



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

**OPERATED BY
EPCOR WATER SERVICES INC.**



**OPERATIONS REPORT
OCTOBER 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 m³/day (annual average daily flow), and a peak wet weather flow capacity of 6,900 m³/day. The plant is expandable by an additional 3,000 m³/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 October, the effluent quality was good with the TSS (total suspended solids) averaging 5 mg/L and CBOD averaging 5 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.

October 1 Raised influent gate to SBR# 2 and shut WAS pump off. This was done to provide sludge storage room while digester# 2 is out of service for repairs and membrane replacement.

Sludge wasting from SBR# 1 is going into SBR#2. Decanter# 2 shut off after final decant of SBR# 2.

October 2 Load banking of plant standby power generator performed by electrical contractor.

October 3 SBR# 2 still appears to have good settle. Regular aeration continuing and dog food added to substitute influent organics. Bacteria fairing well as a result of substitute food and aeration.

October 4 SBR# 2 continuing to settle very well and dog food added daily to maintain bacterial population.

WWTP experienced high flows during time of SBR# 2 isolation. As a result, basin 2's water level rose to a height that had to be decanted. Effluent samples were taken during decant and tested for TSS to ensure discharge quality. (TSS result 7.2 mg/L)

October 5 All necessary equipment assembled for Digester# 2 membrane replacement job. Sludge from Digester# 2 transferred to Digester# 1.

October 6 Vacuum truck on site and removed remaining sludge from Digester# 2. Two confined space entry trained contract labourers also on site for digester membrane job. Operators reversed flow through Digester# 2 sludge line and successfully removed accumulation of debris that had blocked sludge line since Sept. 29. Vac truck performed flush of the line before leaving site. All membranes (216) were replaced and job was completed safely.

October 7 Influent gate opened to SBR# 2 putting process back on line.

October 9 Pulled waste pump from SBR# 1 for annual inspection, checked oil level and impeller condition.



October 12 Operator travelled to Britannia for EPCOR mandated Fall Protection training course.

October 14 Sooke operations staff attended an EPCOR Incident Management Meeting via Webex.

October 15 Centrifuge gearbox leaking oil; oil level/condition checked. Metal filings noted on magnetic drain plug and approximately 1/3 liters oil added.

October 16 Greased internal centrifuge main bearings before starting machine.

October 19 Replaced all bar screen auger brushes in headworks.

October 20 Pulled waste pump from SBR# 2 for annual inspection. No concerns.

Began preliminary centrifuge replacement discussions with Peralisi centrifuge supplier, as centrifuge is working at and beyond capacity and a larger machine should be considered.

October 23 Electrical contractor on site gathering information from SBR blower motor VFDs. Blower motors have been faulting for “motor overload” condition as they are consistently working beyond the electrical motor service factor.

October 27 Toured three employees of District of Sooke through WWTP.

Contractor performed annual inspection of admin building HVAC system.

October 28 Electrical contractor on site to replace exhaust fan belts (2) on headworks building.

October 29 Contractor installed photocell in new location on admin building for outdoor lighting.

Alfa Laval centrifuge supplier on site gathering information for centrifuge replacement proposal.

Wastewater Collection System

October 5 Operator witnessed completion of manhole construction at corner of Caffery Place and Arranwood.

October 22 Odour breakthrough at Sooke Rd. lift station prompted operators to change the granulated activated carbon (GAC).



Lift Stations

The lift stations operated well throughout the month of October.

October 1 Contractor, while doing annual standby generator load banking at Mariner's Village lift station, found issue with automatic transfer switch. Disassembled ATS, found problem to be micro-switch, made necessary repairs and tested OK.

October 2 Load banking continued at Helgesen Rd. lift station.

October 8 Routine lift station checks done at Mariner's Village, Prestige and Sooke Rd., included operation of isolation valves at Prestige. Pump impellers were recently adjusted at Prestige Hotel lift station. Pump down checks were done to confirm both pumps are moving similar volumes of water. Close inspection of isolation valves revealed broken end stop. Valve position checked and double-checked to confirm fully open position, and permanent repairs planned.

October 9 Contractor called to troubleshoot low coolant level alarm on standby power generator at Sooke Rd. lift station. Necessary repairs include: water pump, coolant and heater hose replacement.

October 15 Routine lift station checks at Sunriver and Helgesen Rd. included high level alarm call-outs.

Isolation valve operated at West Coast Rd. lift station. High level alarm call-out also confirmed.

October 24 Operator responded to pump# 2 fault at Sooke Rd. lift station, cleared alarm, reset pump and monitored operation. All appeared normal.

October 25 Operator responded to pump# 1 fault at West Coast Rd. lift station. Alarms cleared, pump reset and tested OK.

October 26 Recent pump# 1 faults at West Coast Rd. lift station had operator change pump selector switch.

October 27 Tested pump fault dial-outs at Sooke Rd. and West Coast Rd. lift stations. Pump faults did not dial-out, checked lift station control philosophies and confirmed that pump faults are not critical alarm dial-outs. Dial-outs occur at high wetwell level setpoints only.

Diesel tech contractor replaced water pump and made all necessary repairs to standby power generator at Sooke Rd. lift station as identified Oct. 9.

October 30 Called diesel technician contractor to troubleshoot coolant low level in generator at Sooke Rd. lift station.



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 I Wastewater Collection System
Corey Hodgson	Operator	Alberta Environment Level III Collection System
Jesse Forcier	Operator	BC EOCP OIT (Operator in Training)

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 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 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
	October	YTD	Annual
Effluent Quality & Violations to Operational Certificates	0	0	0
Laboratory QA/QC Activities	54	392	200
Proactive Environmental/Quality Initiatives	0	4	5
Completion of Required Regulatory Reporting	100%	100%	100%
Activity	Actual Value	Actual Value	Acceptable Value
	October	YTD	Annual
Releases *	0	0	2
People & Safety Performance Measures			
Activity	Actual Values	Actual Values	Target Values
	October	YTD	Annual
Lost Time Accidents	0	0	0
Staff Training (hours)	27	168	40 hrs/ employee
Safety Preventative Activities	24	117	30
Customer Service Performance Measures			
Activity	Actual Values	Actual Values	Target Values
	October	YTD	Annual
Service Outages < 24 hours	100%	100%	90% Complete
Community Related Activities	0	6	4

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



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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	7.01	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	8.30	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	68830	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	40090	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																												
December																												
Total																										529020	53	
Annual	241	253	46	10.5	1387	5443	1859	<4	7	5	<4	21	7	0.08	4.04	0.68	0.00021	<0.05	<0.05	1.50	9.60	4.03	<2	2090	24			

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



Table 5 – Influent Water Quality

		INFLUENT								
		IN HOUSE				EXTERNAL				
	Effluent flows	pH	TSS	COD	NH3-N	COD	CBOD	TSS	NH3-N	TP
Oct	m ³ /d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	1493									
2	1471	7.9	305	941	>55					
3	1528									
4	1813									
5	1600	7.7	385	1172	>55					
6	1590									
7	1483	7.5	295	892	53	568	366	360	47.3	8.3
8	1406									
9	1469	7.8	245	1060	54					
10	1594									
11	1777									
12	1777	7.6	365	1179	>55					
13	1628									
14	1649	7.7	370	921	>55					
15	1718									
16	1473	7.8	240	885	>55					
17	1504									
18	1624									
19	1695	7.8	240	945	>55					
20	1655									
21	1655	7.7	425	900	>55	979	424	331	58.0	9.2
22	1614									
23	1515	7.7	215	841	>55					
24	1485									
25	1560									
26	1618	7.9	250	968	>55					
27	1585									
28	1645	7.7	300	946	>55					
29	1733									
30	2334	7.7	225	618	43					
31	3662									
Min	1406	7.5	215	618	43	568	366	331	47.3	8.3
Max	3662	7.9	425	1179	>55	979	424	360	58.0	9.2
AVG	1689	7.7	297	944	50	774	395	346	52.7	8.8



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Table 6 – Daily Water Quality of Effluent

Oct	SBR 1 EFFLUENT													SBR 2 EFFLUENT												
	IN HOUSE				EXTERNAL									IN HOUSE				EXTERNAL								
	pH	TSS	COD	NH3-N	COD	TSS	CBOD	NH3-N	Temp	pH	TP	Enter-ococci	FC	pH	TSS	COD	NH3-N	COD	TSS	CBOD	NH3-N	Temp	pH	TP	Enter-ococci	FC
	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	6.6	<4		2.0																						
3																										
4														7.2												
5	6.6	4		<0.4																						
6																										
7	6.5	4	63	0.7	50	6	5	1.00	25	6.38	1.50	16														
8																										
9	6.5	<4		<0.4										6.7	<4		<0.4									
10																										
11																										
12	6.7	<4		0.7										6.7	<4		<0.4									
13																										
14	6.6	<4	56	<0.4								16		6.6	<4	44	<0.4									<2
15																										
16	6.6	<4		<0.4										6.6	<4		<0.4									
17																										
18																										
19	6.5	<4		0.7										6.6	<4		<0.4									
20																										
21	6.5	<4	48	<0.4	53	<5	5	0.73	25	6.59	4.35	4		6.7	<4	40	<0.4	49	<5	<4	0.16	25	6.61	4.06	2	
22																										
23	6.5	4		0.6										6.6	<4		0.5									
24																										
25																										
26	6.6	<4		0.4										6.6	<4		0.7									
27																										
28	6.5	10	50	0.4								40		6.5	<4	40	<0.4							20		
29																										
30	6.6	<4		1.4										6.5	<4		1.0									
31																										
Min	6.5	<4	48	<0.4	50	<5	5	0.73	25	6.38	1.50	40	4	6.5	<4	40	<0.4	49	<5	<4	0.16	25	6.61	4.06	20	<2
Max	6.7	10	63	2.0	53	6	5	1.00	25	6.59	4.35	40	16	6.7	7.2	44	1.0	49	<5	<4	0.16	25	6.61	4.06	20	2
AVG	6.6	5	54	0.6	52	6	5	0.87	25	6.49	2.93	40	10	6.6	4	41	0.5	49	<5	<4	0.16	25	6.61	4.06	20	2

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