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

**OPERATED BY  
EPCOR WATER SERVICES INC.**



**OPERATIONS REPORT  
MARCH 2015  
REGISTRATION NUMBER 17300**



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## INTRODUCTION

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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:

- 51 km of collection system piping
- 515 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.



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## OPERATIONS

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### Wastewater Treatment Plant

In March, the effluent quality was excellent with the TSS (total suspended solids) averaging 4 mg/L and CBOD averaging <4 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.

March 4 – Electrical contractor on site to replace electrical connector on actuator motor for aeration valve #2. Also replaced purge/depressurization solenoid.

March 5 – Called electrical contractor back to site to troubleshoot centrifuge back drive motor VFD fault. VFD fault displayed with “motor temp”. Contractor confirmed VFD okay. Found cooling fan for back drive motor not able to cool sufficiently. Guarding/shrouding around back drive motor not venting adequately, alterations made to ensure sufficient air flow.

March 9 – Operator noticed slight aeration occurring in treatment basin during settle phase. Confirmed aeration valve not completely seated. Re-timed limit switches on aeration valve actuator.

March 10 – Operators noticed polymer accumulating in secondary containment structure. Close observation to continue.

March 12 – In response to SBR blower faults, operators worked with EPCOR technologies specialist to change timer sequence in SBR/PLC programming. Issue resolved.

March 16 & 17 – Operators observed increased vibration in centrifuge operation. This can occur if cake solids dry inside machine. Close observation necessary to prevent condition from worsening.

March 20 – On site lift station annual cleaning completed.

March 21 – On-call operator responded to aeration valve failed to open alarm, corrected situation and monitored to ensure proper operation.

March 21 – Storm cycle initiated in SBR# 2 due to high flows from heavy rains.

March 23 – Flows somewhat back to normal after four-day rain event.

March 25 & 26 – Sooke Operator attended confined space rescue course at Britannia Mine Water Treatment Plant.

March 31 – Diesel technician contractor doing lift station generator annual service.



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## Wastewater Collection System

### Lift Stations

The lift stations operated well throughout the month of March.

March 6 – Communication equipment fault at Helgesen Rd. lift station. Operators responded by rebooting ADSL modem, unsuccessfully. Confirmed dial-out for alarms still functioning. The communication fault was the result of an internet information failure to the treatment plant. Advised Telus and they are to replace ADSL modem.

March 7 – Telus technician left message saying Helgesen station communication was up and running. They will continue to monitor.

March 11 – Annual wetwell cleaning at Sunriver lift station at midnight (low flow hours) and continued on to include Sooke, Helgesen, and West Coast Road lift stations.

March 13 – Tested dial-out operation at Sooke Rd. lift station.

March 16 - Electrical contractors installed remote VFD resets at Sooke, Helgesen and West Coast Road lift stations as approved safety initiative works.

March 18 – Operators responded to Mariner’s Village PLC Health alarm, attended lift station and rebooted communication equipment and checked Ethernet connections. ADSL modem connection found to be source of problem and was corrected.

March 20 – Vacuum truck contractor met operators at Mariner’s Village for annual wetwell cleaning. Access road condition to lift station continuing to deteriorate and was discussed at March safety meeting.

March 23 – Met with District of Sooke engineer to assess necessary repairs to access road. Also discussed a plan to identify deficiencies discovered during the attempted commissioning of Mariner’s Village lift station.

March 24 – Routine checks of all lift stations. Also on the 24<sup>th</sup>, the Prestige Hotel pool was drained causing high level alarm at the lift station. Operator attended to control flow to avoid possible overflow.

March 31 – Diesel technician contractor started annual standby generator service work.



## 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 III Wastewater Collection System, classified under EOCP # 1827 in accordance with the Environmental Operators Certification Program.

**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 coming months 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. The substances and the limits are: Carbonaceous BOD:  $\leq 25$  mg/L, Total Suspended Solids:  $\leq 25$  mg/L, and a maximum of Un-ionized Ammonia:  $< 1.25$  mg/L of N @ at  $15^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . The limits come into force on February 1, 2015, but the monitoring provisions were in effect on February 1, 2013. Un-ionized Ammonia testing is no longer required after July 1, 2014, however testing will continue as part of EPCOR’s due diligence.

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 <sup>o</sup> 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. \*\*\*Un-ionized ammonia testing only required from Jan.1, 2013 to July 1, 2014. “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**

<b>Water Quality &amp; Environmental Performance Measures</b>			
<b>Activity</b>	<b>Actual Values</b>	<b>Actual Values</b>	<b>Target Values</b>
	<b>March</b>	<b>YTD</b>	<b>Annual</b>
Effluent Quality & Violations to Operational Certificates	0	0	0
Releases*	0	0	2
Laboratory QA/QC Activities	49	129	200
Proactive Environmental/Quality Initiatives	2	2	5
Completion of Required Regulatory Reporting	100%	100%	100%
<b>People &amp; Safety Performance Measures</b>			
Lost Time Accidents	0	0	0
Staff Training	33	74	40 hrs/employee
Safety Preventative Activities**	28	42	30
<b>Customer Service Performance Measures</b>			
Service Outages < 24 hours	100%	100%	90% Complete
Community Related Activities	0	0	4

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

**Table 4 – WSER Compliance Reporting Table – Effluent**

	<b>CBOD mg/L</b>	<b>TSS mg/L</b>	<b>Un-Ionized NH3-N mg/L</b>	<b>Effluent Flow m3</b>
	<b>Quarterly Average</b>	<b>Quarterly Average</b>	<b>Maximum</b>	<b>Quarterly Total</b>
<b>Regulatory Limit</b>	≤25	≤25	<1.25	
<b>Q1</b>	5	5	<0.05	214,585
<b>Q2</b>				
<b>Q3</b>				
<b>Q4</b>				



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**Table 5 – 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		
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	39.1	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																											
May																											
June																											
July																											
August																											
September																											
October																											
November																											
December																											
Total																										164670	17
Annual	128	136	34	6.7	1574	5443	2382	<4	5	5	3	6	5	0.17	2.50	1.13	0.00021	<0.05	<0.05	2.18	4.35	3.05	4	96	27		

\* WSER- Quarterly average, \*\*MWR





**Table 6 – Influent Water Quality**

		INFLUENT									
		IN HOUSE				EXTERNAL					
	Effluent flows	pH	TSS	COD	NH3-N	COD	CBOD	TSS	NH3-N	pH	TP
Mar.	m <sup>3</sup> /d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
1	2060										
2	2056	7.6	185	516	36.5						
3	1852										
4	1987	7.8	275	697	42.1						
5	1815										
6	1844	7.9	255	620	44.2						
7	1792										
8	1785										
9	1789	7.8	450	889	46.3						
10	1752										
11	1670	7.9	200	679	46.3	645	209	176	47.9	7.25	8.17
12	1681										
13	1574	7.7	155	487	35.0						
14	1857										
15	2391										
16	2919	7.7	120	272	25.7						
17	2416										
18	2416	7.6	165	435	33.1						
19	2180										
20	2180	7.6	145	376	24.6						
21	3305										
22	3076										
23	2615	7.7	120	432	24.4						
24	2349										
25	2515	7.7	140	506	28.2	400	116	135	30.3	7.10	5.85
26	2494										
27	2350	7.6	185	624	32.1						
28	2353										
29	2615										
30	2653	7.9	180	778	32.6						
31	2477										
<b>Min</b>	1574	7.6	120	272	24.4	400	116	135	30.3	7.10	5.85
<b>Max</b>	3305	7.9	450	889	46.3	645	209	176	47.9	7.25	8.17
<b>Avg</b>	2220	7.7	198	562	34.7	523	163	156	39.1	7.18	7.01



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Table 7 – 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	NH3-N (unionized)*	Temp	pH	TP	FC	pH	TSS	COD	NH3-N	COD	TSS	CBOD	NH3-N	NH3-N (unionized)*	Temp	pH	TP	FC
Mar.		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	°C		mg/L	CFU/100 mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	°C		mg/L	CFU/100 mL
1																										
2	6.6	4		0.7										6.6	4		0.7									
3																										
4	6.6	4	25	0.4										6.6	4	27	0.9									
5																										
6	6.6	4		<0.4										6.6	7		1.0									
7																										
8																										
9	6.5	<4		<0.4										6.5	4		1.0									
10																										
11	6.8	4	28	<0.4	35	4	<4	0.17	0.00021	15	6.65	3.56	22	6.6	<4	45	1.0	38	3	<4	0.77	0.0017	15	6.91	3.64	22
12																										
13	6.6	4		<0.4										6.6	4		1.0									
14																										
15																										
16	6.6	6		1.6										6.6	4		1.5									
17																										
18	6.4	5	36	<0.4									28	6.6	<4	48	1.1									66
19																										
20	6.4	<4		1.0										6.4	4		1.1									
21																										
22																										
23	6.5	4		<0.4										6.6	5		2.2									
24																										
25	6.5	<4	43	<0.4	43	<3	<4	0.2	<0.05		6.20	2.57	68	6.6	4	62	2.7	45	<3	<4	1.69	<0.05		6.22	3.00	50
26																										
27	6.5	4		0.7										6.6	4		1.6									
28																										
29																										
30	6.5	4		1.5										6.5	<4		<0.5									
31																										
Min	6.4	<4	25	<0.4	35	<3	<4	0.17	0.00021	15	6.20	2.57	22	6.4	<4	27	<0.5	38	<3	<4	0.77	0.0017	15	6.22	3.00	22
Max	6.8	6	43	1.6	43	4	<4	0.24	<0.05	15	6.65	3.56	68	6.6	7	62	2.7	45	3	<4	1.69	<0.05	15	6.91	3.64	66
Avg	6.5	4	33	1.0	39	4	<4	0.21	0.025	15	6.43	3.07	39	6.6	4	46	1.3	42	3	<4	1.23	0.026	15	6.57	3.32	38

Note: Monthly average reported for fecal coliforms is a geometric mean. WSER limit is <25 mg/L quarterly average TSS/CBOD. MDL = Method Detection Limit, nt=not tested. External testing done by an ISO/IEC 17025 accredited Labs, EXOVA, Surrey, BC, Maxxam, Victoria, BC



**Table 7: Acronyms**

<b>Acronyms /Abbreviations</b>	<b>Description</b>
ATS	Automatic Transfer Switch
AVE or AVG	Average
BC EOCP	British Columbia Environmental Operators Certification Program
BOD	Biochemical Oxygen Demand
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
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