



**KICKING HORSE MOUNTAIN RESORT**

**MAIN WATER SYSTEM**

Facility Number 12-098-00152

**2023 ANNUAL WATER REPORT TO INTERIOR HEALTH**

Date of Issue: May 13 2023

This report was produced on behalf of the Kicking Horse Mountain Utility Corporation Ltd. by  
Travis Jobin, Utility Manager  
Charles Laumet, Utility Operator 1

Kicking Horse Mountain Resort, 1500 Kicking Horse Trail, PO Box 839, Golden, BC, V0A 1H0



## **Potable Water System Operations Summary**

The KHMUC potable water system continued to serve the KHMR village in 2023. Much of our system is approaching the 25 year mark. Some of the major components are in need of replacing and upgrading. The drought conditions in the Columbia valley led to one of our wells (Well 3) to struggle to meet demand. We also had some water distribution samples fail in the Summer and Fall for total coliform. The contamination did not appear to be coming from the water wells.

## **Operator Certification**

- Utility Manager: Travis Jobin (WD1, WWT3, EOCP cert # 7640)  
Continued to act as the lead operator
- Utility Operator: Charles Laumet (MU-WWT, OIT, EOCP cert # 1001818)
- Utility Laborer: Chris Symes (not certified)
- Sr. Utility Operator: Mark Skyring (Lvl 1 WD, EOCP cert #9184) *resigned July 2023*
- Utility Laborer: Kai Rasmussen (not certified) *resigned Dec 2023*

## **Long Term Plans for System Improvements**

Long term plans for system improvements are dependent on the rate of expansion of the resort. We are nearly at the allotted capacity for water in the village. We received the SNC Lavalin report "TW13 Pumping Test and GARP Assessment (Feb 16,2023)". This is the first step toward adding Well 13 to our potable water system.

In an Email on Feb 13, 2024, Subject: Conditions on Permit, Interior Health DWO Jennifer Beverley has tasked KHMUC with investigating secondary disinfection for distribution system. This request is because of the failed total coliform samples from 2023 and the regular manual chlorination of the Reservoir. This investigation is due to be complete September 2025.

## **Emergency Response Plan**

The emergency response plan was reviewed and updated in May 2023. The contact list has been revised periodically throughout the year as contact personnel and phone numbers changed.

## **Events in 2023**

- Water SCADA Replacement – We have engaged with a contractor for a full replacement and are currently reviewing the Proposal.
- PRV Failures – Our Pressure Reducing Valves are in need of rebuilds. The KHMUC has continually done small repairs but we will need to engage a



contractor for the rebuild. There has been a significant delay on the work as we try and create a Confined Space Entry procedure that satisfies the WorksafeBC requirements. We are currently working with a P.Eng to create the procedure.

- **Low Water Levels** – Starting February we started noticing that Well 4 was shutting down mid-cycle. Troubleshooting was hampered because of our SCADA failure. We finally determined that the wells were experiencing low levels. Based on data from Ministry of Environment and are own observation we think that it is likely that was caused by drought conditions in the Columbia Valley. Water table levels rose again in April and were fine the remainder of the year.
- **Total Coliform Failures: Aug 10, Aug 24, Aug 29, Sept 25, Nov 2.** – We had a number of Total Coliform Failures starting Aug 10 2023. Although we do see the occasional failure from time to time the frequency and amount was concerning. The Aug 10, Aug 29, Sept 25 and Nov 2 samples were resampled after manual chlorination of the distribution system and reservoir and passed. The Aug 24 sample was resampled after unidirectional flushing of the main water loop in the village. This sample was collected on Aug 29 and failed. In November the wells were chlorinated and the pipe between the wellhouse and reservoir was allowed to sit with the strong chlorination mix overnight. Interior health was notified of all failures and kept up to date with resample results and any efforts that were taken.

The Wells were also sampled during these events but did not have any Total Coliform bacteria.

Analytical Results										
Sub-Matrix: Water (Matrix: Water)		Client sample ID		WELL 4						
		Sampling date/time		29-Aug-2023 09:30						
Analyte	Method/Lab	LCR	Unit	CDWG MAC						
<b>Microbiological Tests</b>										
Coliforms, total	SD1BCD	1	MPN/100mL	<1	1 MPN/100mL	--	--	--	--	--
Coliforms, Escherichia coli (E. coli)	SD1BCD	1	MPN/100mL	<1	1 MPN/100mL	--	--	--	--	--

Analytical Results										
Sub-Matrix: Water (Matrix: Water)		Client sample ID		WELL 3						
		Sampling date/time		29-Aug-2023 09:30						
Analyte	Method/Lab	LCR	Unit	CDWG MAC						
<b>Microbiological Tests</b>										
Coliforms, total	SD1BCD	1	MPN/100mL	<1	1 MPN/100mL	--	--	--	--	--
Coliforms, Escherichia coli (E. coli)	SD1BCD	1	MPN/100mL	<1	1 MPN/100mL	--	--	--	--	--

Analytical Results										
Sub-Matrix: Water (Matrix: Water)		Client sample ID		WELL 7						
		Sampling date/time		29-May-2023 09:30						
Analyte	Method/Lab	LCR	Unit	CDWG AO	CDWG MAC					
<b>Physical Tests</b>										
Turbidity	812VCO	0.10	NTU	0.52	1 NTU	--	--	--	--	--
<b>Microbiological Tests</b>										
Coliforms, total	801BCD	1	MPN/100mL	<1	1 MPN/100mL	--	--	--	--	--
Coliforms, Escherichia coli (E. coli)	801BCD	1	MPN/100mL	<1	1 MPN/100mL	--	--	--	--	--



### **Planned Activities for 2024**

- SCADA System – We have lost functionality of our SCADA System and will be replacing it. We have an approved PO and are working with a contractor to design and install a new SCADA system.
- Flow Meters – We will be replacing our 2 - 10" flowmeters for the distribution system.
- PRV Repair – We are finalizing our Confined Space procedures and will be getting a contractor to inspect and repair our village Pressure Reducing Valves.
- Hydrant Inspection – A contractor will be inspecting our village Fire Hydrants
- Reservoir Cleaning – We are working on a plan to enter and clean the Reservoir cells.
- Well 7 – We have been sampling Well 7 and are planning on using it if the Low Well Level issue happens again this winter.

**Water Quality Monitoring Program**

Weekly samples were taken and tested for Total Coliform and E. Coli. Samples were processed at ALS Environmental in Calgary AB. Samples were collected at the Wastewater Treatment Plant and the Admin building.

	<i>WWTP</i>	<i>ADMIN</i>
5-Jan	<1	<1
10-Jan	<1	<1
17-Jan	<1	<1
18-Jan	<1	<1
25-Jan	<1	<1
31-Jan	<1	<1
8-Feb	<1	<1
14-Feb	<1	<1
23-Feb	<1	<1
1-Mar	<1	<1
8-Mar	<1	<1
14-Mar	<1	<1
16-Mar	<1	<1
21-Mar	<1	<1
29-Mar	<1	<1
3-Apr	<1	<1
11-Apr	<1	<1
18-Apr	<1	<1
25-Apr	<1	<1
2-May	<1	<1
8-May	<1	<1
16-May	<1	<1
24-May	<1	<1
29-May	<1	<1
31-May	<1	<1
6-Jun	<1	<1
14-Jun	<1	<1
20-Jun	<1	<1
27-Jun	<1	<1

	<i>WWTP</i>	<i>ADMIN</i>
6-Jul	<1	<1
13-Jul	<1	<1
18-Jul	<1	<1
25-Jul	<1	<1
1-Aug	<1	<1
10-Aug	TC=4	TC=8
15-Aug	<1	<1
24-Aug	TC=1	<1
29-Aug	TC=1	TC=2
30-Aug	<1	<1
5-Sep	<1	<1
14-Sep	<1	<1
20-Sep	<1	<1
25-Sep	TC=1	<1
3-Oct	<1	<1
10-Oct	<1	<1
19-Oct	<1	<1
23-Oct	<1	<1
2-Nov	TC=4	TC=3
7-Nov	<1	<1
14-Nov	<1	<1
22-Nov	<1	<1
28-Nov	<1	<1
5-Dec	<1	<1
12-Dec	<1	<1
18-Dec	<1	<1
28-Dec	<1	<1

Legend:  
 <1 <1 Total Coliform, <1 E.Coli  
 TC=1 1 Total Coliform

## Source Monitoring - Wells 3, 4, 7

### Well 3

Analytical Results									
Substrate: Water		Client sample ID		WELL 3					
(Matrix: Water)		Sampling date-time		12-Dec-2023 10:40					
Analyte	Method/Lab	LOD	Unit	C02317570.001	CDWG AO	CDWG MAC	CDWG OG	--	--
<b>Physical Tests</b>									
Turbidity	021100	0.10	NTU	0.30	1 NTU	--	--	--	--
<b>Microbiological Tests</b>									
Coliforms, total	021003	1	MPN/100mL	<1	--	1 MPN/100mL	--	--	--
Heterotrophic plate count (HPC)	02104000	1	MPN/100mL	4	--	--	--	--	--
Coliforms, Escherichia coli (E. coli)	021005	1	MPN/100mL	<1	--	1 MPN/100mL	--	--	--
<b>Total Metals</b>									
Aluminum, total	042000	0.0500	mg/L	<0.0000	--	2.8 mg/L	0.1 mg/L	--	--
Antimony, total	042000	0.00010	mg/L	0.00001	--	0.001 mg/L	--	--	--
Arsenic, total	042000	0.00010	mg/L	0.00425	--	0.01 mg/L	--	--	--
Barium, total	042000	0.00010	mg/L	0.0705	--	2 mg/L	--	--	--
Beryllium, total	042000	0.000020	mg/L	<0.000000	--	--	--	--	--
Bismuth, total	042000	0.000010	mg/L	<0.000000	--	--	--	--	--
Boron, total	042000	0.010	mg/L	<0.010	--	5 mg/L	--	--	--
Calcium, total	042000	0.0000000	mg/L	0.0000003	--	0.007 mg/L	--	--	--
Calcium, total	042000	0.000	mg/L	43.0	--	--	--	--	--
Cadmium, total	042000	0.000010	mg/L	0.0000000	--	--	--	--	--
Chromium, total	042000	0.000000	mg/L	<0.000000	--	0.05 mg/L	--	--	--
Cobalt, total	042000	0.00010	mg/L	<0.000010	--	--	--	--	--
Copper, total	042000	0.000000	mg/L	<0.000000	1 mg/L	2 mg/L	--	--	--
Copper, total	042000	0.010	mg/L	0.000	6.3 mg/L	--	--	--	--
Lead, total	042000	0.000000	mg/L	<0.000000	--	0.001 mg/L	--	--	--
Lithium, total	042000	0.0010	mg/L	0.0000	--	--	--	--	--
Magnesium, total	042000	0.0000	mg/L	17.9	--	--	--	--	--
Manganese, total	042000	0.00010	mg/L	0.000000	0.02 mg/L	0.12 mg/L	--	--	--
Molybdenum, total	042000	0.000000	mg/L	0.0000	--	--	--	--	--
Nickel, total	042000	0.000000	mg/L	0.000000	--	--	--	--	--
Phosphorus, total	042000	0.000	mg/L	<0.000	--	--	--	--	--
Potassium, total	042000	0.000	mg/L	0.217	--	--	--	--	--
Rubidium, total	042000	0.000000	mg/L	<0.000000	--	--	--	--	--
Selenium, total	042000	0.000000	mg/L	<0.000000	--	0.05 mg/L	--	--	--
Silver, total	042000	0.010	mg/L	0.00	--	--	--	--	--

Note: Due to high Uranium and Antimony results in well 3 KHMUC is taking additional samples at well 3 through 2024. Because the wells are mixed the water delivered to users is within the Canadian Drinking Water Guidelines. The latest results of our Mixed, production water are available on our website.

<https://kickinghorseresort.com/utility-services/>



Well 4

Analytical Results										
		Client sample ID		WELL 4						
Sub-Metric: Water		Sampling date/time		12-Dec-2023 10:20						
Metric: Water				CG2317570-002						
Analyte	Method/Lab	LOF	Unit	CDWG AO	CDWG MAC	CDWG OQ				
<b>Physical Tests</b>										
Turbidity	8121CO	0.10	NTU	0.15	1 NTU	--	--	--	--	--
<b>Microbiological Tests</b>										
Coliforms, total	0210CO	1	MPN/100mL	<1	--	1 MPN/100mL	--	--	--	--
Heterotrophic plate count (HPC)	0210HPC05	1	MPN/100mL	37	--	--	--	--	--	--
Coliforms, Escherichia coli (E. coli)	0210CO	1	MPN/100mL	<1	--	1 MPN/100mL	--	--	--	--
<b>Total Metals</b>										
Aluminum, total	8405CO	0.0030	mg/L	<0.0030	--	2.0 mg/L	0.5 mg/L	--	--	--
Antimony, total	8405CO	0.00510	mg/L	0.00148	--	0.06 mg/L	--	--	--	--
Arsenic, total	8405CO	0.00510	mg/L	0.00179	--	0.07 mg/L	--	--	--	--
Barium, total	8405CO	0.00510	mg/L	0.0729	--	2 mg/L	--	--	--	--
Beryllium, total	8405CO	0.000030	mg/L	<0.000030	--	--	--	--	--	--
Bismuth, total	8405CO	0.000050	mg/L	<0.000050	--	--	--	--	--	--
Boron, total	8405CO	0.510	mg/L	<0.010	--	5 mg/L	--	--	--	--
Calcium, total	8405CO	0.005050	mg/L	<0.000050	--	0.007 mg/L	--	--	--	--
Calcium, total	8405CO	0.050	mg/L	44.8	--	--	--	--	--	--
Cesium, total	8405CO	0.000010	mg/L	0.000058	--	--	--	--	--	--
Chromium, total	8405CO	0.00500	mg/L	<0.00050	--	0.08 mg/L	--	--	--	--
Cobalt, total	8405CO	0.00010	mg/L	<0.00010	--	--	--	--	--	--
Copper, total	8405CO	0.00500	mg/L	0.00573	1 mg/L	2 mg/L	--	--	--	--
Iron, total	8405CO	0.510	mg/L	0.022	0.3 mg/L	--	--	--	--	--
Lead, total	8405CO	0.000050	mg/L	<0.000050	--	0.005 mg/L	--	--	--	--
Lithium, total	8405CO	0.0010	mg/L	0.0030	--	--	--	--	--	--
Magnesium, total	8405CO	0.0050	mg/L	17.4	--	--	--	--	--	--
Manganese, total	8405CO	0.00510	mg/L	0.00488	0.02 mg/L	0.12 mg/L	--	--	--	--
Molybdenum, total	8405CO	0.000030	mg/L	0.0160	--	--	--	--	--	--
Nickel, total	8405CO	0.00500	mg/L	0.00068	--	--	--	--	--	--
Phosphorus, total	8405CO	0.050	mg/L	<0.000	--	--	--	--	--	--
Potassium, total	8405CO	0.050	mg/L	0.382	--	--	--	--	--	--
Rubidium, total	8405CO	0.000030	mg/L	<0.000030	--	--	--	--	--	--
Selenium, total	8405CO	0.000050	mg/L	<0.000050	--	0.05 mg/L	--	--	--	--
Silicon, total	8405CO	0.10	mg/L	5.50	--	--	--	--	--	--