



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

**OPERATED BY
EPCOR WATER SERVICES INC.**



**OPERATIONS REPORT
SEPTEMBER 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 September, the effluent quality was good with the TSS (total suspended solids) averaging 6 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.

September 2 Received preliminary report from Pacificus Biological Services for the annual receiving environment monitoring sampling/testing that was done in August.

September 5 Operator responded after hours to an SBR blower motor shutdown due to motor overload. Plant operations have been dealing with the motor overload shutdown issue repeatedly of late. An effort is underway to have electrical contractors identify the cause but it would appear the current blower motors are operating at capacity and beyond to maintain day-to-day operations.

September 6 Two more blower motor overload faults had operator respond to plant after hours.

September 7 Call-outs continuing for blower motor overload faults.

September 9 Operators had EPCOR senior technologists reduce the percentage of electrical current available to blower motors from 100 to 90 percent to reduce the number of blower motor overload faults. This is a temporary resolve until electrical contractors make permanent repairs.

Lab performed monthly quality assurance/quality control performance testing today.

September 13 Operators responded after hours to two more SBR blower motor overload faults.

September 14 Lab results were good in spite of limited aeration over weekend due to SBR blower motor faults.

September 16 Ran centrifuge overnight to try to keep pace with necessary sludge handling.

September 22 Electrical contractor on site to check programming of the blower motor variable frequency drives.

September 23 Centrifuge ran overnight, as well as overnight on the 22nd to maintain sludge handling process.

Centrifuge making unfamiliar sounds that may suggest bearing issues.

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- September 24 In SBR blower motor troubleshooting effort, operators contacted manufacturer's of treatment plant to confirm or deny air piping configuration possibly being responsible for restriction of air flow. Plant drawings were reviewed and confirmed piping not the problem.
- September 28 As a pro-active environmental initiative, un-ionized ammonia analysis was added to the annual test parameters reported in the receiving environment monitoring sampling in Sooke Bay.
- September 29 Underground sludge feed line from digester #2 to centrifuge is clogged. Repeated back-flushing proved unsuccessful. This digester is due for air header membrane replacement on October 6. Clogged sludge feed line will be cleared at that time as digester will be emptied. With one digester out of service, at some point it will become necessary to store sludge elsewhere when other digester is full. One of the SBR treatment reactors will have to be taken offline and used for this purpose.
- September 30 Centrifuge ran all night again to try to stay ahead of sludge production.
- Contractor for TELUS on site continuing work to attain cell signal in admin building.

Wastewater Collection System

- September 10 During routine collection system checks, resident near Sooke Road lift station advised operators of recent odours. Operators investigated nearby lift station odour control equipment and determined the lift station to be the source. Carbon is changed on a five month frequency in the odour control equipment, records were checked and determined that the carbon was last changed June 2 and should not have odour break-through until November. Odour control carbon will be changed as soon as can be acquired from supplier.
- September 16 Lead Hand Operator called EPCOR operator of similar collection system in southern Alberta to collectively discuss monthly collection system issues/concerns. Discussion items included LIT/float operation of wetwells, adjustment of Flyght pump impellers granulated activated carbon odour break-through/ OXYN8 odour control chemical, commercial restaurant grease trap maintenance scheduling and discussion of awareness of possibility for cross-boring of gas lines through sewer mains.
- September 28 Operator attended manhole construction and tie-in of 200mm gravity main at Sunriver Way to accommodate "Old School Site" subdivision.

Lift Stations

The lift stations operated well throughout the month of September.

September 1 Vacuum truck on site at Prestige Hotel lift station to clean wetwell. Annual wetwell cleanings would not be able to maintain safe operation. Rate of grease and debris accumulation is responsible for additional cleanings.

September 8 Routine lift station checks done at Prestige Hotel and Mariner's Village.

September 10 Operators attended all lift stations, clearly marked all hatchways with components' positions as they correlate to kiosk controls.

During lift station checks it was noted that the valve chamber lid is loose at Prestige Hotel. Plan underway to remove hatchway lid and have weld shop extend width so it can be securely anchored to the concrete.

September 14 Routine check at Sunriver lift station found the odour control chemical injection pump had lost prime. Operator re-primed pump and increased dosage 30% in an effort to control odours that were noted downstream (Sooke Rd. lift station area).

September 18 Operators removed hatch from Prestige Hotel valve chamber, took to welding shop, had flanges widened and re-secured to newly mounted concrete anchors in valve chamber.

September 22 Electrical contractor performing annual load banking at West Coast Rd. lift station. The ATS was also tested.

September 25 EPCOR operator and electrical contractor pulled pumps at Prestige lift station and adjusted pump impellers.

Loadbanking and ATS testing performed at Prestige Hotel. Cooling system modifications made earlier in the year included fabrication/installation of fan shroud and large louvered panel installed in generator kiosk to improve air flow. Generator had previously been de-rated to 35 Kw and with recent cooling system work, loadbanking has determined the generator to be capable of 70 Kw and has been re-rated to reflect this.

September 28 Electrical contractor performed generator loadbanking and ATS testing at Sunriver lift station.

Operators added 15 kg bag of carbon to odour control equipment at Sooke Rd. until full shipment of carbon arrives.



Odour control chemical injection pump checked at Sunriver.

September 29 Electrical contractor performing annual loadbanking and ATS testing at Sooke Rd. lift station.

Operators responded to a generator coolant low level alarm at Sooke Rd. lift station.

September 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
	September	YTD	Annual
Effluent Quality & Violations to Operational Certificates	0	0	0
Laboratory QA/QC Activities	39	338	200
Proactive Environmental/Quality Initiatives	0	4	5
Completion of Required Regulatory Reporting	100%	100%	100%
Activity	Actual Value	Actual Value	Acceptable Value
	September	YTD	Annual
Releases *	0	0	2
People & Safety Performance Measures			
Activity	Actual Values	Actual Values	Target Values
	September	YTD	Annual
Lost Time Accidents	0	0	0
Staff Training (hours)	11	141	40 hrs/ employee
Safety Preventative Activities	13	93	30
Customer Service Performance Measures			
Activity	Actual Values	Actual Values	Target Values
	September	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



Sooke Wastewater Treatment Plant
Operations Report September 2015



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	<3	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	36990	4	
October																												
November																												
December																												
Total																										438320	45	
Annual	224	242	45	10.7	1387	5443	1878	<4	7	5	<3	21	7	0.08	4.04	0.69	0.00021	<0.05	<0.05	2.18	9.60	4.10	<2	2090	26			

* 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
Sept	m ³ /d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	1693									
2	1687	7.7	315	911	>55	679	312	334	66	9.9
3	1666									
4	1616	7.6	270	1056	>55					
5	1526									
6	1642									
7	1717	7.6	215	540	48					
8	1707									
9	1518	7.7	340	805	>55					
10	1510									
11	1473	7.7	305	951	>55					
12	1510									
13	1630									
14	1515	7.7	295	1030	>55					
15	1622									
16	1447	7.8	315	832	>55	792	395	278	51	9.7
17	1482									
18	1439	7.7	415	1114	>55					
19	1488									
20	1582									
21	1581	7.7	355	1123	>55					
22	1482									
23	1474	7.6	200	1018	54					
24	1599									
25	1464	7.7	230	1300	55					
26	1531									
27	1615									
28	1632	7.9	255	1045	>55					
29	1488									
30	1595	7.9	285	797	51					
Min	1439	7.6	200	540	48	679	312	278	51	9.7
Max	1717	7.9	415	1300	>55	792	395	334	66	9.8
AVG	1564	7.7	292	963	52	736	354	306	59	9.9



Sooke Wastewater Treatment Plant
Operations Report September 2015



Table 6 – Daily Water Quality of Effluent

	SBR 1 EFFLUENT											SBR 2 EFFLUENT										
	IN HOUSE				EXTERNAL							IN HOUSE				EXTERNAL						
	pH	TSS	COD	NH3-N	COD	TSS	CBOD	NH3-N	pH	TP	FC	pH	TSS	COD	NH3-N	COD	TSS	CBOD	NH3-N	pH	TP	FC
Sept.	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	CFU/ 100mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	CFU/ 100mL	
1																						
2	6.7	4	41	0.6	46	4	<4	0.87	6.63	4.93	22	6.7	10	48	<0.4	57	8	<4	0.10	6.73	4.00	10
3																						
4	6.7	4		0.6								6.7	7		<0.4							
5																						
6																						
7	6.6	<4		0.8								6.6	<4		1.1							
8																						
9	6.6	<4	57	<0.4							18	6.7	4	53	<0.4							14
10																						
11	6.6	<4		<0.4								6.7	6		<0.4							
12																						
13																						
14	6.7	<4		1.3								6.7	<4		<0.4							
15																						
16	6.6	<4	50	<0.4	41	4	<4	0.56	6.63	3.57	32	6.7	4	53	<0.4	51	7	7	0.14	6.70	7.60	10
17																						
18	6.7	<4		0.5								6.7	<4		<0.4							
19																						
20																						
21	6.6	5		0.9								6.5	<4		<0.4							
22																						
23	6.6	4	45	0.8							8	6.7	<4	51	<0.4							<2
24																						
25	6.5	<4		0.5								6.7	<4		<0.4							
26																						
27																						
28	6.5	<4		1.1								6.6	<4		0.8							
29																						
30	6.6	<4	48	1.2								6.7	<4	39	<0.4							
Min	6.5	<4	41	<0.4	41	4	<4	0.56	6.63	3.57	8	6.5	<4	39	<0.4	51	7	<4	0.10	6.70	4.00	<2
Max	6.7	5	57	1.3	46	4	<4	0.87	6.63	4.93	32	6.7	10	53	1.1	57	8	7	0.14	6.73	7.60	10
AVG	6.6	4	48	0.7	44	4	<4	0.72	6.63	4.25	18	6.7	5	49	0.5	54	8	5	0.12	6.72	5.80	7

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 7 – 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				

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

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