0
	Rural South	CFU/100mL	<1	<1	<1	69	0

Table 1.0 Laboratory sample results for the distribution system

Parameter	Sampling Location	Unit	Average	Min	Max	Number of Samples
Field Results						
Free Chlorine	Rural North	mg/L	0.24	0.01	0.52	49
	Municipal	mg/L	0.33	0.04	0.62	102
	Rural South	mg/L	0.16	0.01	0.60	101
Conductivity	Rural North	µS/cm	468	261	765	37
	Municipal	µS/cm	567	279	830	72
	Rural South	µS/cm	627	415	802	69
pH	Rural North		7.5	7.14	7.95	37
	Municipal		7.61	6.09	8.30	72
	Rural South		7.41	6.96	7.8	69
Temperature	Rural North	°C	14.69	7.5	21.5	37
	Municipal	°C	15.15	9.4	20	72
	Rural South	°C	14.56	7.3	25.2	69
Turbidity	Rural North	NTU	0.23	0.11	0.57	37
	Municipal	NTU	0.22	0.07	0.80	72
	Rural South	NTU	0.26	0.09	1.0	69

Table 2.0 Field sample results for the distribution system

Water quality sampling and testing as identified in table 3.0 meets the quality of standard requirement in Schedule A of the DWPR. The Town and the health authority agreed upon a sampling weekly for the distribution system and sampling more frequently for GARP determination. Therefore 472 samples were estimated to be taken for 2024, 13 samples were not collected, for laboratory analysis, seven of these samples were because of the laboratory being closed for the holidays. Six of these samples were due to insufficient staffing at the time of the sampling event.

Water Type	Parameter	Frequency
Well Water (Source Water)	Free Chlorine	Weekly
	Total and fecal coliforms (Escherichia coli)	Weekly
	Turbidity and temperature	Weekly
	Alkalinity, aluminum, arsenic, barium, boron, cadmium, calcium, total organic carbon, chloride, chromium, cobalt, true colour, apparent colour, conductivity, copper, fluoride, hardness, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, ammonia, nitrate, nitrite, nitrogen, pH, potassium, total dissolved residue, selenium, silver, sodium, sulphate, turbidity, zinc	Annually
Test Stations (Distribution System)	Free Chlorine	Weekly
	Total and fecal coliforms (Escherichia coli)	Weekly
	Turbidity and temperature	Weekly

Table 3.0 outlines the water sampling and testing program undertaken by the Town.

*Additional Manganese testing is completed monthly for Miller Well to satisfy the conditions of the permit issued by interior health.

Population Served by the Prescribed Water Supply System:	Number of Samples Per Month:
Less than 5,000	4
5,000 to 90,000	1 per 1,000 of population
More than 90,000	90 plus 1 per 10,000 of population in excess of 90,000

Table 4.0 Frequency of Monitoring Samples for Prescribed Water Supply Systems (Section 8) (Province of British Columbia, 2011)

3.2 SOURCE WATER QUALITY PARAMETERS

For 2024, Oliver's source water wells were monitored weekly for the GARP determination project. These parameters provide support for both operational decisions and the Source Water Protection Plan. The following is a summary of these parameters that are monitored by both field kits and grab samples that are sent to the laboratory for analysis.

Parameter	Sampling Location	Unit	Average	Min	Max	Number of Samples
Field Results						
Conductivity	Rockcliffe	µS/cm	748	709	853	66
	Tucelnuit P2	µS/cm	445	382	688	122
	Tucelnuit P3	µS/cm	567	306	685	109
	Buchanan	µS/cm	313	253	503	120
	Miller	µS/cm	622	569	768	144
	Black Sage 1	µS/cm	430	376	731	57
	Black Sage 2	µS/cm	430	341	619	123
	Black Sage 3	µS/cm	567	497	706	103
pH	Rockcliffe		7.46	6.04	7.87	66
	Tucelnuit P2		7.69	6.09	8.06	122
	Tucelnuit P3		7.67	6.12	8.09	109
	Buchanan		7.46	6.91	7.99	120
	Miller		7.37	6.48	7.74	144
	Black Sage 1		7.40	6.90	7.68	57
	Black Sage 2		7.38	6.99	7.83	123
	Black Sage 3		7.49	7.07	7.84	103
Temperature	Rockcliffe	°C	14.9	8.8	20.4	66
	Tucelnuit P2	°C	14.1	6.1	17.6	122
	Tucelnuit P3	°C	14.6	9.4	19.7	109
	Buchanan	°C	16.1	9.0	26.6	120
	Miller	°C	15.8	7.1	25.1	144
	Black Sage 1	°C	16.2	7.3	24.6	57
	Black Sage 2	°C	16.3	6.3	25.3	123
	Black Sage 3	°C	16.0	6.0	25.8	103
Turbidity	Rockcliffe	NTU	0.21	0.07	0.84	66
	Tucelnuit P2	NTU	0.21	0.07	0.81	122
	Tucelnuit P3	NTU	0.24	0.07	0.92	109
	Buchanan	NTU	0.20	0.06	0.66	120
	Miller	NTU	0.23	0.06	1.40	144
	Black Sage 1	NTU	0.18	0.08	0.46	57
	Black Sage 2	NTU	0.28	0.07	3.10	123
	Black Sage 3	NTU	0.21	0.08	0.66	103

Table 5.0 Summary of field sample results for source water wells for 2024

Analyte	Sampling Location	Unit	Average	Min	Max	Number of Samples	Number of Samples with Exceedances
Lab Results: Microbiological							
Background bacteria	Rockcliffe	CFU/100mL	<1	<1	<1	27	0
	Tucelnuit P2	CFU/100mL	<1	<1	<1	28	0
	Tucelnuit P3	CFU/100mL	<1	<1	<1	26	0
	Buchanan	CFU/100mL	<1	<1	<1	31	0
	Miller	CFU/100mL	<1	<1	<1	26	0
	Black Sage 1	CFU/100mL	<1	<1	>200	13	0
	Black Sage 2	CFU/100mL	<1	<1	<1	23	0
	Black Sage 3	CFU/100mL	<1	<1	<1	21	0
Total Coliforms (Count)	Rockcliffe	CFU/100mL	<1	<1	5	27	2
	Tucelnuit P2	CFU/100mL	<1	<1	<1	28	0
	Tucelnuit P3	CFU/100mL	<1	<1	<1	26	0
	Buchanan	CFU/100mL	<1	<1	1	31	1
	Miller	CFU/100mL	<1	<1	<1	26	0
	Black Sage 1	CFU/100mL	<1	<1	4	13	1
	Black Sage 2	CFU/100mL	<1	<1	4	23	1
	Black Sage 3	CFU/100mL	<1	<1	<1	21	0
E. Coli	Rockcliffe	CFU/100mL	<1	<1	<1	27	0
	Tucelnuit P2	CFU/100mL	<1	<1	<1	28	0
	Tucelnuit P3	CFU/100mL	<1	<1	<1	26	0
	Buchanan	CFU/100mL	<1	<1	<1	31	0
	Miller	CFU/100mL	<1	<1	<1	26	0
	Black Sage 1	CFU/100mL	<1	<1	<1	13	0
	Black Sage 2	CFU/100mL	<1	<1	<1	23	0
	Black Sage 3	CFU/100mL	<1	<1	<1	21	0

Table 6.0 Summary of laboratory sample results for source water wells for 2024

3.3 DISINFECTION BY-PRODUCT MONITORING

Disinfection by-products are chemicals that form when chlorine is used for disinfecting drinking water to prevent disease. The chlorine reacts with decaying organic matter, like leaves and vegetation from lakes and rivers to form disinfection by-products. Utilities make every effort to maintain concentrations as low as reasonably achievable without compromising the effectiveness of disinfection. The disinfection-by-product are summarized in appendix B.

3.4 PESTICIDE MONITORING

Pesticide are chemicals that are used to control pests. When pesticides enter the environment, various chemical reactions and biological processes break them down over time into other chemicals. Those chemicals are called transformation products.

- Within water
- Attached to soil particles
- In the air

Pesticides may enter Canada's waters in many ways. When pesticides are applied in agricultural, forestry and urban environments, they can travel by air (via spray drift) or by surface run-off and unintentionally enter a body of surface water, or they may move through soil to enter groundwater. Pesticides can also enter surface water through rainfall and deposition of dry particles such as dust. The Pesticide monitoring is summarized in “Appendix C”.

3.5 FULL SPECTRUM ANALYSIS

With the weekly tests, the Town performs a full spectrum analysis on its source water wells once a year. A summary of the 2024 results is shown in table 7.0. Highlighted results in the table indicate parameters which were above or approaching the recommended maximum criteria in the GCDWQ. The criteria are either stated as a Maximum Acceptable Concentration (MAC) or Aesthetic Objective (AO). MACs have been established for certain substances that are known or suspected to cause adverse effects on health. AOs apply to certain substances or characteristics of drinking water that can affect its acceptance by consumers.

Manganese

Manganese has a MAC of 0.12mg/L, and AO for total Manganese in drinking water is 0.02 mg/L as indicated in the Guidelines for Canadian Drinking Water Quality: Technical Document.

Analysis	Units	Maximum Standard	Aesthetic Objective	Operational Guidance Values	22904	
					Tuc-el-nuit P#2	Buchanan
					2024-04-02-09:30	2024-04-02-10:30
Alkalinity as CaCO3	mg/L				182	120
Aluminum Total	mg/L	2.9		0.1	<0.005	<0.005
Antimony	mg/L	0.06			<0.0002	<0.0002
Arsenic Total	mg/L	0.01			0.00319	0.00089
Barium Total	µg/L	2			0.068	0.0503
Boron Total	mg/L	5			<0.0500	<0.0500
Cadmium Total	mg/L	0.007			<0.000010	<0.000010
Calcium Total	mg/L				58.1	36.5
Chromium Total	mg/L	0.05			<0.0005	<0.00050
Chloride	mg/L		250		10.5	5.92
Cobalt Total	mg/L				<0.00010	<0.00010
Color - True	TCU		15		<5.0	<5.0
Conductivity	µS/cm				455	290
Copper Total	mg/L	2	1		0.00137	0.00164
Fluoride	mg/L	1.5			0.7	0.42
Hardness as CaCO3	mg/L				213	132
Iron Total	mg/L		0.1		<0.010	0.018
Lead Total	mg/L	0.005			0.00044	0.00022
Lithium Total	mg/L				0.00659	0.00301
Magnesium Total	mg/L				16.4	9.95
Manganese Total	mg/L	0.12	0.02		0.00067	**0.0234**
Molybdenum Total	mg/L				0.0049	0.00217
Nickel Total	mg/L				<0.00040	<0.0004
Nitrogen - Nitrate as N	mg/L	10			1.48	0.089
Nitrogen - Nitrite as N	mg/L	1			<0.010	<0.010
pH	pH units		7.0-10.5		7.8	7.23
Phosphorus Total	mg/L				<0.050	<0.050
Potassium Total	mg/L				3.97	2.08
Selenium Total	mg/L	0.05	NG		0.00281	<0.00050
Silicon Total	mg/L				10.3	4.2
Silver Total	mg/L				<0.000050	<0.000050
Sodium Total	mg/L	NG	200		16	10.4
Strontium Total	mg/L	5			0.65	0.359
Sulfur Total	mg/L		NG		16	8.9
Tellurium Total	mg/L				<0.0005	<0.00050
Thallium Total	mg/L				<0.0002	<0.00020
Thorium Total	mg/L				<0.00010	<0.00010
Tin Total	mg/L				<0.0002	<0.0002
Titanium Total	mg/L				<0.005	<0.005
Tungsten Total	mg/L				<0.001	<0.001
Uranium Total	mg/L	0.02	NG		0.00543	0.00253
Vanadium Total	mg/L				<0.0050	<0.0050
Zinc Total	mg/L	NG	5		0.0188	<0.0040
Zirconium Total	mg/L	NG	NG		<0.00010	<0.00010
Value	Approaching MAC or IMAC of the British Columbia or Canadian Drinking Water Guideline standard					
Value	Exceeding MAC or IMAC of the British Columbia or Canadian Drinking Water Guideline standard					
Valve	Exceeding AO or OG of the British Columbia or Canadian Drinking Water Guideline standard					

Table 7.0 2024 Full Spectrum Analysis

Analysis	Units	Maximum Standard	Aesthetic Objective	Operational Guidance Values	22904 Tuc-el-nuit P#2 Average	22904 Tuc-el-nuit P#2 Minimum	22904 Tuc-el-nuit P#2 Maximum	Buchanan Average	Buchanan Minimum	Buchanan Maximum
Alkalinity as CaCO3	mg/L				184	168	198	129.67	125	138
Aluminum Total	mg/L	2.9		0.1	<0.0050	<0.0050	0.0051	<0.0050	<0.0050	<0.0050
Antimony	mg/L	0.06			<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Arsenic Total	mg/L	0.01			0.00334	0.00315	0.00364	0.00116	0.00104	0.00132
Barium Total	µg/L	2			0.0624	0.0469	0.0718	0.055	0.0514	0.0578
Boron Total	mg/L	5			0.068	<0.050	0.127	0.0117	<0.050	0.0117
Cadmium Total	mg/L	0.007			0.0000105	<0.000010	0.000011	0.000023	0.000019	0.000028
Calcium Total	mg/L				52.5	45.3	59.1	33.67	31.4	36.4
Chromium Total	mg/L	0.05			<0.0050	<0.0050	<0.0050	<0.00050	<0.00050	<0.00050
Chloride	mg/L		250		8.54	4.4	12.5	4.98	4.77	5.35
Cobalt Total	mg/L				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Color - True	TCU		15		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity	µS/cm				425	333	484	279	271	286
Copper Total	mg/L	2	1		0.00892	0.00366	0.0125	0.0063	0.00243	0.01
Fluoride	mg/L	1.5			0.43	0.41	0.47	0.21	0.18	0.27
Hardness as CaCO3	mg/L				193	163	217	122	117	127
Iron Total	mg/L		0.1		0.027	<0.010	0.077	0.042	0.01	**0.103**
Lead Total	mg/L	0.005			0.00034	<0.00020	0.00047	0.00035	0.00025	0.00044
Lithium Total	mg/L				0.0071	0.000565	0.00825	0.004	0.00376	0.000412
Magnesium Total	mg/L				14.9	12	16.8	9.04	8.66	9.24
Manganese Total	mg/L	0.12	0.02		0.00135	0.00059	0.00251	**0.0528**	**0.0362**	**0.0749**
Molybdenum Total	mg/L				0.00437	0.00411	0.00464	0.00319	0.00272	0.00363
Nickel Total	mg/L				0.000416	<0.00040	0.00045	<0.00040	<0.00040	<0.00040
Nitrogen - Nitrate as N	mg/L	10			1.003	0.058	1.73	0.12	<0.010	0.12
Nitrogen - Nitrite as N	mg/L	1			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH	pH units		7.0-10.5		8.04	7.96	8.11	7.89	7.84	7.94
Phosphorus Total	mg/L				0.059	<0.050	0.077	<0.050	<0.050	<0.050
Potassium Total	mg/L				3.773	3.24	4.23	2.5	2.29	2.62
Selenium Total	mg/L	0.05	NG		0.00279	0.00147	0.00415	<0.00050	<0.00050	<0.00050
Silicon Total	mg/L				10.6	9.7	12.4	2.5	2.29	2.62
Silver Total	mg/L				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Sodium Total	mg/L	NG	200		15.27	12.3	17.5	5.93	5.6	6.5
Strontium Total	mg/L	7			0.621	0.519	0.688	0.351	0.336	0.363
Sulfur Total	mg/L				15.3	9.9	18.2	8.7	8.1	9.7
Tellurium Total	mg/L				<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium Total	mg/L				<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Thorium Total	mg/L				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin Total	mg/L				<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Titanium Total	mg/L				<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tungsten Total	mg/L				<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium Total	mg/L	0.02	NG		0.0048	0.00281	0.006	0.00161	0.00135	0.00183
Vanadium Total	mg/L				0.00293	<0.0050	0.002	<0.005	<0.005	<0.005
Zinc Total	mg/L	NG	5		0.007	0.005	0.0088	0.006	<0.0040	0.006
Zirconium Total	mg/L	NG	NG		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Value	Approaching MAC or IMAC of the British Columbia or Canadian Drinking Water Guideline standard									
Value	Exceeding MAC or IMAC of the British Columbia or Canadian Drinking Water Guideline standard									
Valve	Exceeding AO or OG of the British Columbia or Canadian Drinking Water Guideline standard									

Table 8.0 comparison of 2018 to 2023 full spectrum

4.0 WATER SYSTEM COMMUNICATIONS

4.1 WATER QUAILTY ADVISORY

No, “water quality advisory” was issued in 2024.

Water quality advisory means: Some risk associated to consuming drinking water, a Boil Water Notice is not needed. The risk is elevated for people with weakened immune systems, the elderly and infants and young children.

4.2 BOIL WATER NOTICES

One, boil water notice was issued in 2024.

Boil water notice means: Contaminants are in the system or potentially in the system, that can make you sick. To safely consume (ingest) the water, the water must be brought to a rolling boil for at least 60 seconds or use a safe alternate source of water.

The Town of Oliver’s 2024 project for relining the main reservoir feed line caused a boil water notice issued to effected residents for the relining project in March of 2024. On March 29th, and 30th, the Town of Oliver receive necessary tests results prior to reconnecting into the systems. On April 1st, the Town of Oliver’s boil water advisory was lifted for the affected customers.

4.3 DO NOT CONSUME

No, “do no consume” was issued in 2024.

Do not consume means: You can’t make the water safe by boiling. The water can make you sick if you consume (ingest) it. You can’t use the water for drinking, brushing teeth, washing/preparing/cooking food or pet drinking water. You can bathe, shower and water plants and gardens with the water. Contaminants are present in the water which can make you sick.

4.4 DO NOT USE

No, “do not use” was issued in 2024.

Do not use means: Do not turn on your taps for any reason and do not use your water. You can’t make the water safe by boiling it. There are known contaminants in the water and that any contact with the water with the skin, lungs or eyes can be dangerous.

4.5 WATER QUALITY COMPLAINTS

No public complaints were identified in 2024.

Water quality complaints means: complaints regarding water quality coming from a tap in a business or a person(s) home, that is meant from consumption.

5.0 WATER CONSUMPTION

5.1 TOTAL CONSUMPTION

The water works system is twinned in Oliver which means that the groundwater used for domestic purposes and surface water is used for irrigation purposes, each having their own piping system. System 2 is not twinned, as it uses groundwater for both irrigation and domestic purposes. The Town of Oliver consumed 2,963,440,972 US GAL of water in 2024. That is 11,217,844,377 liters (L) of water or 11,217,844 m^3 of water.

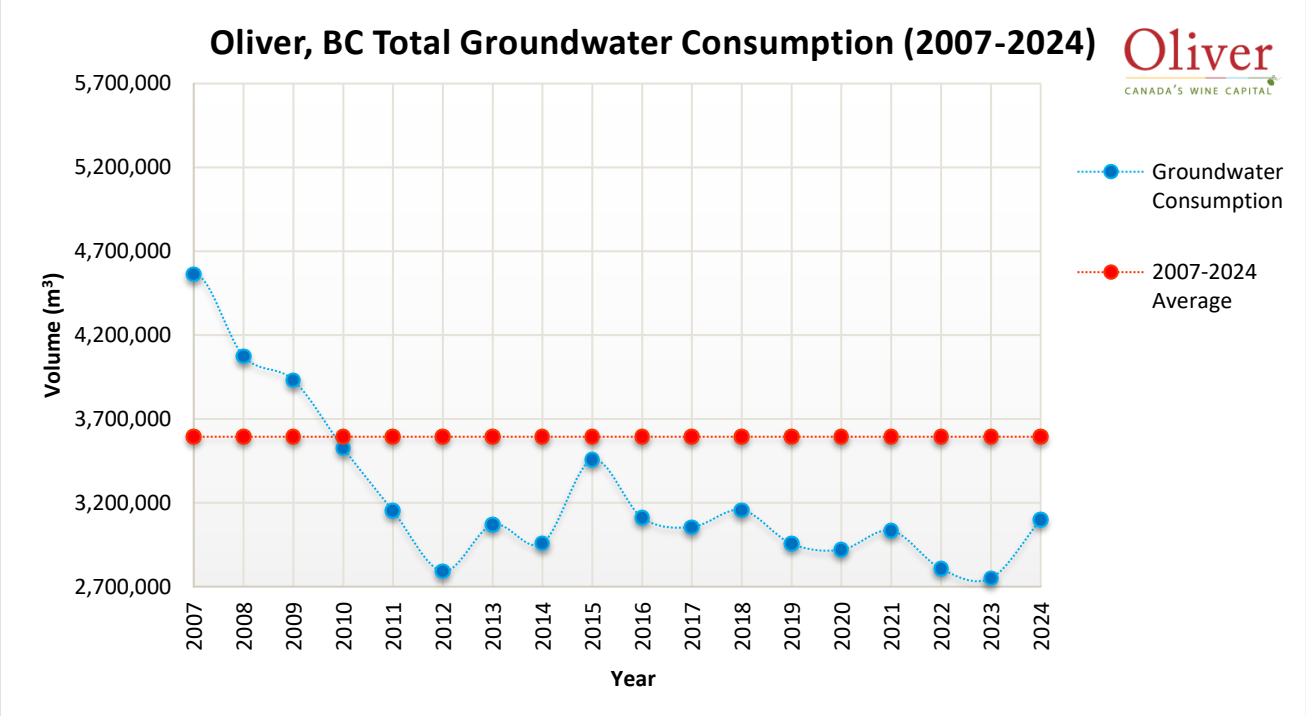

Figure 3: Total Water Consumption 17 Year Trend

As shown in *Figure 3,* the Town consumed 4.80% more water than the previous year (2023). The seventeen-year average is 3,572,441,772US GAL. In 2024, the Town consumed 17.05% less than the seventeen-year average. Water demand is influenced by population and

irrigation usage, population has been slightly increasing each year in the Town and surrounding area. The 2021 Census reported the Town's population as 5,094, however, the Town's water system extends beyond its borders making it difficult to define how many people it serves; it is estimated to be over 8,000 people.

In 2024, the province declared a level 3 drought condition for the Okanagan. The Town of Oliver declared stage 1 drought conditions and was rescinded in October. The Town's maximum residential domestic water demand was on July 17, 2024. *See Figure 4.* The Town had a maximum daily water demand peak of 36,304.47 m^3 on August 11, 2024, while minimum daily demand occurred on March 30, 2024, of 567.00 m^3. See "Appendix D" for summary of 2024 pumping data.

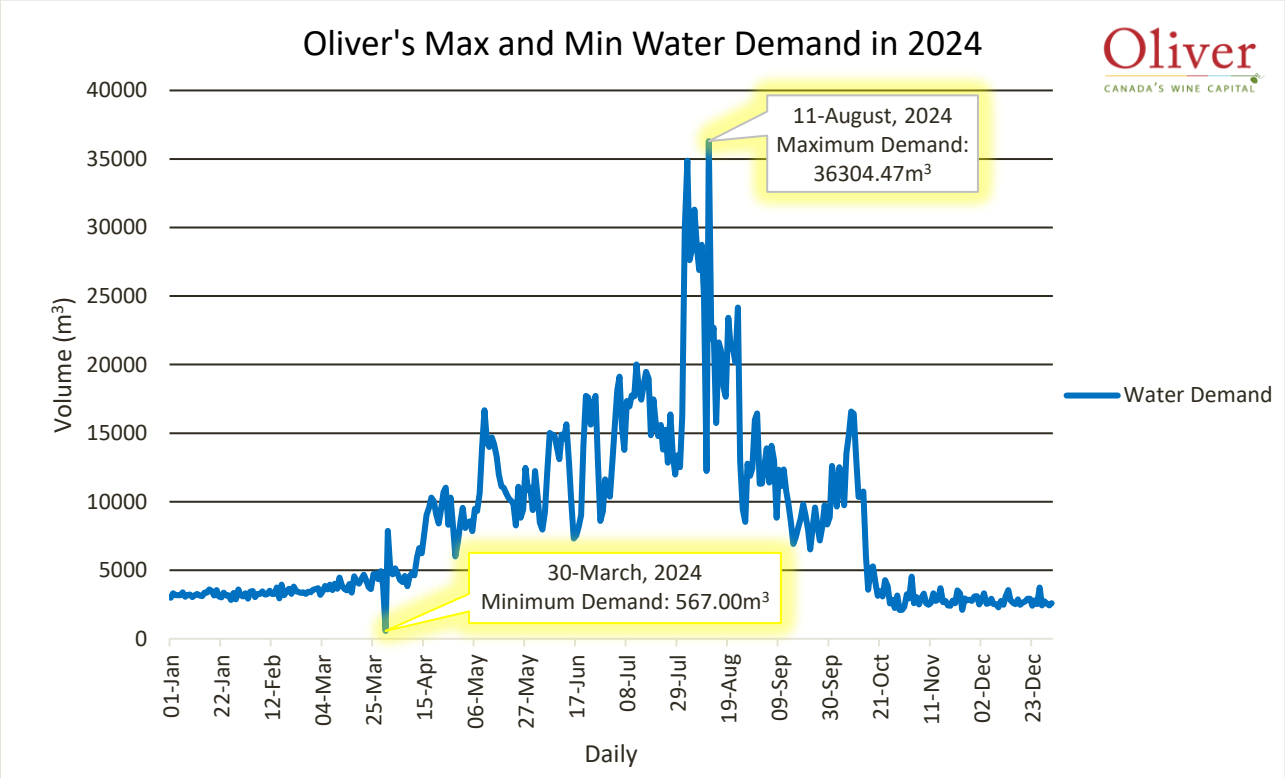

Figure 4: Oliver's 2024 Max and Min Domestic Water Demand

5.2 BREAKDOWN OF CONSUMPTION

The Town consumed 818,848,059 US GAL (3,099,676m^3, 30,099,676,360L) of groundwater in 2024, as summarized in "Appendix E". This amount is 27.63% of the total consumption. The remaining 72.37% is surface water, primarily used for irrigation, having a total consumption of 2,144,592,914 US GAL (8,118,167m^3, 8,118,167,289L). *See Figure 5 below for the breakdown of percentages.*

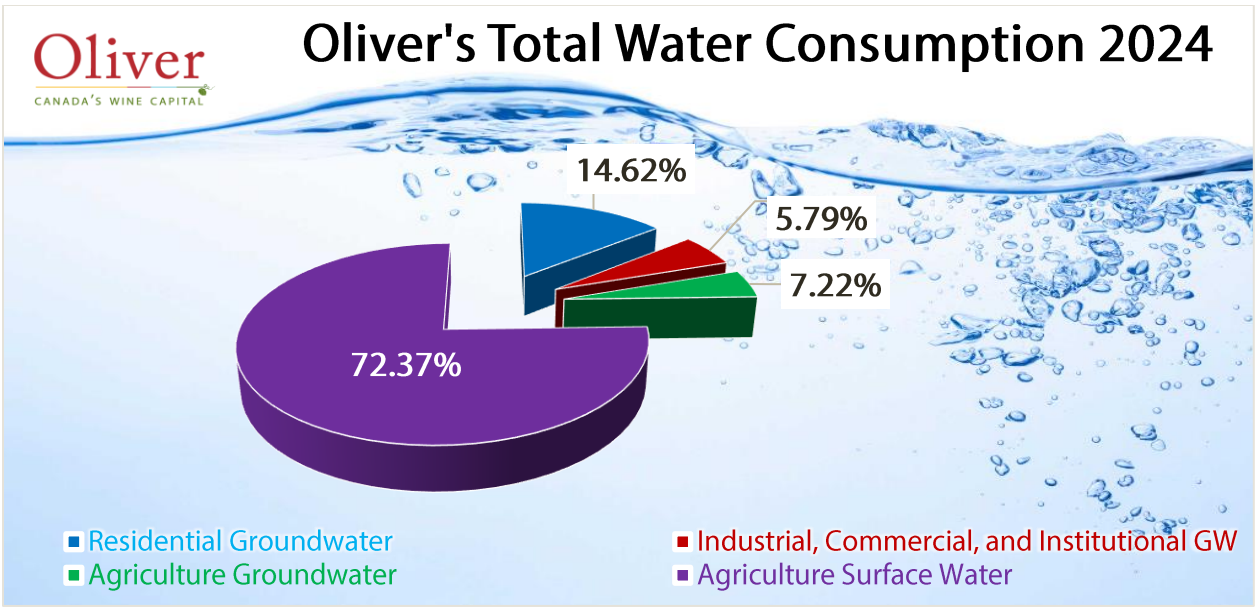

Figure 5: Oliver's Total Water Consumption 2024

5.3 WATER CONSERVATION

The Town works closely with the OBWB, and its *Okanagan Water Wise* program called "Make Water Work", to spread a valley wide awareness on water conservation in the Okanagan. The program acts as a campaign where residents take water conservation survey pledges. OBWB will bring awareness with Radio Ads, Facebook Ads, Billboards, other social media support, yard signs, posters, and magnets linking the Make Water Work website www.makewaterwork.ca.

6.0 SYSTEM CLASSICIATION AND OPERTAOR CERTIFICATION

6.1 SYSTEM CLASSIFICATION

The British Columbia Environmental Operators Certification Program (BC EOCP) is responsible for the classification of potable water systems in BC.

The Town's Water Distribution System is classified as Class III. The Town is also classified as a Level I Water Treatment facility (at multiple locations).

6.2 OPERATOR CERTIFICATION

In addition to system classification, all water operator certification falls under the responsibility of BC EOCP. Operators may hold certifications within the disciplines of Water

Distribution and/or Water Treatment with four levels of certification achievable. All Operators are required to keep up with their education and to maintain 2.4 certified education units (CEU's) every two years, monitored by the EOCP. Various accredited courses were put on at the Town regarding safe work practices. In addition, all operators annually continue to work on augmenting and furthering their levels of certification. All Town Operators certified through the BC EOCP are indicated in Table 9.0 below.

OPERATOR EOCP CERTIFICATION No.	WATER DISTRIBUTION CERTIFICATION LEVELS				WATER TREATMENT CERTIFICATION LEVELS			
	IV	III	II	I	IV	III	II	I
3231		X						X
8895			X					X
8513				X				
1001621				X				
7888								
1001983			X				X	

Table 9.0 EOCP CERTIFIED OPERATORS

7.0 CAPITAL PROJECTS AND IMPROVEMENTS

7.1 PROJECTS COMPLETED IN 2024

The Town continues to make minor and major improvements to the Town's water system every year and works with the Interior Health Authority (IHA) to prioritize some of these goals. Here are the main projects that were completed or started in 2024:

Water Meter Replacements

- This project started in 2020 and is scheduled for several years to complete some necessary change outs. The water meters are coming to the end of their useful life and our Finance Department is looking at upgrading to new replacement meters that have fewer moving parts, are less susceptible to any damage and have longer battery life.

Co-op Avenue

- 265m of 200mm watermain installation along the frontage.
- 40m of 150mm watermain installation along the project frontage.

Water reservoir feed line relining

- A new polyurea liner in the reservoir feed lines from the reservoir valve chamber all the way to Station Street.
- 140m of 400mm watermain relining along School Avenue and Spartan Street.
- 385m of 350mm watermain relining along School Avenue and Spartan Street.
- 300m of 300mm watermain relining along School Avenue and Spartan Street.

Munckhof booster Pumphouse for Domestic

- New MCC after electrical malfunction.

Tamarack upgrades

- New domestic blow off.

Rockcliffe Domestic Pumphouse

- VFD drive Upgrades.
- New motor.
- New Supervisory Control and Data Acquisition (SCADA)
- New HVAC.
- New Flow Meter.
- New Continuous monitoring.

Tucelnuit Pumphouse

- HVAC upgrades.

SCADA

- Start of the SCADA program upgrade.

7.2 CONTINUING PROJECTS INTO 2025

Water Meter Replacements

- Annual replacements

Black Sage domestic well improvements

- Electrical upgrade.
- New VFD drives for all motors.
- Converting 480v to 600v.
- New motors for all three wells.
- Continuous monitoring installation.
- New SCADA Controls

Tucelnuit Pumphouse

- Chlorine pumps upgrades.

SCADA & Programable Logic Controller (PLC's)

- SCADA upgrades to the entire system with new PLC's.

7.3 LONG TERM IMPROVEMENT PLANS

The Town has a 5-year budgeted capital plan for known upgrades and new infrastructure and/or projects. These projects include water meter and fire hydrant replacements on an annual basis:

Projects for 2026 through 2030

- Main Street – Veterans Avenue to School Avenue
- Similkameen Avenue – Fairview Road to Airport Street
- Munckhof Booster Station SCADA
- Earl Crescent Water Relining
- New SCADA and PLC's for system Continued
- Water reservoir feed line 2 relining
- Domestic Pump Station
- Domestic Pump Station Loop Lines
- Station Street – Fairview Rd to Co-op Ave
- Pacific Silica River Crossing
- River Crossing Park Drive and Fairview Road
- Kootenay Street
- New SCADA and PLC's for system Continued
- Sawmill Road Rehabilitation
- Okanagan Street – Similkameen Avenue to Skagit Avenue
- Okanagan Street – Co-op Ave to Haven St.
- Laneway between Main Street and Okanagan Street

- Sawmill Road Rehabilitation
- Black Sage River Crossing

8.0 EMERGENCY RESPONSE PLAN

The Town's *Emergency Response Plan* pertaining to any natural disaster, and the water system. The *Emergency Response Plan* identifies several potential emergencies that could occur and provides a systematic approach to how the Town will respond to the emergency.

9.0 WATER QUALITY MONITORING PROGRAM

The water quality monitoring program was updated in 2024.

The water quality monitoring program is scheduled to be updated in 2025.

10.0 CROSS CONNECTION CONTROL PROGAM

The Town's Cross Connection Control Program continues to work towards addressing the potential for the water system to be compromised by service connections, which could introduce contaminated water into the domestic water system. The program is used to monitor Backflow devices and cross connections through the FAST Program (Facility Assessment & Survey Technology) and is administered by FAST employees. The Cross Connection Program focuses on premise isolation for commercial and industrial customers. In 2024, there were 381 testable backflow assemblies in service (including agricultural devices) being tracked.

11.0 CONCLUSION

The Town works hard to maintain water quality and quantity for their residents as well as numerous customers in the Regional District of Okanagan Similkameen Area 'C'. Efforts are made to ensure appropriate water usage and to educate the public whenever possible. Without these ongoing efforts, the area would not be the robust agricultural community that it is today. If you have any comments regarding this report or other information that you would like to see included, please email works@oliver.ca or request a customer concern form at the Town Hall.

APPENDIX A: 2024 WEEKLY WATER SAMPLING

2024 WEEKLY CHLORINE RESIDUAL & COLIFORMS SAMPLING
(Target 0.2 to 1.50 - Chlorine Residual)

Date	Location	System	Source	Chlorine Residual (mg/L)	Total Coliforms	**E. coli**
2024-01-02	McGowan	Rural North System #1	Groundwater	0.23	<1	<1
2024-01-02	Black Sage	Black Sage System #2	Groundwater	0.02	<1	<1
2024-01-02	Snowbrush	Rural South System #4	Groundwater	0.11	<1	<1
2024-01-02	Sawmill	Municipal	Groundwater	0.23	<1	<1
2024-01-02	Hillside	Municipal	Groundwater	0.06	<1	<1
2024-01-08	Mikes Auto	Rural North System #1	Groundwater	0.38	<1	<1
2024-01-08	Ryegrass	Black Sage System #2	Groundwater	0.01	<1	<1
2024-01-08	Sumac	Rural South System #5	Groundwater	0.09	<1	<1
2024-01-08	Wolfcub	Municipal	Groundwater	0.39	<1	<1
2024-01-08	Meadows	Municipal	Groundwater	0.55	<1	<1
2024-01-15	Pinehill	Rural North System #1	Groundwater	0.04	<1	<1
2024-01-15	Ryegrass	Black Sage System #2	Groundwater	0.03	<1	<1
2024-01-15	6A Booster	Rural South System #6	Groundwater	0.18	<1	<1
2024-01-15	Hillside	Municipal	Groundwater	0.12	<1	<1
2024-01-22	McGowan	Rural North System #1	Groundwater	0.13	<1	<1
2024-01-22	Ryegrass	Black Sage System #2	Groundwater	0.07	<1	<1
2024-01-22	Fruitvale	Rural South System #7	Groundwater	0.12	<1	<1
2024-01-22	Meadows	Municipal	Groundwater	0.19	<1	<1
2024-01-22	Vineyard	Municipal	Groundwater	0.17	<1	<1
2024-01-29	Mikes Auto	Rural North System #1	Groundwater	0.03	<1	<1
2024-01-29	Black Sage	Black Sage System #2	Groundwater	0.24	<1	<1
2024-01-29	Snowbrush	Rural South System #4	Groundwater	0.10	<1	<1
2024-01-29	Grandby	Municipal	Groundwater	0.33	<1	<1
2024-01-29	Fairview	Municipal	Groundwater	0.14	<1	<1
2024-02-05	Pinehill	Rural North System #1	Groundwater	0.03	<1	<1
2024-02-05	Ryegrass	Black Sage System #2	Groundwater	0.08	<1	<1
2024-02-05	Fruitvale	Rural South System #7	Groundwater	0.11	<1	<1
2024-02-05	Meadows	Municipal	Groundwater	0.39	<1	<1
2024-02-05	Wolfcub	Municipal	Groundwater	0.38	<1	<1
2024-02-12	McGowan	Rural North System #1	Groundwater	0.01	<1	<1
2024-02-12	Black Sage	Black Sage System #2	Groundwater	0.02	<1	<1
2024-02-12	6A Booster	Rural South System #6	Groundwater	0.19	<1	<1
2024-02-12	Grandby	Municipal	Groundwater	0.29	<1	<1
2024-02-12	Hillside	Municipal	Groundwater	0.19	<1	<1
2024-02-20	Mikes Auto	Rural North System #1	Groundwater	0.24	<1	<1
2024-02-20	Ryegrass	Black Sage System #2	Groundwater	0.02	<1	<1
2024-02-20	Sumac	Rural South System #5	Groundwater	0.12	<1	<1
2024-02-20	Vineyard	Municipal	Groundwater	0.21	<1	<1
2024-02-20	Wolfcub	Municipal	Groundwater	0.40	<1	<1
2024-02-26	Pinehill	Rural North System #1	Groundwater	0.17	<1	<1
2024-02-26	Black Sage	Black Sage System #2	Groundwater	0.05	<1	<1
2024-02-26	Snowbrush	Rural South System #4	Groundwater	0.17	<1	<1
2024-02-26	Hillside	Municipal	Groundwater	0.18	<1	<1
2024-02-26	Sawmill	Municipal	Groundwater	0.22	<1	<1
2024-03-05	McGowan	Rural North System #1	Groundwater	0.26	<1	<1
2024-03-05	Ryegrass	Black Sage System #2	Groundwater	0.03	<1	<1
2024-03-05	Fruitvale	Rural South System #7	Groundwater	0.4	<1	<1
2024-03-05	Wolfcub	Municipal	Groundwater	0.29	<1	<1

2024-03-05	Meadows	Municipal	Groundwater	0.17	<1	<1
2024-03-11	Mikes Auto	Rural North System #1	Groundwater	0.19	<1	<1
2024-03-11	Black Sage	Black Sage System #2	Groundwater	0.07	<1	<1
2024-03-11	6A Booster	Rural South System #6	Groundwater	0.23	<1	<1
2024-03-11	Grandby	Municipal	Groundwater	0.53	<1	<1
2024-03-11	Fairview	Municipal	Groundwater	0.51	<1	<1
2024-03-18	Pinehill	Rural North System #1	Groundwater	0.28	<1	<1
2024-03-18	Ryegrass	Black Sage System #2	Groundwater	0.07	<1	<1
2024-03-18	Sumac	Rural South System #5	Groundwater	0.17	<1	<1
2024-03-18	Vineyard	Municipal	Groundwater	0.14	<1	<1
2024-03-18	Meadows	Municipal	Groundwater	0.1	<1	<1
2024-03-25	McGowan	Rural North System #1	Groundwater	0.26	<1	<1
2024-03-25	Black Sage	Black Sage System #2	Groundwater	0.07	<1	<1
2024-03-25	Snowbrush	Rural South System #4	Groundwater	0.35	<1	<1
2024-03-25	Hillside	Municipal	Groundwater	0.17	<1	<1
2024-03-25	Grandby	Municipal	Groundwater	0.55	<1	<1
2024-04-02	Mikes Auto	Rural North System #1	Groundwater	0.12	<1	<1
2024-04-02	Ryegrass	Black Sage System #2	Groundwater	0.13	<1	<1
2024-04-02	Fruitvale	Rural South System #7	Groundwater	0.37	<1	<1
2024-04-02	Wolfcub	Municipal	Groundwater	0.38	<1	<1
2024-04-02	Meadows	Municipal	Groundwater	0.43	<1	<1
2024-04-08	Pinehill	Rural North System #1	Groundwater	0.22	<1	<1
2024-04-08	Black Sage	Black Sage System #2	Groundwater	0.07	<1	<1
2024-04-08	6A Booster	Rural South System #6	Groundwater	0.3	<1	<1
2024-04-08	Fairview	Municipal	Groundwater	0.5	<1	<1
2024-04-08	Sawmill	Municipal	Groundwater	0.4	<1	<1
2024-04-16	McGowan	Rural North System #1	Groundwater	0.4	<1	<1
2024-04-16	Ryegrass	Black Sage System #2	Groundwater	0.09	<1	<1
2024-04-16	Fruitvale	Rural South System #7	Groundwater	0.14	<1	<1
2024-04-16	Wolfcub	Municipal	Groundwater	0.26	<1	<1
2024-04-16	Vineyard	Municipal	Groundwater	0.49	<1	<1
2024-04-22	Mikes Auto	Rural North System #1	Groundwater	0.42	<1	<1
2024-04-22	Black Sage	Black Sage System #2	Groundwater	0.25	<1	<1
2024-04-22	Snowbrush	Rural South System #4	Groundwater	0.6	<1	<1
2024-04-22	Grandby	Municipal	Groundwater	0.57	<1	<1
2024-04-22	Hillside	Municipal	Groundwater	0.48	<1	<1
2024-04-29	Pinehill	Rural North System #1	Groundwater	0.23	<1	<1
2024-04-29	Ryegrass	Black Sage System #2	Groundwater	0.13	<1	<1
2024-04-29	Fruitvale	Rural South System #7	Groundwater	0.12	<1	<1
2024-04-29	Vineyard	Municipal	Groundwater	0.37	<1	<1
2024-04-29	Meadows	Municipal	Groundwater	0.35	<1	<1
2024-05-06	McGowan	Rural North System #1	Groundwater	0.22	<1	<1
2024-05-06	Black Sage	Black Sage System #2	Groundwater	0.28	<1	<1
2024-05-06	6A Booster	Rural South System #6	Groundwater	0.2	<1	<1
2024-05-06	Sawmill	Municipal	Groundwater	0.62	<1	<1
2024-05-06	Fairview	Municipal	Groundwater	0.48	<1	<1
2024-05-13	Mikes Auto	Rural North System #1	Groundwater	0.44	<1	<1
2024-05-13	Ryegrass	Black Sage System #2	Groundwater	0.32	<1	<1
2024-05-13	Sumac	Rural South System #5	Groundwater	0.18	<1	<1
2024-05-13	Wolfcub	Municipal	Groundwater	0.42	<1	<1
2024-05-13	Meadows	Municipal	Groundwater	0.43	<1	<1

2024-05-21	Pinehill	Rural North System #1	Groundwater	0.37	<1	<1
2024-05-21	Black Sage	Black Sage System #2	Groundwater	0.16	<1	<1
2024-05-21	Snowbrush	Rural South System #4	Groundwater	0.1	<1	<1
2024-05-21	Hillside	Municipal	Groundwater	0.5	<1	<1
2024-05-21	Sawmill	Municipal	Groundwater	0.48	<1	<1
2024-05-27	McGowan	Rural North System #1	Groundwater	0.39	<1	<1
2024-05-27	Ryegrass	Black Sage System #2	Groundwater	0.43	<1	<1
2024-05-27	Fruitvale	Rural South System #7	Groundwater	0.14	<1	<1
2024-05-27	Meadows	Municipal	Groundwater	0.43	<1	<1
2024-05-27	Vineyard	Municipal	Groundwater	0.43	<1	<1
2024-06-03	Mikes Auto	Rural North System #1	Groundwater	0.3	<1	<1
2024-06-03	Black Sage	Black Sage System #2	Groundwater	0.16	<1	<1
2024-06-03	6A Booster	Rural South System #6	Groundwater	0.26	<1	<1
2024-06-03	Fairview	Municipal	Groundwater	0.43	<1	<1
2024-06-03	Hillside	Municipal	Groundwater	0.37	<1	<1
2024-06-10	Pinehill	Rural North System #1	Groundwater	0.34	<1	<1
2024-06-10	Ryegrass	Black Sage System #2	Groundwater	0.32	<1	<1
2024-06-10	Sumac	Rural South System #5	Groundwater	0.11	<1	<1
2024-06-10	Wolfcub	Municipal	Groundwater	0.42	<1	<1
2024-06-10	Vineyard	Municipal	Groundwater	0.42	<1	<1
2024-06-17	McGowan	Rural North System #1	Groundwater	0.2	<1	<1
2024-06-17	Black Sage	Black Sage System #2	Groundwater	0.15	<1	<1
2024-06-17	Snowbrush	Rural South System #4	Groundwater	0.37	<1	<1
2024-06-17	Sawmill	Municipal	Groundwater	0.34	<1	<1
2024-06-17	Grandby	Municipal	Groundwater	0.39	<1	<1
2024-06-24	Mikes Auto	Rural North System #1	Groundwater	0.22	<1	<1
2024-06-24	Ryegrass	Black Sage System #2	Groundwater	0.27	<1	<1
2024-06-24	Fruitvale	Rural South System #7	Groundwater	0.05	<1	<1
2024-06-24	Vineyard	Municipal	Groundwater	0.43	<1	<1
2024-06-24	Meadows	Municipal	Groundwater	0.46	<1	<1
2024-07-02	Pinehill	Rural North System #1	Groundwater	0.13	<1	<1
2024-07-02	Black Sage	Black Sage System #2	Groundwater	0.09	<1	<1
2024-07-02	6A Booster	Rural South System #6	Groundwater	0.05	<1	<1
2024-07-02	Fairview	Municipal	Groundwater	0.33	<1	<1
2024-07-02	Grandby	Municipal	Groundwater	0.4	<1	<1
2024-07-08	McGowan	Rural North System #1	Groundwater	0.24	<1	<1
2024-07-08	Ryegrass	Black Sage System #2	Groundwater	0.26	<1	<1
2024-07-08	Sumac	Rural Sout System #5	Groundwater	0.11	<1	<1
2024-07-08	Wolfcub	Municipal	Groundwater	0.35	<1	<1
2024-07-08	Meadows	Municipal	Groundwater	0.32	<1	<1
2024-07-15	Hillside	Municipal	Groundwater	0.24	<1	<1
2024-07-15	Grandby	Municipal	Groundwater	0.40	<1	<1
2024-07-15	Mikes Auto	Rural North System #1	Groundwater	0.46	<1	<1
2024-07-15	Black Sage	Black Sage System #2	Groundwater	0.09	<1	<1
2024-07-15	Snowbrush	Rural South System #4	Groundwater	0.31	<1	<1
2024-07-22	Vineyard	Municipal	Groundwater	0.30	<1	<1
2024-07-22	Wolfcub	Municipal	Groundwater	0.26	<1	<1
2024-07-22	Pinehill	Rural North System #1	Groundwater	0.18	<1	<1
2024-07-22	Fruitvale	Rural South System #7	Groundwater	0.06	<1	<1
2024-07-22	Ryegrass	Black Sage System #2	Groundwater	0.11	<1	<1
2024-07-29	Sawmill	Municipal	Groundwater	0.23	<1	<1

2024-07-29	Fairview	Municipal	Groundwater	0.38	<1	<1
2024-07-29	McGowan	Rural North System #1	Groundwater	0.22	<1	<1
2024-07-29	6A Booster	Rural South System #6	Groundwater	0.19	<1	<1
2024-07-29	Black Sage	Black Sage System #2	Groundwater	0.05	<1	<1
2024-08-06	Vineyard	Municipal	Groundwater	0.32	<1	<1
2024-08-06	Meadows	Municipal	Groundwater	0.46	<1	<1
2024-08-06	Sumac	Rural South System #5	Groundwater	0.10	<1	<1
2024-08-06	Mikes Auto	Rural North System #1	Groundwater	0.14	<1	<1
2024-08-06	Ryegrass	Black Sage System #2	Groundwater	0.05	<1	<1
2024-08-08	Grandby	Municipal	Groundwater	0.45	<1	<1
2024-08-12	Hillside	Municipal	Groundwater	0.24	<1	<1
2024-08-12	Fairview	Municipal	Groundwater	0.39	<1	<1
2024-08-12	Pinehill	Rural North System #1	Groundwater	0.13	<1	<1
2024-08-12	Black Sage	Black Sage System #2	Groundwater	0.04	<1	<1
2024-08-12	Snowbrush	Rural south system #4	Groundwater	0.29	<1	<1
2024-08-19	Wolfcub	Municipal	Groundwater	0.31	<1	<1
2024-08-19	Meadows	Municipal	Groundwater	0.15	<1	<1
2024-08-19	McGowan	Rural North System #1	Groundwater	0.17	<1	<1
2024-08-19	Ryegrass	Black Sage System #2	Groundwater	0.09	<1	<1
2024-08-19	Fruitvale	Rural south system #7	Groundwater	0.15	<1	<1
2024-08-26	Mikes Auto	Rural North System #1	Groundwater	0.36	<1	<1
2024-08-26	Black Sage	Black Sage System #2	Groundwater	0.05	<1	<1
2024-08-26	6A Booster	Rural South System #6	Groundwater	0.12	<1	<1
2024-08-26	Sawmill	Municipal	Groundwater	0.38	<1	<1
2024-08-26	Grandby	Municipal	Groundwater	0.41	<1	<1
2024-09-03	Wolfcub	Municipal	Groundwater	0.15	<1	<1
2024-09-03	Vineyard	Municipal	Groundwater	0.22	<1	<1
2024-09-03	Pinehill	Rural North System #1	Groundwater	0.12	<1	<1
2024-09-03	Ryegrass	Black Sage System #2	Groundwater	0.14	<1	<1
2024-09-03	Sumac	Rural South System #5	Groundwater	0.07	<1	<1
2024-09-09	McGowan	Rural North System #1	Groundwater	0.24	<1	<1
2024-09-09	Black Sage	Black Sage System #2	Groundwater	0.09	<1	<1
2024-09-09	Snowbrush	Rural South system #4	Groundwater	0.17	<1	<1
2024-09-09	Hillside	Municipal	Groundwater	0.15	<1	<1
2024-09-09	Sawmill	Municipal	Groundwater	0.33	<1	<1
2024-09-16	Mikes Auto	Rural North System #1	Groundwater	0.18	<1	<1
2024-09-16	Ryegrass	Black Sage System #2	Groundwater	0.32	<1	<1
2024-09-16	Fruitvale	Rural south System #7	Groundwater	0.06	<1	<1
2024-09-16	Vineyard	Municipal	Groundwater	0.43	<1	<1
2024-09-16	Meadows	Municipal	Groundwater	0.42	<1	<1
2024-09-23	Pinehill	Rural North System #1	Groundwater	0.33	<1	<1
2024-09-23	Black Sage	Black Sage System #2	Groundwater	0.06	<1	<1
2024-09-23	6A Booster	Rural South System #6	Groundwater	0.15	<1	<1
2024-09-23	Hillside	Municipal	Groundwater	0.31	<1	<1
2024-09-23	Fairview	Municipal	Groundwater	0.41	<1	<1
2024-10-01	McGowan	Rural North System #1	Groundwater	0.34	<1	<1
2024-10-01	Ryegrass	Black Sage System #2	Groundwater	0.44	<1	<1
2024-10-01	Sumac	Rural South System #5	Groundwater	0.35	<1	<1
2024-10-01	Wolfcub	Municipal	Groundwater	0.42	<1	<1
2024-10-01	Meadows	Municipal	Groundwater	0.41	<1	<1
2024-10-07	Sawmill	Municipal	Groundwater	0.23	<1	<1

2024-10-07	Grandby	Municipal	Groundwater	0.38	<1	<1
2024-10-07	Mikes Auto	Rural North System #1	Groundwater	0.20	<1	<1
2024-10-07	Black Sage	Black Sage System #2	Groundwater	0.17	<1	<1
2024-10-07	Snowbrush	Rural South System #4	Groundwater	0.37	<1	<1
2024-10-15	Pinehill	Rural North System #1	Groundwater	0.38	<1	<1
2024-10-15	Ryegrass	Black Sage System #2	Groundwater	0.05	<1	<1
2024-10-15	Fruitvale	Rural South System #7	Groundwater	0.19	<1	<1
2024-10-15	Wolfcub	Municipal	Groundwater	0.36	<1	<1
2024-10-15	Vineyard	Municipal	Groundwater	0.04	<1	<1
2024-10-21	Black Sage	Black Sage System #2	Groundwater	0.06	<1	<1
2024-10-21	McGowan	Rural North System #1	Groundwater	0.18	<1	<1
2024-10-21	6A Booster	Rural South System #6	Groundwater	0.29	<1	<1
2024-10-21	Sawmill	Municipal	Groundwater	0.26	<1	<1
2024-10-21	Fairview	Municipal	Groundwater	0.41	<1	<1
2024-10-28	Mikes Auto	Rural North System #1	Groundwater	0.28	<1	<1
2024-10-28	Wolfcub	Municipal	Groundwater	0.44	<1	<1
2024-10-28	Meadows	Municipal	Groundwater	0.41	<1	<1
2024-10-28	Ryegrass	Black Sage System #2	Groundwater	0.09	<1	<1
2024-10-28	Sumac	Rural South System #5	Groundwater	0.14	<1	<1
2024-11-04	Pinehill	Rural North System #1	Groundwater	0.32	<1	<1
2024-11-04	Black Sage	Black Sage System #2	Groundwater	0.05	<1	<1
2024-11-04	Sumac	Rural South System #5	Groundwater	0.17	<1	<1
2024-11-04	Hillside	Municipal	Groundwater	0.24	<1	<1
2024-11-04	Grandby	Municipal	Groundwater	0.14	<1	<1
2024-11-12	Vineyard	Municipal	Groundwater	0.28	<1	<1
2024-11-12	Meadows	Municipal	Groundwater	0.26	<1	<1
2024-11-12	McGowan	Rural North System #1	Groundwater	0.27	<1	<1
2024-11-12	Ryegrass	Black Sage System #2	Groundwater	0.28	<1	<1
2024-11-12	Fruitvale	Rural South System #7	Groundwater	0.22	<1	<1
2024-11-18	Fairview	Municipal	Groundwater	0.17	<1	<1
2024-11-18	Grandby	Municipal	Groundwater	0.24	<1	<1
2024-11-18	Mikes Auto	Rural North System #1	Groundwater	0.07	<1	<1
2024-11-18	6A Booster	Rural South System #6	Groundwater	0.06	<1	<1
2024-11-18	Black Sage	Black Sage System #2	Groundwater	0.04	<1	<1
2024-11-25	Wolfcub	Municipal	Groundwater	0.57	<1	<1
2024-11-25	Vineyard	Municipal	Groundwater	0.34	<1	<1
2024-11-25	Sumac	Rural South System #5	Groundwater	0.18	<1	<1
2024-11-25	Ryegrass	Black Sage System #2	Groundwater	0.05	<1	<1
2024-11-25	Pinehill	Rural North System #1	Groundwater	0.02	<1	<1
2024-12-02	Black Sage	Black Sage System #2	Groundwater	0.04	<1	<1
2024-12-02	Hillside	Municipal	Groundwater	0.11	<1	<1
2024-12-02	Fairview	Municipal	Groundwater	0.15	<1	<1
2024-12-02	McGowan	Rural North System #1	Groundwater	0.34	<1	<1
2024-12-02	Snowbrush	Rural South System #4	Groundwater	0.36	<1	<1
2024-12-09	Vineyard	Municipal	Groundwater	0.36	<1	<1
2024-12-09	Meadows	Municipal	Groundwater	0.40	<1	<1
2024-12-09	Mikes Auto	Rural North System #1	Groundwater	0.52	<1	<1
2024-12-09	Ryegrass	Black Sage System #2	Groundwater	0.04	<1	<1
2024-12-09	Fruitvale	Rural South System #7	Groundwater	0.03	<1	<1
2024-12-16	Pinehill	Rural North System #1	Groundwater	<0.02	<1	<1
2024-12-16	Black Sage	Black Sage System #2	Groundwater	0.05	<1	<1

2024-12-16	Sawmill	Municipal	Groundwater	0.40	<1	<1
2024-12-16	Grandby	Municipal	Groundwater	0.31	<1	<1
2024-12-16	6A Booster	Rural South System #6	Groundwater	0.21	<1	<1

APPENDIX B: 2024 THM AND HAA SAMPLING

2024 THMs & HAAs SAMPLING				
Date	**Location**	**System**	**THM MAC=0.1**	**HAA MAC=0.08**
2024-01-08	Ryegrass	Black Sage System #2	0.0089	<0.002
2024-01-08	Sumac	Rural South	0.0071	<0.002
2024-01-08	Wolfcub	Municipal	<0.004	<0.002
2024-01-08	Meadows	Municipal	<0.004	<0.002
2024-01-15	Pinehill	Rural North	0.001	0.0022
2024-04-29	Pinehill	Rural North	<0.004	<0.002
2024-04-29	Ryegrass	Black Sage System #2	0.0083	0.0024
2024-04-29	Fruitvale	Rural South	0.0119	<0.002
2024-04-29	Vineyard	Municipal	<0.004	<0.002
2024-04-29	Meadows	Municipal	<0.004	<0.002
2024-08-19	Wolfcub	Municipal	0.00528	0.00201
2024-08-19	Meadows	Municipal	0.0126	0.00741
2024-08-19	McGowan	Rural North	0.0116	0.00428
2024-08-19	Ryegrass	Black Sage System #2	<0.00400	<0.00200
2024-08-19	Fruitvale	Rural South	0.0145	<0.00200
2024-12-09	Vineyard	Municipal	0.0163	0.00973
2024-12-09	Meadows	Municipal	< 0.00400	0.00204
2024-12-09	Mikes Auto	Rural North	0.00457	< 0.00200
2024-12-09	Ryegrass	Black Sage System #2	0.0117	< 0.00200
2024-12-09	Fruitvale	Rural South	0.0105	< 0.00200

APPENDIX C: PESTICIDES SAMPLING

Pesticides, Herbicides, and Fungicides	MAC	Reporting Limits	Units	Tucelnuit P#2				Tucelnuit P#3				Rockcliffe			
				Results	Date	Results	Date	Results	Date	Results	Date	Results	Date	Results	Date
2,4-D	100	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
2,4-DB	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Dichlorprop (2,4-DP)	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Fenoprop	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
MCPA	350	0.02	µg/L			<0.02	12-11-24			<0.02	30-10-24	<0.02	12-10-24		
MCPB	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
2,4,5-T	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
MCPP	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Acifluorfe	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Bentazon	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Chloramben	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Dicamba	110	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Triclopyr	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Picloram	190	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Clopyralid	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Dinoseb	N/A	0.1	µg/L			<0.10	12-11-24			<0.10	30-10-24	<0.10	12-10-24		
Alachlor	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Aldrin	N/A	0.006	µg/L	<0.006	17-4-24	<0.006	8-11-24	<0.006	2-5-24	<0.006	23-10-24	<0.006	12-10-24	<0.006	23-4-24
Atrazine and metabolites	5	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Azinphos-methyl	20	0.200	µg/L	<0.200	17-4-24	<0.200	8-11-24	<0.200	2-5-24	<0.200	23-10-24	<0.200	12-10-24	<0.200	23-4-24
alpha-BHC	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	8-11-24	<0.010	2-5-24	<0.010	23-10-24	<0.010	12-10-24	<0.010	23-4-24
beta-BHC	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	8-11-24	<0.050	2-5-24	<0.050	23-10-24	<0.050	12-10-24	<0.050	23-4-24
delta-BHC	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	8-11-24	<0.050	2-5-24	<0.050	23-10-24	<0.050	12-10-24	<0.050	23-4-24
gamma-BHC (Lindane)	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	8-11-24	<0.050	2-5-24	<0.050	23-10-24	<0.050	12-10-24	<0.050	23-4-24
Bromacil	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Bromoxynil	30	0.200	µg/L	<0.200	17-4-24	<0.200	8-11-24	<0.200	2-5-24	<0.200	23-10-24	<0.200	12-10-24	<0.200	23-4-24
Butachlor	N/A	0.020	µg/L	<0.020	17-4-24	<0.020	8-11-24	<0.020	2-5-24	<0.020	23-10-24	<0.020	12-10-24	<0.020	23-4-24
Captan	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Chlordane (cis + trans)	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	8-11-24	<0.050	2-5-24	<0.050	23-10-24	<0.050	12-10-24	<0.050	23-4-24
Chlorothalonil	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	8-11-24	<0.050	2-5-24	<0.050	23-10-24	<0.050	12-10-24	<0.050	23-4-24
Chlorpyrifos	90	0.010	µg/L	<0.010	17-4-24	<0.010	8-11-24	<0.010	2-5-24	<0.010	23-10-24	<0.010	12-10-24	<0.010	23-4-24
Cyanazine	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
DDT, Total	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	8-11-24	<0.010	2-5-24	<0.012	23-10-24	<0.010	12-10-24	<0.010	23-4-24
Deltamethrin	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Diazinon	20	0.020	µg/L	<0.020	17-4-24	<0.020	8-11-24	<0.020	2-5-24	<0.020	23-10-24	<0.020	12-10-24	<0.020	23-4-24
Dichlorvos	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Diclofop-methyl	9	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Dieldrin	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	8-11-24	<0.010	2-5-24	<0.010	23-10-24	<0.010	12-10-24	<0.010	23-4-24
Dimethoate	20	0.200	µg/L	<0.200	17-4-24	<0.200	8-11-24	<0.200	2-5-24	<0.200	23-10-24	<0.200	12-10-24	<0.200	23-4-24
Disulfoton	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Diuron	150	0.200	µg/L	<0.200	17-4-24	<0.200	8-11-24	<0.200	2-5-24	<0.200	23-10-24	<0.200	12-10-24	<0.200	23-4-24
Endosulfan I + II	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	8-11-24	<0.010	2-5-24	<0.010	23-10-24	<0.010	12-10-24	<0.010	23-4-24
Endosulfan sulfate	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	8-11-24	<0.050	2-5-24	<0.050	23-10-24	<0.050	12-10-24	<0.050	23-4-24
Endrin	N/A	0.020	µg/L	<0.020	17-4-24	<0.020	8-11-24	<0.020	2-5-24	<0.020	23-10-24	<0.020	12-10-24	<0.020	23-4-24
Endrin aldehyde	N/A	0.020	µg/L	<0.020	17-4-24	<0.020	8-11-24	<0.020	2-5-24	<0.020	23-10-24	<0.020	12-10-24	<0.020	23-4-24
Endrin ketone	N/A	0.020	µg/L	<0.020	17-4-24	<0.020	8-11-24	<0.020	2-5-24	<0.020	23-10-24	<0.020	12-10-24	<0.020	23-4-24
Fenchlorphos (Ronnel)	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Heptachlor	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	8-11-24	<0.010	2-5-24	<0.010	23-10-24	<0.010	12-10-24	<0.010	23-4-24
Heptachlor epoxide	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	8-11-24	<0.010	2-5-24	<0.010	23-10-24	<0.010	12-10-24	<0.010	23-4-24
Linuron	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	8-11-24	<0.050	2-5-24	<0.050	23-10-24	<0.050	12-10-24	<0.050	23-4-24
Malathion	290	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Methoxychlor	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	8-11-24	<0.050	2-5-24	<0.050	23-10-24	<0.050	12-10-24	<0.050	23-4-24
Methyl parathion	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Metolachlor	50	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Metribuzin	80	0.200	µg/L	<0.200	17-4-24	<0.200	8-11-24	<0.200	2-5-24	<0.200	23-10-24	<0.200	12-10-24	<0.200	23-4-24
Parathion	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Pentachloronitrobenzene	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Permethrin	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	8-11-24	<0.010	2-5-24	<0.010	23-10-24	<0.010	12-10-24	<0.010	23-4-24
Phorate	2	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Prometon	N/A	0.300	µg/L	<0.300	17-4-24	<0.300	8-11-24	<0.300	2-5-24	<0.300	23-10-24	<0.300	12-10-24	<0.300	23-4-24
Prometryne	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Simazine	10	0.200	µg/L	<0.200	17-4-24	<0.200	8-11-24	<0.200	2-5-24	<0.200	23-10-24	<0.200	12-10-24	<0.200	23-4-24
Sulfotep	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Tebuthiuron	N/A	0.200	µg/L	<0.200	17-4-24	<0.200	8-11-24	<0.200	2-5-24	<0.200	23-10-24	<0.200	12-10-24	<0.200	23-4-24
Temephos (Abate)	N/A	0.500	µg/L	<0.500	17-4-24	<0.500	8-11-24	<0.500	2-5-24	<0.500	23-10-24	<0.500	12-10-24	<0.500	23-4-24
Terbufos	1	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Triallate	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	8-11-24	<0.100	2-5-24	<0.100	23-10-24	<0.100	12-10-24	<0.100	23-4-24
Trifluralin	45	0.200	µg/L	<0.200	17-4-24	<0.200	8-11-24	<0.200	2-5-24	<0.200	23-10-24	<0.200	12-10-24	<0.200	23-4-24
Surrogate: Tributyl Phosphate	N/A	50-140	%	96	17-4-24	115	8-11-24			133	23-10-24	113	12-10-24	104	23-4-24
Surrogate: 4-chloro-3-nitrobenzotrifluoride	N/A	50-140	%	87	17-4-24	100	8-11-24			103	23-10-24	74	12-10-24	91	23-4-24

Value	Approaching MAC or IMAC of the British Columbia or Canadian Drinking Water Guideline standard
Value	Exceeding MAC or IMAC of the British Columbia or Canadian Drinking Water Guideline standard
Valve	Exceeding AO or OG of the British Columbia or Canadian Drinking Water Guideline standard

Pesticides, Herbicides, and Fungicides	MAC	Reporting Limits	Units	Buchanon				Blacksage well #1		Blacksage well #2						Blacksage well #3						Miller Road			
				Results	Date	Results	Date	Results	Date	Results	Date	Results	Date	Results	Date	Results	Date	Results	Date	Results	Date	Results	Date	Results	Date	Results	Date
2,4-D	100	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
2,4-DB	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Dichlorprop (2,4-DP)	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Fenoprop	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
MCPA	350	0.02	µg/L			<0.02	16-10-24					<0.02	9-5-24	<0.02	30-10-24				9-5-24	<0.02	30-10-24			<0.02	30-10-24
MCPB	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
2,4,5-T	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
MCPP	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Acifluorfe	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Bentazon	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Chloramben	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Dicamba	110	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Triclopyr	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Picloram	190	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Clopyralid	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Dinoseb	N/A	0.1	µg/L			<0.10	16-10-24					<0.10	9-5-24	<0.10	30-10-24				9-5-24	<0.10	30-10-24			<0.10	30-10-24
Alachlor	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Aldrin	N/A	0.006	µg/L	<0.006	17-4-24	<0.006	16-10-24	<0.006	15-5-24	<0.006	2-5-24	<0.006	14-5-24	<0.006	23-10-24	<0.006	2-5-24	<0.006	14-5-24	<0.006	23-10-24	<0.006	2-5-24	<0.006	23-10-24
Atrazine and metabolites	5	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Azinphos-methyl	20	0.200	µg/L	<0.200	17-4-24	<0.200	16-10-24	<0.200	15-5-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	23-10-24
alpha-BHC	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	16-10-24	<0.010	15-5-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	23-10-24
beta-BHC	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	16-10-24	<0.050	15-5-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	23-10-24
delta-BHC	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	16-10-24	<0.050	15-5-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	23-10-24
gamma-BHC (Lindane)	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	16-10-24	<0.050	15-5-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	23-10-24
Bromacil	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Bromoxynil	30	0.200	µg/L	<0.200	17-4-24	<0.200	16-10-24	<0.200	15-5-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	23-10-24
Butachlor	N/A	0.020	µg/L	<0.020	17-4-24	<0.020	16-10-24	<0.020	15-5-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	23-10-24
Captan	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Chlordane (cis + trans)	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	16-10-24	<0.050	15-5-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	23-10-24
Chlorothalonil	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	16-10-24	<0.050	15-5-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	23-10-24
Chlorpyrifos	90	0.010	µg/L	<0.010	17-4-24	<0.010	16-10-24	<0.010	15-5-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	23-10-24
Cyanazine	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
DDT, Total	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	16-10-24	<0.010	15-5-24	<0.010	2-5-24	<0.010	14-5-24	<0.014	23-10-24	<0.012	2-5-24	<0.012	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.011	23-10-24
Deltamethrin	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Diazinon	20	0.020	µg/L	<0.020	17-4-24	<0.020	16-10-24	<0.020	15-5-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	23-10-24
Dichlorvos	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Diclofop-methyl	9	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Dieldrin	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	16-10-24	<0.010	15-5-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	23-10-24
Dimethoate	20	0.200	µg/L	<0.200	17-4-24	<0.200	16-10-24	<0.200	15-5-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	23-10-24
Disulfoton	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Diuron	150	0.200	µg/L	<0.200	17-4-24	<0.200	16-10-24	<0.200	15-5-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	23-10-24
Endosulfan I + II	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	16-10-24	<0.010	15-5-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	23-10-24
Endosulfan sulfate	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	16-10-24	<0.050	15-5-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	23-10-24
Endrin	N/A	0.020	µg/L	<0.020	17-4-24	<0.020	16-10-24	<0.020	15-5-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	23-10-24
Endrin aldehyde	N/A	0.020	µg/L	<0.020	17-4-24	<0.020	16-10-24	<0.020	15-5-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	23-10-24
Endrin ketone	N/A	0.020	µg/L	<0.020	17-4-24	<0.020	16-10-24	<0.020	15-5-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	14-5-24	<0.020	23-10-24	<0.020	2-5-24	<0.020	23-10-24
Fenchlorphos (Ronnel)	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Heptachlor	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	16-10-24	<0.010	15-5-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	23-10-24
Heptachlor epoxide	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	16-10-24	<0.010	15-5-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	23-10-24
Linuron	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	16-10-24	<0.050	15-5-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	23-10-24
Malathion	290	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Methoxychlor	N/A	0.050	µg/L	<0.050	17-4-24	<0.050	16-10-24	<0.050	15-5-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	14-5-24	<0.050	23-10-24	<0.050	2-5-24	<0.050	23-10-24
Methyl parathion	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Metolachlor	50	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Metribuzin	80	0.200	µg/L	<0.200	17-4-24	<0.200	16-10-24	<0.200	15-5-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	23-10-24
Parathion	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Pentachloronitrobenzene	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Permethrin	N/A	0.010	µg/L	<0.010	17-4-24	<0.010	16-10-24	<0.010	15-5-24	<0.010	2-5-24	<0.010	14-5-24	<0.010	23-10-24	<0.010	2-5-24	<0.010	14-5-24	<0.011	23-10-24	<0.010	2-5-24	<0.010	23-10-24
Phorate	2	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Prometon	N/A	0.300	µg/L	<0.300	17-4-24	<0.300	16-10-24	<0.300	15-5-24	<0.300	2-5-24	<0.300	14-5-24	<0.300	23-10-24	<0.300	2-5-24	<0.300	14-5-24	<0.300	23-10-24	<0.300	2-5-24	<0.300	23-10-24
Prometryne	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Simazine	10	0.200	µg/L	<0.200	17-4-24	<0.200	16-10-24	<0.200	15-5-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	23-10-24
Sulfotep	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Tebuthiuron	N/A	0.200	µg/L	<0.200	17-4-24	<0.200	16-10-24	<0.200	15-5-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	23-10-24
Temephos (Abate)	N/A	0.500	µg/L	<0.500	17-4-24	<0.500	16-10-24	<0.500	15-5-24	<0.500	2-5-24	<0.500	14-5-24	<0.500	23-10-24	<0.500	2-5-24	<0.500	14-5-24	<0.500	23-10-24	<0.500	2-5-24	<0.500	23-10-24
Terbufos	1	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Triallate	N/A	0.100	µg/L	<0.100	17-4-24	<0.100	16-10-24	<0.100	15-5-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	14-5-24	<0.100	23-10-24	<0.100	2-5-24	<0.100	23-10-24
Trifluralin	45	0.200	µg/L	<0.200	17-4-24	<0.200	16-10-24	<0.200	15-5-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	14-5-24	<0.200	23-10-24	<0.200	2-5-24	<0.200	23-10-24
Surrogate: Tributyl Phosphate	N/A	50-140	%	99	17-4-24	107	16-10-24								23-10-24					118	23-10-24			112	23-10-24
Surrogate: 4-chloro-3-nitrobenzotrifluoride	N/A	50-140	%	79	17-4-24	74	16-10-24								23-10-24					92	23-10-24			82	23-10-24

Value	Approaching MAC or IMAC of the British Columbia or Canadian Drinking Water Guideline standard
Value	Exceeding MAC or IMAC of the British Columbia or Canadian Drinking Water Guideline standard
Valve	Exceeding AO or OG of the British Columbia or Canadian Drinking Water Guideline standard

APPENDIX D: 2024 PUMPING DATA

TOWN OF OLIVER - PUMPING STATIONS
WATER CONSUMPTION DATA

2024 MONTHLY TOTALS

CUBIC METERS

DAY	GROUNDWATER SOURCES												
	Scada ROCKCLIFFE DOMESTIC PS Mun used for DOMESTIC	Scada TUCELNUIT PS 2 Mun used for DOMESTIC	Scada TUCELNUIT PS 3 Mun used for DOMESTIC	Scada BUCHANAN DOM WELL Sys 1 used for DOMESTIC	Scada MILLER RD RD 13 4,5,6,7 used for DOMESTIC	TOTAL GROUNDWATER USED FOR DOMESTIC	Scada MILLER RD DOM/IRR PS Sys 2 used for BOTH	Scada BLACK SAGE DOM/IRR PS Sys 2 used for BOTH	Scada TOTAL GROUNDWATER USED FOR Both	Scada FAIRVIEW IRR WELL Sys 5A used for AGRICULTURE	Scada BUCHANAN ROAD PS * Sys 1 used for AGRICULTURE	TOTAL GROUNDWATER USED FOR AGRICULTURE	TOTAL GROUNDWATER USED
January	23649	27904	16520	18087	13598	99758	0	0	0	0	0	0	99758
Feburary	24896	23030	18933	19399	11735	97993	0	0	0	0	0	0	97993
March	35440	14190	27217	28850	15214	120911	0	0	0	3134	0	3134	124045
April	66101	36271	23794	23402	21902	171470	0	30197	30197	3134	7668	10802	212469
May	72036	67043	38683	20900	19285	217947	0	106363	106363	3690	13391	17081	341391
June	75562	70723	40948	25923	21694	234850	0	112886	112886	3104	22435	25539	373275
July	99019	76713	43964	62477	22804	304977	0	166954	174728	3555	8708	12263	491968
August	66975	63765	36427	67163	19789	254119	0	127788	127788	255099	22414	277513	659420
September	63292	48366	27538	32483	20111	191790	0	88098	88098	1465	12789	14254	294142
October	28143	36373	13402	34087	46764	158769	0	46764	46764	7060	20295	27355	232888
November	0	35262	12150	23281	16913	87606	0	0	0	0	0	0	87606
December	0	34276	17414	21504	11529	84723	0	0	0	0	0	0	84723
TOTALS	555113	533916	316990	377556	241338	2024913	0	679050	686824	280241	107700	387941	3099678
WHEN ACTIVE					Double Check:	2024913					Double Check:	0	3099678
YTD Max Flow	6886	5486	3219	4772	4791	12056	0	7965	7965	22818	2331	24521	36304
YTD Min Flow	0	0	0	0	0	567	0	0	0	0	0	0	567
Avg Year Flow	41119	41735	24735	29463	18604	217614	0	50300	50876	20759	7978	26755	328797

APPENDIX E: 2024 GROUNDWATER CONSUMPTION DATA

Town of Oliver

Groundwater Consumption Data

US GALLONS

YEAR	January	February	March	April	May	June	July	August	September	October	November	December	YTD	10 YR Average	Average
2024	26,353,270	25,887,007	32,769,173	56,128,446	90,186,023	98,608,813	129,964,041	174,200,287	77,704,067	61,522,434	23,143,052	22,381,444	818,848,059	799,821,138	949,433,874
2023	24,771,142	22,491,971	27,709,991	43,078,316	65,835,695	116,612,458	120,538,580	114,972,194	83,439,470	55,847,904	25,121,453	26,160,971	726,580,146	799,821,138	949,433,874
2022	23,392,643	21,770,642	29,197,368	51,081,623	75,877,918	87,600,014	114,826,928	130,859,944	87,938,299	67,326,124	25,201,930	26,213,514	741,286,947	799,821,138	949,433,874
2021	25,841,686	21,679,210	27,670,223	65,785,664	105,278,837	111,539,990	144,023,757	110,585,662	81,648,387	59,604,827	24,297,510	23,676,188	801,631,941	799,821,138	949,433,874
2020	25,795,469	24,648,672	38,939,523	48,618,456	75,490,661	78,829,209	129,972,821	128,329,944	95,213,591	71,385,016	28,671,338	25,394,770	771,289,469	799,821,138	949,433,874
2019	23,543,266	28,561,243	28,581,167	50,920,567	109,979,293	132,432,802	119,129,918	119,860,386	69,368,736	46,730,582	27,035,693	24,575,289	780,718,943	799,821,138	949,433,874
2018	25,693,865	23,678,138	32,157,774	48,096,882	102,453,177	117,372,052	157,067,454	138,706,689	81,652,713	55,774,737	27,718,659	23,604,690	833,976,828	799,821,138	949,433,874
2017	27,531,385	26,935,811	32,381,863	33,127,917	69,692,881	105,839,743	156,311,916	147,447,499	92,667,928	64,715,211	25,437,142	25,053,945	807,143,242	799,821,138	949,433,874
2016	26,495,703	25,304,817	29,968,727	64,556,558	114,449,576	105,588,928	126,590,568	139,721,723	84,497,704	52,219,628	26,892,706	25,529,293	821,815,931	799,821,138	949,433,874
2015	24,995,670	22,331,907	28,348,130	69,828,360	107,509,652	134,080,260	163,478,571	140,709,274	101,276,667	68,802,269	26,439,576	25,334,906	913,135,245	799,821,138	949,433,874

CUBIC METERS

YEAR	January	February	March	April	May	June	July	August	September	October	November	December	YTD	10 YR Average	Average
2024	99,758	97,993	124,045	212,469	341,391	373,275	491,967	659,420	294,142	232,888	87,606	84,723	3,099,676	3,024,930	3,593,996
2023	93,769	85,141	104,894	163,069	249,215	441,426	456,288	435,217	315,853	211,407	95,095	99,030	2,750,404	3,024,930	3,593,996
2022	88,551	82,411	110,524	193,365	287,229	331,602	434,667	495,359	332,883	254,857	95,400	99,229	2,806,075	3,024,930	3,593,996
2021	97,821	82,065	104,743	249,026	398,524	422,225	545,189	418,612	309,073	225,629	91,976	89,624	3,034,506	3,024,930	3,593,996
2020	97,646	93,305	147,402	184,041	285,763	298,401	492,000	485,781	360,422	270,222	108,533	96,130	2,919,647	3,024,930	3,593,996
2019	89,121	108,116	108,191	192,755	416,317	501,312	450,956	453,721	262,589	176,894	102,341	93,028	2,955,341	3,024,930	3,593,996
2018	97,262	89,631	121,730	182,066	387,827	444,301	594,565	525,062	309,089	211,130	104,926	89,353	3,156,944	3,024,930	3,593,996
2017	104,218	101,963	122,579	125,403	263,816	400,647	591,705	558,149	350,786	244,974	96,290	94,839	3,055,368	3,024,930	3,593,996
2016	100,297	95,789	113,444	244,373	433,239	399,697	479,197	528,904	319,858	197,673	101,800	96,639	3,110,910	3,024,930	3,593,996
2015	94,619	84,535	107,309	264,329	406,968	507,549	618,833	532,642	383,374	260,445	100,085	95,903	3,456,591	3,024,930	3,593,996
10 Yr Average	**95,491**	**90,460**	**113,448**	**200,453**	**347,098**	**412,743**	**516,746**	**490,118**	**327,766**	**232,623**	**99,043**	**94,460**	**3,024,930**		
Average	***113,133***	***106,612***	***129,309***	***237,265***	***401,773***	***477,214***	***635,557***	***602,380***	***398,598***	***267,495***	***116,940***	***107,720***	***3,593,996***		