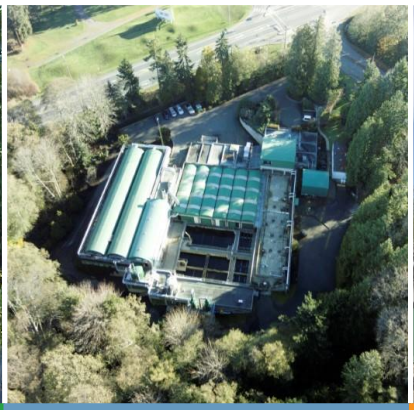
REGIONAL DISTRICT OF NANAIMO



2024 Annual Report

French Creek Pollution Control Centre

February 2025

Submitted to the Ministry of Environment and Parks
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Executive Summary

The Regional District of Nanaimo (RDN) owns and operates the French Creek Pollution Control Centre (FCPCC) located at 957 Lee Road in Parksville. FCPCC provides secondary treatment. Treated effluent is discharged to the Strait of Georgia.

Operation of FCPCC is regulated by Environmental Management Permit No. PE-4200 issued by the Ministry of Environment and Parks. The authorized treatment works include a septage receiving facility; mechanical screens; grit tanks; primary clarifiers; biological reactors; secondary clarifiers; trickling filer; thermophilic aerobic digesters; biosolids thickening and dewatering facilities; odour control facilities; an outfall extending approximately 2 km from shore to a depth of 61 m below mean low water; an effluent pumping station and pipeline to convey effluent to the storage ponds at the Morningstar Golf Course; standby power; and related appurtenances.

This report was written by RDN staff as a permit requirement. This report summarizes and interprets the FCPCC monitoring data for 2024.

The summary of 2024 monitoring data at FCPCC for the outfall effluent is as follows:

Summary of Compliance	Permit	2024	Permit Exceedances
Maximum Daily Flow (Outfall)	16,000 m^3/day	17,777 m^3/day	1
Average Daily Flow	-	10,844 m^3/day	-
Average Daily $cBOD_5$ (Outfall)	45 mg/L	14.7 mg/L	0
Average Daily TSS (Outfall)	60 mg/L	18.3 mg/L	0

- **Flow** – The total volume of effluent discharged to the outfall in 2024 was 3,968,900 m^3/day, at an average daily flow of 10,844 m^3/day. The maximum daily flow was 17,777 m^3/day. In 2024, no flows were discharged to Morningstar Golf Course.

  There was one maximum daily flow non-compliance on December 26, 2024. More information on this non-compliance can be found in Appendix C.

- **5-day Carbonaceous Biochemical Oxygen Demand** – The influent and effluent average 5-day carbonaceous biochemical oxygen demand ($cBOD_5$) concentration for 2024 was 230 mg/L and 14.7 mg/L, respectively. The average removal efficiency in 2024 was 93.7%. There were no $cBOD_5$ permit exceedances in 2024.

- **Total Suspended Solids** – The influent and effluent average total suspended solids (TSS) concentration in 2024 was 395 mg/L and 18.3 mg/L, respectively. The average TSS removal efficiency in 2024 was approximately 94.7%. There were no TSS permit exceedances in 2024.

- **Ammonia and Toxicity** – The average ammonia nitrogen concentration in the effluent for 2024 was 30.2 mg/L and the average toxicity (LC_{50}) of the effluent for 2024 was >100%.

- **General parameters, metals, volatile and semi-volatile compounds** – 2024 results were all consistent with historical data. Only one sample is taken per year so limited conclusions can be made on trending of the parameters.

- **Biosolids** – SYLVIS Environmental Services conducts fecal coliform and full parameter testing as the Qualified Professional for the biosolids soil fabrication program. These results are summarized in the Annual Summary of 2024 Management of Regional District of Nanaimo French Creek Pollution Control Centre Biosolids (see Appendix H).

  In the RDN sampling program, FCPCC biosolids met Class A standards for metals and fecal coliforms. Eight fecal coliform samples and two full parameter samples were taken.

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1) Introduction

The Regional District of Nanaimo (RDN) owns and operates the French Creek Pollution Control Centre (FCPCC) located at 957 Lee Road, Parksville, British Columbia. The authorized works include a septage receiving facility; mechanical screens; grit tanks; primary clarifiers; biological reactors; secondary clarifiers; thermophilic aerobic digesters; biosolids thickening and dewatering facilities; odour control facilities; an outfall extending approximately 2 km from shore to a depth of 61 m below mean low water; an effluent pumping station and pipeline to convey effluent to the storage ponds at the Morningstar Golf Course; standby power; and related appurtenances. Treated effluent from FCPCC is discharged to the Strait of Georgia. In some years, a portion of FCPCC treated effluent is also pumped to irrigation storage lagoons at the Morningstar Golf Course, which are adjacent to the treatment facility. No effluent was pumped to Morningstar Golf Course in 2024.

Operation of the treatment plant is regulated by the Ministry of Environment and Parks (ENV) under Environmental Management Permit No. PE-4200 (the Permit), issued on January 16, 1976, and amended most recently on July 10, 1990 (see Appendix A). In 2023, the RDN requested a minor permit amendment to increase the maximum permitted flow rate by 10%.

The FCPCC was constructed in 1977 as an activated sludge treatment plant capable of serving a population of 12,000 people. In December 1996, a trickling filter was added to the process and an expansion undertaken to accommodate the increasing population of the area. This expansion, completed in 1997, doubled the plant's capacity and significantly improved the quality of its effluent and biosolids. The plant now uses trickling filter and solid contact tank technology. Further work was done to address odour problems associated with the plant's initial design. Future upgrades and expansion are planned in the FCPCC Expansion and Odour Upgrade project. Construction is scheduled to begin in 2025.

This report was written by RDN staff as a permit requirement to summarize and interpret the 2024 FCPCC monitoring data.

1.1 Environmental Management System

The RDN's Wastewater Services department's Environmental Management System (EMS) is certified to the ISO 14001:2015 standard. ISO 14001 is an international EMS standard based on a model of continual improvement. The overall aim of ISO 14001 is to support environmental protection and prevent pollution in balance with socio-economic needs. Visit www.rdn.bc.ca/environmental-management-system for more information.

2) Site Description and Neighborhood

The FCPCC is located at 957 Lee Road between Parksville and Qualicum Beach. The septage receiving area is accessed via a second driveway, located further away from Hwy 19A on Lee Road. The site is approximately 9 acres and is surrounded by trees.

Single-family residential subdivisions are located directly south and west of the plant, and there are condominiums to the southwest. A campground, marina, pub, and restaurant are located across Hwy 19A to the north. Phase I of French Creek Estates, to the north of the FCPCC, was constructed several

years ago. Further phases are proposed in the next fifteen years. There were no significant changes to the layout of the neighbourhood in 2024.

The undeveloped areas around the plant are zoned for high-density residential use, except for the land directly across the highway, which is zoned CMQ6. This zoning allows for the following uses: residential, hotel, resort condominium, neighborhood pub, office, personal service use, public assembly use, recreation facility, restaurant, or retail store.

3) Permit Requirements

3.1 Authorized Discharges

Section 1.1 of the Permit states the maximum daily effluent discharge to the outfall is:

- Maximum daily flow: 16,000 m^3/day.

Section 1.2 of the Permit stipulates that the characteristics of the discharge shall not exceed:

- 5-day carbonaceous biochemical oxygen demand ($cBOD_5$): 45 mg/L
- Total suspended solids (TSS): 60 mg/L.

Appendix 02 of the Permit states the maximum daily effluent discharge to Morningstar Golf Course is:

- 1,370 m^3/day.

And that the discharge shall not exceed:

- 5-day carbonaceous biochemical oxygen demand ($cBOD_5$): 20 mg/L
- Total suspended solids (TSS): 30 mg/L.

3.2 Monitoring Requirements

The Permit monitoring requirements are summarized in Table 1. Monthly reports were submitted to the Ministry of Environment and Parks in 2024, reporting all required test results.

Table 1. Monitoring Requirements by Permit Subsection Number

Appendix C-1 A. Sampling and Analyses A suitable sampling facility shall be installed, and a grab sample of the effluent shall be obtained once a day. The sample shall be analyzed daily for TSS and weekly for $cBOD_5$. Once per year a composite sample, over an eight-hour period shall be collected and analyzed for metals, volatile organics, phenolics, organochlorine pesticides, acid extractable herbicides, anions, and inorganics.
Appendix C-1 B. Flow Measurement A flow measuring device must be provided and maintained to record, once per day, the effluent volume discharged over a 24-hour period.
Appendix B-1 E. Outfall Inspection An inspection of the outfall line is conducted once every five years, using an underwater camera.

Appendix C-1 C. Sampling and Analytical Procedures

Sampling and flow measurement shall be carried out in accordance with the *British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Sediment and Biological Samples (2013 Edition).*

Analyses are to be carried out in accordance with the *British Columbia Environmental Laboratory Manual: For the Analysis of Water, Wastewater, Sediment, Biological Materials and Discrete Ambient Air Samples (2020)*, or by suitable alternative procedures as authorized by the Regional Waste Manager.

Appendix C-2 E. Reporting

The Permittee shall maintain records of analyses and flow measurements for inspection and once per month submit the data, suitably tabulated, to the Regional Waste Manager for the previous month's monitoring.

The 2024 monitoring program adhered to all sampling, analytical, flow measurements, and reporting requirements specified in the Permit.

3.3 Operational Certificate

The RDN's Liquid Waste Management Plan (LWMP) includes a draft Operational Certificate for FCPCC.

3.4 Outfall Inspection

When FCPCC's outfall was inspected by Remote Operated Vehicle (ROV) in 2017 by SeaVeyors Marine and Environmental, the inspection noted that the outfall pipe was in fair condition. No major leaks were identified. However, a small leak was identified from the clamp between the old outfall pipe and the diffuser that was replaced in 2013.

A follow up inspection of the diffuser was done in 2019 by ITB Subsea. The RDN retained GreatPacific to review the ROV videos and provide recommendations in terms of next steps. GreatPacific concluded the small leak from the clamp located approximately 60 m deep and 2 km offshore did not impact the performance of the diffusers. GreatPacific concluded there was no significant risk of the leak to human health or the environment and did not recommend a repair.

The outfall was inspected again in November 2022 by GreatPacific Consulting Ltd. GreatPacific noted the small leak at the diffuser connection did not intensify since 2019. However, another small leak of treated effluent was found at the Flange #3 location. The leak is described as "a diffuse, constant stream of effluent from the west side of the crown." The rate of leakage at this flange was estimated to be much less than that of one of the 25 diffuser ports. GreatPacific noted that it is unlikely that the leak is resulting in imminent risk to environment or human health. The RDN increased the frequency of inspection and monitoring by underwater Remote Operated Vehicle (ROV) to a 3-year interval to ensure the small leaks of treated effluent at the Flange #3 and diffuser clamp location do not intensify. The next inspection is scheduled for 2025.

4) Flow Monitoring

4.1 Treatment Plant and Outfall Flow

Daily flow monitoring data for FCPCC in 2024 are presented in Appendix B. Results are summarised in Table 2 and Figure 1. The combined flow of effluent discharged from the outfall in 2024 was 3,968,900 m^3, at an average daily flow of 10,844 m^3/day.

There was one maximum daily flow non-compliance on December 26, 2024. This non-compliance occurred during a high flow event and was attributed to inflow and infiltration (I&I) in the sewer collection system. More information on this non-compliance can be found in Appendix C.

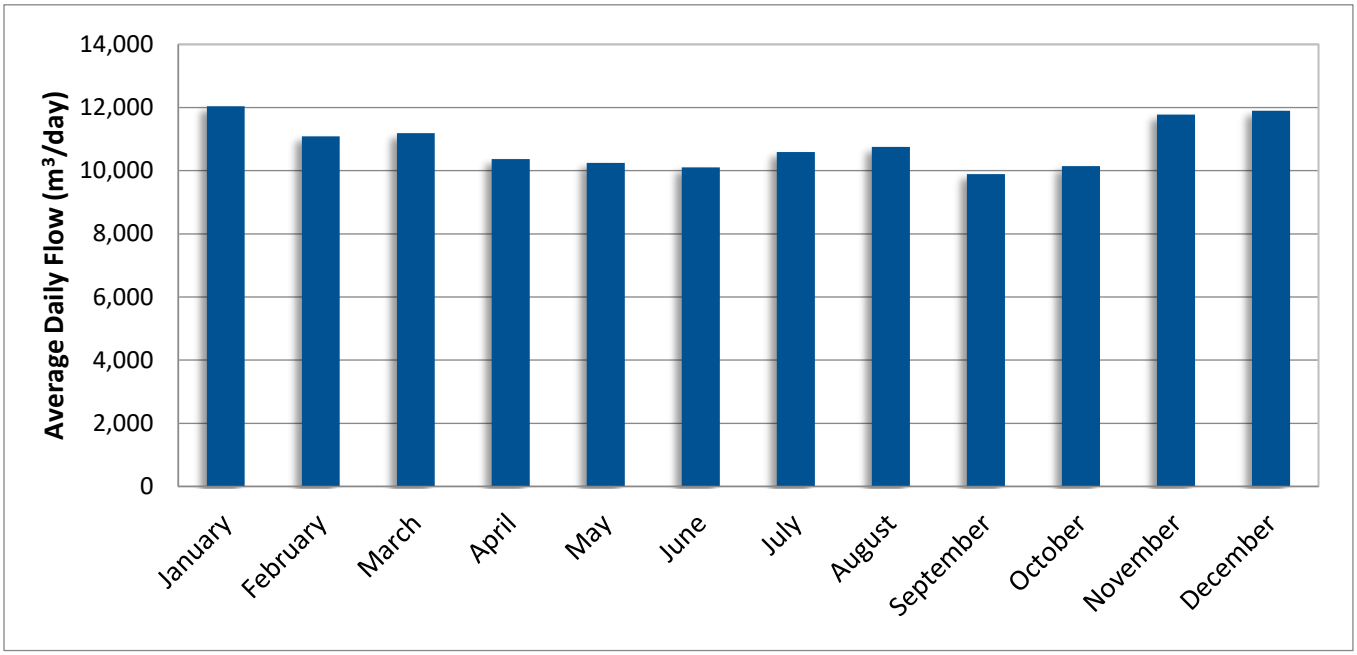
As part of the LWMP process, the RDN is working collaboratively on I&I reduction with our partners in the City of Parksville and the Town of Qualicum Beach. The RDN has also had Closed Circuit TV (CCTV) condition assessments completed of the interceptor pipes. The RDN also monitors influent quality and conducts a flow monitoring program to investigate sources of infiltration. The RDN also conducts a program to repair sources of infiltration on the Qualicum Beach and Parksville interceptor lines.

Table 2. 2024 Treatment Plant Flow from the Outfall

Month	Average Daily Flow (m^3/day)	Total Flow (m^3)	Maximum Flow (m^3/day)	Minimum Flow (m^3/day)	Maximum Flow Non-compliances	Total Monthly Precipitation (mm)
January	12,043.8	373,359.0	15,502.3	10,131.1	0	128.7
February	11,083.4	321,419.5	12,369.1	10,538.5	0	40.4
March	11,193.8	347,009.2	12,369.1	10,582.2	0	56.9
April	10,365.3	310,959.2	10,739.0	9,902.7	0	27.8
May	10,250.7	317,771.4	11,172.0	9,591.3	0	45.0
June	10,108.7	303,259.7	10,790.7	9,653.2	0	28.1
July	10,595.1	328,447.7	10,983.3	10,170.3	0	9.8
August	10,750.4	333,261.6	11,486.1	10,443.1	0	21.6
September	9,896.8	296,903.9	10,525.8	9,529.8	0	19.9
October	10,143.0	314,432.5	14,212.4	9,414.1	0	129.7
November	11,776.7	353,301.7	15,516.4	9,472.4	0	167.7
December	11,896.0	368,774.9	17,777.4	10,210.5	1	94.8
Average	**10,844.0**					
Total		**3,968,900.4**			**1**	**770.4**
Maximum			**17,777.4**			
Minimum				**9,414.1**		

* Source: Qualicum Beach Airport weather station (see Environment and Climate Change Canada)

Figure 1. Monthly Average Daily Outfall Flow



4.2 Flows to Morningstar Golf Course

Treatment effluent was not sent to Morningstar Golf Course in 2024.

4.2.1 Historical Trends

Historical combined, outfall, and Morningstar flow data reported for previous years are summarised in Tables 3 to 5 and graphed in Figure 2. The discharge to Morningstar Golf Course over the past ten years has been variable based on demand from the golf course.

In 2015, the RDN repaired a large source of infiltration of sea water on the Qualicum Beach interceptor line. Repairs to manholes and/or pipe joints to prevent infiltration on the Qualicum Beach interceptor line have also been conducted in 2018, 2019, 2021, 2022, and 2024.

Table 3. Historical Trends: Treatment Plant Flow

Year	Combined Average Daily Flow (m^3/day)	Combined Total Flow (m^3)	Combined Max Daily Flow (m^3/day)
2015	10,713.7	3,910,516.8	15,962.5
2016	10,457.4	3,827,402.4	17,935.2
2017	10,588.5	3,864,816.0	16,275.6
2018	10,356.0	3,779,923.6	19,908.0
2019	9,859.0	3,598,527.4	16,420.3
2020	9,920.3	3,630,815.1	18,439.9
2021	10,511.5	3,836,715.7	25,903.3
2022	10,493.7	3,830,187.6	18,580.1
2023	10,417.3	3,802,325.6	14,663.0
2024	10,844.0	3,968,900.4	17,777.4

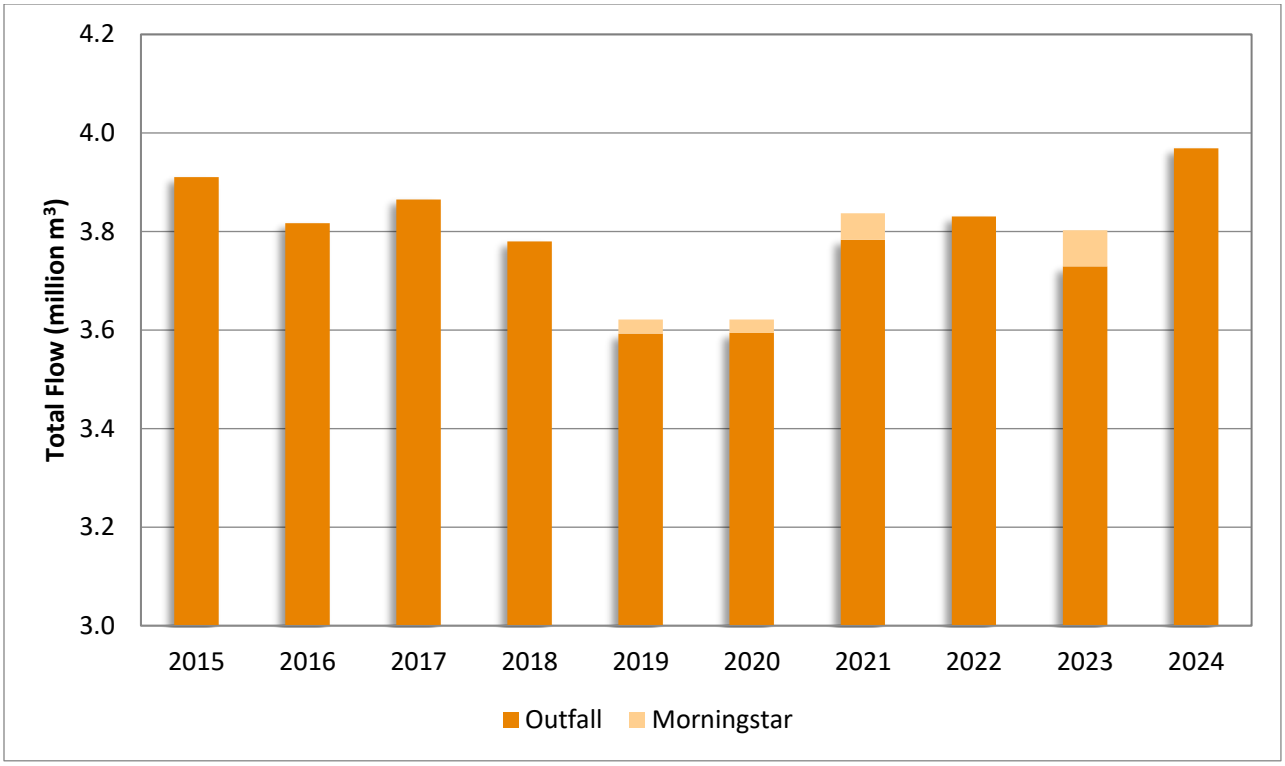
Table 4. Historical Trends: Outfall Discharge

Year	Outfall Average Daily Flow (m^3/day)	Outfall Total Flow (m^3)	Non-conformances (Outfall max daily flow)
2015	10,713.7	3,910,517	0
2016	10,457.1	3,816,837	2
2017	10,588.5	3,864,816	2
2018	10,356.0	3,779,924	3
2019	9,842.4	3,592,469	1
2020	9,846.1	3,593,821	1
2021	10,364.8	3,783,166	3
2022	10,493.7	3,830,188	2
2023	10,217.6	3,729,410	0
2024	10,844.0	3,968,900	1

Table 5. Historical Trends: Morningstar Discharge

Year	Total Flow (m^3)	Max daily flow Permit Exceedances
2015	0.0	0
2016	0.0	0
2017	0.0	0
2018	0.0	0
2019	28,623.6	0
2020	27,271.2	0
2021	53,549.8	0
2022	0.0	0
2023	72,915.5	0
2024	0.0	0

Figure 2. Historical Trends: Combined Total Yearly Flow



5) Effluent Monitoring

5.1 5-Day Carbonaceous Biochemical Oxygen Demand ($cBOD_5$)

Five-day carbonaceous biochemical oxygen demand ($cBOD_5$) is a measure of the quantity of oxygen consumed by microorganisms to break down organic matter in water in which the contribution from nitrogenous bacteria has been suppressed. A high $cBOD_5$ means less oxygen is available to support aquatic life.

The Permit requires testing the effluent for $cBOD_5$ weekly, with a maximum permitted concentration of 45 mg/L for discharge to the outfall, and 20 mg/L for discharge to Morningstar Golf Course. The average influent and effluent $cBOD_5$ concentration for 2024 was 230 mg/L and 14.7 mg/L, respectively. The average $cBOD_5$ removal efficiency was 93.7%. Results are summarized Table 6 and graphed in Figure 3. Appendix B contains the daily $cBOD_5$ results.

Effluent was also tested each week for $cBOD_5$ in a separate sampling program at the ISO17025:2017 certified lab at Greater Nanaimo Pollution Control Centre (GNPCC) to meet the Wastewater Systems Effluent Regulations (WSER) requirements for quarterly average $cBOD_5$ results. Appendix B contains the results of this sampling program.

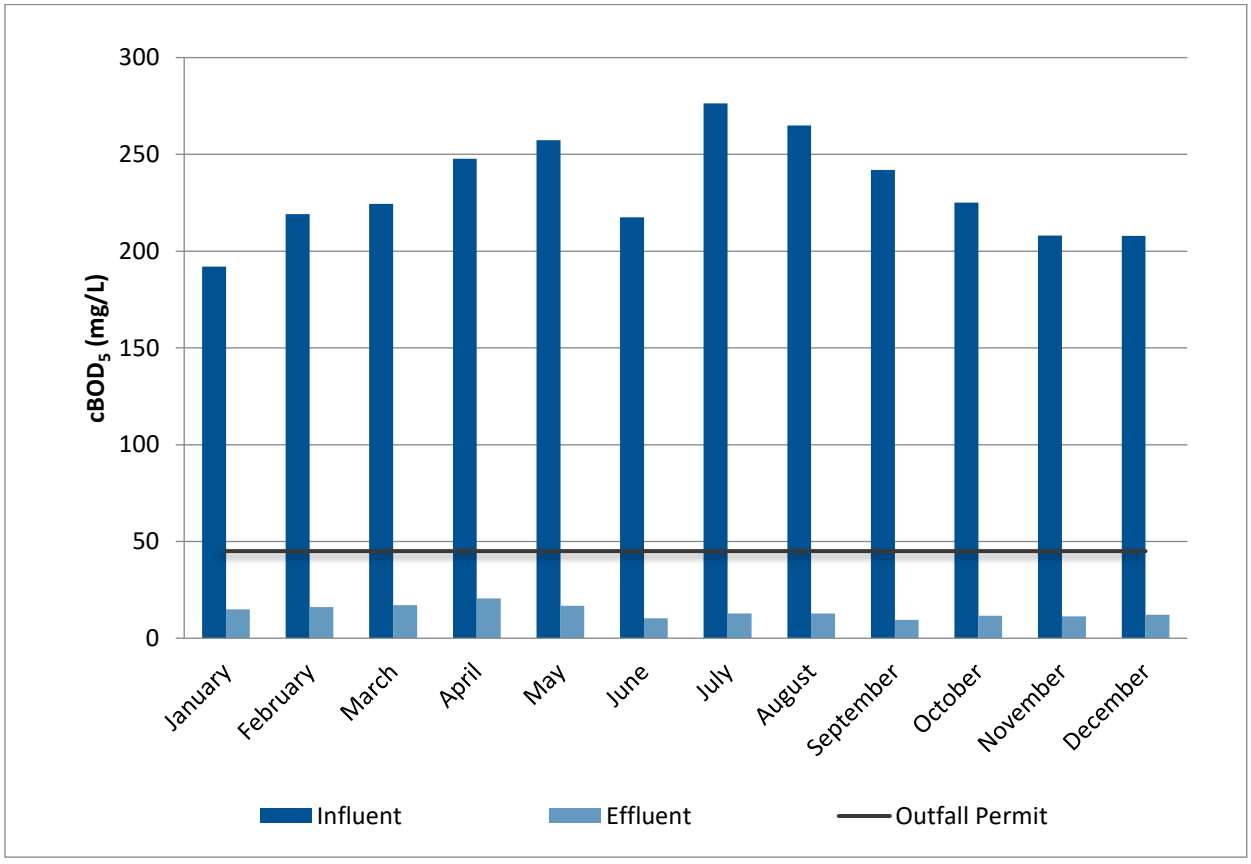
There were no $cBOD_5$ non-compliances in 2024 for the FCPCC effluent. No effluent was sent to Morningstar Golf Course.

Table 6. 2024 Influent & Effluent $cBOD_5$ Concentrations

Month	Influent Average $cBOD_5$ (mg/L)	Effluent Average $cBOD_5$ (mg/L)	Average % Reduction in $cBOD_5$ (%)*	$cBOD_5$ Permit Exceedances
January	192	14.9	92.0	0
February	219	16.0	92.7	0
March	224	17.0	92.2	0
April	248	20.6	91.9	0
May	257	16.7	93.6	0
June	217	10.3	95.1	0
July	276	12.7	95.4	0
August	265	12.7	94.5	0
September	242	9.46	96.0	0
October	225	11.6	96.0	0
November	208	11.4	94.4	0
December	208	12.1	94.2	0
Average	**230**	**14.7**	**93.7**	
Total				**0**

* % Reduction only determined when the influent and effluent $cBOD_5$ testing was done on the same day

Figure 3. 2024 Influent & Effluent Monthly Average $cBOD_5$ Concentration



5.1.1 Historical Trends

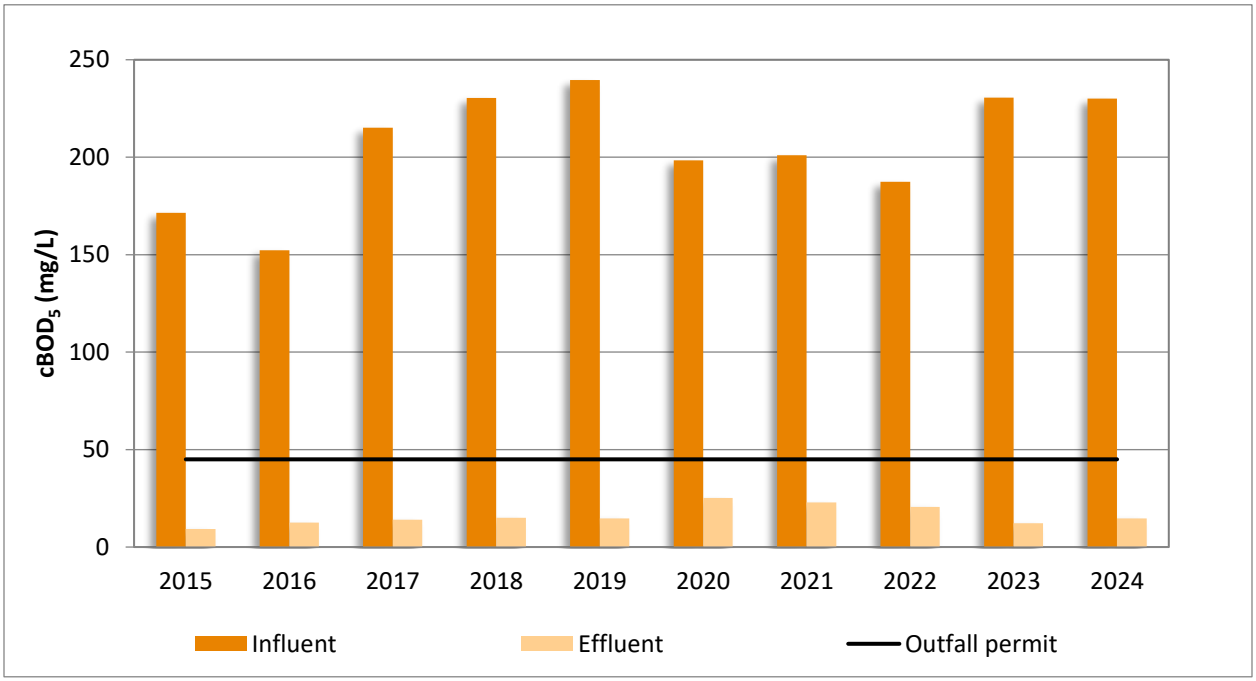
Historical influent and effluent average $cBOD_5$ concentrations, reduction efficiencies and the number of outfall and Morningstar Golf Course $cBOD_5$ non-compliances reported over the past 10 years are summarised in the Table 7 and graphed in Figure 4.

The $cBOD_5$ reduction increased in 2023 and 2024 compared to previous years.

Table 7. Historical Trends: Influent & Effluent $cBOD_5$ Concentrations

Year	Influent Average $cBOD_5$ (mg/L)	Outfall Effluent Average $cBOD_5$ (mg/L)	Average % Reduction in $cBOD_5$	Permit Exceedances (Outfall)	Permit Exceedances (Morningstar)
2015	172	9.3	94.0	0	-
2016	152	12.5	91.4	0	-
2017	215	14.0	93.6	0	-
2018	230	15.1	93.0	2	-
2019	240	14.7	93.7	0	0
2020	198	25.3	88.8	19	0
2021	201	22.8	88.1	1	0
2022	187	20.6	88.8	0	-
2023	231	12.3	94.5	0	0
2024	230	14.7	93.7	0	-

Figure 4. Historical Trends: Influent & Effluent Yearly Average $cBOD_5$ Concentration



5.2 Total Suspended Solids

Total suspended solids (TSS) are solids in wastewater that can be captured on a fine filter paper. They are visible and decrease water clarity. High concentrations of TSS can harm aquatic life.

The Permit requires daily effluent testing, with a maximum permitted concentration of 60 mg/L for discharge to the outfall, and 30 mg/L for discharge to Morningstar Golf Course (see Appendix B for test data). The pump sending effluent to Morningstar Golf Course is controlled by a TSS probe. The pump turns off when the probe reaches 30 mg/L.

The average TSS concentration for influent and outfall effluent was 395 mg/L and 18.3 mg/L, respectively. The average TSS removal efficiency in 2024 was approximately 94.9%. Table 8 and Figure 5 present the average monthly TSS levels for the influent and effluent in 2024. There were no TSS exceedances for the outfall effluent in 2024.

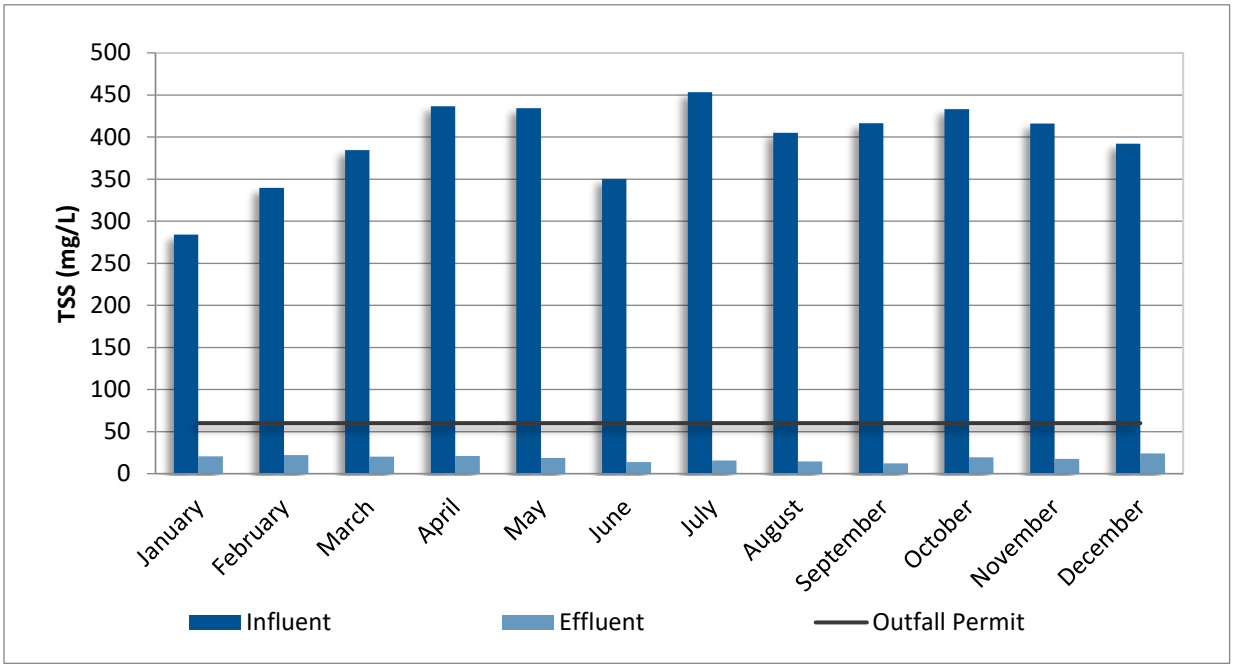
Effluent was also tested each week for TSS in a separate sampling program at the ISO17025:2017 certified lab at Greater Nanaimo Pollution Control Centre (GNPCC) to meet the Wastewater Systems Effluent Regulations (WSER) requirements for quarterly average TSS results. Appendix B contains the results of this sampling program.

The RDN is planning an expansion of FCPCC that will allow the wastewater treatment process to treat higher daily flows more efficiently.

Table 8. 2024 Influent & Effluent TSS Concentrations

Month	Influent Average TSS (mg/L)	Outfall Effluent Average TSS (mg/L)	Average % Reduction in TSS	Outfall Permit (mg/L)	TSS Permit Exceedances (Outfall)
January	284	20.6	92.4	60	0
February	340	22.1	93.3	60	0
March	384	20.0	94.6	60	0
April	436	20.9	95.0	60	0
May	434	18.6	95.5	60	0
June	350	13.8	95.9	60	0
July	453	15.5	96.5	60	0
August	405	14.5	96.3	60	0
September	417	12.2	96.9	60	0
October	433	19.5	95.0	60	0
November	416	17.6	94.7	60	0
December	392	24.0	92.4	60	0
Average	**395**	**18.3**	**94.9**		
Total					**0**

Figure 5. 2024 Influent & Effluent Monthly Average TSS Concentration



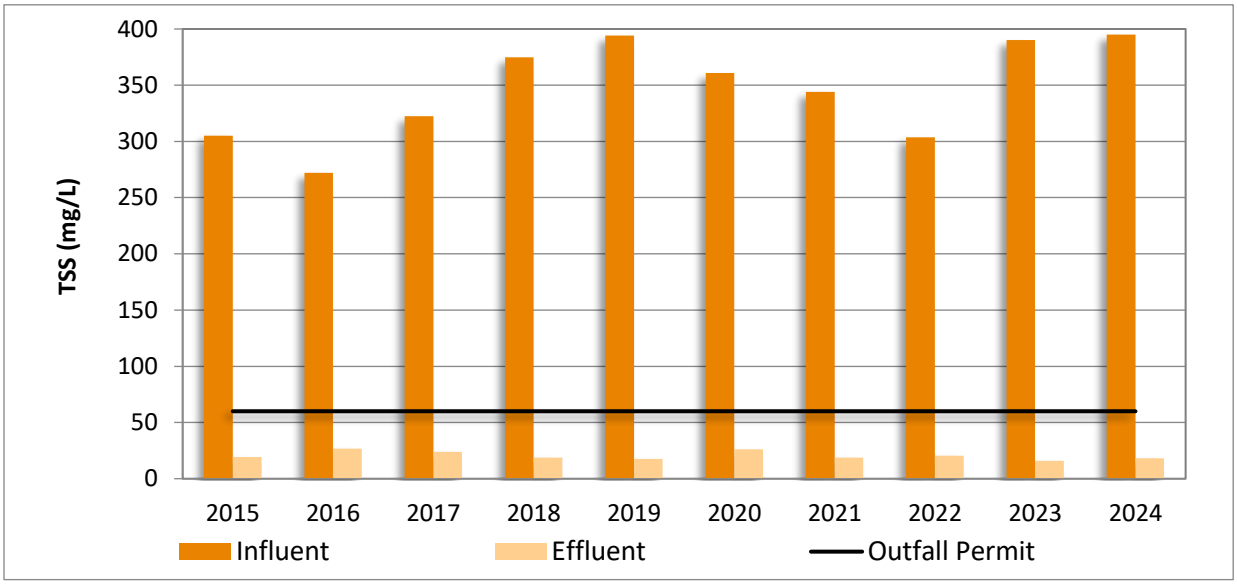
5.2.1 Historical Trends

Historical average TSS concentration in the influent and effluent, reduction efficiencies and the number of outfall and Morningstar Golf Course TSS non-compliances reported over the past 10 years are summarised in Table 9 and graphed in Figure 6. Data from 2024 are consistent with previous years.

Table 9. Historical Trends: Influent & Effluent TSS Concentration

Year	Influent Average TSS (mg/L)	Effluent Average TSS (mg/L)	Average % Reduction in TSS	TSS Permit Exceedances (Outfall)	TSS Permit Exceedances (Morningstar)
2015	305	19.3	93.1%	1	-
2016	272	26.6	90.1%	24	-
2017	322	23.8	92.4%	15	-
2018	375	18.8	94.5%	1	-
2019	394	17.6	95.2%	0	0
2020	361	26.2	92.3%	30	1
2021	344	18.9	94.0%	0	0
2022	304	20.5	92.8%	0	-
2023	390	15.8	95.6%	0	0
2024	395	18.3	94.9%	0	-

Figure 6. Historical Trends: Influent & Effluent Yearly Average TSS Concentration



5.3 Other General Parameters

The RDN completes annual testing on the effluent for the following parameters:

Alkalinity	Dissolved Sulphate	pH	Total Phosphorus
Chloride	Dissolved Sulphide	Total Cyanide	Total Organic Carbon
Dissolved Fluoride	Oil and Grease	Total Nitrogen	

A sample of the effluent is tested by an external laboratory each September. In 2024, the sample was taken on September 3 (see Appendix D for results). Historic results are summarized in Table 10. Results from 2024 were consistent with previous years. Only one sample is taken per year so limited conclusions can be made on trending of the parameters.

Table 10. Historical Trends: Effluent General Parameters

General Parameter	Units	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
pH	mg/L	7.45	7.81	8.17	7.81	7.77	7.71	7.94	7.98	7.90	7.93
Total Alkalinity	mg/L	188	160	202	217	238	250	220	206	224	220
Dissolved Chloride	mg/L	1,830	1,500	1,600	1,400	1,920	1,400	1,700	1,700	-	1,600
Total Kjeldahl Nitrogen	mg/L	21	22.5	31.4	35.9	36.2	37.2	-	-	-	33
Total Nitrogen (as N)	mg/L	-	-	-	-	-	-	41.2	32.3	45.8	39.6
Total Oil and Grease	mg/L	1	<1.0	<1.0	<1.0	<2.0	<1.0	12	<1.0	<1.0	<1.0
Dissolved Sulphate	mg/L	266	220	248	172	270	200	250	230	-	240
Total Sulphide	mg/L	0.02	0.0551	0.0568	0.068	0.039	0.040	0.038	0.023	0.043	0.035
Total Cyanide	mg/L	0.002	0.00238	0.00218	<0.0050	0.00440	0.00250	<0.0050	0.00227	0.00223	0.00238
Dissolved Fluoride	mg/L	0.04	0.110	0.130	0.130	<1.00	0.13	0.14	0.16	-	0.12
Total Organic Carbon	mg/L	16.2	15.8	18.1	21	19	34	22	33	30	25
Total Phosphorus	µg/L	2,650	2,780	2,130	3,740	2,410	4,000	2,100	2,300	4,100	3,400

* Total Alkalinity results reflect average annual results from the internal laboratory starting in 2022. Prior to 2022, this parameter was determined by external laboratory testing.

5.4 Metals

The RDN completes annual testing of the effluent for the following metals:

Aluminum (total)	Chromium (total)	Manganese (dissolved)	Selenium (total)
Arsenic (total)	Cobalt (dissolved)	Mercury (total)	Silver (total)
Barium (dissolved)	Copper (dissolved)	Molybdenum (total)	Tin (total)
Boron (dissolved)	Iron (Dissolved)	Nickel (dissolved)	Zinc (total)
Cadmium (dissolved)	Lead (total)		

A composite sample of the effluent is collected over a 24-hour period in September (a low flow month) each year and is tested by an external laboratory. In 2024, metals were sampled on September 3 (see Appendix D). Historic metals results are summarized in Tables 11 and 12. All parameters were consistent with previous years.

Table 11. Historical Trends: Effluent Total Metal Concentrations

Total Metals	Units	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Aluminum	µg/L	40	97.6	92	30	42.3	80	41	36	45	34
Arsenic	µg/L	0.6	1.2	0.7	0.67	0.72	0.64	0.72	0.60	0.74	0.70
Chromium	µg/L	<0.5	9.7	<5.0	<5.0	1.26	<5.0	<5.0	<5.0	<5.0	<5.0
Lead	µg/L	0.2	0.36	<1.0	<1.0	0.32	<1.0	<1.0	<1.0	<1.0	<1.0
Mercury	µg/L	<0.0025	<0.010	<0.010	0.0040	<0.010	0.0030	0.068	<0.019	<0.038	0.0041
Molybdenum	µg/L	1.4	1.4	<5.0	<5.0	1.98	<5.0	<5.0	<5.0	<5.0	<5.0
Selenium	µg/L	<0.5	0.28	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.72
Silver	µg/L	0.03	0.027	<0.10	<0.10	<0.050	<0.10	<0.10	<0.10	<0.10	0.34
Tin	µg/L	0.38	<5.0	<25	<25	0.56	<25	<25	<25	<25	<25
Zinc	µg/L	29	37.2	<25	<25	24.9	34	<25	31	29	30

Table 12. Historical Trends: Effluent Dissolved Metal Concentrations

Dissolved Metals	Units	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Barium	µg/L	3.8	22.7	7.3	<5.0	<5.0	3.3	78.7	<5.0	91.2	<5.0
Boron	µg/L	510	469	570	490	635	470	550	560	650	540
Cadmium	µg/L	0.02	0.024	<0.050	<0.050	0.033	<0.020	<0.050	<0.050	<0.050	<0.050
Cobalt	µg/L	0.44	<0.50	<1.0	<1.0	1.67	0.47	<1.0	<1.0	<1.0	<1.0
Copper	µg/L	11.6	17.6	14.1	10.8	11.7	17.1	23.0	6.7	10.5	4.8
Iron	µg/L	523	354	146	286	442	807	169	375	254	223
Manganese	µg/L	100	92.2	96.0	83.2	123	96.1	110	117	79.6	76.2
Nickel	µg/L	2.9	2.3	<5.0	<5.0	7.0	3.4	<5.0	<5.0	<5.0	<5.0

5.5 Volatile and Semi-Volatile Compounds

The RDN completes annual testing of effluent for the following volatile and semi-volatile compounds:

Benzene	Dichloromethane	1,1-1 Trichloroethane
Chloroform	Di-n-butyl phthalate	1,1-2 Trichloroethane
Chloromethane	Ethylbenzene	Trichloroethylene
Di(2-ethylhexyl) phthalate	PCBs	Toluene
Dichlorobromomethane	Tetrachloroethylene	Total Phenols

A composite sample of the effluent is collected over a 24-hour period in September (a low flow month) each year and is tested by an external laboratory. In 2024, volatiles were sampled on September 3 (refer to Appendix D for test results). The historical average concentration of the volatile and semi-volatile compounds is summarised in Table 13.

In 2024, the external laboratory only analyzed BTEX (benzene, ethyl benzene, toluene, and xylene compounds) and not the volatile compound group due to an oversight in the sample request. The volatile compound parameters will be requested in future years.

Data from 2024 are consistent with previous years for parameters tested.

Table 13. Historical Trends: Effluent Semi Volatile and Volatile Compounds

Compound	Units	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Benzene	µg/L	<0.5	<0.40	<0.40	1.0	<0.5	<0.40	<0.40	<0.40	<0.40	<0.40
Chloroform	µg/L	<1	<1.0	1.5	1.2	<1.0	1.4	1.2	1.2	1.1	-
Chloromethane	µg/L	<1	<1.0	<1.0	<1.0	NT	<1.0	<1.0	<1.0	<1.0	-
Dichlorobromomethane	µg/L	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Dichloromethane	µg/L	<1	<2.0	<2.0	<2.0	<3.0	<2.0	<1.0	<2.0	<2.0	-
Ethylbenzene	µg/L	<0.5	<1.0	<0.40	<0.40	<1.0	<0.40	<0.40	<0.40	<0.40	<0.40
Tetrachloroethylene	µg/L	<1	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.40
Toluene	µg/L	<0.5	<0.40	<0.40	1.7	<1.0	<0.40	<0.40	<0.40	<0.40	<0.40
Total Phenols	mg/L	0.010	0.005	0.016	0.025	0.0087	0.0082	0.0033	0.0039	<0.0015	0.0021
1,1,1-Trichloroethane	µg/L	<1	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	-
1,1,2-Trichloroethane	µg/L	<1	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	-
Trichloroethylene	µg/L	<1	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	-
Di(2-ethylhexyl)phthalate	µg/L	<0.20	<2.0	<2.0	<2.0	<1.0	<8.0	<2.0	<2.0	<2.0	-
Di-N-Butyl Phthalate	µg/L	<0.2	<2.0	<2.0	<0.80	<1.0	<8.0	<2.0	<2.0	<2.0	-
PCBs	µg/L	<0.009	<0.050	<0.050	<0.050	<0.050	<0.050	<0.056	<0.056	<2.5	<0.050

6) Biosolids

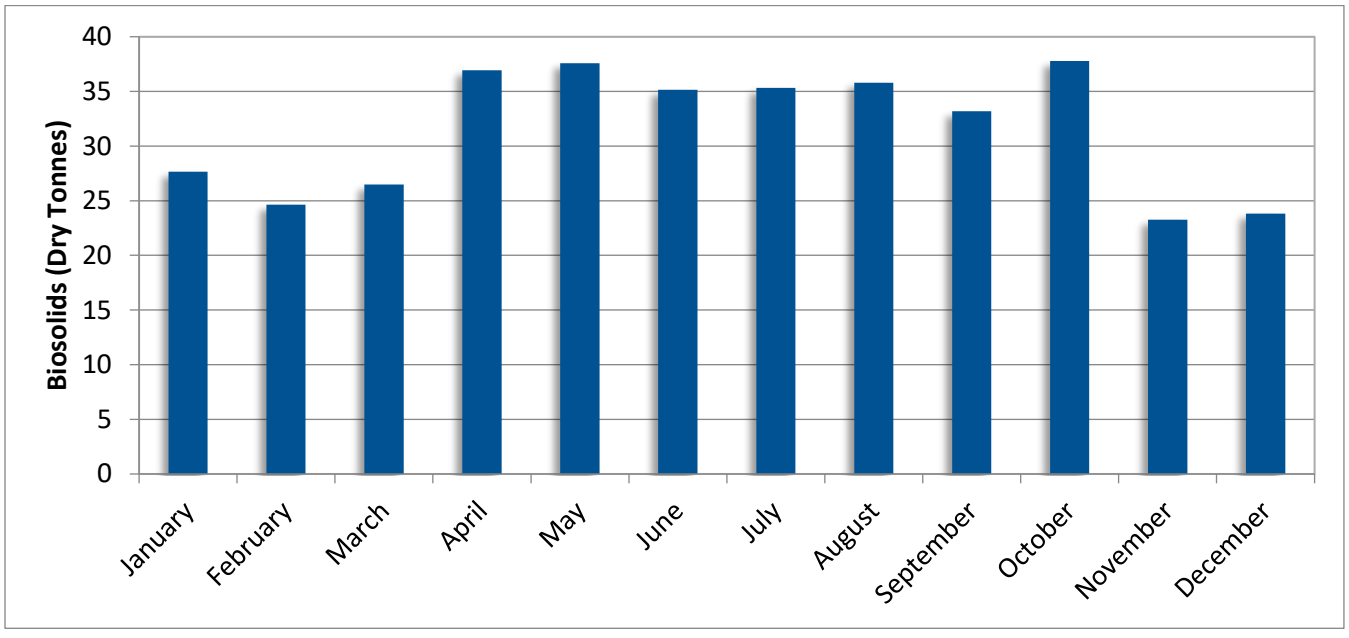
6.1 Biosolids Production

FCPCC produces Class A biosolids. The average monthly production of biosolids in 2024 is summarized in Table 14 and graphed in Figure 7.

Table 14. 2024 Biosolids Production

Month	Trucked Biosolids (Dry Tonnes)	Trucked Biosolids (Wet Tonnes)	Total Solids (%)
January	27.65	83.6	33.1
February	24.6	66.1	37.3
March	26.5	84.0	31.5
April	36.9	91.0	40.6
May	37.6	106.0	35.4
June	35.1	78.9	44.5
July	35.3	102.8	34.4
August	35.8	105.5	33.9
September	33.2	103.4	31.8
October	37.8	112.2	33.7
November	23.3	73.3	31.8
December	23.8	67.0	35.6
Average	**31.5**	**89.5**	**35.2**
Total	**378**	**1,074**	

Figure 7. 2024 Monthly Biosolids Production (Trucked Dry Tonnes)



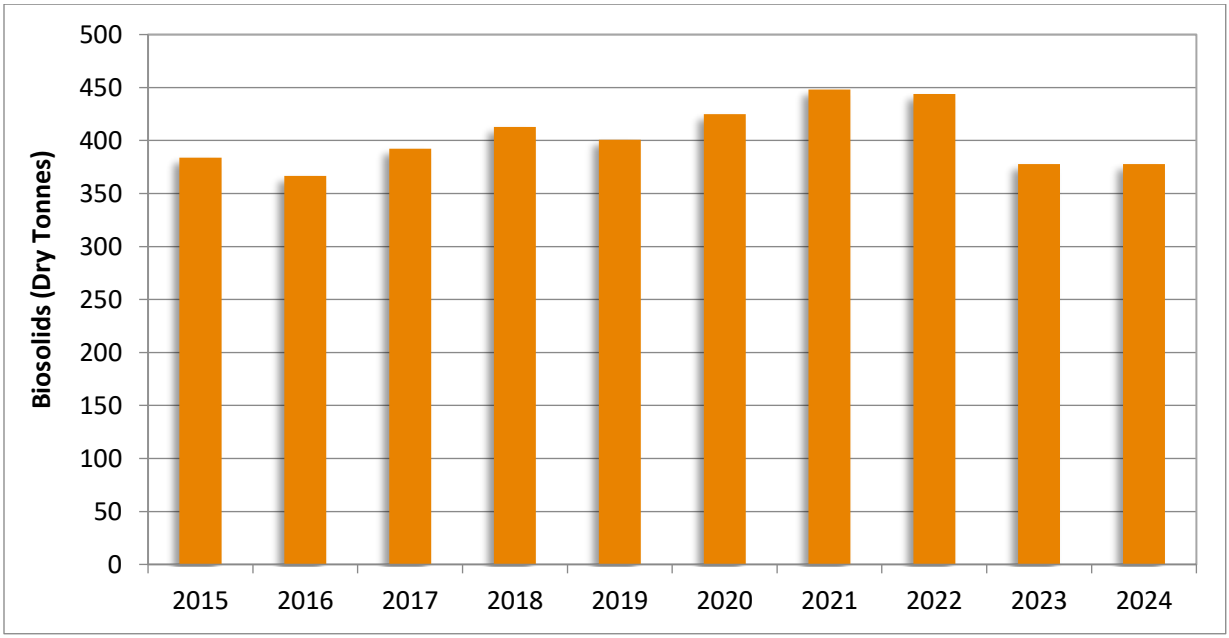
6.1.1 Historical Trends

Historical average polymer usage, total trucked biosolids (wet tons and dry tons) and yearly average percent solids of the biosolids are summarized in Table 15 and graphed in Figure 8. Biosolids production (dry tonnes) was in the range seen over the last ten years.

Table 15. Historical Trends: Biosolids Production

Year	Polymer Usage (Kg/year)	Trucked Biosolids (Dry Tonnes/year)	Trucked Biosolids (Wet Tonnes/year)	Total Solids (%)
2015	6,566	384	1,298.93	29.5
2016	5,867	367	1,188.66	30.8
2017	4,860	392	1,260.32	31.1
2018	5,610	413	1,286.52	32.1
2019	5,481	401	1,255.85	31.9
2020	6,383	425	1,280.71	33.2
2021	4,815	448	1,299.19	34.5
2022	5,108	444	1,291.03	34.4
2023	5,618	378	1,124.71	33.6
2024	6,568	378	1,073.71	35.2

Figure 8. Historical Trends: Biosolids Production per Year (Trucked Dry Tonnes)



6.2 Biosolids Analysis

The Organic Matter Recycling Regulation (OMRR) requires that sampling for quality criteria must be taken once per year or from every 1,000 tonnes dry weight, whichever occurs first.

Sampling to meet requirements of the soil fabrication program is conducted by SYLVIS Environmental Services (SYLVIS). For more information on this sampling, please refer to Appendix H.

The RDN also conducts a program to test FCPCC biosolids for quality criteria. Testing for the following parameters is conducted twice a year by an external laboratory.

Total Solids	Chromium*	Molybdenum*
Volatile Suspended Solids	Cobalt*	Nickel*
Moisture	Copper*	Phosphorus
Total Kjeldahl Nitrogen	Iron	Potassium
Arsenic*	Lead*	Selenium*
Cadmium*	Mercury*	Zinc*

*Monitoring required by the Organic Matter Recycling Regulation (OMRR).

Biosolids were tested in January and July 2024 (see Appendix D for test reports). The average concentration of these parameters, reported over previous years, is summarised in Table 16. Metal concentrations in 2024 were consistent with data from previous years.

All FCPCC biosolids samples in 2024 met the OMRR Class A regulatory limits for metals.

Table 16.: Historical Trends: Biosolids General Parameters

												OMRR Regulatory Limits	
Parameter	**Units**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**Class A**	**Class B**
Total Solids	%	25.5	26.6	29.8	30.8	31.5	32.4	33.7	35.7	31.0	32.4	-	-
Volatile Solids	%	76.9	75.75	70.2	72.9	71.5	74.35	72.45	76.5	71.8	75.4	-	-
Moisture	%	74.5	69.65	69	69.5	68.5	67.8	66	64.5	69	68.0	-	-
Total Kjeldahl Nitrogen	% dry weight	4.875	4.97	5.7	5.7	6.6	3.86	5.5	4.35	4.65	6.00	-	-
Arsenic	µg/g	2.1	2.8	2.8	2.7	3.3	2.1	2.3	2.1	2.2	2.2	75	75
Cadmium	µg/g	1.9	1.9	2.1	1.4	2.1	1.8	1.6	1.3	2.0	1.5	20	20
Chromium	µg/g	19.5	24.5	27.3	27.9	37.9	35.1	37.1	26	27.7	27.0	-	1,060
Cobalt	µg/g	1.6	3.0	4.9	2.9	2.5	2.0	2.5	2.1	2.3	2.3	150	150
Copper	µg/g	733	702.5	807	637	798	620	602.5	531.5	676.5	688	-	2,200
Iron	µg/g	ND	ND	ND	41,400	48,800	37,900	43,800	37,200	31,500	32,600	-	-
Lead	µg/g	15.4	19.2	18.75	21.8	19.3	14.3	13.1	13.45	14.6	14.6	500	500
Mercury	µg/g	1.50	1.60	0.99	0.66	0.80	1.07	0.82	1.21	0.82	1.81	5	15
Molybdenum	µg/g	5.4	5.4	4.7	3.6	4.6	4.9	6.3	5.1	4.3	4.6	20	20
Nickel	µg/g	10.25	12.5	11.7	10.47	14.15	12.95	13.35	10.485	10.77	11.4	180	180
Phosphorus	µg/g	16,900	17,900	25,750	22,800	28,600	21,300	23,850	20,100	19,800	20,300	-	-
Potassium	µg/g	ND	ND	ND	727.5	964.5	759.5	986.5	776.5	833	803	-	-
Selenium	µg/g	4.0	3.9	4.4	3.1	4.2	3.2	3.0	2.8	3.8	4.3	14	14
Zinc	µg/g	880	954.5	1175	890	1,250	1,080	1,110	918	1,270	1,090	1,850	1,850

ND – Not determined

6.3 Fecal Coliforms

OMRR requires seven representative samples for fecal coliforms to be taken every 1,000 tonnes dry weight or once per year, whichever occurs first. The level of fecal coliforms in each Class A sample must be <1000 MPN per gram of total solids (dry weight basis).

SYLVIS, as the Qualified Professional, conducts fecal coliform testing for the soil fabrication program. SYLVIS's results are summarized in the 2024 Management of RDN Biosolids (see Appendix H).

The RDN also conducts its own fecal coliform sampling. Sampling was taken of sludge at a sample point immediately downstream of the ATAD digesters. In 2024, the RDN sent eight representative samples of biosolids to an external laboratory for fecal coliform analysis (see test reports in Appendix D). All the laboratory samples met Class A limits. The geometric mean fecal coliform concentration of the biosolids from the RDN sampling in 2024 was <13 MPN/g (dry weight) and is summarized in Table 17.

Table 17. 2024 FCPCC Biosolids Fecal Coliforms Concentrations

Parameter	Fecal Coliforms (MPN / g dry)
8-Jan-24	<20
11-Mar-24	<20
9-Apr-24	<20
6-May-24	<20
9-Jul-24	<5.4
21-Aug-24	<18
4-Sep-24	<6.5
16-Oct-24	<9.1
Geometric Mean	**<13**

6.4 Stabilization and Dewatering

Biosolids at FCPCC are stabilized using autothermal thermophilic aerobic digesters (ATADs). The ATADs consist of 4 digesters and 3 cooling storage cells which treat sludge collected from the bottom of the sedimentation tanks. Sludge is held in the tanks for 10 to 12 days at 45 to 65°C, during which time it is decomposed and stabilized by biological processes. Once digested, the stabilized sludge is dewatered through a centrifuge, resulting in biosolids with a moist, soil-like consistency. Significant pathogen reduction is achieved in the ATAD tanks, which create Class A biosolids (defined according to OMRR parameters). Stabilization and dewatering process data are presented in Tables 18 and 19.

Volatile Solids Reduction was determined using sampling points from the sludge entering and existing the ATADs. In previous years, Volatile Solids Reduction was determined from samples in ATAD 3 and ATAD 6. Average Volatile Solids Reduction for 2024 is presented below.

Table 18. Stabilization Process Data

Total Mass of Sludge Delivered for Stabilization	102,522 Tonnes (dry)
% of TSS as VSS in Sludge Feed	85.0 %
Mass of Biosolids Remaining after Stabilization	483.1 Tonnes (dry)

Table 19. Dewatering Process Data

Volume of Biosolids delivered for dewatering	17,418 m^3
Average Volatile Solids Reduction	51.81 %
% solids in biosolids dewatering feed	2.77 %
% solids in dewatered biosolids	35.2 %
Polymer dosage to aid dewatering	0.377 kg/m^3

6.5 Biosolids Management

In 2024, FCPCC Class A biosolids were used in a soil fabrication program. This program operates in partnership with Harmac Pacific (Harmac) at their kraft mill site in Nanaimo. There, RDN biosolids, wood waste, and mineral soil are blended to fabricate soil for cover material for the Harmac landfill during its landfill closure activities as well as a commercial grade biosolids growing medium (BGM). More details of the soil fabrication program are provided in the Annual Summary of 2024 Management of Regional District of Nanaimo French Creek Pollution Control Centre Biosolids, completed by SYLVIS Environmental, and attached in Appendix H.

6.5.1 Excellence in Biosolids Award

In 2019, the Regional District of Nanaimo won the Northwest Biosolids 'Excellence in Biosolids' Award for the second time. This award presented by Northwest Biosolids recognizes significant contributions to the development and implementation of cost-effective and environmentally beneficial biosolids management practices. The RDN won this award previously in 2013.

7) Process Control Monitoring

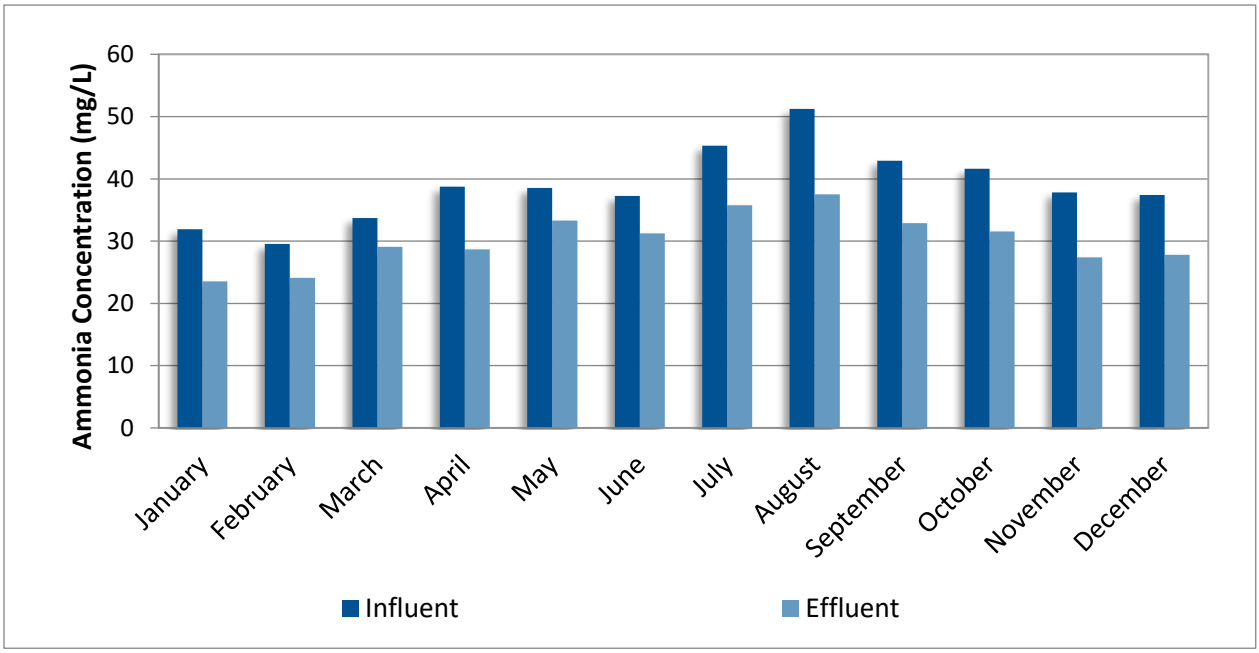
7.1 Ammonia

Ammonia is one of the typical constituents of domestic wastewater. Ammonia can be toxic to fish (freshwater and marine) and is monitored to determine potential impacts to the receiving environment. Ammonia is tested in the influent and effluent weekly. The average ammonia concentration in 2024 in the influent and effluent was 38.8 mg/L and 30.2 mg/L, respectively. Appendix B contains the weekly Ammonia test data for FCPCC for 2024. Results are summarized in Table 20 and Figure 9.

Table 3. 2024 Influent & Effluent Ammonia Concentration

Month	Influent Average Ammonia (mg/L)	Effluent Average Ammonia (mg/L)	% Reduction
January	31.9	23.5	26.3%
February	29.5	24.1	18.5%
March	33.7	29.1	13.6%
April	38.7	28.7	26.0%
May	38.5	33.3	13.6%
June	37.3	31.3	16.1%
July	45.3	35.8	21.1%
August	51.2	37.5	26.8%
September	42.9	32.9	23.4%
October	41.6	31.6	24.2%
November	37.8	27.4	27.5%
December	37.4	27.8	25.8%
Average	**38.8**	**30.2**	**21.9%**

Figure 9. 2024 Influent & Effluent Monthly Average Ammonia Concentration



7.2 96-Hour Rainbow Trout Toxicity Test

This test, or bioassay, determines the toxicity of a material by studying the reaction of a living organism exposed to it. An LC_{50} 96-hour test is the accepted method to determine the toxicity of water and wastewater. This means the lethal concentration at which 50% of test organisms die within 96 hours. The result is given as a percentage, referring to the amount of effluent, in relation to dilution water, used in the test. A toxicity test of 100% is not acutely toxic. The lower the toxicity result (expressed as a percentage) the more acutely toxic the effluent.

To meet requirements of the *Wastewater Systems Effluent Regulation*, annual testing is completed in September by an external laboratory. Appendix D contains the laboratory test results. The result for 2024 was >100% based on a sample from September 24, 2024.

7.2.1 Historical Trends

Historical effluent toxicity results reported over previous years are summarized in the Table 21.

Table 21 Historical Trends: Effluent LC_{50} Toxicity

Year	Average Effluent LC_{50} Toxicity (%)
2015	>100
2016	90.2
2017	>100
2018	90.2
2019	>100
2020	>100
2021	>100
2022	>100
2023	>100
2024	>100

7.3 Nitrate, Nitrite, Alkalinity

Wastewater Services' staff conduct weekly testing of the effluent for nitrate, nitrite, and alkalinity. The average monthly concentration is summarized in Table 22 and graphed in Figures 10 and 11.

Table 22. Effluent Nitrate, Nitrite, and Alkalinity

Month	Effluent Average Nitrate (NO_3) (mg/L)	Effluent Average Nitrite (NO_2) (mg/L)	Effluent Average Alkalinity (mg/L)
January	3.00	0.693	190
February	3.23	0.508	196
March	1.64	0.745	192
April	1.56	0.519	224
May	1.25	0.784	238
June	3.39	1.72	204
July	1.88	0.998	171
August	1.57	1.93	162
September	4.05	1.24	181
October	2.61	1.45	203
November	2.78	1.32	164
December	1.92	1.16	170
Average	**2.42**	**1.05**	**192**

Figure 10. 2024 Effluent Nitrate and Nitrite Monthly Average Concentration

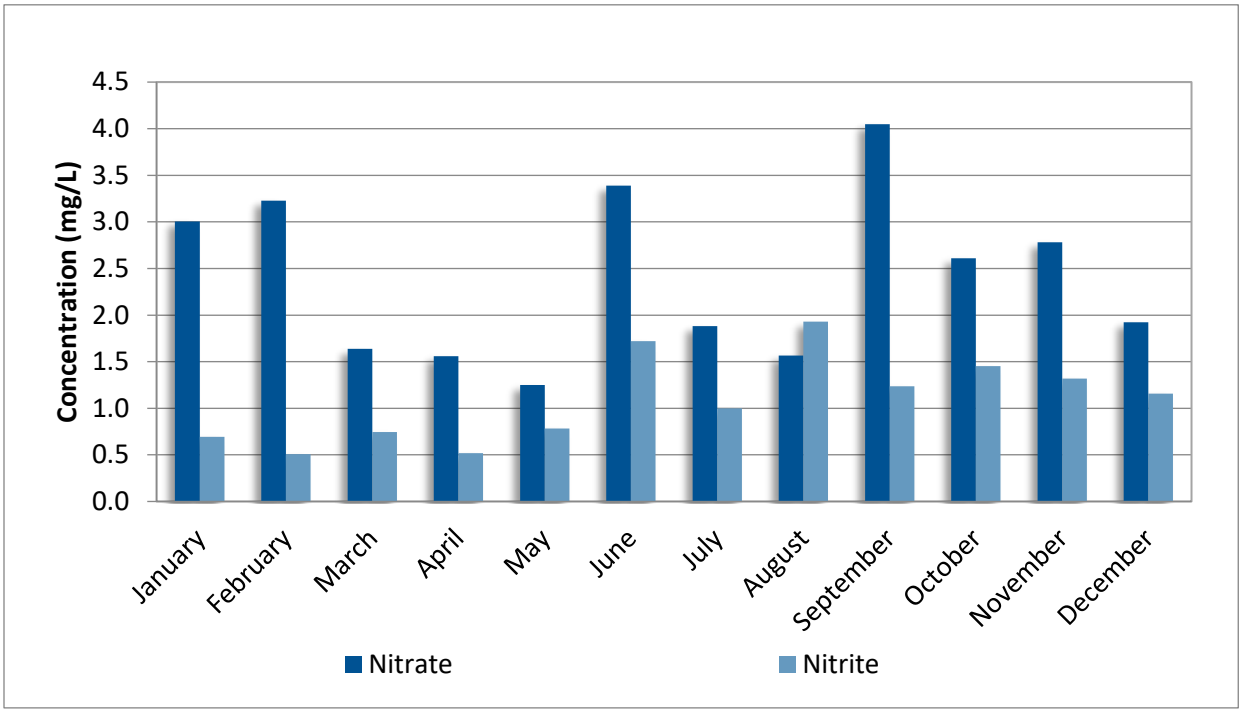
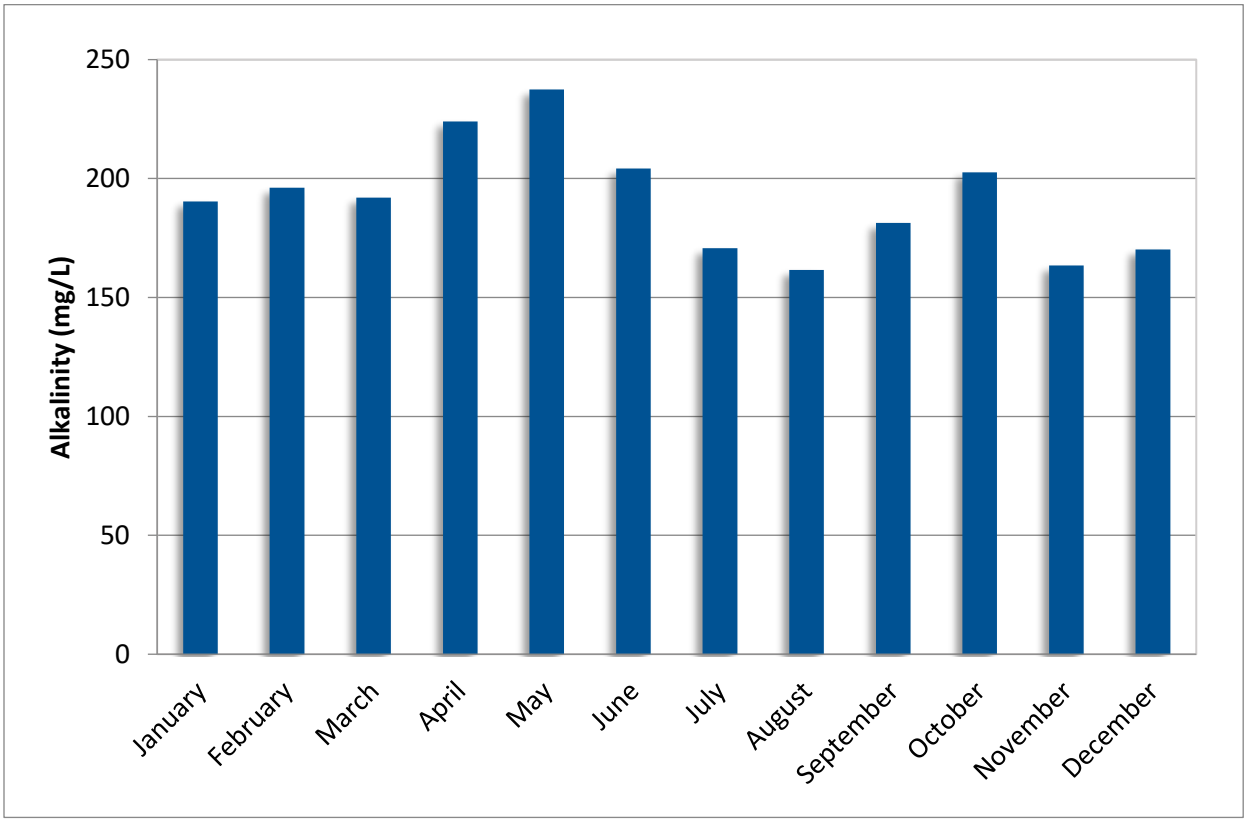


Figure 11. 2024 Effluent Alkalinity Monthly Average



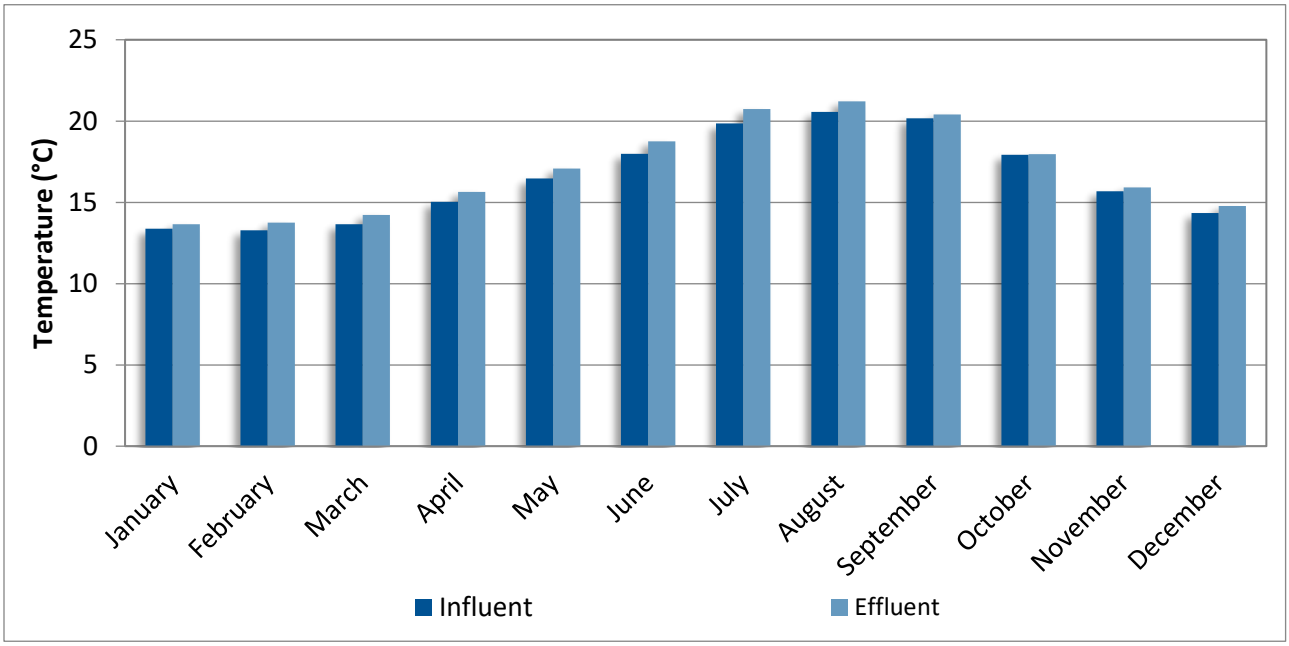
7.4 Temperature

Wastewater Services staff monitor the temperature of the influent and effluent daily. Temperature data for 2024 are presented in Appendix B. The average monthly temperature is summarized in Table 23 and graphed in Figure 12.

Table 23. 2024 Influent & Effluent Temperatures

Month	Average Temperature (°C)	
	Influent	Effluent
January	13.3	13.8
February	13.0	13.4
March	12.9	13.4
April	13.7	14.3
May	16.5	17.6
June	18.7	19.3
July	19.8	21.0
August	20.4	21.1
September	19.7	19.9
October	18.1	18.1
November	15.9	16.0
December	14.5	15.1
Average	**16.4**	**16.9**

Figure 12. 2024 Influent & Effluent Monthly Average Temperature



7.4.1 Historical Trends

Historical influent and effluent average temperatures reported over previous years are summarized in Table 24. Data from 2024 are consistent with historical data.

Table 24. Historical Trends: Influent & Effluent Average Temperature

Year	Average Temperature (°C)	
	Influent	Effluent
2015	16.9	17.4
2016	16.7	17.2
2017	16.1	16.6
2018	16.3	16.9
2019	16.1	16.6
2020	16.0	16.5
2021	16.7	16.9
2022	16.1	16.8
2023	16.4	16.9
2024	16.4	16.9

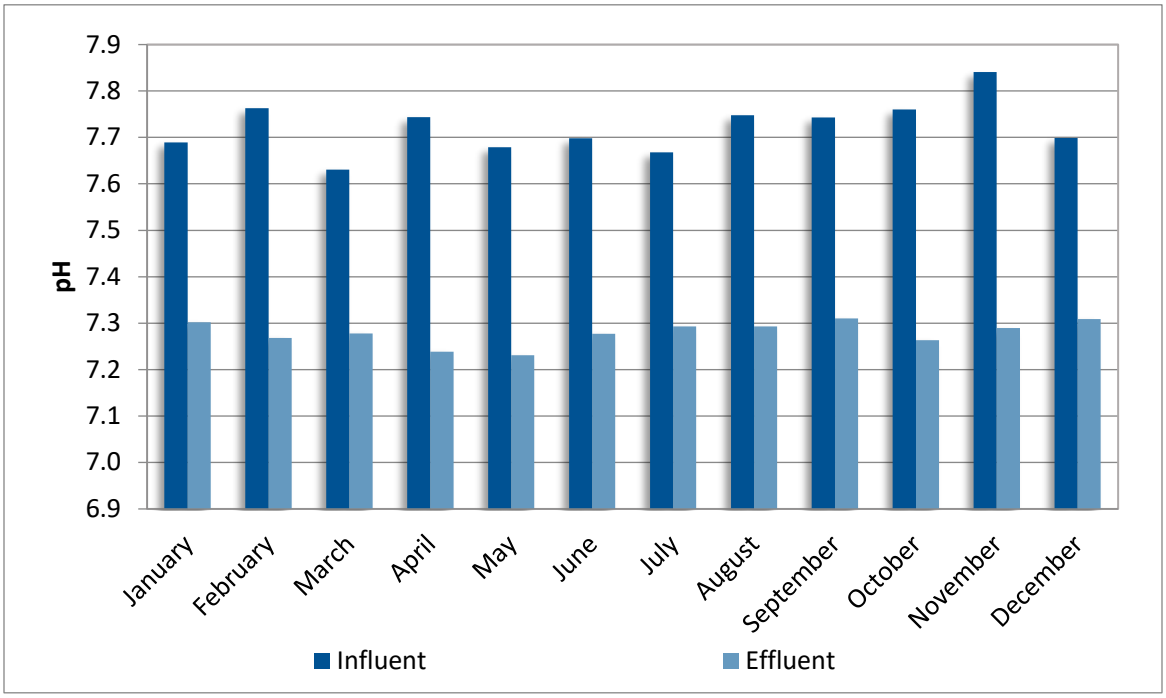
7.5 pH

Grab samples of the influent and effluent are monitored for pH daily. The pH data for FCPCC for 2024 are presented in Appendix B, the average monthly pH data are summarized in Table 25 and Figure 13.

Table 25. 2024 Influent & Effluent Average pH

Month	Average pH	
	Influent	Effluent
January	7.69	7.30
February	7.76	7.27
March	7.63	7.28
April	7.74	7.24
May	7.68	7.23
June	7.70	7.28
July	7.67	7.29
August	7.75	7.29
September	7.74	7.31
October	7.76	7.26
November	7.84	7.29
December	7.70	7.31
Average	**7.72**	**7.28**

Figure 13. 2024 Influent & Effluent Monthly Average pH



7.5.1 Historical Trends

Historical average influent and effluent pH values reported previous years are summarized in Table 26. Data from 2024 are consistent with historical data.

Table 26. Historical Trends: Influent & Effluent pH

Year	Average pH	
	Influent	Effluent
2015	7.79	7.07
2016	7.84	7.22
2017	7.68	7.35
2018	7.67	7.35
2019	7.72	7.34
2020	7.59	7.30
2021	7.61	7.31
2022	7.62	7.24
2023	7.69	7.24
2024	7.72	7.28

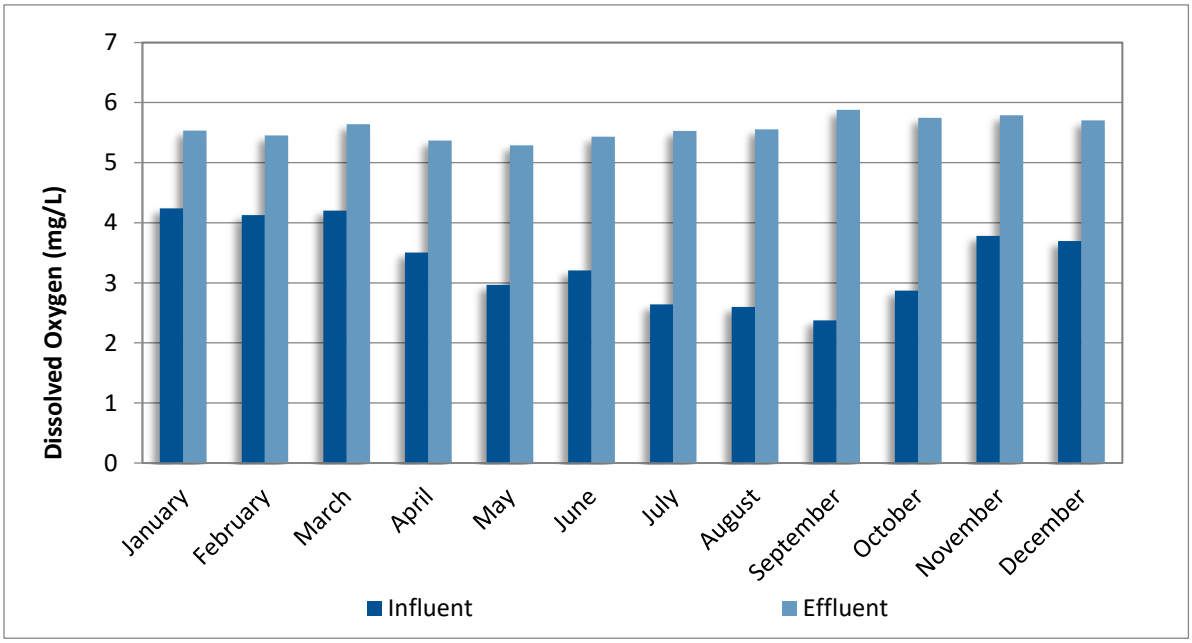
7.6 Dissolved Oxygen

The dissolved oxygen (DO) of the influent and effluent is measured daily. The average monthly DO concentrations are summarized in Table 27 and graphed in Figure 14.

Table 27. 2024 Influent & Effluent Dissolved Oxygen Concentration

Month	Average Dissolved Oxygen (mg/L)	
	Influent	Effluent
January	4.24	5.54
February	4.13	5.45
March	4.20	5.64
April	3.50	5.37
May	2.96	5.29
June	3.21	5.43
July	2.64	5.53
August	2.60	5.55
September	2.37	5.88
October	2.87	5.75
November	3.78	5.79
December	3.70	5.70
Average	**3.35**	**5.58**

Figure 14. 2024 Influent & Effluent Average Dissolved Oxygen Concentration



7.6.1 Historical Trends

Historical influent and effluent average DO concentration are summarized in Table 28. Data from 2024 are consistent with historical data.

Table 28. Historical Trends: Influent & Effluent Dissolved Oxygen Concentration

Year	Average Dissolved Oxygen (mg/L)	
	Influent	Effluent
2015	3.26	5.11
2016	2.62	4.25
2017	3.44	4.91
2018	3.45	5.01
2019	3.08	5.20
2020	3.36	5.51
2021	2.99	5.32
2022	3.05	5.92
2023	3.30	5.39
2024	3.51	5.58

8) Resource Consumption

8.1 Chemical Consumption

Table 29 summarizes the cost of chemicals used in the treatment process in 2024.

Table 29. 2024 Chemical Consumption

Chemical	FCPCC Usage (%)	Consumption	Units	Cost ($)*	Use
Dry Polymer	100%	6,567	Kg	$63,141	Dewatering
Liquid Polymer	100%	3,904	Kg	$30,878	Residual Sludge Thickening
Secondary Polymer	100%	379	kg	$2,351	Secondary Polymer
Ferrous Chloride	100%	87,255	kg	$45,198	Odour Control
Sodium Hypochlorite	100%	23,550	L	$22,709	Reclaimed Service Water
Other				$19,226	Odour Control (Chemical Scrubber)
Total				**$183,503**	

8.1.1 Historical Trends

Annual costs of chemicals consumed in over the last ten years are summarised in Table 30. Pricing has increased since 2020 due the market trends and supply chain issues.

Total cost decreased in 2024 due to a reduction in ferrous chloride consumption.

Table 30. Historical Trends: Chemical Costs

Year	Dewatering Polymer	Thickening Polymer	Secondary Polymer	Caustic Soda	Ferrous Chloride	Sodium Hypochlorite	De-Odorizer	De-Foamer	Hydrogen Peroxide	Actizyme	Other	Total
2015	$42,680	$14,978	$3,375	$7,241	$9,021	$12,348	$1,820	$5,146	-			**$96,608**
2016	$38,137	$13,627	$9,563	$7,260	$13,015	$10,149	$0	$0	-			**$91,752**
2017	$31,592	$16,288	$15,754	$393	$15,976	$11,673	$2,018	$2,759	-			**$96,453**
2018	$36,467	$21,980	$133	$1,726	$20,798	$15,899	$1,995	$1,576	-			**$100,574**
2019	$35,628	$28,071	-	$2,060	$19,974	$34,576	-	-	$1,862			**$122,172**
2020	$41,488	$27,510	-	$879	$20,696	$24,608	-	-	$3,724			**$118,905**
2021	$32,982	$25,279	-	$7,469	$23,765	$32,923	-	$3,991	-			**$126,409**
2022	$45,050	$25,824	-	$8,091	$52,306	$42,408	-	$4,026	-	$4,463		**$182,168**
2023	$53,648	$35,620	-	$1,601	$80,921	$27,919	-	-	-	$4,463	$7,475	**$211,647**
2024	$63,141	$30,878	$2,351	-	$45,198	$22,709	-	-	-	-	$19,226	**$183,503**

Note: In 2014, use of ferrous chloride was discontinued at Hall Road pump station. Due to a corrosion of the ferrous chloride tank at Bay Avenue pump station, ferrous was only delivered to FCPCC since 2017. In 2024, ferrous chloride was only added to the process at FCPCC.

8.2 Electrical Consumption

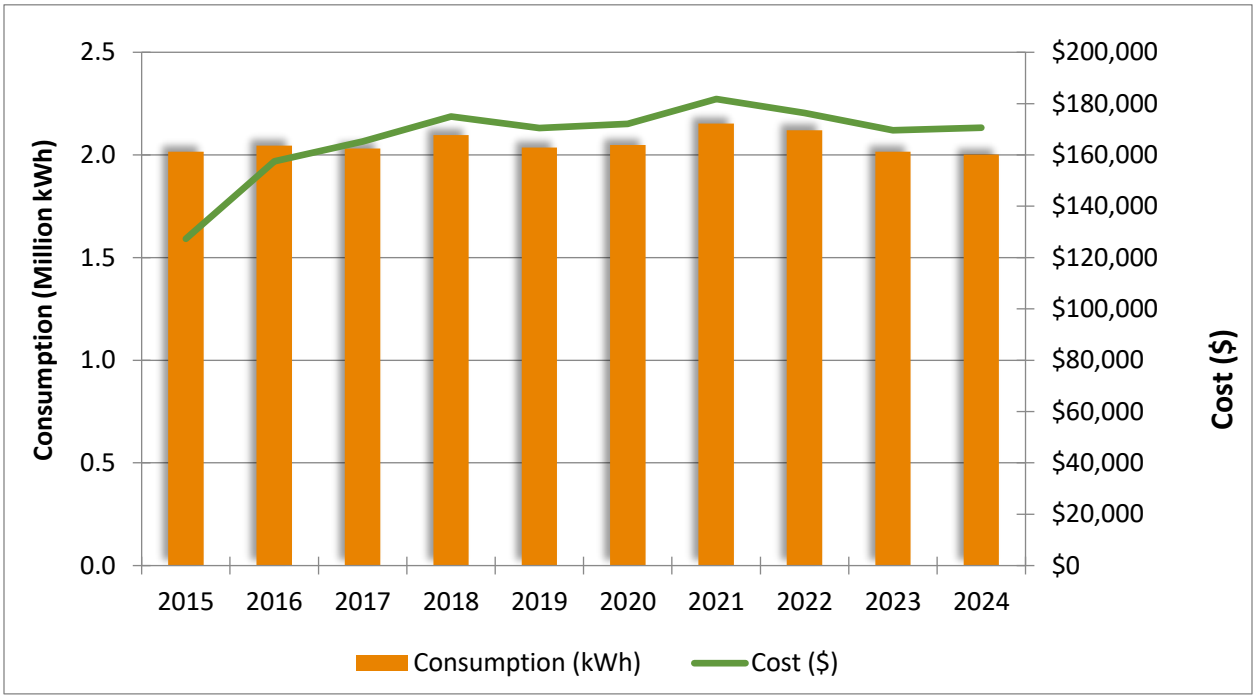
Historical annual electrical consumption and costs are summarised in Table 31 and graphed in Figure 15. Note: this section reports electrical consumption at the treatment plant only (pump stations are excluded). The cost of electricity excludes federal and provincial taxes.

Table 31. Historical Trends: FCPCC Electrical Consumption

Year	Consumption (kWh)	Cost ($)
2015	2,014,928	$127,321
2016	2,044,800	$157,473
2017	2,031,840	$165,277
2018	2,097,360	$174,964
2019	2,035,440	$170,450
2020	2,048,974	$172,096
2021	2,152,216	$181,784
2022	2,120,888	$176,288
2023	2,015,041	$169,614
2024	2,002,149	$170,553

Note: Electrical consumption at the treatment plant only (pump stations are excluded).

Figure 15. Historical Trends: FCPCC Electrical Consumption and Costs (Treatment Plant Only)



8.3 Water Consumption

Water consumption at FCPCC for 2024 was estimated at 4,778 m^3 using water invoices. Table 32 contains the water consumption records over the last eight years. There have been considerable decreases in water consumption due to proactive water monitoring and increased use of reclaimed water in treatment processes. Water use has declined due to a new technology to pressurize the seals on pumps using air pressure and water as opposed to constant water flow. Note: this is water consumption at the treatment plant only (pump stations are excluded).

Table 32. Historical Trends: FCPCC Water Consumption

Year	Consumption (m^3)
2015	5,109
2016	4,575
2017	2,013
2018	4,894
2019	6,160
2020	4,815
2021	4,356
2022	2,324
2023	1,937
2024	4,778

9) Odour

Odours at the FCPCC were a significant concern prior to 2000, and considerable progress has been made in reducing odours at the FCPCC facility. The odour control system at FCPCC now includes two bioscrubbers, one chemical scrubber, and one biofilter.

Wastewater staff continues to monitor the effectiveness of odour control initiatives to ensure the impacts to neighborhoods adjacent to the plant are minimized. The RDN acknowledges the assistance and input from residents in addressing air quality issues around the FCPCC.

9.1 Operational Procedures

Wastewater that enters FCPCC is primarily from domestic sources. Tourism in the summer months increases the flows to the treatment plant, as well as results in more solids. Winter flows are higher, but the solids concentration is lower during this time. TSS and $cBOD_5$ are measured in the influent and effluent to determine the strength of the wastewater. A higher strength of wastewater in the summer appears to correlate to a higher level of odours throughout the treatment plant.

Influent and effluent temperatures increase during the summer months, thereby also increasing odours. Increased temperature releases additional gas and vapour into the atmosphere causing odours. As a result, odour reports increase in the summer.

The FCPCC staff have a schedule of routine duties that have an impact on odour mitigation. Some duties include skimming scum from the clarifiers, hosing/cleaning, checking odour control systems to ensure they are operating as intended, and monitoring ferrous chloride dosage. In 2020, the media for the bio-filters was replaced. In 2022, repairs were made to the trickling filter piping which have significantly reduced the number of odour concerns. In 2023, repairs were also completed to the chemical scrubber and replacement of dewatering biofilter media was completed.

9.2 Odour Concerns

The most common sources of odours at wastewater treatment plants are ammonia and hydrogen sulfide gases. At FCPCC, more odour reports are typically received in the summer months due to septage dumping (septic trucks) and higher temperatures resulting in increased biological activity. The concentration of hydrogen sulfide gas in the influent also increases in the summer months.

Odour concerns received at FCPCC are routinely recorded on a form and entered into the department's Environmental Management System. The location of the odour, time of day, weather conditions, and current activities at the plant are noted along with the report. Through this system, the Chief Operator and Senior Operator are notified of all reports within 24 hours.

In previous years, many of the odour reports were mistaken as odours from FCPCC but were due to odours from herring roe. Herring spawn along the beaches near FCPCC in the spring and the rotting of these eggs later in the season produces strong odours near the treatment plant. There were no roe odour complaints in 2024.

The number of odour reports decreased after 2021 compared to previous years. This is attributed to the replacement of the media in the biofilters in 2020 and the trickling filter piping repair in 2022.

Appendix E contains further information on the 20 odour reports received in 2024.

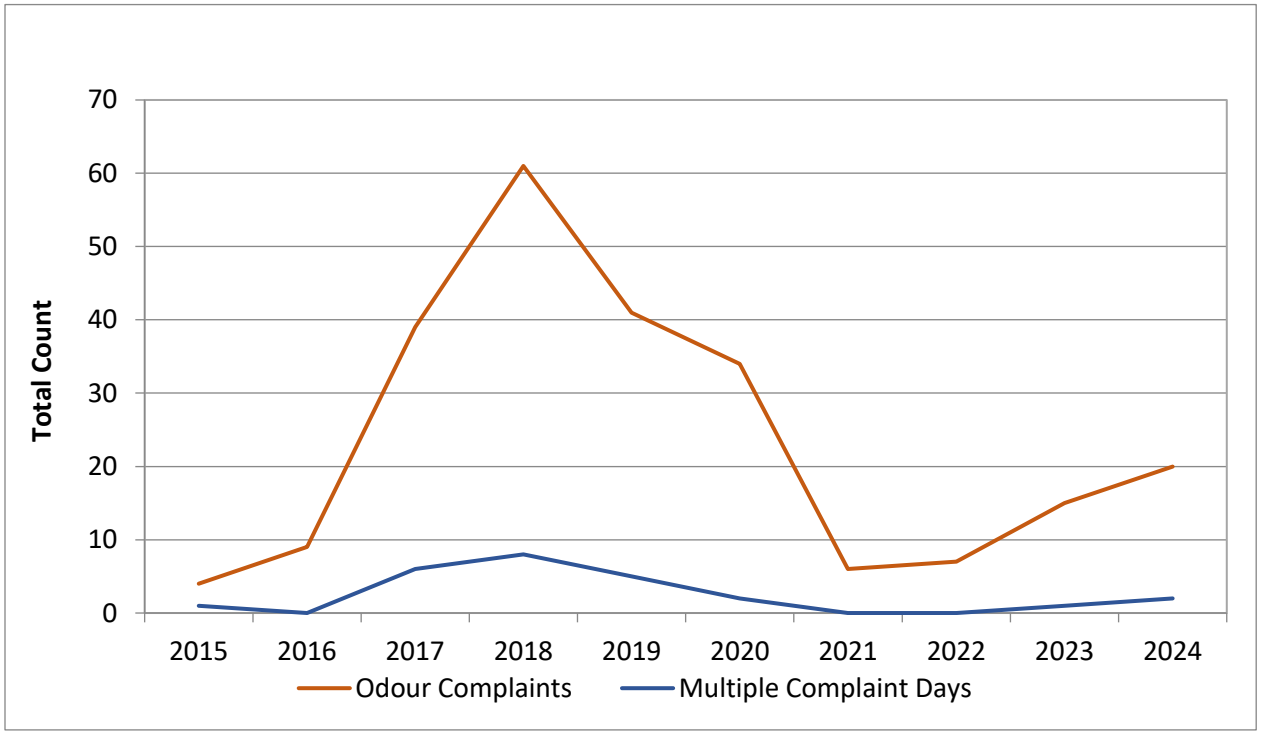
9.2.1 Historical Trends

The odour reports over the last 10 years are summarized in Table 33 and graphed in Figure 16.

Table 33. Historical Trends: FCPCC - Number of Odour Reports

Year	Odour Complaints	Multiple Complaint Days
2015	4	1
2016	9	0
2017	39	6
2018	61	8
2019	41	5
2020	34	2
2021	6	0
2022	7	0
2023	15	1
2024	20	2

Figure 16. Historical Trends: FCPCC Odour Reports



9.3 Odour Episodes

An odour episode is a disruption in the regular operation of the treatment plant that may cause odour. Several odour episodes were identified in the records (see Appendix F):

- Transferring sludge between ATADs to adjust digestion temperatures may have contributed to an odour concern in April.

- A contributing factor to another odour concern in April was filling one of the primary sedimentation tanks.
- An odour concern in June was attributed to maintenance on the ATAD ducting.
- An odour concern in June may have been related to a project to line the FCPCC influent pipe.

9.4 Future Plans

Wastewater staff will continue to monitor the effectiveness of odour control initiatives to ensure that the impacts on adjacent neighborhoods are minimized.

The RDN has been working in partnership with Vancouver Island University (VIU) researchers to identify, locate, and monitor sources of odours near FCPCC. Monitoring at FCPCC was ongoing in 2024 and identified several odour control systems at FCPCC which could be made more efficient. The design of the expansion project will incorporate the monitoring results. The RDN has also established a long-term agreement with VIU for an odour monitoring program.

The FCPCC Expansion and Odour Control Upgrade is scheduled to start construction in 2025. The project will include significant odour control upgrades at the existing plant and the expansion site.

10) Septage Receiving

The total combined volume of Septage and Pump & Haul discharged in 2024 was 2,736,830 Imperial gallons (12,442 m^3). This volume does not include discharge of NBPCC sludge to FCPCC. These volumes are tabulated in the 2024 NBPCC Annual Report.

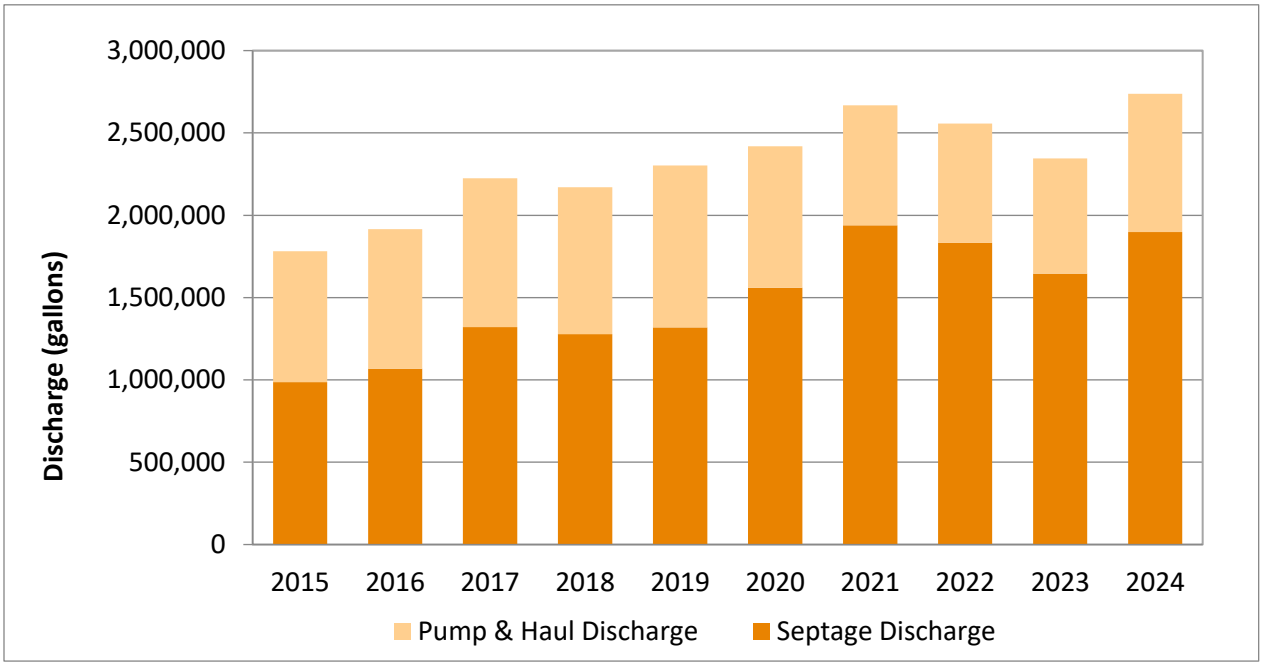
10.1 Historical Trends

The volumes of Septage and Pump & Haul waste discharged over the past ten years are summarised in Table 34 and graphed in Figure 17. The volume received has shown an increasing trend. The volume peaked in 2021 and has been gradually decreasing since then. This is likely related to better tracking of volumes discharged due to the installation of a septage meter.

Table 34. Historical Trends: Septage and Pump & Haul Discharged at FCPCC

Year	Total Septage (Imperial Gallons)	Total Pump & Haul (Imperial Gallons)	Combined Total (Imperial Gallons)	Combined Total (m^3/year)
2015	986,594	795,197	1,781,791	8,100
2016	1,067,458	847,500	1,914,958	8,706
2017	1,320,987	903,700	2,224,687	10,114
2018	1,277,508	893,594	2,171,102	9,870
2019	1,318,518	984,713	2,303,231	10,471
2020	1,559,241	859,025	2,418,266	10,994
2021	1,938,308	729,999	2,668,307	12,130
2022	1,831,525	726,302	2,557,827	11,628
2023	1,645,958	699,183	2,345,141	10,661
2024	1,898,526	838,304	2,736,830	12,442

Figure 17. Historical Trends: Annual Septage and Pump & Haul Waste Discharged at FCPCC



11) Contributory Population and Remaining Plant Capacity

The current FCPCC plant operating capacity is designed for an average daily flow of 12,000 m^3/day, with a maximum daily flow capacity of 18,360 m^3/day. Wastewater Services continues to install new equipment and upgrade existing technology to ensure the future carrying capacity of the treatment plant is adequate and permit levels are not exceeded.

In 2024, the combined average daily flow from FCPCC was 10,844.0 m^3/day with a maximum daily discharge of 17,777.4 m^3/day. The estimated population serviced in 2024 was 29,738 with a projected annual growth rate of approximately 1.39 %.

The LWMP states that FCPCC will likely need to be expanded between 2018 and 2025. In 2017, the RDN commissioned a preliminary design study to evaluate expansion options for FCPCC. The Integrated Project Delivery Project Validation for the FCPCC Stage 4 expansion and Odour Control Upgrades was ongoing in 2024. Construction is planned for 2025.

12) Environmental Incidents

As part of the RDN's ISO 14001 Environmental Management System certification, records are maintained regarding any environmental incidents that are associated with the RDN's wastewater infrastructure and treatment facilities including spills, leaks, and fires. Environmental incidents may be related to spills, leaks, or fires from the treatment plant, gravity sewer interceptor and forcemains conveying wastewater to FCPCC.

On December 26, 2024, due to heavy flows entering the treatment and the inability of effluent pumps to pump effluent through the outfall fast enough, effluent levels backed up and started to spill in the outside door of the Waste Biological Sludge (WBS) building and outside to the soil berm. The estimated volume of this spill was 200 L. The contaminated soil was cleaned up. This spill was reported to ENV.

More information on this Environmental Incident can be found in Appendix F.

13) Conditional Management Plan

On May 1, 2012, the RDN entered into a Conditional Management Plan (CMP) agreement with the Canadian Food Inspection Agency, Environment Canada, Fisheries and Oceans Canada, and the British Columbia Ministry of Environment (now Ministry of Environment and Parks). The CMP was renewed several times, with the current agreement expiring January 31, 2028.

The CMP has these key objectives:

- Provides enhanced management of shellfish harvesting in Conditionally Classified Harvest Areas adjacent to FCPCC.
- Outlines the roles and responsibilities of the signatories in the event of a "trigger event," which is a discharge of wastewater to the marine environment from the identified pump stations.

No trigger events occurred in 2024. The 2024 CMP Annual Report in Appendix G provides more information.

14) Upgrades & Major Projects

14.1 Upgrades and Repairs Completed in 2024

- Qualicum Beach Manhole and Joint Repairs
- Bay Avenue Pump Station (Completion of Project)
- Centrifuge #1 Rotating Assembly.

14.2 Studies and Projects Completed in 2024

- FCPCC Stage 4 Expansion and Odour Control Upgrade – Project Validation and Selection of Integrated Project Delivery Team
- ISO 14001:2015 Surveillance Audit
- Federation of Canadian Municipalities Side Stream Ammonia Study
- VIU Odour Monitoring Study (ongoing).

14.3 Upgrades and Repairs Planned for 2025

- Bay Avenue Pump Station – Public Access Improvements
- Ferrous chloride tanks
- Columbia Beach pump replacement (for Utility Services)
- Rotacut Sludge Macerator.

14.4 Studies and Projects Planned for 2025

- FCPCC Stage 4 Expansion and Odour Control Upgrade – Construction
- FCPCC outfall inspection – 3-year cycle
- Review of the Development Cost Charge Bylaw for the Northern Communities
- VIU Odour Monitoring Study (ongoing).

15) Resource Recovery

15.1 Biosolids Reuse

Since 1999, RDN biosolids have been beneficially used in agriculture, landfill closures, mine reclamation, soil fabrication, and forest fertilization. Biosolids management in 2024 is discussed in Section 6.5.

15.2 Effluent Reuse

The reuse of effluent in operational processes at FCPCC has decreased the plant's demand for potable water from the community's supply. Effluent was not used to irrigate Morningstar Golf Course in 2024.

15.3 Solid Waste and Recycling

Wastewater Services has a general recycling program at the treatment plant, initiated as part of the department's Environmental Management System, and continues to recycle metals, plastics, cardboard, waste oils, paints and paint thinners.

16) Education Programs

16.1 Source Control

Source Control Bylaw No. 1730 regulates the discharge of waste into any sewer or drain connected to an RDN sewage facility, including discharges to municipal collection systems. The bylaw provides a process for issuing Waste Discharge Permits and a fee structure based on waste strength and volume. The Bylaw also lists prohibited waste items and has provisions for fees and enforcement.

Trucked Liquid Waste Rates and Regulations Bylaw No. 1732 includes source control provisions including a schedule of prohibited wastes and a schedule of restricted wastes. It also includes enforcement tools.

16.2 Water Conservation

The RDN has a water conservation and outreach program, called Team WaterSmart, for municipalities in the region and electoral areas. The RDN's Board also approved a Water Conservation Plan in 2020. This plan was completed in collaboration with member municipalities.

16.3 Open House

Open houses are occasionally offered at FCPCC to provide the public with opportunities to tour the facilities, learn about recent upgrades, browse information, and ask questions. An open house was not held at FCPCC in 2024.

16.4 SepticSmart

SepticSmart is and RDN educational program that provides information on septic system operation and maintenance. It aims to prolong the life of functioning systems in the region. More information on the SepticSmart Program is available at: https://www.rdn.bc.ca/septicsmart.

The SepticSmart program includes an information package, annual workshops and a rebate program. Two SepticSmart workshops were held in 2024. To date, the SepticSmart rebate program has issued more than $400,000 in rebates to homeowners to help with septic tank repairs and maintenance.

16.5 Liquid Waste Management Plan

The RDN Liquid Waste Management Plan (LWMP) is a long-range plan to support sustainable wastewater management in the region. This plan authorizes the RDN to find community-driven and cost-effective solutions to protect public health and achieve a standard level of wastewater treatment over time. The BC Minister of the Environment approved the RDN's LWMP in October 2014. An LMWP annual report will be submitted under separate cover in June.

In December 2023, the RDN submitted a request to the Province of BC for an LWMP Amendment.

16.6 Website

The RDN's Wastewater Services department website www.rdn.bc.ca/wastewater-services is regularly updated and provides education material related to wastewater treatment, environmental management, pollution prevention and septic system maintenance (the SepticSmart program).

The Get Involved RDN webpage is an online public engagement space that hosts outreach information specific to the regional projects. In 2024, the following FCPCC projects were highlighted:

- FCPCC Expansion and Odour Control Upgrade Project
- Bay Avenue Pump Station Replacement.
- Liquid Waste Management Plan Amendment.

Appendix A – Waste Management Permit No. PE-4200 & Amendments

Province of
British Columbia

Ministry of
Environment

Vancouver Island Region
Regional Headquarters
2569 Kenworth Road
Nanaimo
British Columbia
V9T 4P7
Telephone: (604) 758-3951

JUL 10 1990

REGISTERED MAIL

File: PE-4200

Regional District of Nanaimo
6300 Hammond Bay Road
Lantzville, British Columbia
V0R 2H0

Gentlemen:

LETTER OF TRANSMITTAL

Enclosed is a copy of amended Permit No. PE-4200, issued under the provisions of the Waste Management Act, in the name of Regional District of Nanaimo. Your attention is respectfully directed to the terms and conditions outlined in the Permit. An annual fee for Permit No. PE-4200 will be determined on the basis of your industrial code and capacity in accordance with the Waste Management Fees Regulation.

The administration of this Permit will be carried out by staff from our Regional Office located at 2569 Kenworth Road, Nanaimo, British Columbia, V9T 4P7 (telephone 758-3951). Plans, data and reports pertinent to the Permit are to be submitted to the Regional Waste Manager at this address.

You will note that values have been expressed in the International System of Units (SI). These units are to be used in submitting monitoring results and any other information in connection with this Permit.

This Permit does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority shall rest with the Permittee.

Yours very truly,

G. E. Oldham, P. Eng.
Regional Waste Manager

28.05.90 Enclosure
28.5.90
DAB 09/06/90

Recycled Paper

MINISTRY OF ENVIRONMENT

PERMIT

Under the Provisions of the Waste Management Act

REGIONAL DISTRICT OF NANAIMO
6300 Hammond Bay Road
Lantzville, British Columbia
V0R 2H0

is hereby authorized to discharge effluent from a municipal sewage system located within the Regional District of Nanaimo to the Strait of Georgia and to storage lagoons at the Morningstar Golf Course near Parksville, British Columbia

This permit has been issued under the terms and conditions prescribed in the attached Appendices

01, 02, A-1, A-2, B-1, B-2, C-1 and C-2

Regional Waste Manager
Permit No. PE-4200

Date issued: January 16, 1976
Date amended: JUL 10 1990
28.05.90
20.5.90
09/06/90

ENV 2093

MINISTRY OF ENVIRONMENT

WASTE MANAGEMENT BRANCH

APPENDIX 01

to Permit No. PE-4200

(Effluent)

(a) The discharge of effluent to which this appendix is applicable is from a municipal sewage system servicing the Parksville and Qualicum Beach area as shown on the attached Appendix A-1.

(b) The maximum rate at which effluent may be discharged is 16 000 m^3/d.

(c) The characteristics of the effluent shall be equivalent to or better than:
5-day Biochemical Oxygen Demand - 45 mg/L
Total Suspended Solids - 60 mg/L.

(d) The works authorized are screening, degritting and ancilliary facilities, a secondary treatment plant, sludge digestion and dewatering facilities and an outfall with diffuser extending 2440 m from mean low water to a depth of 61 m below mean low water and related appurtenances approximately located as shown on the attached Appendix A-1.

(e) The location of the facilities from which the effluent originates and to which this appendix is appurtenant is Lot 2, Plan 2570, District Lot 28, Nanoose District.

(f) The location of the point of discharge and to which this appendix is appurtenant is the Strait of Georgia off the mouth of French Creek.

(g) Those works authorized must be completed and in operation on and from the date of this appendix.

Date issued: January 16, 1976

Date amended: JUL 10 1990

28.05.90

28.5.90

PAB 03/04/90

Regional Waste Manager

ENV. 2096 W-817

MINISTRY OF ENVIRONMENT

WASTE MANAGEMENT BRANCH

APPENDIX 02

to Permit No. PE-4200

(Effluent)

(a) The discharge of effluent to which this appendix is applicable is from a municipal sewage treatment facility as shown on the attached Appendix A-2.

(b) The maximum rate at which effluent may be discharged is 1 370 m^3/d.

(c) The characteristics of the effluent shall be equivalent to or better than:
5-day Biochemical Oxygen Demand - 20 mg/L;
Total Suspended Solids - 30 mg/L.

(d) The works authorized are a secondary sewage treatment plant, a pump station and pipeline, and related appurtenances approximately located as shown on the attached Appendix A-2.

(e) The location of the facilities from which the effluent originates and to which this appendix is appurtenant is Lot 2, Plan 2570, District Lot 28, Nanoose District.

(f) The location of the point of discharge and to which this appendix is appurtenant is a pipeline to storage lagoons (authorized works under Waste Management Permit No. PE-8195) situated on the northern half of District Lot 83, Nanoose Land District.

(g) Those works authorized must be completed and in operation on and from the date of this appendix.

Date issued: JUL 10 1990

Date amended: 28.05.90

28.5.90

09/04/90

Regional Waste Manager

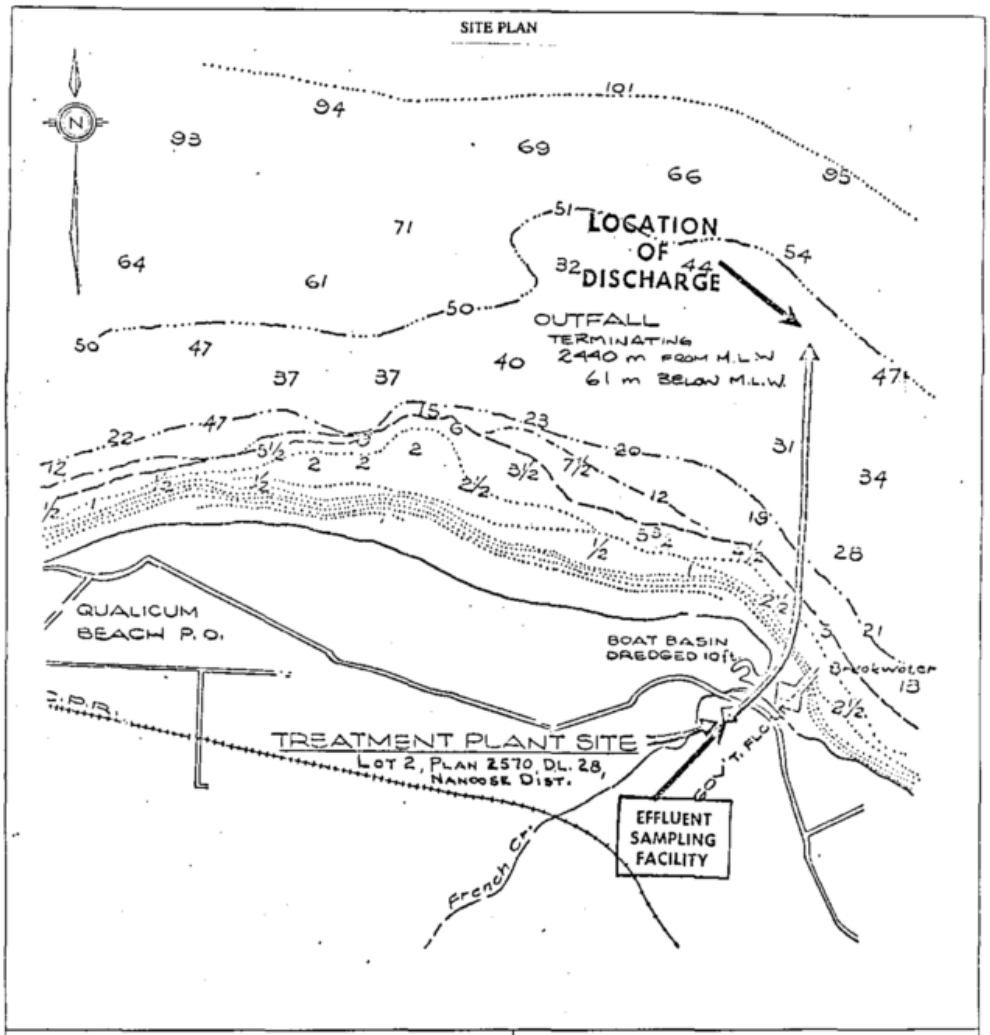
ENV. 2096 W&H

Province of British Columbia

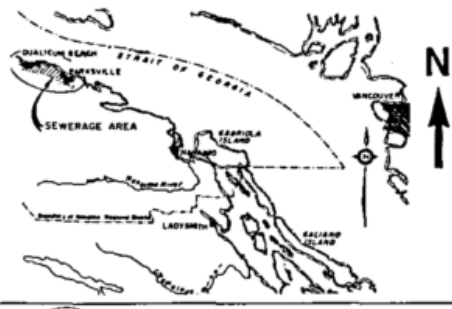
Ministry of Environment

WASTE MANAGEMENT

SITE PLAN



LOCATION MAP



Regional District of Nanaimo
(Name of applicant(s))

(Date) (Signature of applicant(s) or agent)

(FOR OFFICE USE ONLY)

Date Issued JUL 10 1990 Regional Waste Manager

Date Amended

Appendix A-1 to Permit No. PE-4200

Approval No.

ENV 1987

29.05.90

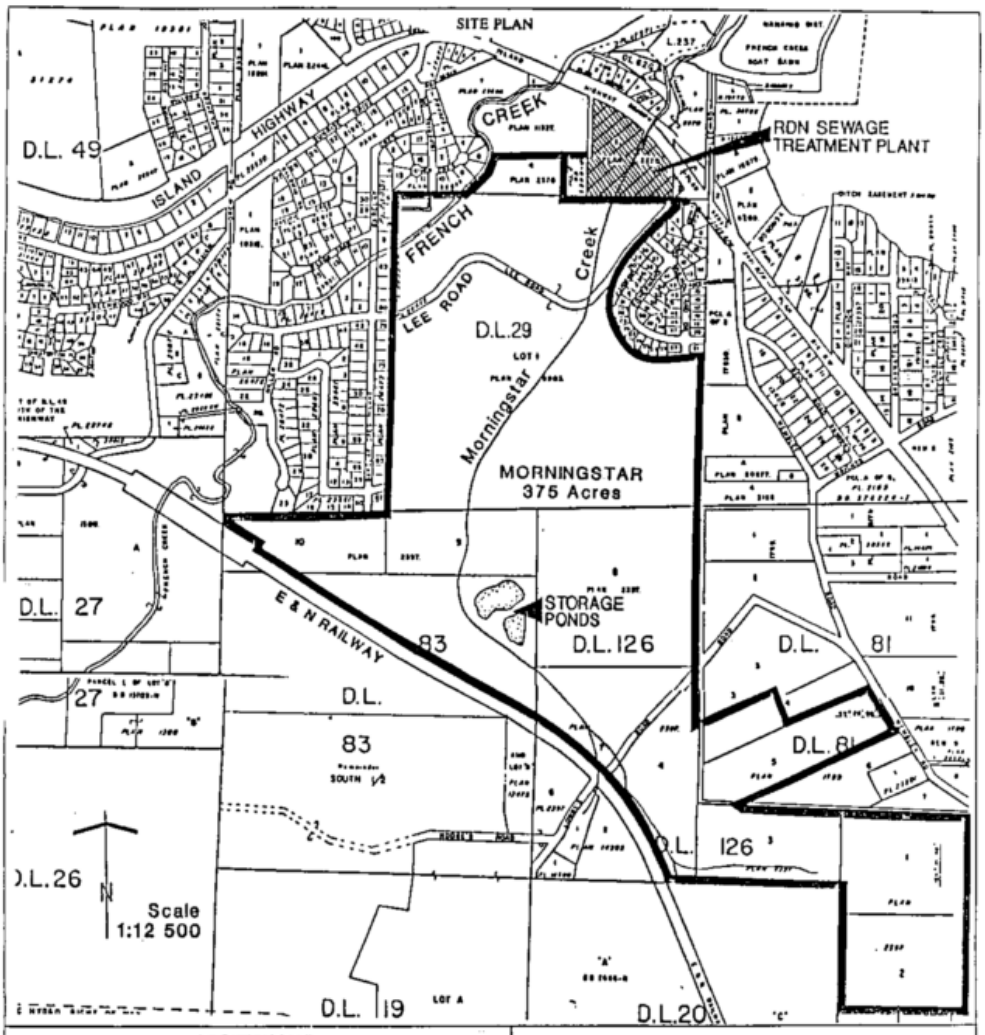
28.5.90

RMS 09/04/90

Province of British Columbia

Ministry of Environment

WASTE MANAGEMENT



Regional District of Nanaimo
(Name of applicant(s))

(Date) (Signature of applicant(s) or agent)

(FOR OFFICE USE ONLY)

JUL 10 1990
Date Issued

Regional Waste Manager

Date Amended

Appendix A-2 to Permit No. PE-4200

Approval No.

ENV 1987

08.05.90

~~ted~~ 28.5.90

RAS 09/06/90

MINISTRY OF ENVIRONMENT

WASTE MANAGEMENT BRANCH

APPENDIX B-1

to Permit No. PE-4200

A. MAINTENANCE OF WORKS

The Permittee shall inspect the pollution control works regularly and maintain them in good working order. Notify the Regional Waste Manager of any malfunction of these works.

B. EMERGENCY PROCEDURES

In the event of an emergency or condition beyond the control of the Permittee which prevents continuing operation of the approved method of pollution control, the Permittee shall immediately notify the Regional Waste Manager and take appropriate remedial action.

C. BYPASSES

The discharge of effluent which has bypassed the authorized works is prohibited unless the approval of the Director or the Regional Waste Manager is obtained and confirmed in writing.

D. PROCESS MODIFICATIONS

The Permittee shall notify the Regional Waste Manager prior to implementing changes to any process that may affect the quality and/or quantity of the discharge.

E. OUTFALL INSPECTION

The Permittee shall conduct a dye test on the outfall line authorized in Appendix 01 (or inspect by another method approved by the Regional Waste Manager) once every five years or as may otherwise be required by the Regional Waste Manager.

F. DISINFECTION

Although disinfection of the effluent discharge authorized by Appendix 01 is not required at this time, suitable provisions should be made to include disinfection facilities in the future. If disinfection is by chlorination, dechlorination facilities may also be required.

Date issued: JUL 10 1990

Date amended: _____

_____

_____

Regional Waste Manager

2805.90

28.5.90

RAB 07/06/90

ENV. 2096 WASTE

MINISTRY OF ENVIRONMENT
WASTE MANAGEMENT BRANCH

APPENDIX B-2

to Permit No. PE-4200

G. SLUDGE WASTING AND DISPOSAL

Sludge wasted from the treatment plant shall be disposed of to a site and in a manner approved by the Regional Waste Manager.

H. EFFLUENT UPGRADING

Based on receiving environment monitoring data and/or other information obtained in connection with this discharge, the Permittee may be required to provide additional treatment facilities.

Date issued: JUL 10 1990

Date amended: 28.05.90
28.5-90
09/06/90

Regional Waste Manager

ENV. 2096 W-817

MINISTRY OF ENVIRONMENT
WASTE MANAGEMENT BRANCH

APPENDIX C-1

to Permit No. PE-4200

A. SAMPLING AND ANALYSIS

The Permittee shall install a suitable sampling facility and obtain a grab sample of the effluent once every day. The sample shall be analyzed on a daily basis for Total Suspended Solids and on a weekly basis for 5-day Biochemical Oxygen Demand.

Once per year a composite sample, over an eight-hour period, shall be taken during a low flow period in July or August and analyzed for parameters such as metals, volatile organics, phenolics, organochlorine pesticides, acid extractable herbicides, anions, and inorganics. The Regional Waste Manager shall advise the Permittee in writing of the specific parameters to be analyzed.

B. FLOW MEASUREMENT

For the discharge authorized by Appendix 01, provide and maintain a suitable flow measuring device and record once per day the effluent volume discharged over a 24-hour period.

C. SAMPLING AND ANALYTICAL PROCEDURES

Sampling and flow measurement shall be carried out in accordance with the procedures described in "Field Criteria for Sampling Effluents and Receiving Waters", April 1989.

Analyses are to be carried out in accordance with procedures described in "A Laboratory Manual for the Chemical Analysis of Waters, Wastewaters, Sediments and Biological Materials, (1976 edition including updates)", April 1989.

Copies of the above manuals are available from the Data Standards Group, Ministry of Environment, 3800 Wesbrook Mall, Vancouver, British Columbia, V6S 2L9, at a cost of $20.00 and $70.00, respectively, and are also available for inspection at all Waste Management offices.

Date issued: JUL 10 1990

Date amended: _____

_____

_____

Regional Waste Manager

DAT: 06/07/90

V. 2096 WBM 4.7.90

04.07.90

MINISTRY OF ENVIRONMENT

WASTE MANAGEMENT BRANCH

APPENDIX C-2

to Permit No. PE-4200

D. RECEIVING ENVIRONMENT MONITORING

At the discretion of the Regional Waste Manager, the Permittee may be required to conduct a receiving environment monitoring program for the discharge authorized by Appendix 01. The program shall be established in consultation with the Regional Waste Manager, who will advise the Permittee in writing of the program requirements.

E. REPORTING

Maintain data of analyses and flow measurements for inspection and once per month submit the data, suitably tabulated, to the Regional Waste Manager for the previous month's monitoring. The first report is to be submitted by September 30, 1990.

Date issued: JUL 10 1990

Date amended: _____

_____

_____

Regional Waste Manager

ENV. 2096 w617

Paris 05/07/90

4.7.90

09.07.90

Province of
British Columbia
Ministry of
Environment,
Lands and Parks

BC Environment

Environmental Protection Division
777 Broughton Street
Victoria
British Columbia
V8V 1X5

COPY

Telephone: (604) 387-9974
Facsimile: (604) 356-9836

File: PE-4200

June 17, 1993

Regional District of Nanaimo
6300 Hammond Bay Road
Lantzville, British Columbia
V0R 2H0

Dear Permittee:

Re: Notification of Amendment to Permit No. PE-4200

Please note that Permit No. PE-4200, issued under the provisions of the Waste Management Act, in the name of Regional District of Nanaimo is amended by adding to Appendix B-2 the following clauses:

(h) FACILITY CLASSIFICATION

The Permittee shall classify the wastewater treatment facility authorized in part (d) of Appendix No. 01 (the facility) and the classification shall be maintained with the "British Columbia Water and Wastewater Operators Certification Program Society" (BCWWOCPS). The Permittee shall submit an application to classify the facility to BCWWOCPS by **August 1, 1993**. Although the facility may have already been voluntarily classified previously, an application for classification must be submitted by the above date.

(i) OPERATOR CERTIFICATION

If the facility is classified by the BCWWOCPS (the Program) at Level II or higher, the Permittee shall ensure that all operators of the facility shall be certified by the Program to a Class I level, at a minimum, by **December 1, 1994**.

Operators in Training:

The Permittee shall ensure that all operators in training (OIT) working at the facility classified by the BCWWOCPS at Level II or higher shall be required to successfully pass an OIT examination within three (3)

../2

months of commencement of employment at the facility. The OIT certificate shall be valid for fifteen (15) months from the date of issue. Prior to the expiry date of the OIT certificate, but not sooner than twelve (12) months from the date when the OIT commenced facility operation, the OIT shall successfully complete a Class I certification examination in order to continue to operate at the facility.

Chief Operator: Level II or higher

If the facility is classified by the BCWWOCPS at Level II or higher, the Permittee shall designate at least one operator to be the "Chief Operator" of the facility by **December 1, 1996**. The "Chief Operator" shall be certified at a Class II level, at a minimum.

After **December 1, 1996**, no person shall have "Direct Responsible Charge", as defined by the BCWWOCPS, of a municipal wastewater treatment facility classified at Level II or higher unless they possess a valid operator's certificate not more than one level below the classification level of the facility.

Chief Operator: Level III and IV

If the facility is classified by the BCWWOCPS at Level III, the Permittee shall designate a "Chief Operator", certified at a Class III level by **December 1, 1998**.

If the facility is classified by the BCWWOCPS at Level IV, the Permittee shall designate a "Chief Operator", certified at a Class IV level by **December 1, 1998**.

All other terms and conditions of Permit No. PE-4200 remain in full force and effect. If you have any questions regarding this amendment please contact John Finnie at 751-3183.

Yours truly,

R.J. Driedger,
Deputy Director of Waste Management

cc: Ted Oldham
BCWWOCPS

DB
AGL
BMM

August 24, 1994

File: PE-4200

Regional District of Nanaimo
6300 Hammond Bay Rd
PO Box 40
Lantzville BC V0R 2H0

ATTENTION: Mike Donnelly
Manager of Operations

Dear Mike Donnelly:

Re: Monitoring of French Creek
Pollution Control Centre Effluent

As outlined in Appendix C-1 to Permit PE-4200, the Regional District of Nanaimo is required to obtain a composite sample of the effluent once per year during July or August and have the sample analyzed for several parameters. The exact parameters were listed in our letter to you dated July 17, 1990 (copy enclosed). Our records indicate that the Regional District last sampled for these specific parameters on July 16, 1992.

Environmental Protection staff have reviewed the results of your July, 1992 sampling. Since the analysis shows that the levels meet the ministry's 1994 Approved and Working Criteria for Water Quality, we advise you that repeating this sampling procedure is not necessary at this time, although it may be required in the future.

If you have any questions or concerns, please contact Al Leuschen, P. Eng., or Bernie MacKay of this office at 751-3100.

Yours truly,

J. O. Finnie, P.Eng.
Head, Municipal & Environmental
Safety Sections
Environmental Protection
DB/dpc
monitor.db
Enclosure

94.08.25

Appendix B – Internal Flow Monitoring and Laboratory Raw Data (Permit Data)

2024 Treatment Plant and Outfall Flow (Cubic Metres)												
Day	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	10,749.9	12,238.5	11,197.4	10,738.7	10,226.8	10,265.3	10,387.3	10,793.2	10,525.8	9,479.6	10,909.7	10,898.9
2	11,123.1	11,725.7	11,639.7	10,648.0	10,030.3	10,672.4	10,640.9	11,026.1	10,466.0	9,439.3	10,653.2	10,711.4
3	11,025.2	11,510.7	11,831.6	10,594.9	10,203.6	10,790.7	10,541.0	10,790.2	10,184.6	9,484.0	10,314.5	10,497.9
4	10,760.1	11,307.0	12,369.1	10,318.1	10,051.8	10,253.1	10,237.4	10,849.3	9,765.4	9,503.3	11,152.0	10,534.2
5	13,506.7	11,112.6	10,885.6	10,511.4	10,213.3	9,947.8	10,379.8	11,131.2	9,863.9	9,414.1	10,454.9	10,451.7
6	11,400.5	10,826.1	10,919.4	10,479.7	10,289.0	10,230.1	10,504.4	10,916.3	9,738.3	9,481.6	10,259.8	10,888.1
7	11,315.4	11,005.2	10,701.7	10,463.3	10,270.6	10,322.2	10,313.0	10,933.5	9,997.6	9,459.4	9,472.4	10,757.3
8	13,165.2	10,792.8	10,988.2	10,660.3	10,141.0	10,531.2	10,479.4	10,854.3	10,253.2	9,477.5	10,774.6	10,493.0
9	12,954.4	10,795.1	11,355.1	10,459.4	10,091.3	10,484.1	10,457.7	10,692.9	9,920.1	9,969.8	10,719.2	10,313.5
10	12,076.0	11,174.9	11,514.9	10,346.5	10,330.5	9,922.3	10,357.4	10,614.1	9,956.2	9,595.1	11,075.1	10,210.5
11	11,743.3	11,565.5	11,684.6	10,594.4	10,457.2	9,846.9	10,170.3	10,699.6	10,060.4	9,430.8	12,247.4	10,510.8
12	10,957.0	11,354.5	11,367.3	10,326.3	10,171.8	9,749.8	10,447.0	10,712.3	9,874.5	9,644.0	12,760.8	10,349.3
13	10,890.0	10,778.7	10,971.1	10,307.2	10,581.5	9,673.2	10,305.0	10,616.5	10,109.9	9,782.2	15,516.4	11,038.3
14	10,749.8	10,846.0	10,899.9	10,295.4	10,111.5	9,653.2	10,563.7	10,724.8	9,786.5	9,858.7	13,088.6	12,492.9
15	10,574.7	10,887.2	10,838.5	10,163.3	10,144.9	9,819.8	10,819.4	10,791.9	9,870.9	9,689.4	11,814.4	11,189.5
16	10,490.9	10,766.4	10,769.3	10,164.0	9,591.3	9,785.8	10,369.0	10,823.1	9,829.1	9,749.3	11,986.0	11,296.2
17	10,131.1	10,781.5	10,669.5	10,187.3	10,151.1	9,922.1	10,526.1	10,691.5	9,690.8	9,699.2	11,493.2	12,920.8
18	10,398.9	10,692.1	10,797.5	9,902.7	10,238.6	9,830.9	10,925.1	10,657.7	9,773.4	11,318.0	11,438.8	12,592.7
19	11,893.2	10,736.6	10,746.2	10,118.8	10,012.6	9,857.2	10,774.8	11,486.1	9,770.1	11,659.3	12,918.0	12,753.1
20	11,744.1	10,836.9	10,672.0	10,088.8	10,268.9	9,937.3	10,754.2	10,578.1	9,593.3	14,212.4	13,627.2	12,337.8
21	12,726.0	11,166.4	10,582.2	10,150.5	11,172.0	10,030.6	10,848.2	10,739.2	9,780.9	11,066.0	12,313.0	12,218.2
22	15,502.3	11,159.3	10,936.3	10,291.1	10,462.5	10,195.1	10,823.2	10,639.0	9,849.3	10,488.8	14,505.7	12,866.2
23	12,808.6	10,990.7	11,433.4	10,424.0	10,149.9	10,033.7	10,720.0	10,653.0	9,998.1	10,107.9	14,598.4	12,475.4
24	13,182.2	10,800.3	10,931.7	10,274.1	10,506.0	10,468.6	10,716.7	10,669.3	9,627.4	9,876.2	12,694.3	12,149.6
25	12,217.2	10,754.6	11,281.9	9,927.8	10,415.7	9,970.0	10,558.9	10,518.7	10,321.5	10,290.9	11,791.8	13,317.1
26	12,861.5	10,538.5	11,302.3	10,739.0	10,466.4	10,003.5	10,488.3	10,894.2	9,835.8	10,649.5	11,299.8	17,777.4
27	13,714.1	10,611.4	11,958.1	10,538.2	10,493.5	10,222.4	10,800.9	10,573.4	9,750.9	10,829.5	11,051.7	13,436.9
28	13,470.7	12,369.1	11,678.5	10,414.1	10,469.7	10,130.4	10,909.4	10,484.3	9,554.4	10,538.2	10,819.0	13,780.6
29	13,678.7	11,295.2	11,436.8	10,451.6	10,073.7	10,306.2	10,983.3	10,443.1	9,529.8	9,992.7	10,731.5	12,696.6
30	12,741.4		11,687.0	10,380.3	9,951.0	10,403.8	10,841.5	10,682.2	9,625.8	10,294.4	10,820.3	12,510.3
31	12,806.8		10,962.4		10,033.4		10,804.4	10,582.5		9,951.4		12,308.7
Total:	**373,359**	**321,420**	**347,009**	**310,959**	**317,771**	**303,260**	**328,448**	**333,262**	**296,904**	**314,433**	**353,302**	**368,775**
Average:	**12,044**	**11,083**	**11,194**	**10,365**	**10,251**	**10,109**	**10,595**	**10,750**	**9,897**	**10,143**	**11,777**	**11,896**
Minimum:	**10,131**	**10,539**	**10,582**	**9,903**	**9,591**	**9,653**	**10,170**	**10,443**	**9,530**	**9,414**	**9,472**	**10,211**
Maximum:	**15,502**	**12,369**	**12,369**	**10,739**	**11,172**	**10,791**	**10,983**	**11,486**	**10,526**	**14,212**	**15,516**	**17,777**
Non compliance (max flow)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**

Maximum permitted daily flow: 16,000 cubic metres/day

2024 Influent 5-day Biochemical Oxygen Demand (BOD_5) (mg/L)												
Day	**Jan**	**Feb**	**March**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
1		198								264		
2	239				284	164	304					
3			203				NT				166	232
4	242	210		245		246	272					
5			207		226				280			208
6		222						160				
7	191		236		242		236				234	
8		261						289	214			188
9	159			325		186						
10			191							211		263
11		204		280		234	280					
12			203		208				232		NR	264
13						236						
14	208		200	239								
15		NR						251				180
16	230				264	NR						
17										255	NR	190
18	164			258		145						
19			276						NT			
20		228				224					NR	
21	146		290	207	238							
22		237						339				158
23	162			240	251	200						
24			214				294		NR	194		
25	180	228		216								
26					193							
27		221				322						
28				208	415		246				224	
29		182						286		214		188
30	192			260	252		302					
31										213		
Average	**192**	**219**	**224**	**248**	**257**	**217**	**276**	**265**	**242**	**225**	**208**	**208**

2024 Effluent 5-day Biochemical Oxygen Demand (BOD_5) (mg/L)												
Day	**Jan**	**Feb**	**March**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
1		15.3			21.6					11.4		
2	14.4			21.2	17.7	8.3	12.8					
3			17.4				NT				10.8	9.70
4	11.8	14.0		21.7		14.6	9.31					
5			18.2		16.4			10.7	9.02			8.98
6		16.8						15.1				
7	13.5		15.4		20.9		8.34				12.9	
8		17.0						14.8	9.73			9.21
9	11.9			26.6	24.2	8.7						
10			16.4							6.15		14.6
11		17.2		20.3		13.4	10.6					
12			15.8		14.6				9.63		NR	12.8
13						11.6						
14	14.9		15.0	19.0	16.4							
15		NR			13.0			12.6				8.56
16	19.0			25.6	18.2	NR						
17			14.6							10.2	NR	15.8
18	13.7			23.4		8.79	12.5	12.0				14.6
19			18.6						NR			
20		21.8				9.34				27.8	NR	
21	14.7		20.0	16.2	16.4							
22		17.7			15.5			12.4				10.2
23	19.6			21.4	15.6	8.36						
24			19.0				14.6		NR	7.82		
25	14.6	13.3		19.2								
26					10.7							
27		16.0				10.1						
28				12.8	16.2		14.7				10.4	
29		11.1						11.5		10.6		16.4
30	16.2			19.4	12.6		19.4					
31										7.4		
Average	**14.9**	**16.0**	**17.0**	**20.6**	**16.7**	**10.3**	**12.7**	**12.7**	**9.5**	**11.6**	**11.4**	**12.1**
Non compliance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

FCPCC Outfall Maximum $cBOD_5$: 45 mg/L

2024 Effluent 5-day Biochemical Oxygen Demand (BOD_5) (mg/L) - GNPCC Accredited Lab												
Day	**Jan**	**Feb**	**March**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
1	14.3			18.3			9.0					13.6
2						11.8			10.3			
3			13.2				13.3					
4		13.5									13.2	
5					16.8			10.7				
6								15.1		14.7		
7	11.1			18.9			11.20					
8								14.8	9.73			11.30
9						13.5						
10			14.7									
11		16.0				13.4		14.6			11.8	
12					13.6							
13												
14	13.3			15.6			12.2			11.0		
15									11.00			
16						11.5						
17			14.6								10.3	
18		16.7					12.5	12.0				14.4
19												
20					9.8					27.8		
21	14.4			16.6			9.0					
22									9.2			
23						9.82						
24			18.1				14.6				10.1	
25		14.7						13.0				
26					12.1							
27										14.4		
28	14.6			14.7			14.7					
29												
30							19.4		8.2			
31												
Average	**13.5**	**15.2**	**15.2**	**16.8**	**13.1**	**12.0**	**12.7**	**13.4**	**9.7**	**17.0**	**11.4**	**13.1**
Permit Exceedance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Quarterly Average (For WSER)	**14.6**			**14.0**			**12.2**			**13.9**		

2024 Influent Total Suspended Solids (TSS) (mg/L)												
Day	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	269	336	560	313	492	419	342	477	284	NR	324	383
2	346	424	312	487	418	259	533	436	354	NR	193	635
3	389	273	230	537	737	487	313	248	445	570	388	581
4	460	247	338	402	363	413	385		354	407	373	539
5	289	335	346	420	300	378	521	387	410	421	465	542
6	245	447	344	350	488	377	435	553	495	557	200	394
7	230	393	440	337	490	384	351	474	324	442	504	349
8	321	406	446	415	522	333	406	400	373	448		363
9	265	257	323	488	NR	285	521	369	341	535		553
10	253	251	268	386	642	367	392	360	540	465		558
11		273	315	410	375	350	331	320	350	471		445
12	292	295	405	385	295	337	637	448	405	384	671	458
13	288	303	455	374	564	370	418	396	751	387	562	379
14	269	333	359	286	440	327	437	517	340	401	691	333
15	301	387	383	461	426	329	549	419	310	435	381	444
16	335	312	345	528	445	260	536	361	508	416	366	398
17	280	375	447	498	444	342	546	362	440	520	437	404
18	227	289	390	456	372	143	NR	350	563	416	405	164
19	378	278	514	462	360	329	403	336	502	284	376	379
20	246	423	396	408	325	263	322	404	373	283	388	341
21	216	356	497	329	439	282	290	392	359	358	382	364
22	232	374	601	678	410	272	470	511	387	668	NR	326
23	273	369	348	550	344	288	444	387	640	459	60	467
24	298	412	279	425	460	417	467	499	380	411	352	123
25	266	272	322	441	331	497	463	313	266	328	423	198
26	249	338	363	482	278	450	386	499	539	289	440	381
27	215	429	421	351	384	556	427	388	384	297	477	353
28	227	310	312	348	724	346	340	361	362	476	507	108
29	373	349	410	592	618	349	620	465	351	479	570	348
30	232		440	492	278	297	707	420	366	474	464	450
31	263		310		261		603	292		474		393
Average:	**284**	**340**	**384**	**436**	**434**	**350**	**453**	**405**	**417**	**433**	**416**	**392**

2024 Effluent Total Suspended Solids (TSS) (mg/L)												
Day	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	19.8	21.2	18.2	21.2	19.8	16.2	12.2	14.0	11.2	11.2	19.0	12.4
2	20.8	25.6	25.2	22.8	17.4	14.4	15.4	13.8	12.0	11	17.0	15.2
3	17.8	28.2	14.4	24.0	25.8	17.8	13.2	14.2	12.6	11	12.6	15.6
4	15.2	17.0	15.8	26.8	25.0	15.2	13.0	12.4	12.0	10.0	16.8	19.8
5	26.2	22.0	14.0	24.4	19.8	12.6	18.2	10.7	12.0	13	16.6	16.2
6	23.4	23.0	19.8	30.0	25.4	14.2	15.8	15.3	14.8	11.6	14.0	16.6
7	19.6	20.8	21.8	23.6	19.6	14.4	11.8	16.0	16.0	16.8	13.6	20.2
8	16.8	21.4	22.8	26.2	16.4	17.2	13.6	16.0	10.8	20.4	14.0	17.8
9	15.0	24.0	24.4	21.4	14.8	11.6	33.0	18.0	9.2	26.0	10.2	18.4
10	16.8	20.8	18.2	21.0	17.2	13.8	14.0	15.4	10.7	18.2	16.2	23.2
11	15.6	20.4	19.4	19.8	16.6	13.6	11.6	13.2	13.6	20.4	15.8	52.0
12	23.4	26.6	20.4	16.8	14.2	14.0	13.0	14.4	13.6	25.8	14.8	19.6
13	18.4	21.8	16.8	18.4	30.2	13.6	15.2	13.4	13.2	24.4	17.4	20.0
14	14.8	26.0	17.0	17.4	21.0	14.2	14.4	15.0	11.6	17.4	17.2	18.4
15	24.0	24.6	17.4	17.6	21.0	13.2	18.0	14.4	12.8	23	17.6	14.8
16	21.8	18.4	18.6	23.0	21.2	12.6	14.0	17.4	13.8	25	15.2	31.4
17	20.0	20.6	16.0	20.6	19.4	14.2	15.4	15.4	13.4	18	18.4	31.2
18	17.0	19.8	17.3	20.8	16.8	13.8	12.0	18.8	12.6	24.8	19.8	22.8
19	20.0	18.8	20.0	24.0	18.2	11.0	11.4	16.4	13.2	23.2	17.4	28.6
20	20.6	30.4	20.8	20.6	11.8	12.6	14.6	14.6	13.8	42.8	18.4	19.4
21	17.6	29.6	20.0	17.4	18.0	12.4	10.4	16.6	11.8	22.0	14.4	24.4
22	38.6	23.8	27.6	22.0	15.2	11.0	11.4	14.2	11.6	18.5	17.2	21.8
23	26.6	30.2	24.0	18.4	17.6	12.0	17.0	14.6	11.2	18.0	14.8	23.4
24	22.2	21.4	21.0	19.2	23.4	15.4	44.0	15.8	14.0	17.4	15.2	22.6
25	21.2	17.4	20.0	22.0	14.2	15.2	15.6	13.2	10.2	18.2	15.8	31.2
26	25.4	17.2	22.8	17.2	14.6	15.2	14.2	11.8	12.6	19.2	19.8	25.6
27	21.2	17.6	20.4	16.0	17.0	13.0	15.8	12.2	10.0	18.0	19.8	29.8
28	22.8	16.6	19.2	15.2	17.4	12.4	11.2	15.2	10.8	21.2	17.4	34.4
29	20.8	15.8	20.4	19.2	13.8	12.8	15.3	12.4	12	24.4	54.4	29.6
30	17.8		26.6	20.6	16.4	13.0	13.3	13.2	10.4	17.2	16.6	37.2
31	16.2		21.0		17.2		12.7	13.0		16.2		29.6
Average:	**20.6**	**22.1**	**20.0**	**20.9**	**18.6**	**13.8**	**15.5**	**14.5**	**12.2**	**19.5**	**17.6**	**24.0**
Non-compliances (Morningstar)	0	0	0	0	0	0	0	0	0	0	0	0
Non-Compliance (Outfall)	0	0	0	0	0	0	0	0	0	0	0	0
Total Non-Compliances	0	0	0	0	0	0	0	0	0	0	0	0

FCPCC Outfall Maximum TSS: 60 mg/L

Days highlighted in yellow were days in which TSS exceed levels in the outfall permit.

2024 Effluent Total Suspended Solids (TSS) (mg/L) - GNPCC Accredited Lab												
Day	**Jan**	**Feb**	**March**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
1	23.3			22.0			10.0	14.0				12.4
2						15.3	14.7		13.2			
3			15.2				14.0					
4		16.7					11.3				13.3	
5					21.3		18.0	10.7				
6							14.0	15.3		11.6		
7	18.7			23.6			14.0	16.0				
8							13.3	16.0	10.8			14.8
9						12.7						
10			18.0				14.7					
11		20.0				13.6	12.8	13.2			16.7	
12					17.3		17.6					
13							15.2					
14	14.7			13.3			14.4			15.2		
15							22.8		12.8			
16						14.0						
17	20.0		16.0								16.4	
18		24.0	17.3					18.8				20.0
19												
20					10.0					42.8		
21	16.0			16.7			10.4		12.0			
22									11.6			
23						18.0						
24			23.3						14.0		11.2	
25		19.2						13.2				
26					12.7							
27										18.0		
28	22.8			15.6			11.2					
29	20.8						15.3					
30							13.3		11.2			
31							12.7					
Average:	**19.5**	**20.0**	**18.0**	**18.2**	**15.3**	**14.7**	**14.2**	**14.7**	**12.2**	**21.9**	**14.4**	**15.7**
Non-Compliance (Outfall)	0	0	0	0	0	0	0	0	0	0	0	0
Quarterly WSER Average	19.1			16.2			13.9			17.5		

;

2024 Influent Ammonia (NH_3) (mg/L)												
Day	**Jan**	**Feb**	**March**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
Sample 1	34.9	23.9	35.2	39.8	34.6	36.7	42.8	54.4	46.2	39.6	NR	39.6
Sample 2	35.4	30.4	32.2	41.7	41.3	37.4	41.3	49.9	45.5	44.0	36.8	44.7
Sample 3	25.5	33.3	33.7	35.7	39.7	35.0	45.1	49.4	39.4	47.7	38.8	33.0
Sample 4		36.2		39.6		39.9	52.1		42.3	37.0		35.6
Sample 5		23.9		36.9					41.2	39.8		34.2
Average	**31.9**	**29.5**	**33.7**	**38.7**	**38.5**	**37.3**	**45.3**	**51.2**	**42.9**	**41.6**	**37.8**	**37.4**

2024 Effluent Ammonia (NH_3) (mg/L)												
Day	**Jan**	**Feb**	**March**	**April**	**May**	**June**	**July**	**August**	**Sept**	**Oct**	**Nov**	**Dec**
Sample 1	27.3	19.5	30.8	14.0	35.6	29.2	36.9	35.6	34.6	35.8	NR	25.3
Sample 2	30.9	23.3	26.6	30.6	26.0	32.2	37.9	42.5	29.7	31.0	23.9	31.0
Sample 3	17.6	27.8	29.3	30.8	33.8	28.2	35.7	42.4	34.8	31.9	30.9	28.0
Sample 4	18.3	31.0	29.7	32.6	37.8	35.4	30.6	32.4	29.1	38.6		27.5
Sample 5		18.8		35.4			37.8	34.7	36.1	20.5		27.1
				34.0					27.7	26.0		28.4
									30.4	25.6		
										28.0		
Average	**23.5**	**24.1**	**29.1**	**28.7**	**33.3**	**31.3**	**35.8**	**37.5**	**32.9**	**31.6**	**27.4**	**27.8**
% reduction	**26.3%**	**18.5%**	**13.6%**	**26.0%**	**13.6%**	**16.1%**	**21.1%**	**26.8%**	**23.4%**	**24.2%**	**27.5%**	**25.8%**

Regular Ammonia testing is not required for permit, regular testing is completed internally and has historically been reported in this section of the Annual Report.

2024 Influent Temperature												
Day	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	13.1	13.2	13.1	14.0	15.4	17.8	18.8	20.3	20.9	18.8	16.8	15.6
2	14.6	13.6	13.4	15.3	16.1	16.5	18.8	20.0	19.8		15.4	
3	15.4	13.1	14.0	15.3	14.9	17.1	19.0	20.9	21.0		15.1	14.8
4	14.0	13.9	13.0	15.1	16.8	17.2	18.8	20.6	19.9	18.2	16.5	15.2
5	15.1	13.1	12.5	15.1	16.4	17.0	19.1	20.1	21.0	18.2	17.0	14.1
6	14.2	13.2	13.2	14.5	15.2	16.8	19.5	21.2	20.4	18.5	16.2	14.5
7	13.4	13.3	12.9	14.6	15.2	17.6	19.3	20.6	20.5		16.7	14.3
8	13.8	13.3	13.2	15.0	15.5	17.2	19.3	20.7	20.3	19.8	17.2	15.1
9	13.4	13.9	12.6	15.4	15.7	17.5	19.1	20.0		18.2	16.5	14.7
10	13.9	13.9	13.3	15.0	16.2	17.4	19.2	21.3	20.5	19.1	15.8	15.1
11	13.2	12.6	13.8	15.5	16.0		19.6	21.3	20.0	18.1	16.6	14.2
12		13.4	13.1	15.8	15.8	19.2	19.7		21.0	18.5	16.8	15.0
13	12.9	13.7	14.0	14.3	17.6	17.8	19.8	20.7	20.5	19.1	15.6	13.3
14	13.7	13.1	13.2	13.7	16.5	17.6	20.1	20.8	21.0	19.2	15.5	14.1
15	13.1	13.1	13.1	15.6	17.5	17.4		21.0	20.6	17.8	16.0	13.6
16	12.9	13.1	13.4	16.0	16.6	17.2	19.7	20.7		17.6	15.8	14.2
17	14.9	13.5	13.4	15.5	17.1	18.7	20.4	21.5	20.1	17.4	15.2	15.1
18	13.0	12.3	13.8	14.8	16.8	18.8	21.0	21.6	20.6	17.1	15.1	13.9
19	13.0	12.1	12.9	15.6	16.8	17.8	20.1		19.9	16.9	15.3	14.6
20	12.6	13.1	13.6	13.6	17.2	19.2	20.6	21.5	20.2	17.4	15.1	14.1
21	12.6	13.6	14.2	15.8	16.8	18.4	20.8	21.3	18.7		14.9	14.6
22	12.9	13.5	13.7	14.8	17.4	18.4		20.5	20.1	17.9	15.5	14.1
23	12.6	13.5	13.8	14.7	17.0	18.1	20.6	20.6		18.6	14.4	13.8
24	12.3	13.1	13.2	15.3	16.6	18.7	20.2	19.6	20.7	16.7	15.3	13.8
25	12.5	13.0	15.8	14.5	16.1	18.3	20.1	19.4		18.1	15.1	14.6
26	13.5	13.5	15.1	14.6	17.1	18.4	20.3	21.2	19.1	16.6	14.7	14.4
27	12.1	13.6	14.6	14.9	17.0	19.0	20.3	20.3	18.5	16.5	14.7	13.8
28	12.5	12.8	14.8	15.7	17.2	18.9	21.1	18.8	19.9		15.4	13.7
29	13.0	14.1	13.3	15.8	16.7	18.6		19.8	20.0	17.1	14.9	14.6
30	13.5		15.4	15.3	16.7	18.9	20.2	19.5	19.2	17.7	15.5	13.5
31	13.6		13.8		16.7		20.1	20.3		17.0		13.7
Average:	**13.4**	**13.3**	**13.7**	**15.0**	**16.5**	**18.0**	**19.8**	**20.6**	**20.2**	**17.9**	**15.7**	**14.3**
Minimum:	**12.1**	**12.1**	**12.5**	**13.6**	**14.9**	**16.5**	**18.8**	**18.8**	**18.5**	**16.5**	**14.4**	**13.3**
Maximum:	**15.4**	**14.1**	**15.8**	**16.0**	**17.6**	**19.2**	**21.1**	**21.6**	**21.0**	**19.8**	**17.2**	**15.6**

2024 Effluent Temperature												
Day	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	14.6	14.2	13.4	15.5	15.5	18.4	19.7	21.1	21.2	19.0	16.6	15.7
2	14.8	14.6	13.3	16.0	15.6	18.1	19.8	20.5	21.4	18.6	17.0	
3	15.2	14.1	13.6	16.0	15.6	17.6	18.9	21.6	21.3	18.9	17.1	15.3
4	14.8	14.2	13.2	15.0	16.7	17.7	19.6	21.5	20.7	18.6	16.9	14.5
5	15.3	13.1	13.6	14.9	16.6	17.7	20.3	20.8	20.9	18.6	17.0	14.4
6	13.7	13.1	13.8	15.7	16.1	17.3	20.6	21.6	21.0	19.3	16.5	15.0
7	14.2	13.5	13.0	15.6	15.9	17.6	20.8	20.6	21.9		16.6	15.7
8	13.8	13.4	13.7	15.1	15.9	18.1	20.5	21.5	21.7	19.2	16.8	16.1
9	13.2	12.0	13.8	15.8	16.9	18.9	20.2	21.3		18.6	17.1	14.9
10	14.0	13.6	13.8	15.5	17.1	18.2	20.2	22.2	20.4	18.2	17.0	14.9
11	13.1	13.8	14.2	16.2	17.8	18.7	20.6	22.1	20.4	17.3	16.9	14.6
12	12.2	13.6	13.8	15.1	17.5	18.9	20.6		19.9	18.4	16.3	14.2
13	12.6	13.2	13.6	15.8	17.4	18.4	21.1	21.3	20.4	18.8	15.9	14.4
14	13.6	13.1	13.7	16.4	17.3	18.2	21.0	21.7	21.0	19.2	16.5	15.1
15	13.0	13.5	13.3	16.2	18.7	18.8		21.5	20.7	18.9	16.6	14.6
16	12.7	12.5	14.5	16.0	17.3	18.6	20.5	21.4		17.9	16.1	14.6
17	12.6	14.2	14.1	15.8	17.6	19.3	21.1	21.6	20.4	17.8	16.0	14.5
18	12.3	14.1	14.0	15.2	17.7	19.1	21.1	22.0	20.4	17.6	14.9	14.5
19	12.8	13.9	13.8	15.7	18.1	18.4	21.2		19.6	18.1	14.8	14.5
20	13.8	13.7	14.7	15.4	18.0	18.9	21.6	21.8	19.7	18.4	14.5	14.5
21	13.5	14.3	14.6	16.0	17.3	18.9	21.2	21.3	20.1		15.2	15.7
22	13.0	14.1	14.8	15.3	17.0	20.2		21.3	20.6	17.0	15.2	15.3
23	13.0	14.2	15.3	15.3	17.0	19.8	21.1	20.5		17.1	15.2	14.1
24	12.7	14.2	15.1	15.9	17.3	19.0	21.0	20.9	19.7	16.7	15.7	14.8
25	12.9	14.5	15.3	15.4	17.2	18.9	21.4	20.8		17.1	15.4	15.2
26	14.0	14.5	14.1	15.8	17.5	19.4	20.9	21.0	19.5	17.2	15.4	15.1
27	13.7	13.7	15.1	15.9	17.9	19.5	21.4	20.2	19.2	17.4	14.5	13.9
28	14.2	14.8	15.5	16.0	17.3	**19.8**	21.7	20.4	19.8		14.1	14.8
29	14.5	13.0	15.4	15.5	17.4	19.9		20.3	19.6	16.6	14.3	15.1
30	14.8		15.4	15.4	16.7	20.0	21.4	20.8	19.0	16.8	15.5	13.7
31	14.6		15.3		17.2		21.2	21.3		15.5		13.8
Average:	**13.7**	**13.7**	**14.2**	**15.6**	**17.1**	**18.7**	**20.7**	**21.2**	**20.4**	**18.0**	**15.9**	**14.8**
Minimum:	**12.2**	**12.0**	**13.0**	**14.9**	**15.5**	**17.3**	**18.9**	**20.2**	**19.0**	**15.5**	**14.1**	**13.7**
Maximum:	**15.3**	**14.8**	**15.5**	**16.4**	**18.7**	**20.2**	**21.7**	**22.2**	**21.9**	**19.3**	**17.1**	**16.1**

2024 Influent pH												
Day	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	7.59	7.68	7.85	7.43	7.87	7.76	7.53	7.60	7.67	7.91	7.73	7.67
2	7.86	7.79	7.57	7.91	8.15	7.49	7.23	7.55	7.34		7.67	
3	7.35	7.70	8.07	7.91	7.56	7.89	8.02	7.93	7.82		7.55	7.73
4	7.28	8.04	7.74	7.89	7.66	7.78	7.76	7.84	7.54	7.78	7.80	8.07
5	8.02	7.73	7.14	8.32	7.81	7.56	7.74	7.28	7.76	6.97	8.13	7.63
6	7.92	7.68	7.70	7.74	7.39	7.80	7.62	7.87	7.78	7.30	7.70	7.95
7	7.72	7.73	7.67	7.53	7.69	7.59	7.49	7.94	8.01		8.01	7.77
8	7.79	7.62	7.38	7.57	7.71	7.51	7.94	7.89	7.41	8.23	8.04	7.69
9	7.71	7.90	7.86	7.99	7.74	7.52	7.67	7.82		7.77	7.69	7.98
10	7.56	8.00	7.68	7.65	7.01	7.67	7.81	7.67	6.94	7.92	7.67	8.11
11	7.29	7.59	7.69	7.60	7.39		7.99	7.86	7.87	7.96	7.68	7.91
12		7.83	7.56	8.59	7.47	7.84	7.62		8.29	7.89	7.98	8.09
13	7.74	7.94	7.90	7.70	8.13	7.53	7.70	7.55	7.79	7.91	7.88	7.12
14	7.91	7.77	7.68	7.49	7.88	7.75	7.78	7.74	8.03	7.66	7.84	7.57
15	7.47	7.69	7.54	7.99	7.68	7.92		7.95	7.33	7.54	8.05	7.52
16	7.59	7.55	7.53	7.97	7.80	7.63	7.90	7.88		7.65	7.95	7.84
17	8.26	7.90	7.54	7.70	7.79	7.67	7.71	7.81	7.85	7.89	7.66	8.03
18	7.96	7.50	7.64	7.35	8.00	7.92	7.60	7.61	7.89	7.63	8.00	7.76
19	7.67	7.46	6.70	7.94	7.37	7.67	7.54		7.91	7.76	7.93	7.74
20	7.67	7.56	7.64	7.64	7.74	7.67	7.73	7.54	7.96	7.49	7.98	7.68
21	7.58	7.86	7.69	7.98	7.41	7.95	7.39	8.16	7.03		8.02	7.82
22	7.81	7.83	7.73	7.16	7.92	7.45		7.62	7.95	7.66	7.94	7.49
23	7.67	7.75	7.60	7.73	7.88	7.51	7.80	7.88		8.26	7.55	7.68
24	7.66	7.55	7.50	7.90	7.50	7.65	7.45	6.94	8.19	7.70	7.40	7.60
25	7.76	7.75	7.89	7.38	7.44	7.69	7.60	7.51		8.02	7.99	7.29
26	7.84	7.79	7.90	7.54	7.79	7.65	7.79	8.11	7.88	7.69	7.76	7.19
27	7.57	7.95	7.83	7.39	7.56	8.05	7.64	7.76	7.84	7.43	8.06	7.75
28	7.45	7.96	7.72	7.85	7.72	7.77	7.77	8.00	7.72		8.01	7.44
29	7.76	8.03	7.52	7.48	7.55	7.71		7.81	7.93	7.99	7.66	7.29
30	7.57		7.60	8.00	7.90	7.65	7.62	7.79	7.58	7.74	7.89	7.85
31	7.65		7.50		7.53		7.12	7.77		8.01		7.71
Average:	**7.69**	**7.76**	**7.63**	**7.74**	**7.68**	**7.70**	**7.67**	**7.75**	**7.74**	**7.76**	**7.84**	**7.70**
Minimum:	**7.28**	**7.46**	**6.70**	**7.16**	**7.01**	**7.45**	**7.12**	**6.94**	**6.94**	**6.97**	**7.40**	**7.12**
Maximum:	**8.26**	**8.04**	**8.07**	**8.59**	**8.15**	**8.05**	**8.02**	**8.16**	**8.29**	**8.26**	**8.13**	**8.11**

2024 Effluent pH												
Day	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	v	7.28	7.24	7.24	7.31	7.20	7.26	7.30	7.35	7.31	7.18	7.22
2	7.28	7.32	7.38	7.34	7.28	7.24	7.30	7.25	7.28	7.33	7.19	
3	7.37	7.27	7.33	7.33	7.25	7.26	7.29	7.34	7.30	7.33	7.23	7.44
4	7.24	7.32	7.31	7.28	7.27	7.23	7.31	7.25	7.34	7.36	7.20	7.35
5	7.25	7.21	7.21	7.15	7.21	7.24	7.32	7.34	7.28	7.37	7.10	7.44
6	7.34	7.28	7.19	7.33	7.28	7.21	7.31	7.28	7.28	7.36	7.24	7.38
7	7.84	7.29	7.27	7.31	7.30	7.23	7.29	7.28	7.36		7.24	7.29
8	7.35	7.23	7.27	7.22	7.31	7.19	7.28	7.30	7.35	7.33	7.32	7.27
9	7.29	7.26	7.32	7.31	7.27	7.13	7.28	7.28		7.31	7.26	7.38
10	7.32	7.34	7.36	7.30	7.26	7.27	7.09	7.19	7.33	7.22	7.24	7.40
11	7.30	7.31	7.43	7.21	7.20	7.30	7.29	7.31	7.33	7.25	7.25	7.36
12	7.32	7.26	7.31	7.22	7.19	7.38	7.36		7.30	7.29	7.27	7.36
13	7.59	7.22	7.31	7.17	7.29	7.25	7.28	7.37	7.34	7.35	7.28	7.42
14	7.25	7.26	7.28	7.18	7.28	7.36	7.24	7.31	7.26	7.32	7.30	7.24
15	7.25	7.29	7.26	7.31	7.30	7.30		7.31	7.34	7.25	7.39	7.23
16	7.27	7.28	7.26	7.29	7.26	7.34	7.27	7.31		7.27	7.21	7.33
17	7.32	7.05	7.32	7.28	7.33	7.43	7.31	7.32	7.29	7.27	7.28	7.31
18	7.27	7.36	7.27	7.06	7.28	7.34	7.33	7.30	7.33	7.23	7.37	7.35
19	7.29	7.16	7.20	7.28	7.15	7.28	7.33		7.32	7.04	7.42	7.36
20	7.09	7.24	7.32	7.21	7.20	7.26	7.25	7.29	7.36	7.15	7.40	7.35
21	7.13	7.31	7.38	7.25	7.24	7.33	7.20	7.33	7.25		7.28	7.11
22	7.18	7.38	7.24	7.11	7.22	7.25		7.30	7.41	7.16	7.38	7.23
23	7.37	7.24	7.20	7.13	7.13	7.30	7.30	7.23		7.32	7.25	7.35
24	7.31	7.22	7.24	7.22	7.20	7.28	7.26	7.30	7.29	7.18	7.18	7.37
25	7.21	7.21	7.28	7.21	7.12	7.37	7.40	7.28		7.22	7.36	7.14
26	7.39	7.30	7.18	7.28	7.08	7.26	7.53	7.25	7.30	7.29	7.42	7.10
27	7.26	7.29	7.33	7.20	7.21	7.31	7.19	7.34	7.28	7.26	7.40	7.27
28	7.22	7.36	7.29	7.19	7.19	7.31	7.24	7.28	7.20		7.42	7.26
29	7.25	7.23	7.20	7.26	7.24	7.23		7.31	7.26	7.26	7.42	7.25
30	7.28		7.19	7.29	7.14	7.24	7.35	7.26	7.33	7.21	7.20	7.35
31	7.23		7.24		7.17		7.34	7.28		7.13		7.35
Average:	**7.30**	**7.27**	**7.28**	**7.24**	**7.23**	**7.28**	**7.29**	**7.29**	**7.31**	**7.26**	**7.29**	**7.31**
Minimum:	**7.09**	**7.05**	**7.18**	**7.06**	**7.08**	**7.13**	**7.09**	**7.19**	**7.20**	**7.04**	**7.10**	**7.10**
Maximum:	**7.84**	**7.38**	**7.43**	**7.34**	**7.33**	**7.43**	**7.53**	**7.37**	**7.41**	**7.37**	**7.42**	**7.44**

Appendix C – Permit Non-conformance Reports

Permit Non-Conformances

Date of Non-compliance	Describe the Issue	What was the Immediate Resolution?	Describe the Suspected Cause or Solution	Investigation Results
FCPCC FLOW(x1)				
December 26, 2024	On December 26, 2024, the effluent flow recorded from FCPCC was 17,777.4 which exceeded the permit limits of 16,000 m3/day.		This flow result occurred during a high flow event was attributed to inflow and infiltration into the collection system.	The RDN has submitted a permit amendment to increase the maximum flow limits on the permit. The RDN is also working with member municipalities to reduce inflow and infiltration to the collection system.

Appendix D – External Laboratory Results

FCPCC INFLUENT & EFFLUENT (ANNUAL) –September 3, 2024			
Parameter	**Unit**	**Influent**	**Effluent**
AMMONIA NITROGEN	mg/L	44	34
pH	pH Units	7.58	7.93
ALKALINITY	mg/L	270	220
DISSOLVED CHLORIDE	mg/L	1,700	1,600
TOTAL KJELDAHL NITROGEN	mg/L	61	33
TOTAL NITROGEN	mg/L	61.3	39.6
OIL AND GREASE	mg/L	56	<1.0
SULPHATE (D)	mg/L	240	240
SULPHIDE (T)	mg/L	0.23	0.035
CYANIDE (STRONG ACID DISSOLVED)	mg/L	0.00183	0.00238
FLUORIDE (D)	mg/L	0.12	0.12
TOTAL PHENOLS	mg/L	0.064	0.0021
TOTAL ORGANIC CARBON	mg/L	150	25
PHOSPHOROUS (T)	mg/L	6.9	3.4
METALS			
Parameter	**Unit**	**Influent**	**Effluent**
ALUMINUM (T)	µg/L	1,410	34
ARSENIC (T)	µg/L	1.17	0.70
BARIUM (D)	µg/L	14	<5.0
BORON (D)	µg/L	560	540
CADMIUM (D)	µg/L	0.055	<0.050
CHROMIUM (T)	µg/L	<5.0	<5.0
COBALT (D)	µg/L	<1.0	<1.0
COPPER (D)	µg/L	8.9	4.8
IRON (D)	µg/L	424	223
LEAD (T)	µg/L	2.9	<1.0
MANGANESE (D)	µg/L	49.4	76.2
MERCURY (T)	µg/L	61.9	4.10
MOLYBDENUM (T)	µg/L	<5.0	<5.0
NICKEL (D)	µg/L	<5.0	<5.0
SELENIUM (T)	µg/L	0.71	<0.50
SILVER (T)	µg/L	0.34	<0.10
TIN (T)	µg/L	<25	<25
ZINC (T)	µg/L	241	30
VOLATILE ORGANIC COMPOUNDS, PCBs, and PHTHALATES			
Parameter	**Unit**	**Influent**	**Effluent**
METHYL-TERT-BUTYLETHER (MTBE)	µg/L	<4.0	<4.0
BENZENE	µg/L	<0.40	<0.40
TOLUENE	µg/L	2.4	<0.40
ETHYLBENZENE	µg/L	<0.40	<0.40
M&P-XYLENE	µg/L	<0.40	<0.40
O-XYLENE	µg/L	<0.40	<0.40
STYRENE	µg/L	<0.40	<0.40
XYLENES (TOTAL)	µg/L	<0.40	<0.40
VH C6-C10	µg/L	<300	<300
DI(2-ETHYLHEXYL)PHTHALATE	µg/L	<20	<2.0
DI-N-BUTYLPHTHALATE	µg/L	<8.0	<0.80
NAPHTHALENE	µg/L	<0.10	<0.10
PCBS	µg/L	<0.050	<0.050

FCPCC Effluent		
Parameter	Unit	September 24, 2024
Survival Rate (Rainbow Trout)	%	>100

FCPCC Biosolids				
Parameter	Unit	8-Jan-24	9-Jul-24	Average
TOTAL SOLIDS	%	29.4	35.4	**32.4**
VOLATILE SOLIDS	%	70.3	80.4	**75.4**
MOISTURE	%	71	65	**68**
TOTAL KJELDAHL NITROGEN	% dry wt.	7.80	4.20	**6.0**
ARSENIC (T)	µg/g	2.16	2.15	**2.16**
CADMIUM (T)	µg/g	1.46	1.48	**1.47**
CHROMIUM (T)	µg/g	32.3	21.7	**27.0**
COBALT (T)	µg/g	2.59	2.05	**2.32**
COPPER (T)	µg/g	764	612	**688**
IRON (T)	µg/g	43,700	21,400	**32,600**
LEAD (T)	µg/g	15.1	14.0	**14.6**
MERCURY (T)	µg/g	2.36	1.26	**1.81**
MOLYBDENUM (T)	µg/g	4.17	5.09	**4.63**
NICKEL (T)	µg/g	12.4	10.4	**11.4**
PHOSPHOROUS (T)	µg/g	27,700	12,800	**20,300**
POTASSIUM (T)	µg/g	966	639	**803**
SELENIUM (T)	µg/g	4.65	4.03	**4.34**
ZINC (T)	µg/g	1,080	1,090	**1,090**

FCPCC Biosolids	
Parameter	Fecal Coliforms
Unit	MPN / g dry
8-Jan-24	<20
11-Mar-24	<20
9-Apr-24	<20
6-May-24	<20
9-Jul-24	<5.4
21-Aug-24	<18
4-Sep-24	<6.5
16-Oct-24	<9.1
Geometric Mean	**<13**

Note: Fecal coliform samples for FCPCC biosolids were taken from the ATAD Out Sample Point

Appendix E – Odour Concern Reports

Odour Concerns

Date of Occurrence	Location	Incident Description	Preventative Measures Identified	Notes	Conclusion
19-Jan-24	Columbia Beach and Sumar Lane area	(Incident was submitted by way of online web form) [redacted] indicated that there has been extreme odor all day and night since Jan. 17 to the time that she called in. “Extreme odor all day all night From Jan 17 to Jan 19/24 Columbia Beach entire area and Sumar Road, Johnson Road Absolutely disgusting that we can’t even go out for a walk or enjoy a soak in the hot tub without hour smelling that disgusting place. It is so bad it is like being stuck at stink intersection waiting for light to change green. We retired in Columbia Beach because it was one of the few places that did not have this odor. I have dates and times of all the other stench days recorded so that I don’t have to call every day. I don’t want a call back”		Monday morning investigated complaint and re-started up the Septage odour modifier sprayer. Went to site of odour complaint, but nothing was detected at time of the visit. Checked plant and process, with nothing abnormal being discovered. All supply and Exhaust fans running normally. The weather has been cloudy and raining with a temperature just above freezing with very little rain. I was unable to make contact with the complainant.	Intermittent odor in area was investigated and appropriate actions taken by [redacted].
21-Jan-24	Columbia Beach - Dalmatian Drive	(Incident was submitted by way of online web form) [redacted] indicated Columbia Drive- Dalmatian Drive lower end. Putrid odour! First discovered at 10:30 and still occurring at 12:45 No call back please. This is the second odour complaint in the area over the weekend.		Monday morning investigated complaint and re-started up the Septage odour modifier sprayer. Went to site of odour complaint, but nothing was detected at time of the visit. Checked plant and process, with nothing abnormal being discovered. All supply and Exhaust fans running normally. Weather at the time of the complaint was cloudy and raining with very little wind and around 6 deg. I was unable to make contact with complaintent.	Odor concern submitted was followed up appropriately by [redacted] and person was not called back as per their request...just an fyi from resident.

Date of Occurrence	Location	Incident Description	Preventative Measures Identified	Notes	Conclusion
23-Jan-24	Columbia Beach - Dalmatian Drive	[redacted] was out for a walk and indicated that she could smell the treatment plant at the end of Columbia Beach Road (Admiral Tryon Bivd. & Columbia Drive) by the beach. [redacted] said that the odour has just started[redacted] said that it was fine when she left her house but then started to smell so she called it in to report it.		I went and drove around in the area where the odour complaint was reported but could not detect any odours at that time (16:20Hrs) I talked to some residence in the area that were out walking and they said that they can smell the plant from time to time, but had not noticed it today. The odour control equipment at the plant is all operating normally with no abnormal plant activity.	[redacted]'s comments and actions are good.
25-Jan-24	Dalmatian Drive, Sumar Lane and Johnstone Road	[redacted] out for a walk and can smell the plant. [redacted] said that it started at the end of Dalmation Drive by the beach and can be smelt along Sumar Lane and on to Johnstone Road.		I checked for any issues with the plant process. Nothing was found at the time. Plant operation is all normal and closed for the night. Dewatering has been offline since 14:30 (There have been more odours detected from the Bio-filter when De-watering is running lately) Checked area and could not detect any odours. Wind has been blowing to the east and location of odous was Northwest of plant.	Actions taken by [redacted] are appropriate, and there are not any abnormal work/process ongoings at FCPCC to add to odor.
26-Jan-24	FCPCC	Continuous abnormal smell for the past 3 or 4 days, has experienced odours for years	Checked all odour control systems and plant operation - everything normal	Walked along west side of plant and dewatering area - didn't notice any foul odours	Odors noticed in area for quite some time, and nothing unusual was noted at FCPCC to contribute to extra odors.

Date of Occurrence	Location	Incident Description	Preventative Measures Identified	Notes	Conclusion
31-Jan-24	Dalmatian Drive, Sumar Lane and Johnstone Road	[redacted] submitted an online odour complaint stating the following: Reporting continuing odour from January 31 - Juan de Fuca and up dalmatian drive 11:30am to 11:30 pm (when I noticed it -was trying to enjoy my hot tub at 11:15 - it was like we were at a red light on poo corner) Feb. 1- up Dalmatian Drive, Sumar Road, down French Connection and on Juan De Fuca - very ripe again from 4:00 pm to 5:30 - the times I was out. Feb. 2 - 5:00 pm up dalmatian Drive when out to get the mail. Disgusting		Checked logbook for any operational issues last week. It was noted by some staff that the de-watering bio-filter has been a bit odorous but nothing substantial. I have talked to [redacted] about the media on the bio-filter and anything that could be done.	Added odour likely originated at dewatering area, and odour control in this area appears to be normal, and effective. FCPCC Expansion to address further odour mitigations.
18-Mar-24	[redacted] Leeward Way Qualicum	[redacted] called and left a message on the odour complaint mail box to say that he could smell the plant today and was told to call in whenever he had an issue with the odours of the treatment plant.		I called [redacted] back but was unable to make contact. I left a message indicating that I was following up on the odour complaint and would be investigating. I walked around the treatment plant and checked in with staff as to any potential operational issues on site. Everything was normal with no issues identified. The septage area was a little bit odorous as a hauler had just off loaded. I drove to the location of the odour complaint but was unable to smell any odours. (Smelt like a spring day). It was noted that the wind was going in the direction of the location of the odours complaint location that was roughly 1.5 to 2km away from the plant.	[redacted] actions are acceptable for this odour incident.

Date of Occurrence	Location	Incident Description	Preventative Measures Identified	Notes	Conclusion
19-Apr-24	[redacted] Mulholland Drive	Call was received through the RDN's after hours emergency contact number. [redacted] called to follow up with person that called in the odour complaint, but was unable to make contact as the person did not answer the phone. Weather is sunny (12.8 C with wind NW 5km/h humidity 33%)		Checked odour control system (all normal). Checked plant operation. Only issue noted was staff dealing with lower ATAD temperatures and had transferred sludge from ATAD #4 to ATAD #3. It was found that there was ATAD odours on Lee Road.	Chief Operator's investigation and findings are accurate and acceptable, and further odor mitigations will be in place after the FCPCC expansion project.
26-Apr-24	Dalmatian Drive, to Admiral Tryon	[redacted] stated "Stink all the way down Dalmatian Drive to Admiral Tryon in Columbia Beach. 8:30 No need for phone call There have been many times the past couple of months. Didn't bother emailing"		Since the complaint came in after hours, no immediate actions were taken. The weather was rainy and cool. Reviewing the Plant log, plant was operating normally, and all odour control systems were functioning normally.	Chief Operator investigation acceptable, odor to be address in FCPCC expansion project.
26-Apr-24	[redacted] Dalmation Drive	[redacted] stated "Dalmatian Drive front and back yard. Extremely disgusting at 11:10 can't even use our hot tub" This is the second odour complaint by [redacted] this evening in the area.		Since the complaint came in after hours, no immediate actions were taken. The weather was rainy and cool. Reviewing the Plant log, plant was operating normally (Primary #3 tank was being filled) and all odour control systems were functioning normally.	Chief Operator investigation acceptable, and source from plant maintenance operations...odor to be address in FCPCC expansion project.
21-Jun-24	FCPCC	Email from [redacted] on Dalmation Drive (Columbia Beach). [redacted]. Odour while at the end of my walk at 21:30 up Dalmation Drive. Screen doors were open to cool the house down and windows with the breeze but no, the smell filled it up and had to close my everything down. Not acceptable - now it's stifling hot on here again. Do better.		Odour complaint came in via email after hours. All odour equipment working. Doors closed, normal after hours operation. When I went to get the historical weather data for wind speed, direction, and temperature I was not able to locate our weather station app. I logged into the website and it shows our weather station has not updated since Dec 15, 2023. We used to have a computer for the weather station on the SCADA desk.	Odour control equipment working well, concern came in after hours so hard to investigate. FCPCC influent liner project was ongoing at this time so may have contributed to odor.

Date of Occurrence	Location	Incident Description	Preventative Measures Identified	Notes	Conclusion
				Where did that computer go?	
27-Jun-24	FCPCC	Caller experiencing terrible odour. ATAD fan off for ductwork maintenance. ATAD temperatures high - producing a lot of steam	Ducting re-established and ATAD exhaust fan turned back on.	Contractor ran into difficulties installing new dampeners. Executed temporary fix and will return tomorrow to finish job. Called complainant to check that odor experienced has ceased and informed her of potential odor occurring tomorrow.	Maintenance work to ATAD ducting was needed, which did increase odors in the areas, new ducting has been installed by Canwest.
23-Jul-24	FCPCC	Smell from treatment plant in backyard and have to close windows to keep out stench. Typically don't get smell as 2 km away	Checked plant operation and odor control equipment - all normal		FCPCC intermittent odor still present and future expansion will improve odor mitigation
24-Jul-24	FCPCC	Smell & stench coming from waste water treatment plant, have to close windows & feeling surrounded, not happy	Checked plant operation and odor control equipment - all normal	Drove through neighborhood & back to plant - no odors detected	Odors are occasional still from FCPCC and current odor control system is working as intended, and the expansion will address odor mitigation.
27-Jul-24	Pepper place	[redacted] emailed the RCU inquiries email address with a concern that indicated that [redacted] lives on Pepper place near the treatment plant and has noticed the odour from the plant seems to be worse this year.		I checked the plant log book for the weekend and nothing was noted. Plant and odour control systems are working properly. I emailed [redacted] back with an update on the current schedule of the upgrade indicating that the project will be starting this fall. (As indicated by [redacted])	Improved odor mitigation to be addressed in FCPCC expansion
7-Aug-24	FCPCC	Another BBQ ruined by poop smell	After hours, all systems & trends normal	Caller wants to know if started work on this dump as it was supposed to start years ago and he's tired of it. I was at plant just after for call out and drove through the neighbourhood and didn't notice any odours.	Odors more present as weather is warmer in summer, to be mitigated during FCPCC expansion

Date of Occurrence	Location	Incident Description	Preventative Measures Identified	Notes	Conclusion
8-Aug-24	[redacted] Glenhale Cres.	Strong odour smell on occasions in the evenings	Odour control upgrades	After hours - all systems operating normally	Warmer summer temps can add to odor, and the fcpcc expansion will mitigate odor concerns
9-Aug-24	FCPCC	On Lee Rd. for walk and smell was very bad. Noticed septage trucks lined up. Normally has smells occurring at residence but this was much worse.	Checked plant and odor control systems - all normal, busy day at septage receiving station		Added septage hauling causes odor dur to truck offloading

Note: Two odour concerns were also received in October and December 2024. Records were not retained from these odour concerns due to the transition in software used to track these concerns.

Appendix F – Environmental Incident Reports

Environmental Incidents:

Date of Occurrence	Incident Title	Quantity of Material Spilled	Accident Location	Incident Description	Extent of damage (if applicable)	Preventative Measures Identified	Conclusion for this Environmental Incident
December 26, 2024	FCPCC Effluent Channel Spill	200 L	FCPCC	Due to heavy flows entering the treatment plant and the inability of the EFF pumps to pump the effluent out the outfall fast enough the effluent levels started to rise and back up in the plant. Staff received a high effluent sump level alarm and upon arriving on site found that the water level in the Effluent channel had backed up to the point of overflowing the channel and starting to spill out the outside door of the WBS building and across the road to the soil berm. Spill was determined to of started around 13:40 Hrs and stopped at 13:50Hrs.	Soil contamination located in area outside door to WBS Room.	Some of the TF Effluent pumps were turned off and staff also turned off all but one pump at the Lee Rd. pump station to reduce the immediate flow to the treatment plant.	Incident was reported to EMBC. End of Spill report submitted on January 17, 2025.

Appendix G – Conditional Management Plan 2024 Annual Report

REGIONAL DISTRICT OF NANAIMO

January 6, 2025 File: 2240-20-CMP

Erin Milligan
Canadian Shellfish Sanitation Program Coordinator
Fisheries and Oceans Canada
VIA EMAIL: erin.milligan@dfo-mpo.gc.ca

Dear Erin,

Re: 2024 Annual Report
French Creek Pollution Control Centre – Conditional Management Plan

The Regional District of Nanaimo (RDN) has a Conditional Management Plan (CMP) for two pump stations associated with the French Creek Pollution Control Centre (FCPCC) near Parksville, BC:

- Hall Road Pump Station, 300 Hall Road
- Bay Avenue Pump Station, 385 Bay Avenue.

The original CMP was established in 2012 and has been renewed several times. The current agreement expires on January 31, 2025, and a revision is pending.

According to the agreement, the RDN shall report CMP activities annually. This letter summarizes CMP activities from January 1, 2024, to December 31, 2024. It also lists notable upgrades and activities at FCPCC and suggests proposed changes, if any, to future versions of the CMP.

CMP Activities

There were no trigger events in this reporting period.

FCPCC Upgrades and Activities

The most notable change is the removal of the overflow at the Bay Avenue Pump Station. Details were previously communicated with Fisheries and Oceans Canada. As a result, this overflow location is being removed from the next version of the CMP.

Other upgrades and activities at FCPCC in 2024 include:

- Awarded the contract for the detailed design and construction of the French Creek Pollution Control Centre Expansion and Odour Control Upgrade Project.
- Continued the partnership with VIU to monitor air quality.
- Added an electrician and millwright to the staff.
- Lined the influent pipe to extend its useable life.
- Reinforced the bypass gate to prevent the potential of wastewater bypassing FCPCC.
- Replaced foul air ducting in the waste biological sludge
- Completed construction on the Bay Avenue Pump Station Upgrade.

Proposed CMP Changes

As this revision of the CMP expires on January 31, 2025, an update is underway and recommended edits have already been communicated to DFO staff.

If you have any questions regarding this report, please do not hesitate to contact me at 250-390-6575 or snorum@rdn.bc.ca.

Sincerely,

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Appendix H – Annual Summary 2024 Management of RDN FCPCC Biosolids (SYLVIS)

ANNUAL SUMMARY

2024 Management of Regional District of Nanaimo French Creek Pollution Control Centre Biosolids

Presented to:	Shelley Norum, RDN
Presented by:	Christian Evans, SYLVIS Environmental
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BACKGROUND

Regional District of Nanaimo (RDN) Class A biosolids from the French Creek Pollution Control Centre (FCPCC) are delivered to the Nanaimo Forest Products Harmac Pacific pulp and paper mill (Harmac) in Nanaimo, BC where they are blended with hog fuel and sand to produce a biosolids growing medium (BGM), a retail-grade product regulated under the BC *Organic Matter Recycling Regulation* (OMRR). BGM from FCPCC biosolids has been produced at Harmac since 2020 and has been sold to local property developers or used in on-site landfill closure.

SYLVIS provides qualified professional oversight of the BGM program and certifies batches of BGM as per OMRR criteria. All batches of BGM produced to date have met regulatory quality criteria with the exception of the batch produced from deliveries occurring between July 2023 and September 2024, which was sampled and tested in September 2024. This material technically remains a Class A biosolids. Harmac will identify an end-use for this material in 2025.

2024 MANAGEMENT SUMMARY

In 2024 a volume correction factor has been included to align with documented stockpile clearing events. Volume changes can result from handling and blending of the feedstocks. Theoretical volume calculations based on the mix ratio are likely biased towards higher volumes, and thus require a periodic correction.

Row #	Material	Category	2020	2021	2022	2023	2024
1	FCPCC Biosolids (wt)	Carry over from previous year	0	730	1,031	1,363	791
2		Tonnage delivered to BGM project	1,007	1,299	1,291	1,124	1,074
3		Tonnage exported from site	277	998	640	605	238
4		Tonnage used in landfill cover	0	0	0	648	0
5		Tonnage Correction	0	0	320	443	0
6		Carry over to next year (1+2)-(3+4)	730	1,031	1,363	791	1,627
7	BGM (m^3)	Carry over from previous year	0	3,320	4,720	6,260	3,610
8		Volume mixed	4,720	6,020	5,980	5,200	4,970
9		Volume exported from site	1,400	4,620	2,960	2,800	1,100
10		Volume used in landfill cover	0	0	0	3,000	0
11		Volume Correction	0	0	1,480	2,050	0
12		Carry over to next year (7+8)-(9+10+11)	3,320	4,720	6,260	3,610	7,480

Note: Biosolids are mixed at a ratio of 2 biosolids : 4 hog fuel : 5 sand to produce BGM.

BIOSOLIDS QUALITY SUMMARY

In 2024, three composite samples were collected by SYLVIS and analyzed for physical parameters, nutrients, and trace elements. In 2024 FCPCC biosolids met the OMRR Class A criteria for trace element concentrations. Eight samples for fecal coliform analysis were collected by SYLVIS in 2024. All samples tested below the Class A criterion of 1,000 MPN/g. Five samples tested at < 10 MPN/g. The other three samples tested at < 1,000 MPN/g due to "dilution effects" resulting from requirements of the analytical method for those specific samples. The dilution effect increases the detection limit, in this case increasing it up to the regulatory criterion. In all likelihood the actual fecal coliform count was similar to other samples but the lab could not confirm that, although they did confirm that the values were below the regulatory criterion. FCPCC biosolids continued to meet the OMRR Class A criterion of < 1,000 MPN/g fecal coliforms in 2024.

Table 1: French Creek Pollution Control Centre biosolids quality summary - 2024.

WWTP	FCPCC	OMRR Class A Biosolids Criteria[a]	Units
# of samples	**3**		
Available Nutrients			
Ammonia + Ammonium - N (available)	3,133	-	µg/g
Nitrate - N (available)	46	-	µg/g
Phosphorus (total)	20,100	-	µg/g
Potassium (available)	948	-	µg/g
Classification			
Organic Matter	68.5	-	%
Total Nitrogen	5.08	-	%
C:N Ratio	7.6	-	-
OMRR Trace Elements			
Arsenic	2.1	75	µg/g
Cadmium	1.61	20	µg/g
Chromium	31.0	1,060[b]	µg/g
Cobalt	2.20	150	µg/g
Copper	696	2,200[b]	µg/g
Lead	13.1	500	µg/g
Mercury	0.594	5	µg/g
Molybdenum	4.89	20	µg/g
Nickel	11.5	180	µg/g
Selenium	4.5	14	µg/g
Zinc	1,367	1,850	µg/g

Note: All analyses based on dry weight.

a Class A trace element criteria specified in the August 2017 version of *Trade Memorandum T-4-93, Standards for Metals in Fertilizers and Supplements*, and microbiological criteria specified in Schedule 3 of the BC *Organic Matter Recycling Regulation*.

b For context, OMRR Class B trace element criteria are specified where no Class A criteria exist.

Table 1 cont'd: French Creek Pollution Control Centre biosolids quality summary - 2024.

WWTP	FCPCC	OMRR Class A Biosolids Criteria[a]	Units
# of samples	**3**		
Physical Properties			
Total Solids	31.3	-	%
Electrical Conductivity (Sat Paste)	8.87	-	dS/m
pH (1:2 Soil:Water)	7.0	-	pH
Foreign Matter	< 0.1	1	%
Foreign Matter (sharps)	< 0.1	0	%
Microbiology			
Fecal coliforms	< 1,000[c]	1,000	MPN/g Dry

Note: All analyses based on dry weight.

a Class A trace element criteria specified in the August 2017 version of *Trade Memorandum T-4-93, Standards for Metals in Fertilizers and Supplements*, and microbiological criteria specified in Schedule 3 of the BC *Organic Matter Recycling Regulation*.

c Value is the maximum of eight samples collected by SYLVIS throughout 2024.

REGIONAL DISTRICT OF NANAIMO

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