



---

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

**OPERATED BY  
EPCOR WATER SERVICES INC.**



**OPERATIONS REPORT  
NOVEMBER 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<sup>3</sup>/day (annual average daily flow), and a peak wet weather flow capacity of 6,900 m<sup>3</sup>/day. The plant is expandable by an additional 3,000 m<sup>3</sup>/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 November, the effluent quality was excellent with the TSS (total suspended solids) averaging 5 mg/L and CBOD averaging 5 mg/L. (MWR limit is  $\leq 45$  mg/L and WSER limit is  $\leq 25$  mg/L quarterly average). The results, as detailed in this report, are obtained from samples tested at an independent ISO/IEC 17025 accredited lab.

November 2 Heavy rains over past two days created higher flows to the plant.

The operator attended wastewater treatment course for a week and is now a certified level I WWTP operator.

November 4 Operations responded to centrifuge back drive motor overload VFD fault. Rebooted back drive VFD by cycling power and restarted centrifuge. Back drive motor overload due to change in sludge characteristics. Same sludge that was manageable by centrifuge a few days prior was not manageable today as digestion process had reduced the organic portion of the sludge which increased torque to the centrifuge.

Centrifuge gearbox oil level checked before restarting centrifuge after VFD shutdown trouble. Although oil was at safe operating level, it contained metal filings.

November 6 Removed centrifuge guarding and greased the main scroll and bowl bearings.

November 10 Laboratory performance testing as QA/QC initiative.

November 12 Experienced a UV lamp intensity alarm. Checked UV lamp intensity, observed it was not below an alarm set point but noted debris in UV channel.

November 13 Wind and rainstorm hit Sooke area and operators responded to many alarms. Specific alarms included pump faults at West Coast Road, Sooke Road and Sunriver lift stations. Responding operator called in second operator at 03:40 am to assist in maintaining lift station control. By 04:15 am second operator decanting effluent by hand to avoid UV channel overflow. First on-call operator sent home at 08:00 am to get sleep.

Effluent samples were taken from both SBRs during hand decanting and tested for TSS and COD to verify regulatory expectations for discharge. Plant returned to auto control by 10:15 am.

November 17 Heavy rains and winds started at approximately 02:00 am. Several trees fell next to the plant but no damage done to property. Operators hand-decanted all day and into the evening. When UV channel high level alarm set point is reached, a “decanter park” mode is initiated to prevent UV channel overflow. This is why “hand decanting” is necessary and operations staff must be on site



Annual average daily flows are approximately 2000m<sup>3</sup>/day and were 5500m<sup>3</sup>/day as a result of the rain event.

November 18 Treatment process has remained good throughout recent storms. Effluent results taken November 13 were excellent as was recorded in the lab data sheets.

WWTP continued to run in “storm flow” mode throughout the day.

November 23 Lead hand operator attended wastewater collection course for a week and is now a certified level II operator.

November 24 UV modules/lamps of bank A of UV channel removed and cleaned.

Routine oil check in gearbox of centrifuge revealed metal filings attached to magnetic drain plug and approximately 200 milliliters of oil added.

November 25 On-call operator responded to an alarm at 05:55 am for basin #2 aeration valve leak. Trouble-shooting found electric air depressurization solenoid frozen as temperatures below zero.

November 27 Influent COD result was 90 mg/L and is suspicious as a typical value is around 500 mg/L.

November 30 Operators noticed development of foam on surface of SBR# 1 and also noted soap or detergent odour in headworks last Friday. Suspicious influent COD (90mg/L) also recorded Friday may all be results of a toxic substance in the waste stream. Microscope analysis of bacteria provided proof that a toxic substance was present as bacteria were dead or dying.

## **Wastewater Collection System**

### **Lift Stations**

The lift stations operated well throughout the month of November and routine inspections were completed on November 19 at all six lift stations.

November 12 On-call operator called to Sooke Road, West Coast Road and Helgesen Road lift station at 02:00 am for pump faults. If pumps are running at time when utility power is lost they will fault and require manual reset before they can restart. Pump faults were reset and pumps did restart and avoided overflows at all three lift stations.



---

November 15 On-call operator responded to Prestige Hotel lift station for wet well high level. Hotel staff confirmed draining swimming pool to be the cause. Wet well levels monitored and a controlled pool drain avoided possible overflow.

November 16 Pump# 1 at West Coast Road lift station faulted and has faulted a few times of late. Electrical contractor was advised of pump faults and is trouble-shooting.

November 17 Power out at Helgesen Road and Sooke Road lift stations, generators started and controlling wet well levels.

Communication failure alarms occurred at Sunriver and West Coast Road lift stations as a result of high winds and rain. Operators were in contact with TELUS technicians, provided reboots to ADSL modems, determined modem at Sunriver had malfunctioned and a replacement was ordered from TELUS.

November 22 On-call operator responded to hi-hi level alarm at Sooke Road lift station. Operator pumped wet well level in hand until LIT resumed control of pumps and automatic control restored.

November 25 Routine lift station check discovered rats inside of standby power generator kiosk at Sooke Road lift station. Will develop plan to remove rats and prevent future access.

November 26 Replaced malfunctioning communication modem at Sunriver lift station. Communication checks were made and system proved okay.

### **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**

<b>Name</b>	<b>Position</b>	<b>Qualifications</b>
Shawn Pearson	Lead Operator	BC EOCPCertified: Level III Wastewater Treatment & Level II Wastewater Collection System
Jesse Forcier	Operator	BC EOCPCertified: 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°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 GM/30 days	NA	6 x / year
<i>Enterococci</i>	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 <sup>3</sup> /day	2/week
Flow, Maximum			To be determined	2/week	6,900 m <sup>3</sup> /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 on 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
	November	YTD	Annual
Effluent Quality & Violations to Operational Certificates	0	0	0
Laboratory QA/QC Activities	66	458	200
Proactive Environmental/Quality Initiatives	0	4	5
Completion of Required Regulatory Reporting	100%	100%	100%
Activity	Actual Value	Actual Value	Acceptable Value
	November	YTD	Annual
Releases *	0	0	2

**People & Safety Performance Measures**

Activity	Actual Values	Actual Values	Target Values
	November	YTD	Annual
Lost Time Accidents	0	0	0
Staff Training (hours)	100	268	40 hrs/ employee
Safety Preventative Activities	3	120	30

**Customer Service Performance Measures**

Activity	Actual Values	Actual Values	Target Values
	November	YTD	Annual
Service Outages < 24 hours	100%	100%	90% Complete
Community Related Activities	1	7	4

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





Sooke Wastewater Treatment Plant  
Operations Report November 2015



**Table 4 – Monthly Quality Summary**

	Influent				Effluent																			Biosolids Shipped			
	CBOD mg/L	TSS mg/L	NH3-N mg/L	TP	Flow m <sup>3</sup> /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		
<b>Regulatory Limit</b>						14400	3000		≤45**	≤25 *		≤45**	≤25 *					<1.25							<200		
<b>January</b>	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
<b>February</b>	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
<b>March</b>	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
<b>April</b>	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
<b>May</b>	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	68830	7
<b>June</b>	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	40090	4
<b>July</b>	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
<b>August</b>	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
<b>September</b>	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
<b>October</b>	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
<b>November</b>	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
<b>December</b>																											
<b>Total</b>																										587580	59
<b>Annual</b>	235	243	45	10.2	1387	6042	1947	<4	7	5	<4	21	7	0.08	4.04	0.71	0.00021	<0.05	<0.05	1.30	9.60	3.82	<2	2090	25		

\* WSER- Quarterly average, \*\*MWR and proposed OC



**Table 5 – Influent Water Quality**

		INFLUENT								
		IN HOUSE				EXTERNAL				
	Effluent flows	pH	TSS	NH3-N	COD	COD	CBOD	TSS	NH3-N	TP
Nov	m <sup>3</sup> /d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	3551									
2	3112	7.7	140	26	627					
3	2472									
4	2119	7.7	95	43	590	460	266	170	42.9	6.80
5	2028									
6	2011	7.6	340	41	731					
7	2369									
8	2445									
9	2232	7.6	230	38	683					
10	2154	7.6	105	34	503					
11	2339									
12	3081									
13	6042									
14	3745									
15	4208									
16	3393	7.6	130	27	449					
17	5513									
18	4004	7.5	120	21	534	405	84	130	22.1	6.45
19	3280									
20	2887	7.4	135	32	507					
21	2463									
22	2411									
23	2267	7.6	175	37	584					
24	2537									
25	2190	7.6	205	37	473					
26	2051									
27	1940	7.7	190	40	90					
28	1981									
29	2035									
30	2016	7.7	215		694					
Min	1940	7.4	95	21	90	405	84	130	22.1	6.45
Max	6042	7.7	340	43	731	460	266	170	42.9	6.80
AVG	2829	7.6	173	34	539	433	175	150	32.5	6.63



Sooke Wastewater Treatment Plant  
Operations Report November 2015



Table 6 – Daily Water Quality of Effluent

	SBR 1 EFFLUENT												SBR 2 EFFLUENT												
	IN HOUSE				EXTERNAL								IN HOUSE				EXTERNAL								
	pH	TSS	NH3-N	COD	COD	TSS	CBOD	NH3-N	Temp	pH	TP	FC	pH	TSS	NH3-N	COD	COD	TSS	CBOD	NH3-N	Temp	pH	TP	FC	
Nov	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	°C	mg/L	CFU/ 100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	CFU/ 100mL	
1																									
2	6.7	4	2.20										6.8	<4	1.00										
3																									
4	6.7	4	2.00	27	39	5	6	1.12	25	6.43	5.27	10	6.6	<4	<0.4	41	40	4	4	0.73	25	6.52	2.25	2	
5																									
6	6.6	4	1.00										6.6	<4	1.20										
7																									
8																									
9	6.5	4	1.20										6.6	5	2.10										
10	6.7	<4	1.20	34									6.5	4	0.80	50									
11																									
12																									
13																									
14																									
15																									
16	6.4	<4	3.00										6.4	7	1.60										
17																									
18	6.3	<4	1.40	30	24	<4	<4	0.98	25	6.33	1.19	92	6.4	6	0.80	34	43	6	<4	0.99	25	6.34	1.30	160	
19																									
20	6.4	<4	1.40										6.5	5	1.90										
21																									
22																									
23	6.4	<4	1.40										6.4	4	<0.4										
24																									
25	6.5	5	1.50	42								470	6.3	4	<0.4	40								10	
26																									
27	6.3	8	1.00										6.3	6	0.60										
28																									
29																									
30	6.4	13											6.5	6											
Min	6.3	<4	1.00	27	24	<4	<4	0.98	25	6.33	1.19	10	6.3	<4	<0.4	34	40	4	<4	0.73	25	6.34	1.30	2	
Max	6.7	13	3.00	42	39	5	6	1.12	25	6.43	5.27	470	6.8	7	2.10	50	43	6	4	0.99	25	6.52	2.25	160	
AVG	6.5	6	1.57	33	32	5	5	1.05	25	6.38	3.23	76	6.5	5	1.02	44	42	5	4	0.86	25	6.43	1.78	15	

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 <sup>3</sup> /day	Cubic meters per day (flow)
mg/L	Milligram per liter
MDL	Method detection limit
MSR	Municipal Sewage Regulation
MWR	Municipal Wastewater Regulation
NH <sub>3</sub>	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