# DISTRICT OF SOOKE
# WASTEWATER TREATMENT PLANT
# AND COLLECTION SYSTEM

## OPERATED BY
## EPCOR WATER SERVICES INC.

# OPERATIONS REPORT
# DECEMBER 2015
# REGISTRATION NUMBER 17300

# INTRODUCTION

The Sooke wastewater collection system and treatment plant are owned by the District of Sooke and operated by EPCOR Water Services Inc. The system services the core area of Sooke.

The system consists of:

- 54 km of collection system piping
- 522 manholes
- 7 pump lift stations (Sooke Road, West Coast Road, Helgesen Road, Sunriver, Prestige Hotel, Mariner's Village and Treatment Plant)
- A secondary treatment wastewater plant with disinfection
- A marine discharge through a 1.7 km long, 30m deep outfall

The treatment plant uses a Sequencing Batch Reactor (SBR) treatment process with UV disinfection to provide secondary wastewater treatment. Plant treatment removes over 95% of the total suspended solids and high levels of other contaminants, providing significant environmental benefits to the District of Sooke and the receiving waters.

The treatment plant has a design capacity of 3,000 $m^3$/day (annual average daily flow), and a peak wet weather flow capacity of 6,900 $m^3$/day. The plant is expandable by an additional 3,000 $m^3$/day (average daily flow).

Construction of the Sooke collection system and wastewater treatment plant began in 2004 and the system was commissioned in December 2005. Individual domestic and commercial connections began in May 2006 and continued throughout 2006 and 2007, with the majority completed by December 2006. Additional connections have continued since that time for new construction in the specified sewer area.

# OPERATIONS

**Wastewater Treatment Plant**

In December, effluent quality was good with the TSS (total suspended solids) averaging 22 mg/L and CBOD averaging 18 mg/L. (MWR limit is ≤45 mg/L and WSER limit is ≤25 mg/L quarterly average). The results, as detailed in this report, are obtained from samples tested at an independent ISO/IEC 17025 accredited lab.

December 1 In response to "toxic shock" received in November operators are wasting healthy sludge from SBR# 2 to SBR# 1. This effort being carried out to try to "re-seed" SBR# 1 as it has experienced a complete bacterial die-off.

Exhaust fans in headworks building not working. Troubleshooting found a VFD reset to be necessary in the motor control center (MCC) room.

Lock cylinder in one of the headworks room doors not working. Locksmith called.

December 2 Operators continuing to waste sludge in hand from SBR# 2 to SBR# 1 in the "re-seeding" process.

Arranged for disposal of spent COD reagent vials.

Arranged permit for disposal of granulated activated carbon with Hartland Landfill.

Condensation in headworks building completely gone now that exhausts fans are operating correctly.

Electrical contractor called to plant as grit classifier motor making loud noises. Motor disassembled and taken to electrical shop for rebuild.

December 3 Centrifuge replacement meeting held at WWTP with centrifuge supplier, District of Sooke staff, EPCOR lead hand and senior manager.

Operators cleaned UV lamps and sleeves in bank "B" of UV channel.

Rebuilt grit classifier motor was installed and tested.

December 4 Plumbing contractor replaced corroded water line fittings in headworks building.

SBR# 1 still in poor condition due to toxic shock/bacterial die-off. Effluent TSS at 21 mg/L and COD 100mg/L indicating unconsumed organic matter due to lack of biological process. These effluent results still well within regulatory limits for discharge and microscopic analysis improving as number of bacteria is increasing.

Operators wasting sludge in hand from SBR# 2 to SBR# 1 which is continuing to re-seed SBR# 1 with healthy bacteria.

December 7 Re-seeding process continuing.

December 8 Centrifuge replacement meeting held.

Lead hand operator travelled to observe newly commissioned centrifuge at Ladysmith WWTP.

December 9 SBR# 2 showing signs of poor settle. Operators monitoring sludge volumes in both basins.

December 10 Operations dealing with issues resulting from toxic shock to WWTP.

December 14 Centrifuge showing signs of age as biosolids quality is down. Operations using all possible centrifuge adjustments to make best possible biosolids quality. Also, sludge "dewaterability" has been adversely affected by reduced biological activity which is the direct result of toxic shock from foreign substance entering wastewater stream.

December 15 Monthly EPCOR Incident Management meeting attended by lead hand operator.

Operators have centrifuge making best quality biosolids cake possible under current conditions.

December 17 Operators completed eight hour online training course.

December 18 Operators increased biosolids handling to create digester sludge storage room for upcoming holidays.

December 22 Centrifuge making acceptable quality biosolids cake.

December 31 Started, ran and tested on-site standby power generator.

**Wastewater Collection System**

**Lift Stations**

The lift stations operated well throughout the month of December.

December 10 Routine lift station checks done at Sunriver, Helgesen and West Coast Road lift stations. Hi level floats were tipped at these lift stations and alarm dial-outs to monitoring company were confirmed. Inspection of West Coast Rd. lift station found large accumulation of debris on low level float. Debris removed.

December 18 Have recently experienced two instances of Hi level alarms at Sooke Road lift station. In both instances, when operators arrived, lift station wetwell level has been high and pumps are not running. SCADA trends show pumps starting and stopping repeatedly but only removing a small volume of water each cycle. First method of troubleshooting has been to replace LIT.

December 19 On-call operator found pump# 2 in fault condition at Sunriver lift station

December 21 Electrical contractor called in to troubleshoot fault condition of pump# 2 at Sunriver lift station.
Fault condition has been diagnosed as a failed VFD.

SCADA trends show excessive pump starts and stops at Helgesen Road lift station. Operators inspected check valves in valve chamber and found them to be working properly. Rainwater is entering the lift station and thought to be the cause.

December 22 Routine lift station checks completed at Prestige Hotel and West Coast Road. Debris accumulation noted on low level float at West Coast Road lift station and had to be removed. Scheduled wetwell cleaning with vacuum truck contractor.

December 24 Lift station check done at Mariner's Village, Sooke Road, Sunriver and Helgesen lift stations. Sooke Road - witnessed white liquid flowing into wetwell. No chemical odour noted. With Sunriver lift station pump# 2 currently out of order (VFD repairs), hi level float tipped, confirming alarm dial-out and pump# 1 taking control of lift station.

West Coast Road lift station displayed a PLC health alarm and returned to normal minutes later.

December 25 Simulated a fault condition with pump# 1 at Sunriver lift station, tipped Hi level float to test call-out alarm. Alarm dial-out was confirmed and pump# 1 faults were cleared, resets made and returned to auto-control.

December 29 Lift station checks made at West Coast Road, Sooke Road, Sunriver and Helgesen Road lift stations.

December 30 Started and ran standby power generators at Sooke Road, Sunriver, Helgesen Road and West Coast Road lift stations. Generators were operated four and a half hours.

Scheduled wetwell cleanings with vacuum truck contractor for Helgesen Road and West Coast Road lift stations. Both lift stations have excessive accumulations of grease and debris beyond what would be considered typical since last cleaning. Cleanings to take place starting midnight Jan. 06.16

December 31 Added fuel stabilizer to standby power generators at Sooke Road, Sunriver, Helgesen Road and West Coast Road lift stations.

December 31 No further issues at Sooke Road lift station since LIT replacement of Dec. 18.

**Plant and Operator Classification**

The Wastewater Treatment Plant is a Class III plant, classified under EOCP # 1358 and is operated under MOE Guidelines. The Sooke WWT plant is operated in compliance with the MWR and meets the certification requirements.

The collection system is a Class II Wastewater Collection System, classified under EOCP # 1827 in accordance with the Environmental Operators Certification Program. Previously, the collection system was determined to be a Class III facility. The collection system classification is reviewable every five years and was recently reviewed. Discrepancies were noted in a previous classification application and most recent application information has resulted in a change to the collection system classification.

**Table 1– Operator Certification**

| Name | Position | Qualifications |
|---|---|---|
| Shawn Pearson | Lead Operator | BC EOCP Certified: Level III Wastewater Treatment & Level II Wastewater Collection System |
| Jesse Forcier | Operator | BC EOCP Certified: Level I Wastewater Treatment |

# QUALITY

The District of Sooke Liquid Waste Management Plan was approved by the Ministry of Environment in June 2011. Contained in the approved plan is a proposed Operational Certificate (OC). The OC provides more extensive standards and guidelines for the operation of the wastewater treatment plant than is contained in the plant registration that was submitted by the District to the Ministry in 2002 or in the general guidelines provided in the Municipal Waste Regulations (MWR). The Operational Certificate will be finalized in the future and will become the standard for the plant operation.

The Wastewater Systems Effluent Regulations (WSER), under the Federal Fisheries Act, was gazetted on July 18, 2012. The Government of Canada worked with the provinces and engaged municipalities and others to establish the country's first national standards for wastewater treatment. It establishes limits for deleterious substances in the wastewater plant effluent that can be released into the natural environment.

Table 2 contains the WSER, MWR and the proposed OC requirements for information.

## Table 2 – Summary of Regulatory Requirements

| Parameters or Description | WSER | | MWR | | Proposed OC | |
|---|---|---|---|---|---|---|
| | Limits | Frequency | Limits | Frequency | Limits | Frequency |
| Ammonia-Nitrogen | | | NA | Quarterly (Grab) | NA | Quarterly (grab) |
| Ammonia (un-ionized) as N at $15^0$C ( WSER) | <1.25 mg/L | Monthly (until June 30, 2014) | NA | NA | NA | NA |
| CBOD | ≤25 mg/L (Quarterly Average) | Monthly (Grab) | ≤45 mg/L | Monthly (Grab) | ≤45 mg/L | Monthly (Grab) |
| Fecal Coliforms | NA | | <200 CFU/100 ml * Geometric Mean | 5 samples 30 days | NA | 6 x / year |
| *Enterococci* | NA | | NA | NA | NA | 6 x / year |
| pH | | | 6.0 - 9.0 | | 6.0 - 9.0 | Monthly (Grab) |
| Receiving Environment Testing | | | Required | Annually | As per Receiving Environment Monitoring Plan | 1/year |
| Operator Certification | | | Required notification to regulator when there is a change in operator with the highest certification level in the plant | NA | Required notification to regulator when there is a change in operator with the highest certification level in the plant | NA |
| Reports, Annual | | | As requested by Director | As requested by Director | 1/year | Within 120 days of calendar Year |
| Reports, General | Quarterly | Within 45 days after the end of the quarter | Data submission 2 times per year | | Quarterly | Within 31 days of quarter ends |
| Flow Measurement | | Daily Total | | | NA | Daily Total |
| Flow, Average | | | To be determined | 2/week | 3,000 $m^3$/day | 2/week |
| Flow, Maximum | | | To be determined | 2/week | 6,900 $m^3$/day | 2/week |
| Total Phosphorus | | | NA | Quarterly (Grab) | Not Required | NA |
| Effluent TSS | ≤25 mg/L (Quarterly Average) | Monthly (Grab) | ≤ 45 mg/L | Monthly (Grab) | ≤ 45 mg/L | Monthly (Grab) |
| Post of Outfall Sign | | | Required | | Erect sign above high water mark. | NA |
| Out fall Inspection | | | Required | Every 5 years | Required | Every 5 years. Next Due 2018 |
| Biosolids Management | | | NA | | Shall be transported to an approved receiving facility | NA |

*<200 CFU/100 mL on a geometric mean of the last 5 samples in 30 days at the edge of the dilution zone for recreational water use and <14 CFU/100 mL for shellfish bearing waters. ** All regulated tests are conducted by an ISO/IEC 17025 accredited laboratory. "Grab" refers to a grab sample, which is a single sample that represents the composition of the water at that specific time and place.

## Table 3 – Performance Measures – District of Sooke O&M Key Performance Indicators

### Water Quality & Environmental Performance Measures

| Activity | Actual Values | Actual Values | Target Values |
|---|---|---|---|
| | December | YTD | Annual |
| Effluent Quality & Violations to Operational Certificates | 0 | 0 | 0 |
| Laboratory QA/QC Activities | 95 | 553 | 200 |
| Proactive Environmental/Quality Initiatives | 1 | 5 | 5 |
| Completion of Required Regulatory Reporting | 100% | 100% | 100% |
| **Activity** | **Actual Value** | **Actual Value** | **Acceptable Value** |
| | **December** | **YTD** | **Annual** |
| Releases * | 0 | 0 | 2 |

### People & Safety Performance Measures

| Activity | Actual Values | Actual Values | Target Values |
|---|---|---|---|
| | December | YTD | Annual |
| Lost Time Accidents | 0 | 0 | 0 |
| Staff Training (hours) | 15 | 283 | 40 hrs/ employee |
| Safety Preventative Activities | 26 | 146 | 30 |

### Customer Service Performance Measures

| Activity | Actual Values | Actual Values | Target Values |
|---|---|---|---|
| | December | YTD | Annual |
| Service Outages < 24 hours | 100% | 100% | 90% Complete |
| Community Related Activities | 1 | 8 | 4 |

* Uncontrolled discharges of wastewater that are reportable to Provincial Emergency Plan under legislation, excluding abnormal circumstances

## Table 4 – Monthly Quality Summary

| | Influent | | | | Effluent | | | | | | | | | | | | | | | | | | | | Biosolids Shipped | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CBOD mg/L | TSS mg/L | NH3-N mg/L | TP | Flow $m^3$/day | | | CBOD mg/L | | | TSS mg/L | | | NH3-N mg/L | | | Un-Ionized NH3-N mg/L | | | TP | | | FC CFU/100mL | | | Kg | # of Loads |
| | Ave | Ave | Ave | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max | Ave | Min | Max | Geo Mean | | |
| Regulatory Limit | | | | | | 14400 | 3000 | | ≤45** | ≤25 * | | ≤45** | ≤25 * | | | | | <1.25 | | | | | | | <200 | | |
| January | 152 | 168 | 28 | 5.2 | 1931 | 5443 | 2613 | <4 | 5 | 5 | 5 | 6 | 5 | 1.14 | 2.50 | 1.68 | <0.05 | <0.05 | <0.05 | 2.18 | 3.28 | 2.72 | 10 | 64 | 29 | 72990 | 8 |
| February | 70 | 86 | 37 | 7.8 | 1767 | 3543 | 2313 | <4 | <4 | <4 | 5 | 6 | 6 | 0.17 | 2.19 | 1.00 | <0.05 | <0.05 | <0.05 | 2.33 | 4.35 | 3.25 | 4 | 96 | 19 | 41270 | 4 |
| March | 163 | 156 | 39 | 7.0 | 1574 | 3305 | 2220 | <4 | <4 | <4 | 3 | 4 | 4 | 0.17 | 1.69 | 0.72 | 0.00021 | <0.05 | 0.025 | 2.57 | 3.64 | 3.19 | 22 | 68 | 38 | 50410 | 5 |
| April | 214 | 239 | 43 | 8.3 | 1718 | 2485 | 1973 | <4 | 5 | 4 | <5 | 11 | 7 | 0.13 | 0.61 | 0.37 | <0.05 | <0.05 | <0.05 | 3.25 | 4.37 | 3.89 | 6 | 76 | 19 | 68000 | 7 |
| May | 138 | 230 | 43 | 13.7 | 1516 | 1800 | 1643 | <4 | 6 | 5 | <5 | 8 | 7 | 0.08 | 0.51 | 0.28 | <0.05 | <0.05 | <0.05 | 3.54 | 4.52 | 4.07 | 16 | 160 | 37 | 68810 | 7 |
| June | 340 | 195 | 45 | 14.0 | 1439 | 1709 | 1559 | <4 | 6 | 5 | <4 | 14 | 9 | 0.10 | 0.46 | 0.27 | <0.05 | <0.05 | <0.05 | 3.52 | 6.80 | 4.54 | 18 | 72 | 33 | 40320 | 4 |
| July | 269 | 346 | 63 | 10.7 | 1387 | 1644 | 1514 | <4 | 7 | 5 | 7 | 17 | 11 | 0.26 | 0.35 | 0.21 | nr | nr | nr | 2.35 | 8.40 | 4.75 | 8 | 260 | 43 | 29860 | 3 |
| August | 314 | 456 | 49 | 20.0 | 1410 | 1765 | 1500 | <4 | 6 | 5 | 4 | 21 | 12 | 0.23 | 4.04 | 1.26 | nr | nr | nr | 2.80 | 9.60 | 5.85 | 4 | 2090 | 27 | 29880 | 3 |
| September | 354 | 306 | 59 | 9.9 | 1439 | 1717 | 1564 | <4 | 7 | 5 | 4 | 8 | 6 | 0.10 | 0.87 | 0.42 | nr | nr | nr | 3.57 | 7.60 | 4.61 | <2 | 32 | 11 | 47140 | 4 |
| October | 395 | 346 | 53 | 8.8 | 1406 | 3662 | 1689 | <4 | 5 | 5 | <5 | 6 | 5 | 0.16 | 1.00 | 0.63 | nr | nr | nr | 1.50 | 4.35 | 3.41 | <2 | 16 | 5 | 80550 | 8 |
| November | 175 | 150 | 33 | 6.6 | 1940 | 6042 | 2829 | <4 | 6 | 5 | <4 | 6 | 5 | 0.73 | 1.12 | 0.96 | nr | nr | nr | 1.30 | 1.30 | 1.78 | 2 | 470 | 33 | 58560 | 6 |
| December | 139 | 230 | 35 | 5 | 1959 | 5246 | 2984 | 8 | 28 | 18 | 16 | 31 | 22 | 0.21 | 2.21 | 1.36 | nr | nr | nr | 1.01 | 4.66 | 3.20 | 12 | 2030 | 184 | 69750 | 7 |
| Total | | | | | | | | | | | | | | | | | | | | | | | | | | 657540 | 66 |
| Annual | 227 | 242 | 44 | 9.8 | 1387 | 6042 | 2033 | <4 | 28 | 6 | <4 | 31 | 8 | 0.08 | 4.04 | 0.76 | 0.00021 | <0.05 | <0.05 | 1.01 | 9.60 | 3.77 | <2 | 2090 | 32 | | |

* WSER- Quarterly average, **MWR and proposed OC, nr = not required

**Table 5 – Quarterly WSER Compliance Reporting Table - Effluent**

| | CBOD mg/L | TSS mg/L | Un-Ionized NH3-N * mg/L | Effluent Flow m3 |
|---|---|---|---|---|
| | Quarterly Average | Quarterly Average | Maximum | Quarterly Total |
| **Regulatory Limit** | **≤25** | **≤25** | **<1.25** | |
| **Q1** | 5 | 5 | <0.05 | 214,585 |
| **Q2** | 5 | 8 | <0.05 | 156,895 |
| **Q3** | 5 | 9 | nr | 140,258 |
| **Q4** | 9 | 11 | nr | 225,689 |

* Un-ionized NH3-N tested with pH at 15°C and is not required (nr) after June 30/2014

## Table 6 – Influent Water Quality

| | | INFLUENT | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | IN HOUSE | | | | EXTERNAL | | | | | | |
| | Effluent flows | pH | TSS | $NH_{3-N}$ | COD | COD | CBOD | TSS | $NH_3$ | TP | Conductivity | Surfactants |
| Dec. | $m^3/d$ | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | µS/cm at 25 C | mg/L |
| 1 | 2080 | | | | | | | | | | | |
| 2 | 1959 | | | | | | | | | | | |
| 3 | 2375 | 7.8 | 240 | 43 | 723 | 605 | 161 | 260 | 39 | 5.7 | 647 | 1.9 |
| 4 | 2637 | 7.8 | 210 | 37 | 588 | | | | | | | |
| 5 | 2558 | | | | | | | | | | | |
| 6 | 2749 | | | | | | | | | | | |
| 7 | 2749 | 7.6 | 165 | 27 | 431 | | | | | | | |
| 8 | 3950 | | | | | | | | | | | |
| 9 | 5246 | 7.4 | 95 | 14 | 325 | | | | | | | |
| 10 | 3903 | | | | | | | | | | | |
| 11 | 3280 | 7.6 | 160 | 26 | 424 | | | | | | | |
| 12 | 2870 | | | | | | | | | | | |
| 13 | 3319 | | | | | | | | | | | |
| 14 | 3020 | 7.6 | 160 | 26 | 481 | | | | | | | |
| 15 | 2789 | | | | | | | | | | | |
| 16 | 2665 | 7.5 | 220 | | 520 | 499 | 116 | 200 | 32 | 5.1 | | |
| 17 | 2632 | | | | | | | | | | | |
| 18 | 3609 | 7.7 | 125 | | 315 | | | | | | | |
| 19 | 3463 | | | | | | | | | | | |
| 20 | 3153 | | | | | | | | | | | |
| 21 | 3186 | 7.6 | 120 | 25 | 354 | | | | | | | |
| 22 | 3073 | | | | | | | | | | | |
| 23 | 3234 | 7.7 | 110 | 24 | 394 | | | | | | | |
| 24 | 3732 | | | | | | | | | | | |
| 25 | 3078 | 7.3 | 105 | 16 | 321 | | | | | | | |
| 26 | 2611 | | | | | | | | | | | |
| 27 | 2655 | | | | | | | | | | | |
| 28 | 2626 | 7.4 | 80 | 25 | 299 | | | | | | | |
| 29 | 2577 | | | | | | | | | | | |
| 30 | 2370 | 7.6 | 140 | 32 | 455 | | | | | | | |
| 31 | 2351 | | | | | | | | | | | |
| Min | 1959 | 7.3 | 80 | 14 | 299 | 499 | 116 | 200 | 32 | 5.1 | 647 | 1.9 |
| Max | 5246 | 7.8 | 240 | 43 | 723 | 605 | 161 | 260 | 39 | 5.7 | 647 | 1.9 |
| AVG | 2984 | 7.6 | 148 | 27 | 433 | 552 | 139 | 230 | 35 | 5.4 | 647 | 1.9 |

## Table 7 – Daily Water Quality of Effluent

| | SBR 1 EFFLUENT | | | | | | | | | | | | | SBR 2 EFFLUENT | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | IN HOUSE | | | | EXTERNAL | | | | | | | | | IN HOUSE | | | | EXTERNAL | | | | | | | |
| | pH | TSS | $NH_{3\text{-}N}$ | COD | COD | TSS | CBOD | $NH_3$ | Temp | pH | TP | *Enter-ococci* | FC | pH | TSS | $NH_{3\_N}$ | COD | COD | TSS | CBOD | $NH_3$ | Temp | pH | TP | *Enter-ococci* | FC |
| **Dec.** | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | °C | | mg/L | CFU/ 100mL | CFU/ 100mL | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | °C | | mg/L | CFU/ 100mL | CFU/ 100mL |
| **1** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **2** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **3** | 6.5 | 21 | 2.1 | 105 | 113 | 31 | 28 | 2.21 | | 6.45 | 4.66 | | 2000 | 6.4 | 12 | <0.4 | 56 | 60 | 17 | 10 | 0.21 | | 6.46 | 3.21 | | 68 |
| **4** | 6.6 | 24 | 1.9 | 113 | | | | | | | | | | 6.5 | 9 | <0.4 | 97 | | | | | | | | | |
| **5** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **6** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **7** | 6.6 | 27 | 1.3 | | | | | | | | | | | 6.5 | 12 | 1.0 | | | | | | | | | | |
| **8** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **9** | 6.7 | 28 | 0.9 | 83 | | | | | | | | | 1470 | 6.4 | 15 | 0.5 | 42 | | | | | | | | | 510 |
| **10** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **11** | 6.6 | 23 | 3.5 | 63 | | | | | | | | | | 6.3 | 14 | 1.0 | 54 | | | | | | | | | |
| **12** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **13** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **14** | 6.4 | 25 | 2.0 | 101 | | | | | | | | | | 6.6 | 8 | 1.4 | 58 | | | | | | | | | |
| **15** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **16** | 6.6 | 20 | | 82 | 99 | 24 | 24 | 2.17 | 25 | 6.58 | 3.93 | 4800 | 2030 | 6.4 | 12 | | 58 | 56 | 16 | 8 | 0.84 | 25 | 6.59 | 1.01 | 40 | 68 |
| **17** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **18** | 6.5 | 13 | 3.3 | 73 | | | | | | | | | | 6.4 | 11 | 1.2 | 55 | | | | | | | | | |
| **19** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **20** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **21** | 6.5 | 10 | 1.5 | 57 | | | | | | | | | 154 | 6.4 | 7 | <0.4 | 41 | | | | | | | | | 68 |
| **22** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **23** | 6.5 | 11 | 2.6 | 59 | | | | | | | | | | 6.4 | 9 | <0.4 | 54 | | | | | | | | | |
| **24** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **25** | 6.4 | 12 | 2.5 | | | | | | | | | | | 6.4 | 8 | <0.4 | | | | | | | | | | |
| **26** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **27** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **28** | 6.4 | 9 | 0.6 | 59 | | | | | | | | | | 6.4 | 7 | <0.4 | 46 | | | | | | | | | |
| **29** | | | | | | | | | | | | | 56 | | | | | | | | | | | | | 12 |
| **30** | 6.4 | 8 | <0.4 | 42 | | | | | | | | | | 6.3 | 8 | 0.6 | 52 | | | | | | | | | 82 |
| **31** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Min** | 6.4 | 8 | <0.4 | 42 | 99 | 24 | 24 | 2.17 | 25 | 6.45 | 3.93 | 4800 | 56 | 6.3 | 7 | <0.4 | 41 | 56 | 16 | 8 | 0.21 | 25 | 6.46 | 1.01 | 40 | 12 |
| **Max** | 6.7 | 28 | 3.5 | 113 | 113 | 31 | 28 | 2.21 | 25 | 6.58 | 4.66 | 4800 | 2030 | 6.6 | 15 | 1.4 | 97 | 60 | 17 | 10 | 0.84 | 25 | 6.59 | 3.21 | 40 | 510 |
| **AVG** | 6.5 | 18 | 1.9 | 76 | 106 | 28 | 26 | 2.19 | 25 | 6.52 | 4.30 | 4800 | 552 | 6.4 | 10 | 1.0 | 56 | 58 | 17 | 9 | 0.53 | 25 | 6.53 | 2.11 | 40 | 74 |

Note: Monthly average reported for fecal coliforms is a geometric mean. WSER limit is ≤25 mg/L quarterly average TSS/CBOD. pH is regular at 25 °. External testing done by an ISO/IEC 17025 accredited Labs, EXOVA , Surrey, BC.,

**Table 8: Acronyms**

| Acronyms /Abbreviations | Description |
|---|---|
| ATS | Automatic Transfer Switch |
| AVE or AVG | Average |
| BC EOCP | British Columbia Environmental Operators Certification Program |
| BOD | Biochemical Oxygen Demand |
| BO/PO | Blow off /pump out |
| CBOD | Carbonaceous Biochemical Oxygen Demand |
| CFU/100mL | Colony Forming Units Per 100 milliliters |
| COD | Chemical Oxygen Demand |
| FC | Fecal Coliforms |
| F/M ratio | Food-to-microorganism ratio |
| HMI | Human Machine Interface |
| IC | Inspection Chamber |
| I/I | Inflow & Infiltration |
| LIT | Level Indicator Transmitter |
| LPS | Low pressure system |
| $m^3$/day | Cubic meters per day (flow) |
| mg/L | Milligram per liter |
| MDL | Method detection limit |
| MSR | Municipal Sewage Regulation |
| MWR | Municipal Wastewater Regulation |
| $NH_3$ | Ammonia |
| OC | Operational Certificate |
| PLC | Programmable Logic Controller |
| Q | Yearly Quarter |
| SBR | Sequencing Batch Reactor |
| SCADA | Supervisory Control And Data Acquisition (system) |
| SSA | Specified Sewer Area |
| TP | Total Phosphorus |
| TSS | Total Suspended Solids |
| VFD | Variable Frequency Drive |
| WWC | Wastewater Collection System |
| WSER | Wastewater Systems Effluent Regulations |
| WWTP | Wastewater Treatment Plant |
| YTD | Year to Date |