DISTRICT OF SOOKE
WASTEWATER TREATMENT PLANT
AND COLLECTION SYSTEM

OPERATED BY
EPCOR WATER SERVICES INC.

OPERATIONS REPORT
JUNE 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 June, the effluent quality was excellent with the TSS (total suspended solids) averaging 9 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.

June 1– SBR blower #2 fault for motor overload (occurs when both SBR blowers run simultaneously). Blowers somewhat "compete" with each other when running together as they deliver to a common air pipe. Blower VFDs are designed to shut blower motors down when full load amperage is exceeded. Trouble shooting had begun previously and will continue until resolved.

June 3 – Performance testing in lab for monthly QA.
– Aeration valve #2 "fail to open".
– Decanters washed with fire hose.
– Both SBR blowers now coming on. Aerations trends much improved bacteria population much more evident under microscope.

June 4 – Changed all UV lamps and sleeves in bank "A" od UV channel, cleaned bank "B" and washed entire channel. Also replaced blown fuse in module 7/ bank "A".

June 5 – Rewrote SOP for wastewater collection low slope and for WWTP polymer spill. Removed poly spill response form ERP binder, added to centrifuge operation SOP.

June 8 – EPCOR lab auditors here for two days to conduct annual lab audit.
– Replaced fuse in module #7/bank "A" of UV channel again.

June 9 – Found tailgate latch follower missing from biosolids bin. Called welding shop to arrange repairs.

June 10 – Troubleshooting found a failed circuit board in part of the UV system that interrupted power to one of the UV module s. New parts on order.

June 11 – Routine check of centrifuge operation found poor quality cake. The cause was identified as lack of polymer. Repairs made to polymer delivery system and problem resolved.

June 12 – Had trucking company stop at local welding shop on route to Hartland with load of biosolids. Tailgate latch follower system repairs were made.

June 15 – Centrifuge polymer system clogged again. Shut centrifuge down and found foreign matter in polymer drum to be the issue. Cleared polymer delivery lines and closely monitored operation.

June 16 – Regular maintenance had operators replace DO probe membrane in SBR#2.
– Screenings were noticed getting past bar screen auger. Temporary repairs were made to correct bar screen position in center of influent channel.

June 17 – Changed oil in centrifuge gearbox. Flushed with oil and there is evidence of metallic filings stuck to magnetic drain plug. Further investigation necessary.

June 19 – Monthly safety meeting conducted.

June 23 – Operations conducted conference call which included EPCOR senior technologist, EPCOR SCADA technician, local electrical contractor and EPCOR operators. Objective of meeting was to resolve ongoing aeration valve # 2 "fail to open" issue, Problem has been occurring frequently for past several weeks.

June 24 – Alarm monitoring company on site looking into cause of repeated intruder alarms. Technician checked, serviced and tested entire system and concluded the HVAC system had triggered alarms.

June 26 – Conducted various troubleshooting procedures for aeration valve "fail to open" issue. These efforts have been ongoing and are continuing daily.

Wastewater Collection System

June 1 – Operators investigating odour concern at residence on French Rd. N. as per request for service from District of Sooke. Operators could not locate the IC at this property. Of note, air admittance valves were installed one year ago. Operators installed valve at neighbour's sewer service line to prevent odours going back and escaping through roof vents.

June 6 – Resident of Lanark Rd. on low pressure system called after hours to report possible sewage overflow in driveway. On call operators responded and found sewer overflow to be contained in the municipal connection to low pressure system. Property owner agreed to not use any water until next morning.

June 7 – Vacuum truck arrived to Lanark, removed sewage from municipal connection box. Operators then could see point of failure was broken check valve in connection box. As this is a relatively newly constructed residence, property owner was contacted and advised of the situation. Operators called local plumbing contractor. In order to make necessary repairs, it was determined that the driveway needed to be excavated and the call to BC One was made.

June 8 – Repairs to 6494 Lanark completed.

June 11 – Maintenance check found broken fittings on suction hose of the sewage sani vacuum pump at the District of Sooke public boat launch. Sani vacuum pump was serviced and locks were lubricated.

June 12 – Operators replaced fittings as necessary on sani vacuum pump at the District of Sooke public boat launch.

June 18 – Padlocks on sewage sani vacuum pump at District of Sooke public boat launch were replaced as originals were corroded.

June 23– Operators attended 6868 West Coast Rd. for an odour concern as per request for service from the District of Sooke. Carbon was changed in odour control device at West Coast Rd. lift station. Also, it was noted that there was a broken lid on top of a 4" vertical PVC pipe in grass area of this property. Attempts to contact the property manager have been unsuccessful thus far.

June 29 – Operators attended Larkspur for an odour concern as per request for service from the District of Sooke. No odours were noted and report was complete.

Lift Stations

The lift stations operated well throughout the month of June. Routine lift station checks were completed including LIT cleanings and alarm dial-out function tests.

June 2 – Activated carbon changed in odour control equipment at Sooke Rd. lift station

June 11 – Operators responded to high level alarm at Prestige Hotel lift station. Found pump running and observed large amount of water pouring into the lift station. Hotel maintenance person was found and advised operators that they were draining a hot tub which raised the wetwell level too fast for the pumps to keep up. Monitored lift station until safe levels were observed.

June 18 – On call operator responded to call out to Mariner's Village lift station. Alarm was for "vent fan fault". Vent fan breaker was reset and fan operated as designed.

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. The substances and the limits are: Carbonaceous BOD: ≤25 mg/L, Total Suspended Solids: ≤25 mg/L, and a maximum of Un-ionized Ammonia: <1.25 mg/L of N @ at 15°C ± 1°C. Un-ionized Ammonia testing was no longer required after July 1, 2014, however testing continued until June 30, 2015 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^{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 GM/ 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 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
	June	YTD	Annual
Effluent Quality & Violations to Operational Certificates	0	0	0
Laboratory QA/QC Activities	31	227	200
Proactive Environmental/Quality Initiatives	0	3	5
Completion of Required Regulatory Reporting	100%	100%	100%
Activity	Actual Value	Actual Value	Acceptable Value
	June	YTD	Annual
Releases **	0	0	2
People & Safety Performance Measures			
Activity	Actual Values	Actual Values	Target Values
	June	YTD	Annual
Lost Time Accidents	0	0	0
Staff Training (hours)	1	130	40 hrs/ employee
Safety Preventative Activities	10	52	30
Customer Service Performance Measures			
Activity	Actual Values	Actual Values	Target Values
	June	YTD	Annual
Service Outages < 24 hours	100%	100%	90% Complete
Community Related Activities	1	4	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	7.01	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																											
August																											
September																											
October																											
November																											
December																											
Total																										341590	35
Annual	179	179	39	9.3	1439	5443	2054	<4	6	5	<3	14	6	0.08	2.50	0.72	0.00021	<0.05	<0.05	2.18	6.80	3.61	4	160	27		

* 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
June	m^3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	1623	7.8	325	910	>55					
2	1566				>55					
3	1709	7.6	250	931	>55					
4	1567									
5	1553	7.8	285	927	>55					
6	1550									
7	1462									
8	1683	7.7	360	1303	>55					
9	1569									
10	1703	7.6	305	713	39	1390	243	118	38.1	17.9
11	1526									
12	1481	7.6	280	974	>55					
13	1554									
14	1623									
15	1541	7.7	465	1452	>55					
16	1515									
17	1481	7.9	325	800	>55					
18	1537									
19	1525	7.8	245	823	>55					
20	1547									
21	1594									
22	1516	7.7	275	1167	>55					
23	1636									
24	1492	7.5	350	900	52	788	437	272	51.0	10.1
25	1484									
26	1439	7.6	385	1308	>55					
27	1487									
28	1673									
29	1501	7.7	355	1060	>55					
30	1620									
Min	1439	7.5	245	713	39	788	243	118	38.1	10.1
Max	1709	7.9	465	1452	>55	1390	437	272	51.0	17.9
AVG	1559	7.7	323	1021	54	1089	340	195	44.6	14.0

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	NH3-N (un-ionized)*	Temp	pH	TP	*Enter-ococci*	FC	pH	TSS	COD	NH3-N	COD	TSS	CBOD	NH3-N	NH3-N (un-ionized)*	Temp	pH	TP	*Enter-ococci*	FC
June		mg/L	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	mg/L	°C		mg/L	CFU/ 100mL	CFU/ 100mL
1	6.5	4		<0.4											6.5	7		<0.4										
2																												
3	6.6	4	35	<0.6										28	6.6	7	41	0.6										26
4																												
5	6.6	4		<0.9											6.5	6		<0.4										
6																												
7																												
8	6.6	<4		0.7											6.5	10		><0.4										
9																												
10	6.7	5	54	<0.4	58	<3	<4	0.10	<0.05	15	6.41	3.93			6.5	13	55	1.0	74	8	5	0.46	<0.05	15	6.45	3.90		
11																												
12	6.5	6		<0.4											6.5	14												
13																												
14																												
15	6.6	4													6.6	13		<0.4										
16																												
17	6.5	6	52	<0.4									<10	18	6.6	11	60	0.9									30	72
18																												
19	6.4	6		<0.4											6.5	8		0.6										
20																												
21																												
22	6.5	7		<0.4											6.6	11		<0.4										
23																												
24	6.5	12	61	<0.4	60	11	4	0.11	<0.05	15	6.16	6.80		30	6.6	12	73	0.8	73	14	6	0.41	<0.05	15	6.16	3.52		42
25																												
26	6.6	12		0.6											6.6	18		0.9										
27																												
28																												
29	6.5	9		0.6											6.7	7		<0.4										
30																												
Min	6.4	<4	35	<0.4	58	<3	<4	0.10	<0.05	15	6.16	3.93	<10	18	6.5	6	41	<0.4	73	8	5	0.41	<0.05	15	6.16	3.52	30	26
Max	6.7	12	61	0.7	60	11	4	0.11	<0.05	15	6.41	6.80	<10	30	6.7	18	73	1.0	74	14	6	0.46	<0.05	15	6.45	3.90	30	72
AVG	6.5	7	51	0.4	59	7	4	0.11	<0.05	15	6.29	5.37	<10	25	6.6	10	57	0.5	74	11	6	0.44	<0.05	15	6.31	3.71	30	43

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. External testing done by an ISO/IEC 17025 accredited Labs, EXOVA , Surrey, BC, except Enterococci done by Maxxam Analytical, Victoria, 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				
Q4				

* Un-ionized NH3-N tested with pH at 15°C and is not required 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