

## Greater Vernon Water (GVW) Water Quality Report for July 2024

The following is the water quality summary for the Greater Vernon Water (GVW) utility.

### 1. Potable Sources

GVW has two sources that are used for potable water. The two sources are Duteau Creek and Kalamalka Lake. Raw (untreated) water samples are taken at the intakes of Duteau Creek and Kalamalka Lake once per week. Tables 1 and 2 summarize the results for bacteria and turbidity.

**Table 1 Duteau Creek Intake**

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
<b>E.coli<sup>2</sup></b>	Caro	MPN/100 mL	6	-----	4	33	20
<b>E.coli<sup>2</sup></b>	RDNO Lab	MPN/100 mL	12	-----	1.0	50.4	24.1
<b>Total Coliform</b>	Caro	MPN/100 mL	6	-----	345	1730	1170.8
<b>Total Coliform</b>	RDNO Lab	MPN/100 mL	12	-----	313.0	1413.6	828.7
<b>Turbidity</b>	GVW WQ Tech	NTU	5	-----	1.10	1.93	1.46
<b>Turbidity</b>	SCADA <sup>1</sup> Daily Average <sup>3</sup>	NTU	31 Days	-----	0.80	1.62	1.10

<sup>1</sup>SCADA: Supervisory Control and Data Acquisition.

<sup>2</sup>Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in British Columbia (Sec 4.3): The number of E. coli in raw water samples should not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

<sup>3</sup>SCADA data for this online analyzer is a 24 hour average taken every 10 minutes.

**Table 2 Kalamalka Lake Intake**

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
E.coli <sup>3</sup>	Caro	MPN/100 mL	5	-----	<1	2	<1
E.coli <sup>3</sup>	RDNO Lab	MPN/100 mL	10	-----	<1	1	<1
Total Coliform	Caro	MPN/100 mL	5	-----	2	77	31
Total Coliform	RDNO Lab	MPN/100 mL	10	-----	1	14.6	6.7
Turbidity <sup>2</sup>	GVW WQ Tech	NTU	5	-----	0.70	1.08	0.95
Turbidity <sup>2</sup>	SCADA <sup>1</sup> Average <sup>4</sup>	NTU	31 Days	-----	0.50	0.95	0.74

<sup>1</sup>SCADA: Supervisory Control and Data Acquisition.

<sup>2</sup>Operation Guideline: As outlined in Deviation Response Plan, turbidity <3 NTU.

<sup>3</sup>Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in British Columbia (Sec 4.3): The number of E. coli in raw water samples should not exceed 20/100 mL in at least 90% of the weekly samples from the previous six months.

<sup>4</sup>SCADA data for this online analyzer is a 24 hour average with readings taken every 15 seconds.

## 2. Agriculture/ Irrigation Sources

The sources used for irrigation supply include Duteau Creek, King Edward/Deer Creek, Goose Lake, Coldstream Ranch Well #2 and Well #3. Table 3 summarizes the daily flows for each irrigation system.

The majority of the Duteau Creek water (approx. 85%) is treated. The other sources are separated from the potable system and are not chlorinated.

The irrigation season is from April 15 to September 15. Irrigation water used during the off season is used mainly for livestock watering. This water comes from Ranch Well #2, Ranch Well #3, King Edward and Duteau Creek.

**Table 3 Irrigation Volumes for Irrigation Sources over the Month**

Irrigation Sources	DCWTP	Well 3	Well 2	King Edward
Min (ML/Day)	3.11	0.00	0.00	1.22
Max (ML/Day)	14.50	5.18	1.93	12.02
Average (ML/Day)	11.72	2.65	0.42	7.38
Monthly Total (ML)	363.29	82.01	12.93	228.85

### 3. Treatment Plants

GVW has two treatment plants: Duteau Creek Water Treatment Plant (DCWTP) and Mission Hill Water Treatment Plant (MHWTP). At the DCWTP, water is treated with a coagulant and mixed to create a floc before clarification is achieved by Dissolved Air Flotation (DAF). Chlorine is added after clarification to ensure contact time for the removal of viruses, followed by Ultra-violet (UV) disinfection. Finally, an additional dose chlorine is added before entering the distribution system to maintain a set point for the residual chlorine value. MHWTP uses a dual disinfection process of UV and chlorine.

Tables 4 and 6 summarize results for chlorine, bacteria, turbidity, and UV Transmittance (UVT). Table 5 summarizes the log removal of viruses at the DCWTP.

**Table 4 Duteau Creek Water Treatment Plant Reservoir**

Parameter	Laboratory	Units	# of Samples	# of Deviations	Min	Max	Average
Free Chlorine <sup>2</sup>	SCADA <sup>1</sup> Daily Average	mg/L	31 Days	-----	1.83	1.97	1.90
E.coli	Caro	CFU/100 mL	5	-----	<1	<1	<1
E.coli	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1
Total Coliform	Caro	CFU/100 mL	5	-----	<1	<1	<1
Total Coliform	RDNO Lab	MPN/100 mL	5	-----	<1	<1	<1
Turbidity <sup>2</sup>	SCADA <sup>1</sup> Daily Average	NTU	31 Days	-----	0.20	0.34	0.29
Pre UVT <sup>3</sup>	SCADA <sup>1</sup> Daily Average	%	31 Days	-----	83.02	88.24	85.67

<sup>1</sup>SCADA: Supervisory Control and Data Acquisition.

<sup>2</sup>Operation Guideline: As outlined in Deviation Response Plan, free chlorine >1.0 mg/L, turbidity <1.0 NTU.

<sup>3</sup>UVT is monitored pre-UV treatment which is used to determine UV dosage.

This month, 0 m<sup>3</sup> of off-spec water occurred at DCWTP.

**Table 5 DCWTP – Log Removal of Viruses**

Log Removal of Viruses <sup>1</sup>	
Days Monitored	31 Days
Days 4-Log Removal Achieved	31 Days

<sup>1</sup>4-log virus removal logged by the minute on SCADA.

**Table 6 Mission Hill Water Treatment Plant**

Parameter	Laboratory	Units	# of Samples	# of Deviations	Min	Max	Average
<b>Free Chlorine</b>	SCADA <sup>1</sup> Daily Average	mg/L	31 Days	-----	1.97	2.21	2.08
<b>E.coli</b>	Caro	CFU/100 mL	5	-----	<1	<1	<1
<b>E.coli</b>	RDNO Lab	MPN/100 mL	6	-----	<1	<1	<1
<b>Total Coliform</b>	Caro	CFU/100 mL	5	-----	<1	<1	<1
<b>Total Coliform</b>	RDNO Lab	MPN/100 mL	6	-----	<1	<1	<1
<b>Turbidity<sup>2</sup></b>	SCADA <sup>1</sup> Daily Average	NTU	31 Days	-----	0.48	0.93	0.74
<b>Pre UVT</b>	SCADA <sup>1</sup> Daily Average	%	31 Days	-----	91.04	91.91	91.43

<sup>1</sup>SCADA: Supervisory Control and Data Acquisition.

<sup>2</sup>Operation Guideline: As outlined in Deviation Response Plan, free chlorine >0.8 mg/L, turbidity <3.0 NTU.

This month, no off-spec water occurred at MHWTP.

#### 4. Distribution

GVW has two distribution systems that interconnect: Duteau System typically supplied by Duteau Creek and Kalamalka System typically supplied by Kalamalka Lake. GVW has approximately 23,000 service connections.

Table 7 summarizes the daily flow for each distribution system. The Duteau and Kalamalka systems have many locations where they can be interconnected. This means there are areas where there is a blend of water quality and can be identified by the conductivity of the water.

**Table 7 Volumes for GVW Distribution Systems over the Month**

Volumes	DCWTP	MHWTP
<b>Min (ML/Day)</b>	24.00	25.46
<b>Max (ML/Day)</b>	95.10	38.48
<b>Average (ML/Day)</b>	73.56	33.61
<b>Monthly Total (ML)</b>	2206.70	1008.26

Tables 8 and 9 summarize results for chlorine, bacteria, and turbidity for each distribution system. These systems are monitored by handheld instruments weekly.

**Table 8 Duteau Distribution**

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
<b>Free Chlorine<sup>1</sup></b>	Operator Grab Samples	mg/L	66	2	0.08 <sup>4</sup>	1.96	0.93
<b>Total Chlorine</b>	Operator Grab Samples	mg/L	66	-----	0.20	2.25	1.13
<b>E.coli</b>	Caro	CFU/100 mL	27	-----	<1	<1	<1
<b>E.coli</b>	RDNO lab	MPN/100 mL	41	-----	<1	<1	<1
<b>Total Coliform</b>	Caro	CFU/100 mL	27	-----	<1	<1	<1
<b>Total Coliform</b>	RDNO Lab	MPN/100 mL	41	-----	<1	<1	<1
<b>Turbidity</b>	Operator Grab Samples	NTU	66	8	0.2	132 <sup>2</sup>	2.06 <sup>3</sup>

<sup>1</sup>GVW WQ Deviation Response Plan: free chlorine >0.20 mg/L, turbidity <1 NTU.

<sup>2</sup>Seven samples had turbidity >1 NTU but below the 5 NTU upper threshold outline in the RDNO Deviation Response Plan. One sample was above the upper threshold of 5 NTU due to the combination of scheduled maintenance and a coinciding power outage. This area was flushed after work was completed and turbidity of <1NTU was observed

<sup>3</sup>Monthly average is >1 NTU due to skewing of data due to a high turbidity being observed during scheduled maintenance and a coinciding power outage.

<sup>4</sup>Two samples showed free chlorine below the 0.20mg/L threshold set out by the Canadian Drinking Water Guidelines. Additional analysis show that there is no negative impact on water quality at these sites.

**Table 9 Kalamalka Distribution**

Parameter	Laboratory		# of Samples	# of Deviations	Min	Max	Average
<b>Free Chlorine<sup>1</sup></b>	Operator Grab Samples	mg/L	84	-----	0.20	1.97	1.20
<b>Total Chlorine</b>	Operator Grab Samples	mg/L	84	-----	0.44	2.20	1.47
<b>E.coli</b>	Caro	CFU/100 mL	59	-----	<1	<1	<1
<b>E.coli</b>	RDNO Lab	MPN/100 mL	42	-----	<1	<1	<1
<b>Total Coliform</b>	Caro	CFU/100 ml	59	-----	<1	<1	<1
<b>Total Coliform</b>	RDNO Lab	MPN/100 mL	42	5	<1	>200.5 <sup>2</sup>	<1 <sup>3</sup>
<b>Turbidity<sup>1</sup></b>	Operator Grab Samples	NTU	84	-----	0.38	1.63	0.88

<sup>1</sup>Operation Guidelines: free chlorine >0.20 mg/L, turbidity <3 NTU.

<sup>2</sup>All five Total Coliform results were taken from a single sample station. Further investigation showed no impact to surrounding residences and a broken sample station was discovered. The sample station was replaced in August and will be monitored moving forward.

<sup>3</sup>The two results of >200.5 MPN/100mL were removed from the Average calculation to prevent skewing the data.

The GVW distribution system contains six sampling sites (Table 10) that frequently have free chlorine <0.2 mg/L due to the sample sites being located at the end of the distribution

line. Measures are currently in place to mitigate this issue including regular monitoring and flushing. The three sites at Boss Creek represent a localized area.

**Table 10 Low Chlorine Sites and Mitigation Measures**

Frequent Low Free Chlorine Sites	Mitigation Measures
O’Keefe Ranch SS	On a localized Water Quality Advisory
9007 Aberdeen Rd SS	Regular monitoring and flushing
Noble Canyon B/O	Regular monitoring and flushing
Boss Creek PH 1 (Lower) Return/Inlet	Regular monitoring
Boss Creek PH 2 (Upper) Discharge/Outlet	Regular monitoring
Boss Creek PH 2 (Upper) return/inlet	Regular monitoring

**5. Water Quality and Customer Calls and Notifications**

Water Quality Customer calls within the GVW Service area are tracked and recorded. There was a total of 11 customer calls this month.

**Table 11 Water Quality Customer Calls for the month**

# of Calls	Type of Call	Issue/Inquiry	Investigation	Comments
1	Issue	Suspected poor water quality made caller sick	No	Caller was in hospital for eight days and thought it was the water because of the construction near his house. Customer was under a BWN at the time of the call. Customer stated he was going to investigate this further. No further action by RDNO.
1	Information	Questions regarding filters for brewing during a BWN	No	Customer got in touch with Interior Health and have the correct filters to be used during a BWN.
1	Information	Question regarding if she was on a BWN and if drinking the water would make her sick	No	Customer was informed she is not on the BWN.
1	Information	Customer has a private intake on Okanagan Lake and was wondering about sampling protocols	No	Customer was advised to contact Interior Health
1	Information	Customer on WQA was asking for	No	Customer was advised that we were taking samples in the area and were

		information on how bacteria got in the water and what we are doing about it. Also had questions about how we alert the public.		lifting the WQA the following day pending bacteria results. Advised that they could sign up for our email list through the website.
1	Information	Customer on WQA had questions on whether they could fill pool. Also stated that there should be more signage.	No	Customer was advised that it is a precautionary advisory. Also explained that we notify customers through email, media, and signage.
1	Information	Customer wanted to get powder tested	No	Customer was advised that RDNO does not test powders. Suggested they try a private laboratory.
1	Issue	Customer noticed yellow water in their tap.	Yes	Customer was advised that there was a break next door and has since been repaired. Customer was advised to flush their water using an outdoor tap.
1	Issue	Customer complaint of brown colored water.	Yes	Customer was notified that there was maintenance work happening on their street. Suggested they flush their house and explained that they are on a 48 hour WQA. Customer called back next day stating water was cloudy. It was determined to be air in the line. Customer was advised to flush from an outside tap.
1	Issue	Customer noticed poor water quality in the last few months. Having to change filters often and they are dirty when changed.	Yes	Informed customer that the source water was switched back in December to Kal water and that is most likely the source of clogged filters. Kal lake had increased turbidity due to Marl. Suggested they sign up for email notifications
1	Issue	Brown water coming out of tap	Yes	CoV was doing hydrant flushing in the mobile home park causing the brown water. Called and left message to property owner suggesting she flush her home once main flushing was complete.

## 6. Operational or Maintenance Activity

Operational activity within the GVW service area are tracked and recorded using an online database. There were a total of 23 operational activities this month outlined in Table 12.

**Table 12 Monthly operational work and maintenance for the City of Vernon**

NUMBER OF LOCATIONS	TYPE OF WORK
0	Hydrant Maintenance
0	Hydrant Maintenance – Corrective
0	New Hydrant Install
3	Water Service GIS Locate
9	Water Main Break Repair
1	Property Damage Repair
0	Water Valve Maintenance
4	Water Valve Repair
1	Water Service Install
5	Water Service Repair
0	Reservoirs Cleaned
0	New Hydrant Sticker Install

**7. Localized WQA’s and Other Activity**

Water quality events are tracked and recorded below. There were a total of 14 Water Quality Advisories and 2 Boil Water Notices outlined below.

On July 2, 2024, some customers in the Okanagan Landing and Tronson Rd areas were put on a BWN due to a valve break on the water main in the area resulted in depressurization.

On July 4, 2024, some customers along 32 Ave between 38 St and Bella Vista Rd were put on a BWN due to a rupture in the water main during infrastructure upgrades resulting in depressurization.

On July 5, 2024, some customers in the areas of Mission Hill, Commonage Rd, and West Kal were put on a WQA due to the presence of Total Coliforms during routine testing.

July 5, 2024, The BWN sent out to customers in the Okanagan Landing area on July 2, 2024, was rescinded.

On July 8, 2024, Chapman industrial notified some customers along 24 Ave between 35A St and 36 St via hand delivery that they will experience a water interruption due to infrastructure upgrades on July 8. A WQA was put in place for 48 hours following completion of the work.

On July 9, 2024, the City of Vernon notified some customers along 43 St and 25 Ave via hand delivery that they will experience a water disruption on July 10. Customers were placed on a WQA following the work.



On July 10, 2024, Polson Park was put on a WQA due to a rupture of the water main in the area. Signage was posted on public water utilities in this area. This WQA was automatically rescinded on July 12, 2024.

On July 12, 2024, the WQA that was sent out on July 5 to customers in the areas of Mission Hill, Commonage Rd, and West Kal was rescinded.

On July 12, 2024, the BWN issued to customers along 32 Ave between 38 St and Bella Vista Rd was extended due to another break in the water main.

On July 15, 2024, some customers on Bolduc Rd and BX Rd were put on a WQA due to a service leak repair in the area. The WQA was automatically lifted 48 hours after completion of the work.

On July 16, 2024, some customers in Lavington were placed on a WQA due to a power outage that resulted in a loss of water pressure and increased turbidity. This WQA was set to be automatically rescinded July 19 at 5:00pm.

On July 17, 2024, the BWN that was issued to customers along 32 Ave between 38 St and Bella Vista Rd has been rescinded.

On July 18, 2024, the WQA that was issued to parts of Lavington on July 16 was extended until July 22, 2024, due to elevated turbidity still being present in the system.

On July 19, 2024, the City of Vernon notified some customers near Stepping Stones Rd and Stepping Stones Cres via hand delivery that they will experience a water disruption on July 23<sup>rd</sup>. Customers were placed on a 48 hour WQA advisory once work was completed.

On July 19, 2024, the City of Vernon notified some customers near 1999 15 Ave via hand delivery that they will experience a water disruption on July 24<sup>th</sup>. Customers were placed on a 48 hour WQA advisory once work was completed.

On July 19, 2024, some customers near the 1300 block of 28 Ave were put on a WQA due to a water main repair in the area. This WQA automatically rescinded July 23 at 5:00pm.

On July 22, 2024, some customers along 25 Ave between 15 St and Francis St were placed on a WQA due to a water main break in the area. The WQA was automatically rescinded after 48 hours.

On July 26, 2024, the City of Vernon notified some customers on 38 St between 30 and 32 Ave that they were put on a WQA due to a water main repair in the area. The WQA was automatically rescinded after 48 hours.

On July 26, 2024, Chapman Industries notified some customers in the 3400 block of 24<sup>th</sup> Ave that their water would be turned off to complete some infrastructure upgrades on July 29<sup>th</sup>. Residents were placed on a WQA until Thursday August 1<sup>st</sup> following completion of the work.

On July 31, 2024, Sunridge Contracting notified some customers near 32 Ave between Alexis Park Dr and Bella Vista Rd via hand delivery that water will be turned off to accommodate infrastructure upgrades. A 48 hour WQA was issued following completion of the work.