



---

## WATER TREATMENT PLANT & DISTRIBUTION SYSTEM

---



## Operations Performance Annual Report 2022

Facility Numbers 529 & 155

## OVERVIEW

Port Hardy, with a population of 4,132 residents and over 5,000 connected to the infrastructure is located at the northern end of Vancouver Island. In May 2000 the water treatment plant was commissioned and established Port Hardy's reputation for having some of British Columbia's best water quality.

Port Hardy's source water is the Tsulquate River. The water from this river is tinted brown from tannins and other leachates. Port Hardy's Water Treatment Plant uses a Dissolved Air Flotation (DAF) system which is very effective in treating highly colored water. Treatment is achieved using ISOPAC 6 and Soda Ash to remove the color, particles, sediment and organics that are present. A filter aid, Hydrofloc 400 is added in trace amounts after the DAF treatment and prior to the filters to improve coagulation of fine particles. Filtration is done through a mixed media consisting silica sand and anthracite. Lime slurry, carbon dioxide and sodium hypochlorite are injected post filtration for alkalinity, pH adjustment and disinfection.

In 2020, the plant continued to produce a very high level of treatment providing excellent water quality to the District of Port Hardy.

## PERMIT TO OPERATE

The Port Hardy water treatment plant is a Level III facility as deemed by the Environmental Operators Certification Program (EOCP), certification number 529. The distribution system is a Level III system with a certification number of 155.

## CERTIFIED OPERATORS

The Operational Permit from Vancouver Island Health Authority Operational requires that a certified operator is employed to match the Water Treatment Plant Certification, a level III plant. The District currently employs a Level IV operator and two, Level III operators. The District also employs two Level III Water Distribution Operator.

Operator	Title	Certification
Joe Jewell	Utilities Supervisor	WT IV, WD III, WWT II, WWC II
Justin Reusch	Chief Operator	WT III, WD III, WWT II, WWC I
Roland LeFort	Operator	WWT III, WT III, WWC I
Cory Henschke	Operator	WWT I, WD II
Robert Cousins	Operator	WT I, WWT II, Cross Connection
Patrick Traverse	Labourer	Not Certified
Owain Jewell	Labourer	Not Certified

## WATER TREATMENT PLANT

Throughout 2020, there were times where due to heavy rains and high river colour events, that the water treatment process was upset. In these events, the plant is taken offline and no water is pumped to the reservoir. Water is only pumped to the reservoirs once the treatment plant's process quality is restored. This will result in lower than desired reservoir levels but quality will not be compromised.

### CAPITAL PROJECTS

Most capital projects in 2022 were delayed due to supply chain issues. Labour was limited due to the Coronavirus pandemic. The filter header repair project was postponed due to another project taking priority. The engineering is planned for 2023. A new treated water pump was ordered in 2021. After several delays from the supplier, all the parts have arrived. Final commissioning will occur in early 2023. A new heat pump was installed at the water plant this summer. The unit's electrical breakers arrived in late December. The system will help keep the electrical room cooler, reducing the amount of blown fuses due to heat.

### HIGHLIGHTS:

- No violations to permit in 2022
- 1552 ML of water were produced in 2022
- Quarterly samples for THMs and HAAs all returned within acceptable limits
- All bacteriological testing came back within expected parameters
- A Stage 1 water use restriction as per Port Hardy Water Conservation Bylaw No. 06-2005. A Stage 2 was later implemented and held after the normal October cutoff due to a lack of precipitation
- Several power outages occurred in 2022
- A new lime pump was purchased
- All flocculation and DAF tanks were taken offline for maintenance in January. Bearings were replaced and headers cleaned
- Community members have opted to run their taps to avoid pipes from freezing during the cold weather in December causing increased demand for water and puts the community at risk if there was to be a fire or a malfunction at the water plant or in the distribution system. Water demand was almost double the daily average (4.4 ML/d vs 7.5 ML/d). December was our highest water production month of 2022
- A electrical connection servicing a heater was found to be arcing at the water plant and was replaced

## WATER DISTRIBUTION SYSTEM

In 2020, the District of Port Hardy commenced on a major upgrade to the water distribution system in the Storey's Beach area. A new 2000 cubic meter (m<sup>3</sup>) reservoir was constructed on Fort Rupert Road and 3000 meters of distribution pipe was replaced. The replacement distribution pipe was also increased in size from 150mm and 250mm to 300mm and 350mm. Additional hydrants were also installed ensuring a fire flow of 150 Litres/second where required. The Fort Rupert Reservoir site is equipped with backup power generation and chlorine disinfection booster pumps. The reservoir level is controlled by an altitude control valve which keeps the tank at a predetermined level within 1.5 meters. A rolling diaphragm pressure reducing valve is also installed on site to regulate the pressure in the event the reservoir is offline. The entire site can be monitored remotely from the water treatment.

## CAPITAL PROJECTS

In 2022, mapping of the water distribution system commenced using the new ArcGIS software and antenna purchased. Several changes are being vetted to make the interface more useable. This will be moved into Operations and Maintenance.

## ADDITIONAL HIGHLIGHTS:

- All fire hydrants were "B" Serviced this year. Hydrants were also stripped and repainted
- Water main clearing continued to keep our infrastructure accessible
- Backflow preventors were all tested and serviced
- Several commercial meters were either replaced or adjusted to be radio read units. This initiative has reduced the time required to read meters by half
- Emergency power generators were serviced and load bank tested in October
- Cold weather in late December caused high water demands. Many commercial users had broken lines that unnecessarily wasted water for several days. Operator spent many hours locating these leaks and contacting the property owners to reduce water consumption

## CROSS CONNECTION CONTROL

A formal Cross Connection Control program created by Maintenance Tracking Systems Inc (MTS) was presented to the District of Port Hardy in late 2010. Currently, backflow preventers are installed in all high risk areas of the treatment plants, sewage liftstations with a washdown hose, public sani dumps and public gardens. In August, all District Backflow assemblies were tested and recertified.

## WATER WISE PROGRAM CONTINUATION

A total of 165 water meters are being read including commercial users and multi-family dwellings. All new homes and constructions will have meter setters installed as part of this program. Continuing public education around proposed metering/rate changes and general information on water wise initiatives was conducted and will be ongoing until all users are metered. In 2016, new watering restrictions as per Port Hardy Water Conservation Bylaw No. 06-2005 were adopted. As part of the water system upgrade in 2018, water meter setters were installed on all single-family dwellings on Beaver Harbour Road as new service lines were run to the property line.

Continuing from 2021, touch read meters have either been replaced or modified to be radio read meters. This has greatly reduced the amount of time required to read the meters for billing.

## WATERSHED PROTECTION PLAN

The District of Port Hardy has taken steps to implement a watershed protection plan. The purpose of this is to create a plan that guides users in the best management and preservation of the Tsulquate River and Kains Lake watershed as a drinking water source for the District of Port Hardy. The plan will develop a public awareness, identify stakeholders, increase knowledge and public awareness of the watershed and develop procedures for an emergency response.

Water Treatment Plant / Distribution Testing													
	January	February	March	April	May	June	July	August	September	October	November	December	Total
Raw Water pH	26	24	27	25	27	26	26	27	26	26	26	26	312
Reservoir Water pH Daily Grab Sample or Continuous 6.5 - 8.5	31	28	31	30	31	30	31	31	30	31	30	31	365
Colour (Reservoir) AO: <= 15 TCU	26	24	27	25	27	26	26	27	26	26	26	26	312
Free Chlorine Residual (Reservoir) Daily Grab Sample or Continuous	31	28	31	30	31	30	31	31	30	31	30	31	365
Free Chlorine Residual Distribution Grab Sample	48	47	46	48	55	53	46	46	46	48	46	46	575
Turbidity (Distribution) Grab Samples	48	47	46	48	55	53	46	46	46	48	46	46	575
Turbidity (Filter) Grab Sample or Continuous <= 0.3 NTU in at least 95%; never > 1.0 NTU	31	28	31	30	31	30	31	31	30	31	30	31	365
Turbidity (Reservoir) Daily Grab Sample or Continuous 1 NTU Maximum in finished water	31	28	31	30	31	30	31	31	30	31	30	31	365
Escherichia Coli ( <i>E.coli</i> ) 11 per month Distribution, 1 Raw MAC: 0 CFU/100mL	12	12	12	12	12	12	12	12	12	12	12	12	144
Total Coliforms 11 per month Distribution, 1 Raw MAC: 0 CFU/100mL	12	12	12	12	12	12	12	12	12	12	12	12	144
Chemical and Physical Parameter Tests Once every 5 years													0
Trihalomethanes & Haloacetic Acids (THMs & HAAs) Quarterly <0.100 mg/L annual average	2			1			1			1			5
Monthly Report 15 <sup>th</sup> of the following month	1	1	1	1	1	1	1	1	1	1	1	1	12
Annual Report Before January 31 <sup>st</sup>	1												1
Permit Violations	0	0	0	0	0	0	0	0	0	0	0	0	0

Workplace Metrics													
	January	February	March	April	May	June	July	August	September	October	November	December	Total
Safety Meetings	1	1	1	1	1	1	1	1	1	1	1	1	12
Worksite Inspections	1	1	1	1	1	1	1	1	1	1	1	1	12
Kain's Lake Dam Inspections	0	0	2	2	3	2	2	2	2	4	0	0	19
Water Service Locates	2	6	2	4	4	1	6	4	10	4	4	8	55
Water Service Repairs	0	2	1	1	4	0	0	0	1	0	2	2	13
Water Main Repairs	0	0	0	0	0	0	0	0	1	0	0	0	1
BC One Calls	0	7	31	6	7	11	10	10	14	12	10	14	132
PRV Inspections	0	11	0	2	0	0	11	11	11	11	11	0	68
ERP Exercises	0	0	0	1	0	0	0	0	0	0	0	0	1
Power Outages	3	3	1	1	3	1	0	2	0	1	1	0	16
Air Valve Inspections	0	0	0	0	0	0	0	0	0	0	32	0	32
Mainline Valve Locates/Inspections	0	1	4	3	2	4	2	10	10	0	4	6	46
Hydrant A - Services	0	0	0	0	0	0	0	0	0	0	0	0	0
Hydrant B - Services	0	0	1	65	34	32	32	12	25	0	0	0	201

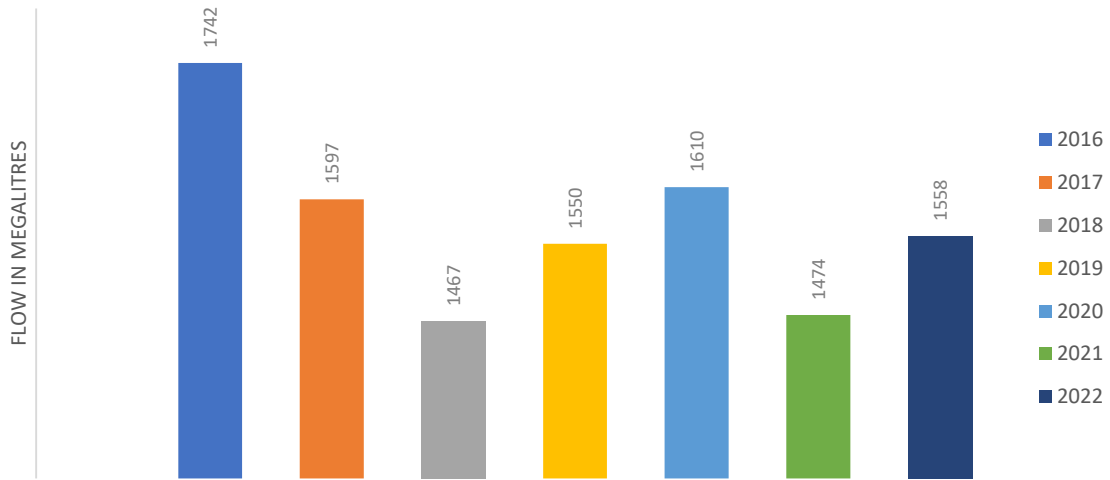
## RAW AND TREATED WATER PRODUCTION

Water Plant Data													
	January	February	March	April	May	June	July	August	September	October	November	December	Total
Raw Water Pumped in ML	146	127	130	119	125	127	139	141	131	131	139	144	1599
Treated Water Production in ML	141	124	127	118	122	123	136	137	127	127	130	139	1552
Rainfall in mm	185	109	125	101	98.6	47	15	10.4	67.7	124.8	172.4	156.8	1212
Backwashes	36	32	36	32	37	36	34	35	34	34	35	36	417

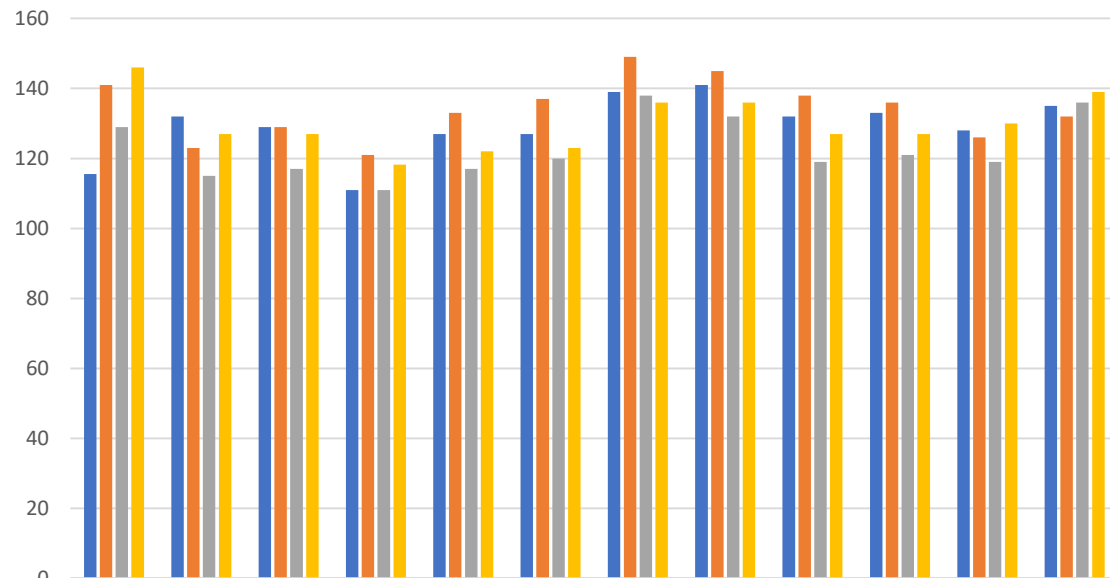
## CHEMICAL USAGE

	January	February	March	April	May	June	July	August	September	October	November	December	Total
ISOPAC 6 Coagulant in kg	4843	4950	5523	4315	4880	5167	5154	3764	4327	4630	6214	5557	59324
Soda Ash in kg	1544	1839	1816	1339	1634	1453	1385	726	1044	1022	1998	1771	17570
Filter Aid (LT20) in kg	0.98	0.89	0.86	0.81	0.80	0.90	0.97	0.48	0.46	0.47	0.58	0.92	9.12
Salt for Chlorine Generator in kg	740	500	540	560	700	720	700	840	700	560	860	700	8120
Liquid Sodium Hypochlorite 12% in kg	0	0	0	280	0	0	0	0	0	0	0	0	280
Lime in kg	2545	2286	2863	2646	2695	2287	2701	2701	2798	2858	2624	2547	31551
Carbon Dioxide in kg	2471	2723	2576	2582	2479	2116	3163	3081	3001	2469	3203	2746	32610

## WATER PRODUCTION 2016 - 2022



## Water Production 2019 to 2022 in ML









January						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
01/17/22	Hospital	1.0	0.46	7.7	L1	L1
01/10/22	Airport Washroom	0.3	0.22	7.6	L1	L1
01/31//22	Chatham Ave.	0.6	0.17	7.8	L1	L1
01/31/22	Bear Cove Reservoir	0.8	0.22	7.6	L1	L1
01/10/22	Highway 19 PRV	1.1	0.16	7.7	L1	L1
01/04/22	Pioneer Inn	0.9	0.18	7.5	L1	L1
01/10/22	Public Works Yard	1.0	0.52	7.7	L1	L1
01/17/22	Glen Lyon Restaurant	0.9	0.17	7.7	L1	L1
01/04/22	Airport Inn	0.7	0.40	7.5	L1	L1
01/17/22	Peel St Liftstation	0.7	0.39	7.6	L1	L1
01/04/22	B.C. Ferry	0.7	0.18	7.5	L1	L1

February						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
02/22/22	Hospital	0.7	0.30	7.6	L1	L1
02/07/22	Airport Washroom	0.4	0.31	7.6	L1	L1
02/07/22	Chatham Ave.	0.6	0.18	7.8	L1	L1
02/22/22	Bear Cove Reservoir	0.7	0.20	7.6	L1	L1
02/22/22	Highway 19 PRV	0.9	0.15	7.6	L1	L1
02/22/22	Pioneer Inn	0.8	0.20	7.5	L1	L1
02/22/22	Public Works Yard	0.9	0.23	7.5	L1	L1
02/22/22	Glen Lyon Restaurant	0.8	0.16	7.6	L1	L1
02/07/22	Airport Inn	0.5	0.20	7.6	L1	L1
02/07/22	Peel St Liftstation	0.9	0.14	7.6	L1	L1
02/22/22	B.C. Ferry	0.7	0.21	7.6	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
01/04/22	Tsulquate River (Untreated)	0	0.75	7.0		

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
02/24/22	Tsulquate River (Untreated)		0.38	6.7	18	L1

March						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
03/07/22	Hospital	0.8	0.34	7.7	L1	L1
03/07/22	Airport Washroom	0.3	0.30	7.7	L1	L1
03/07/22	Chatham Ave.	0.6	0.18	7.8	L1	L1
03/21/22	Bear Cove Reservoir	0.8	0.16	7.8	L1	L1
03/21/22	Highway 19 PRV	0.8	0.15	7.9	L1	L1
03/07/22	Pioneer Inn	0.9	0.16	7.6	L1	L1
03/14/22	Public Works Yard	0.9	0.19	7.6	L1	L1
03/14/22	Glen Lyon Restaurant	0.8	0.19	7.5	L1	L1
03/14/22	Airport Inn	0.5	0.27	7.7	L1	L1
03/21/22	Peel St Liftstation	0.7	0.18	7.7	L1	L1
03/14/22	B.C. Ferry	0.6	0.23	7.7	L1	L1

April						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
04/04/22	Hospital	0.5	0.20	7.7	L1	L1
04/25/22	Airport Washroom	0.4	0.21	7.6	L1	L1
04/04/22	Chatham Ave.	0.3	0.16	7.6	L1	L1
04/19/22	Bear Cove Reservoir	0.7	0.23	7.6	L1	L1
04/19/22	Highway 19 PRV	1.0	0.17	7.7	L1	L1
04/04/22	Pioneer Inn	0.5	0.21	7.5	L1	L1
04/25/22	Public Works Yard	0.7	0.17	7.8	L1	L1
04/25/22	Glen Lyon Restaurant	0.8	0.17	7.6	L1	L1
04/04/22	Airport Inn	0.5	0.44	8.0	L1	L1
04/19/22	Peel St Liftstation	0.7	0.23	7.5	L1	L1
04/25/22	B.C. Ferry	0.8	0.18	7.8	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
03/21/22	Tsulquate River (Untreated)		0.52	6.7		

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
04/19/22	Tsulquate River (Untreated)		1.19	6.8		

May						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
05/02/22	Hospital	0.4	0.29	7.4	L1	L1
05/09/22	Airport Washroom	0.3	0.21	7.6	L1	L1
05/02/22	Chatham Ave.	0.5	0.22	7.8	L1	L1
05/16/22	Bear Cove Reservoir	0.6	0.36	7.6	L1	L1
05/16/22	Highway 19 PRV	0.8	0.29	7.6	L1	L1
05/02/22	Pioneer Inn	0.8	0.68	7.5	L1	L1
05/09/22	Public Works Yard	0.4	0.17	7.7	L1	L1
05/09/22	Glen Lyon Restaurant	0.7	0.18	7.5	L1	L1
05/02/22	Airport Inn	0.6	0.19	7.6	L1	L1
05/02/22	Peel St Liftstation	0.6	0.19	7.5	L1	L1
05/09/22	B.C. Ferry	0.6	0.19	7.5	L1	L1

June						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
06/06/22	Hospital	0.5	0.05	7.5	L1	L1
06/20/22	Airport Washroom	0.2	0.76		L1	L1
06/06/22	Chatham Ave.	0.3	0.18	7.6	L1	L1
06/20/22	Bear Cove Reservoir	0.6	0.14	7.6	L1	L1
06/20/22	Highway 19 PRV	0.6	0.16	7.7	L1	L1
06/06/22	Pioneer Inn	0.7	0.19	7.4	L1	L1
06/13/22	Public Works Yard	0.6	0.22	7.6	L1	L1
06/13/22	Glen Lyon Restaurant	0.6	0.28	7.6	L1	L1
06/06/22	Airport Inn	0.3	0.15	7.6	L1	L1
06/13/22	Peel St Liftstation	0.5	0.15	7.6	L1	L1
06/13/22	B.C. Ferry	0.3	0.15	7.2	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
05/16/22	Tsulquate River (Untreated)		0.78	6.7		

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
06/20/22	Tsulquate River (Untreated)		0.39	6.9	2419.6	19.5

July						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
07/04/22	Hospital	0.7	0.18	7.6	L1	L1
07/18/22	Fort Rupert Reservoir	0.6	0.14	8.1	L1	L1
07/04/22	Chatham Ave.	0.5	0.11	7.6	L1	L1
07/11/22	Bear Cove Reservoir	0.3	0.17	7.6	L1	L1
07/11/22	Highway 19 PRV	0.7	0.29	7.7	L1	L1
07/04/22	Pioneer Inn	0.7	0.18	7.6	L1	L1
07/18/22	Public Works Yard	0.2	0.30	7.9	L1	L1
07/18/22	Glen Lyon Restaurant	0.8	0.18	7.9	L1	L1
07/04/22	Airport Inn	0.3	0.17	7.6	L1	L1
07/11/22	Peel St Liftstation	0.5	0.17	7.5	L1	L1
07/18/22	B.C. Ferry	0.2	0.16	7.6	L1	L1

August						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
08/15/22	Hospital	0.5	0.16	7.6	L1	L1
08/22/22	Fort Rupert Reservoir	0.6	0.20	7.3	L1	L1
08/08/22	Chatham Ave.	0.4	0.13	7.8	L1	L1
08/22/22	Bear Cove Reservoir	0.4	0.28	7.3	L1	L1
08/08/22	Highway 19 PRV	0.7	0.18	7.7	L1	L1
08/15/22	Pioneer Inn	0.7	0.20	7.7	L1	L1
08/08/22	Public Works Yard	0.7	0.21	7.6	L1	L1
08/15/22	Glen Lyon Restaurant	0.7	0.17	7.6	L1	L1
08/22/22	Airport Inn	0.3	0.22	7.6	L1	L1
08/15/22	Peel St Liftstation	0.6	0.44	7.6	L1	L1
08/08/22	B.C. Ferry	0.3	0.17	7.7	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
07/11/22	Tsulquate River (Untreated)		0.57	7.1		

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
08/22/22	Tsulquate River (Untreated)		0.38	7.1		

September						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
09/06/22	Hospital	0.4	0.28	7.5	L1	L1
09/12/22	Fort Rupert Reservoir	0.9	0.18	7.5	L1	L1
09/06/22	Chatham Ave.	0.5	0.15	7.6	L1	L1
09/20/22	Bear Cove Reservoir	0.5	0.21	7.6	L1	L1
09/20/22	Highway 19 PRV	0.9	0.17	7.7	L1	L1
09/06/22	Pioneer Inn	0.6	0.16	7.4	L1	L1
09/12/22	Public Works Yard	0.9	0.24	7.7	L1	L1
09/12/22	Glen Lyon Restaurant	1.0	0.38	7.7	L1	L1
09/06/22	Airport Inn	0.5	0.18	7.4	L1	L1
09/20/22	Peel St Liftstation	0.7	0.19	7.6	L1	L1
09/12/22	B.C. Ferry	0.8	0.17	7.6	L1	L1

October						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
10/11/22	Hospital	0.5	0.21	7.8	L1	L1
10/17/22	Fort Rupert Reservoir	0.7	0.14	7.7	L1	L1
10/11/22	Chatham Ave.	0.3	0.23	8.0	L1	L1
10/11/22	Bear Cove Reservoir	0.4	0.21	7.8	L1	L1
10/11/22	Highway 19 PRV	0.8	0.18	7.9	L1	L1
10/17/22	Pioneer Inn	1.1	0.17	7.7	L1	L1
10/11/22	Public Works Yard	0.5	0.27	7.9	L1	L1
10/24/22	Glen Lyon Restaurant	0.9	0.29	7.8	L1	L1
10/17/22	Airport Inn	0.8	0.18	7.8	L1	L1
10/17/22	Peel St Liftstation	0.7	0.13	7.7	L1	L1
10/17/22	B.C. Ferry	0.7	0.17	7.8	L1	L1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
09/20/22	Tsulquate River (Untreated)		0.47	6.8		

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
10/24/22	Tsulquate River (Untreated)		0.64	7.0		

November						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
11/07/22	Hospital	0.6	0.22	7.6	<1	<1
11/14/22	Fort Rupert Reservoir	0.6	0.21	7.7	<1	<1
11/07/22	Chatham Ave.	0.2	0.21	7.7	<1	<1
11/07/22	Bear Cove Reservoir	0.7	0.15	7.5	<1	<1
11/07/22	Highway 19 PRV	0.8	0.24	7.3	<1	<1
11/21/22	Pioneer Inn	0.8	0.16	7.7	<1	<1
11/14/22	Public Works Yard	0.8	0.18	7.5	<1	<1
11/21/22	Glen Lyon Restaurant	1.0	0.22	7.6	<1	<1
11/14/22	Airport Inn	0.6	0.25	7.8	<1	<1
11/14/22	Peel St Liftstation	0.8	0.21	7.7	<1	<1
11/21/22	B.C. Ferry	0.6	0.15	7.6	<1	<1

December						
Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
12/19/22	Hospital	0.7	0.33	7.9	<1	<1
12/19/22	Fort Rupert Reservoir	0.5	0.44	7.8	<1	<1
12/14/22	Chatham Ave.	0.5	0.21	7.8	<1	<1
12/14/22	Bear Cove Reservoir	0.8	0.29	7.8	<1	<1
12/14/22	Highway 19 PRV	1.0	0.29	8.0	<1	<1
12/19/22	Pioneer Inn	0.8	0.33	7.8	<1	<1
12/14/22	Public Works Yard	0.9	0.18	8.0	<1	<1
12/19/22	Glen Lyon Restaurant	0.8	0.33	7.8	<1	<1
12/19/22	Airport Inn	0.4	0.26	7.8	<1	<1
12/14/22	Peel St Liftstation	0.7	0.23	7.7	<1	<1
12/14/22	B.C. Ferry	0.8	0.18	7.7	<1	<1

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
11/21/22	Tsulquate River (Untreated)		0.84	0.6		

Sample Date	Sample Location	Free Chlorine (mg/L)	Turbidity (NTU)	pH	Total Coliform CFU/100ml	E.Coli CFU/100ml
12/19/22	Tsulquate River (Untreated)		0.51	6.9		

# QUARTERLY THM/HAA RESULTS



Element  
#104, 19575-55 A Ave.  
Surrey, British Columbia  
V3S 8P8, Canada

T: +1 (604) 514-3322  
F: +1 (604) 514-3323  
E: info.vancouver@element.com  
W: www.element.com

## Analytical Report

Bill To: District of Port Hardy Box 68 Port Hardy, BC, Canada V0N 2P0 Attn: Accounts Payable Sampled By: Company: District of Port Hardy	Project ID: Project Name: THM/HAA Sampling for Quarter #1 2022 Project Location: LSD: P.O.: 6153 Proj. Acct. code:	Lot ID: <b>1547581</b> Control Number: Date Received: Jan 19, 2022 Date Reported: Jan 27, 2022 Report Number: 2711532
--	--	---

Reference Number	1547581-1
Sample Date	January 18, 2022
Sample Time	NA
Sample Location	
Sample Description	WTP Reservoir
Sample Matrix	Water

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
<b>Trihalomethanes Screen - Water</b>					
Chloroform	mg/L	0.015	0.001		
Bromodichloromethane	mg/L	0.001	0.001		
Dibromochloromethane	mg/L	<0.001	0.001		
Bromoform	mg/L	<0.001	0.001		
Total Trihalomethanes	mg/L	0.016	0.001	0.1	Below MAC
<b>Trihalomethanes - Surrogate Recovery</b>					
Dibromofluoromethane	EPA Surrogate %	99	50-140		
Toluene-d8	EPA Surrogate %	97	50-140		
Bromofluorobenzene	EPA Surrogate %	102	50-140		
<b>Haloacetic Acids - Water</b>					
Monochloroacetic Acid	µg/L	<2.0	2.0		
Monobromoacetic Acid	µg/L	<2.0	2.0		
Dichloroacetic Acid	µg/L	6.2	2.0		
Trichloroacetic Acid	µg/L	7.5	2.0		
Bromochloroacetic Acid	µg/L	<2.0	2.0		
Dibromoacetic Acid	µg/L	<2.0	2.0		
Total Haloacetic Acids (HAA6)	µg/L	13.7	12.0	80	Below MAC
2,3-Dibromopropionic acid	%	110	50-150		



Element  
#104, 19575-55 A Ave.  
Surrey, British Columbia  
V3S 8P8, Canada

T: +1 (604) 514-3322  
F: +1 (604) 514-3323  
E: info.vancouver@element.com  
W: www.element.com

Analytical Report

Bill To: District of Port Hardy Box 68 Port Hardy, BC, Canada V0N 2P0	Project ID: Project Name: THM/HAA Sampling for Quarter #1 2022	Lot ID: <b>1547581</b>
Attn: Accounts Payable	Project Location: LSD:	Control Number:
Sampled By:	P.O.: 6153	Date Received: Jan 19, 2022
Company: District of Port Hardy	Proj. Acct. code:	Date Reported: Jan 27, 2022
		Report Number: 2711532

Reference Number	1547581-2
Sample Date	January 18, 2022
Sample Time	NA
Sample Location	
Sample Description	Chatham Ave.
Sample Matrix	Water

Analyte	Units	Result	Nominal Detection Limit	Guideline Limit	Guideline Comments
<b>Trihalomethanes Screen - Water</b>					
Chloroform	mg/L	0.038	0.001		
Bromodichloromethane	mg/L	0.002	0.001		
Dibromochloromethane	mg/L	<0.001	0.001		
Bromoform	mg/L	<0.001	0.001		
Total Trihalomethanes	mg/L	0.040	0.001	0.1	Below MAC
<b>Trihalomethanes - Surrogate Recovery</b>					
Dibromofluoromethane	EPA Surrogate %	94	50-140		
Toluene-d8	EPA Surrogate %	99	50-140		
Bromofluorobenzene	EPA Surrogate %	111	50-140		
<b>Haloacetic Acids - Water</b>					
Monochloroacetic Acid	µg/L	<2.0	2.0		
Monobromoacetic Acid	µg/L	<2.0	2.0		
Dichloroacetic Acid	µg/L	12.9	2.0		
Trichloroacetic Acid	µg/L	19.9	2.0		
Bromochloroacetic Acid	µg/L	<2.0	2.0		
Dibromoacetic Acid	µg/L	<2.0	2.0		
Total Haloacetic Acids (HAA6)	µg/L	32.8	12.0	80	Below MAC
2,3-Dibromopropionic acid	%	100	50-150		

Analytical Report

<b>Bill To:</b> District of Port Hardy Water & Wastewater Division 8900 Park Drive Port Hardy, BC, Canada V0N 2P0	<b>Project ID:</b> <b>Project Name:</b> <b>Project Location:</b> <b>LSD:</b> <b>P.O.:</b> 6319 <b>Proj. Acct. code:</b>	<b>Lot ID:</b> <b>1564938</b> <b>Control Number:</b> <b>Date Received:</b> Apr 13, 2022 <b>Date Reported:</b> Apr 22, 2022 <b>Report Number:</b> 2737704
<b>Attn:</b> Joe Jewell		
<b>Sampled By:</b>		
<b>Company:</b>		

	Reference Number	1564938-1	1564938-2		
	Sample Date	Apr 12, 2022	Apr 12, 2022		
	Sample Time	NA	NA		
	Sample Location	Chatham / THM/HAA / 5.8 °C	WTP Reservoir / THM/HAA / 5.8 °C		
	Matrix	Water	Water		
Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Trihalomethanes Screen - Water</b>					
Chloroform	mg/L	0.048	0.022		0.001
Bromodichloromethane	mg/L	0.004	0.002		0.001
Dibromochloromethane	mg/L	<0.001	<0.001		0.001
Bromoform	mg/L	<0.001	<0.001		0.001
Total Trihalomethanes	mg/L	0.050	0.024		0.001
<b>Trihalomethanes - Surrogate Recovery</b>					
Dibromofluoromethane	EPA Surrogate %	100	99		50-140
Toluene-d8	EPA Surrogate %	99	99		50-140
Bromofluorobenzene	EPA Surrogate %	98	100		50-140
<b>Haloacetic Acids - Water</b>					
Monochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Monobromoacetic Acid	µg/L	<2.0	<2.0		2.0
Dichloroacetic Acid	µg/L	17.1	8.2		2.0
Trichloroacetic Acid	µg/L	21.7	9.8		2.0
Bromochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Dibromoacetic Acid	µg/L	<2.0	<2.0		2.0
Total Haloacetic Acids (HAA8)	µg/L	38.8	18.0		12.0
2,3-Dibromopropionic acid	%	70	85		50-150

Analytical Report

Bill To: District of Port Hardy  
Water & Wastewater Division  
8900 Park Drive  
Port Hardy, BC, Canada  
V0N 2P0  
Attn: Joe Jewell  
Sampled By: JJ  
Company: District of Port Hardy

Project ID:  
Project Name:  
Project Location:  
LSD:  
P.O.:  
Proj. Acct. code:

Lot ID: **1604974**  
Control Number:  
Date Received: Oct 7, 2022  
Date Reported: Oct 16, 2022  
Report Number: 2796704

	Reference Number	1604974-1	1604974-2		
	Sample Date	Oct 06, 2022	Oct 06, 2022		
	Sample Time	NA	NA		
	Sample Location				
	Sample Description	Reservoir / 8.6 °C	Chatham Ave. / 8.6 °C		
	Matrix	Water	Water		
Analyte	Units	Results	Results	Results	Nominal Detection Limit
<b>Trihalomethanes Screen - Water</b>					
Chloroform	mg/L	0.041	0.081		0.001
Bromodichloromethane	mg/L	0.003	0.004		0.001
Dibromochloromethane	mg/L	<0.001	<0.001		0.001
Bromoform	mg/L	<0.001	<0.001		0.001
Total Trihalomethanes	mg/L	0.044	0.085		0.001
<b>Trihalomethanes - Surrogate Recovery</b>					
Dibromofluoromethane	EPA Surrogate %	117	125		50-140
Toluene-d8	EPA Surrogate %	100	104		50-140
Bromofluorobenzene	EPA Surrogate %	100	97		50-140
<b>Haloacetic Acids - Water</b>					
Monochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Monobromoacetic Acid	µg/L	<2.0	<2.0		2.0
Dichloroacetic Acid	µg/L	13.2	23.5		2.0
Trichloroacetic Acid	µg/L	17.6	33.7		2.0
Bromochloroacetic Acid	µg/L	<2.0	<2.0		2.0
Dibromoacetic Acid	µg/L	<2.0	<2.0		2.0
Total Haloacetic Acids (HAA5)	µg/L	30.8	57.2		12.0
2,3-Dibromopropionic acid	%	91	96		50-150

Approved by:



Mike Yohemas, BSc  
General Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).  
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.  
Terms and Conditions: <https://www.element.com/terms-and-conditions>



# STOREY'S BEACH SAMPLE RESULTS



**BUREAU  
VERITAS**

Bureau Veritas Job #: C244061  
Report Date: 2022/06/24

DISTRICT OF PORT HARDY  
Your P.O. #: 5143

## MICROBIOLOGY (WATER)

Bureau Veritas ID		AVQ736	AVQ737	AVQ738	AVQ739	AVQ740		
Sampling Date		2022/06/22 09:30	2022/06/22 09:55	2022/06/22 09:00	2022/06/22 08:50	2022/06/22 08:40		
COC Number		G153119	G153119	G153119	G153119	G153119		
	UNITS	CARLTON	SCOTIA	PAVILLION	NW PAVILLION	SE PAVILLION	RDL	QC Batch
Microbiological Param.								
Enterococcus spp.	CFU/100mL	1.0	<1.0	<1.0	2.0	1.0	1.0	A620233
Fecal Coliforms	CFU/100mL	<1	<1	<1	<1	<1	1	A620235
RDL = Reportable Detection Limit								



**BUREAU  
VERITAS**

Bureau Veritas Job #: C254451  
Report Date: 2022/07/28

DISTRICT OF PORT HARDY  
Your P.O. #: 5143

## MICROBIOLOGY (WATER)

Bureau Veritas ID		AYD518	AYD519	AYD520	AYD521	AYD522		
Sampling Date		2022/07/26 10:15	2022/07/26 11:15	2022/07/26 10:30	2022/07/26 10:00	2022/07/26 11:00		
COC Number		G153131	G153131	G153131	G153131	G153131		
	UNITS	100M N PAVILLION	SCOTIA	100M S PAVILLION	PAVILLION	CARLTON	RDL	QC Batch
Microbiological Param.								
Enterococcus spp.	CFU/100mL	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	A659688
RDL = Reportable Detection Limit								