DISTRICT OF SOOKE
WASTEWATER TREATMENT
AND COLLECTION SYSTEM

OPERATED BY
EPCOR WATER SERVICES INC.

2010 ANNUAL REPORT
REGISTRATION 17300

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INTRODUCTION

The Sooke wastewater collection and treatment system is owned by the District of Sooke and operated by EPCOR Water Services Inc. The system encompasses the Sooke core area.

Construction of the Sooke collection system and wastewater treatment plant began in 2004 and the system was commissioned in November 2005. Individual domestic and commercial hook-ups began in January 2006 and continued throughout 2006 and 2007, with the majority completed by December 2006.

System Statistics

The system consists of:

- 34 km of collection system piping
- 4 pump lift stations (Sooke Road, West Coast Road, Helgeson Road & Sunriver)
- A secondary wastewater treatment plant
- 1.7 km long, 30 m deep outfall

The treatment plant uses a Sequencing Batch Reactor (SBR) treatment process with UV disinfection to provide secondary wastewater treatment. Secondary sewage treatment removes over 95% of the total suspended solids and high levels of other contaminants, providing significant environmental benefits to the District of Sooke.

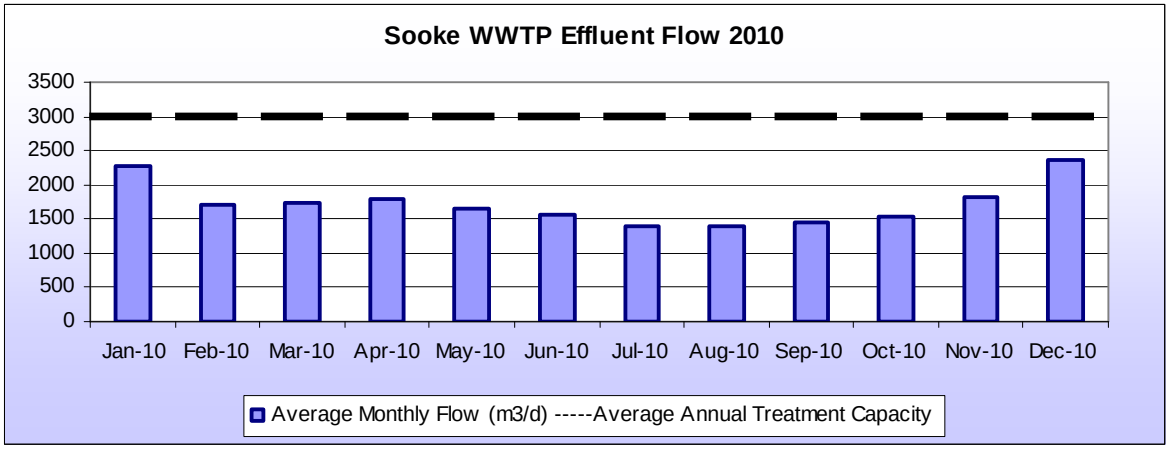
The treatment plant has a designed capacity of 3,000 m^3/day (annual average daily flow), and is expandable by an additional 3,000 m^3/day.

Table 1: Acronyms

Acronyms /Abbreviations	Description
mg/L	Milligram per liter
BOD	Biochemical Oxygen Demand
FC	Fecal Coliforms
CFU/100ml	Colony Forming Units Per 100 milliliters
COD	Chemical Oxygen Demand
NH_3	Ammonia
TSS	Total Suspended Solids
m^3/day	Cubic meters per day (flow)
MSR	Municipal Sewage Regulations
BCEOCP	British Columbia Environmental Operators Certification Program
I & I	Inflow and Infiltration

OVERVIEW

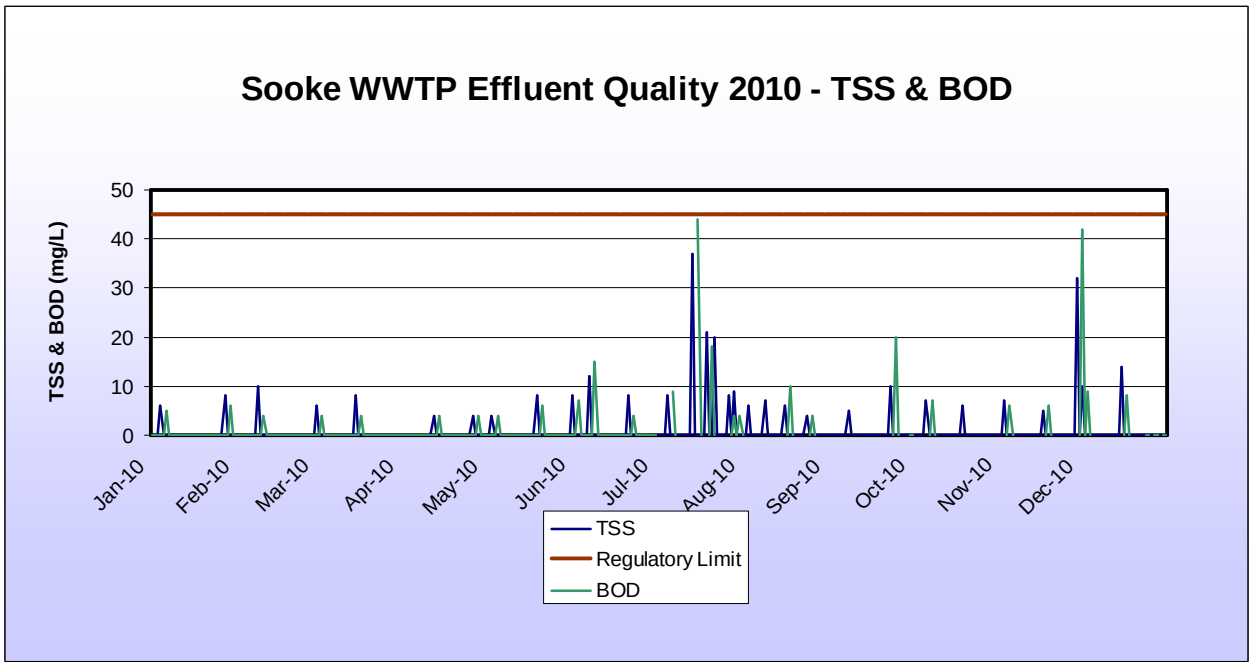
The annual average effluent flow treated in the plant during 2010 was 1725 m^3/day. The following figure summarizes the monthly average flows during the year compared to the plant design capacity (annual average flow). The flow has gradually increased each year as new connections are made to the sewer system.

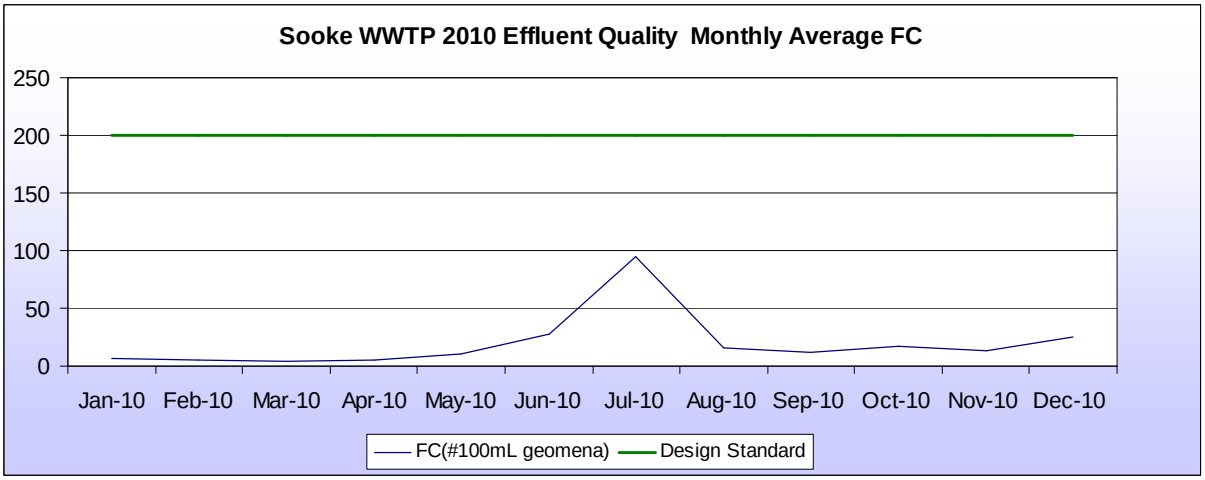


Plant Performance

The wastewater treatment plant is performing very well. Three of the important parameters monitored at the plant are total suspended solids (TSS), biochemical oxygen demand (BOD) and fecal coliforms (FC).

The following figures summarizes the external lab test results for TSS, BOD and FC in the plant effluent through the year compared to the regulatory standards. The TSS, BOD and FC in the plant effluent were consistently better than the regulatory requirements throughout the year.





OPERATIONS

Certification

The wastewater treatment plant is a Class III Wastewater Treatment Plant, Certification # 1358, in accordance with the Environmental Operators Certification Program.

Operators working at the Sooke WWTP in 2010:

Name	Position	Qualifications
John Reynolds	Senior Operator	BCEOCP Certified: Level IV Municipal Wastewater Treatment
Shawn Pearson	Operator	BCEOCP Certified: (OIT) Operator in Training

Water Quality Summary

Sooke Wastewater Treatment Plant – 2010 Monthly Water Quality Summary

	Influent			Effluent															Bio Solids Shipped
	BOD mg/L	TSS mg/L	NH_3 mg/L	Flow m^3/day			BOD mg/L			TSS mg/L			NH_3 mg/L			FC CFU/100mL			Kg
	Ave	Ave	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave* GMean	
Regulatory Limit					**			≤45			≤45				**			≤200**	
January	103	102	20	1603	3811	2284	5	6	6	6	8	7	12	23	18	3	18	7	43, 280
February	170	187	NA	1505	1891	1703	4	4	4	10	10	10	NA	NA	NA	1	54	5	41, 040
March	146	145	20	1474	2513	1739	4	4	4	6	8	7	12	12	12	1	10	3	39, 930
April	193	214	23	1506	2235	1797	<4	<4	2	4	4	2	14	16	15	1	10	5	49, 470
May	150	128	25	1368	2050	1644	4	6	5	4	8	6	23	28	26	5	48	11	49, 620
June	135	134	18	1248	2337	1559	2	15	8	8	12	9	2	27	21	4	494	28	59, 200
July	162	178	41	1187	1557	1397	4	44	15	8	37	17	9	48	25	20	4500	95	48,640
August	165	138	34	1221	1654	1387	4	10	6	4	7	6	9	13	11	8	40	16	31,720
September	166	238	49	1196	1898	1454	14	20	17	5	10	8	8	10	9	4	57	12	50.190
October	211	237	41	1252	2355	1544	5	7	6	6	7	7	13	13	10	<10	66	17	62,760
November	135	181	25	1401	2377	1831	6	6	6	5	7	6	9	14	12	2	58	13	32,680
December	97	124	18	1324	6442	2359	8	9	8.5	10	14	12	9	13	11	<10	90	25	38,880
Total						20,698													497,270
Annual	153	167	29	1357	2593	1725	5	12	7	6	11	8	11	20	15	1	4500	13	41,439

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NOTES: Data presented in table is conducted by an external CALA certified laboratory (Canadian Association for Laboratory Accreditation).

*Monthly average reported for fecal coliforms is a geometric mean.

**Limits being clarified with Ministry of Environment as part of the Liquid Waste Management Plan and Operational Certificate approval.

Operations, Maintenance & Improvements

Ongoing operations and maintenance activities and improvements occurred throughout the year. Highlights of those activities are included below.

TREATMENT PLANT

Biosolids

Bio-solids extracted from the centrifuge are trucked to the Hartland Landfill for disposal under Control Waste Permits #2010-025 and #2010-026. During 2010, on average, approximately 42 tonnes of bio-solids per month were trucked to the landfill.

Power Outages

BC Hydro power outages to the plant and lift station sites occurred regularly during the winter and fall months (January to April, September to December). At all times, the standby generators started and operated the facilities as designed during those events. The most severe BC Hydro outage was for 48 hours at the treatment plant and the West Coast Road lift station on April 2nd and 3rd.

Due to the high volume of outages and power phase losses, the Variable Frequency Drives (VFDs) on both of the SBR blowers failed in the fall – one on October 25 and the other on November 30. The failure frequency of electronic equipment like the VFDs appears to have increased over the past 6 months and is higher than should be expected for this equipment. Special power supply monitoring equipment was installed for a few weeks in November to help identify the cause of the high rate of failure. It was determined that there are frequent surges in the power supply to the plant due to the location of the plant on the BC Hydro grid. Additional surge protection equipment is recommended to be installed on the main power supply to the plant to protect valuable equipment like the VFDs. A budget has been submitted for approval to complete the upgrades.

Maintenance

Continuous and ongoing maintenance of the treatment plant equipment was conducted throughout the year. Equipment inspections, preventative maintenance and repairs were completed including the following activities:

- Backup power generator inspections and testing including monthly run tests and annual load testing
- Centrifuge maintenance including gearbox and auger motor repairs
- Headworks mechanical bar screen, grit auger and air-lift blower maintenance
- Onsite lift station inspections and annual maintenance
- DO probe calibrations and repairs

- Oil changes for rotating equipment such as digestor blowers, SBR blowers, SBR decanter gearboxes
- Monthly rotating equipment maintenance
- Regular greasing schedules for equipment such as the SBR blowers and centrifuge
- Digester blower belt changes
- Annual maintenance of UV bulbs
- Centrifuge gear box and auger motor replacements
- SBR aeration blower VFD replacements
- SBR aeration valve motor and actuator replacements

Treatment Process

The treatment plant performed very well throughout the year, even when being challenged by several different conditions through the year. The TSS, BOD and FC treatment standards were met throughout the year.

The first cycle of annual pool maintenance at SEAPARC since the facility was connected to the collection system was completed in 2010. SEAPARC and EPCOR personnel worked together closely during the salt water pool draining in June. The effect of the high volume of salt water on the plant was monitored. The higher conductivity of the influent water had an impact on the plant operation, although all treatment quality parameters were met during the operation. Some refinements of the operating procedures have been made to reduce the impact on the treatment process for future pool draining.

Very low biological activity was noted in the treatment plant in mid-July. While this resulted in higher than desired TSS and FC concentrations from the treatment process, the treated water quality continued to meet treatment standards during that period. A shock of toxic material coming into the plant was suspected as the cause of the elimination of almost all of the biological activity. Additional internal and external testing, including heavy metals and surfactant tests, was conducted to try and pinpoint the cause of the treatment shock. No conclusive source of the low biological activity was identified. The treatment plant quality returned to normal in August.

A filamentous bacteria outbreak occurred in SBR #2 in October. Upon further investigation it was concluded that filamentous bacteria had been introduced when floating material from the digester had been re-introduced into the SBR treatment basin. A process adjustment was made to increase the dissolved oxygen, which brought the filamentous bacteria under control.

As described above, several equipment failures occurred in October and November which created very challenging treatment conditions. One treatment train had to be operated manually and was offline for much of November and part of December while the repairs were being completed to the two SBR blower VFDs and one of the SBR aeration valve motors. This required very careful monitoring and operation of the plant during that period. Despite the difficult operating conditions, all treatment standards were met during the period.

In the month of December the Sooke area experienced several large rain events. There was a total of 246 mm of rainfall with 100 mm coming on December 12. These heavy rainfalls cause flooding in the streets and collection system with corresponding high flows coming into the plant. For this particular event, careful operation of the plant was required for approximately 48 hours due to the higher flows coming into the plant. At one point, the flows peaked and the UV channel overflowed for approximately 2 minutes. On the morning of December 12, the highest influent flows into the plant occurred, which caused the Ultra Violet Channel to overflow about two cubic meters for approximately 2 minutes. The small volume of treated, but non-disinfected, effluent was diluted with rain water and flowed off the plant site into the bush around the plant site and eventually into Nott Brook and the Juan de Fuca Strait 0.5 km from the plant. PEP was notified immediately (#11974). As a precaution, Environment Canada placed a 7 day shellfish closure in the area.

Controls

There is an extensive controls and alarm system available at the plant and lift stations to help monitor and control the facilities, and alert the operators of conditions that require immediate response. During the year, several repairs, tests and upgrades were completed to the system.

On March 20th the main SCADA control computer failed. The plant remained operational while it was replaced and there was no effect on the treatment quality due to the extensive backup systems that are available.

Several critical alarms were tested during the year and some new alarms were added to improve the level of continuous monitoring available at the plant. The alarms that were tested include blower outage alarms and high UV channel and SBR basin level alarms. A new alarm for digester belt failures was added and tested during the year.

Other

A new polymer tank drain/catchment pan was installed under the polymer batch tank in June. This provides more extensive containment of spills that might occur from the polymer storage tank.

During the summer of 2010, some of the neighbours located next to the treatment plant raised concerns regarding odours they were noticing from the plant. Complaints were escalated to the Ministry of Environment, but were later rescinded after consultation with EPCOR and efforts were made to troubleshoot the odour issues. There have been significant changes to the private property located to the north of the treatment plant since the plant was designed and constructed, resulting in residential homes being very close to the treatment process with little buffer. This has had an impact on the operation of the plant and in our efforts to maintain a long term 'good neighbour' relationship.

Through extensive consultation with the neighbours, it was determined that the source of odours was primarily from the headworks building and to a lesser extent from the solids handling room. The odours are intermittent depending on time of day, wind, weather conditions and season, and are more noticeable during warmer summer temperatures. Trials were completed with temporary carbon filtration systems installed on the ventilation exhaust for the two rooms during the summer of 2010, which made a noticeable improvement but wasn't completely successful in addressing the neighbours concerns. More permanent upgrades have been identified and await budget approval.

The District of Sooke continues to proceed with completion of the final stages of the Liquid Waste Management plan (LWMP) for the community. After completing Steering Committee and public consultation steps in 2009, the final Stage 3 of the LWMP was submitted to the Ministry of Environment early in 2010 and the District of Sooke awaits final approval from the Ministry.
The final Stage 3 Sanitary LWMP includes a draft Operating Certificate for the plant, which will provide an update to the current Registration. The Registration for discharge was submitted to the Ministry of Water, Land and Air protection in 2002 as required for the grant funding process, however, this was before the plant design was finalized and the construction contract was awarded. Several parameters contained in the registration (flow, fecal coliform concentration and ammonia removal) do not reflect the final design of the plant and need to be updated. While the operational certificate is being finalized, EPCOR uses the provincial Municipal Sewage Regulation (MSR) as guidance for quality parameters.
Receiving environment monitoring around the outfall was conducted in April and October 2010. Results continue to be excellent, with most parameters below detection limits. The reports are attached in Appendices 3 and 4.

LIFT STATIONS

There are four lift stations in the Sooke collection system – West Coast Road Lift Station, Sooke Road Lift Station, Sunriver Lift Station and Helgeson Road Lift Station. All stations operated well throughout the year.

Regular maintenance was conducted at the stations throughout the year including inspections, wet well cleaning, generator run tests, annual generator servicing and load tests and annual pump inspections and servicing.

An intermittent communications alarm was coming from the West Coast Road Lift Station throughout the year. There is a communications link between the lift station and the wastewater treatment plant control system which monitors the lift station and sends out any critical alarms to the operator. An alarm is sent out if this communications link is interrupted for more than 15 minutes. The cause of the alarm was difficult to locate due to the intermittent nature of the alarm and the various pieces of equipment and service providers for the alarm and communications systems. By the end of 2010, an extensive team of specialists were able to identify the potential source of the alarm and repairs are expected early in 2011.

BC Hydro power outages to the plant and lift station sites occurred regularly during the winter and fall months (January to April, September to December). At all times, the standby generators started and operated the facilities as designed during those events. The most severe was a 48 hour outage at the West Coast Road Lift Station and the treatment plant on April 2nd and 3rd.

The odour control system at the Sooke Road lift station was maintained during the year based on the loading of the system. Odour investigations were begun in January after observations were

received from the neighbours of the station. The carbon in the filter system was washed and regenerated in February and the carbon was changed in June. Grease was cleaned from the screen on the inlet to the carbon filter in October.

Additional maintenance was completed at the Sunriver lift station due to the accumulation of debris and grease that occurs at that station. One of the pumps was rebuilt and reinstalled at the station in January. The wetwell had to be cleaned with a vacuum truck twice during the year due to accumulation of debris.

COLLECTION SYSTEM

The collection system operations were smooth during the year.

Investigations for sources of inflow and infiltration (I&I) were increased in the winter of 2010/11. Regular inspections are being conducted through the winter rainy period to identify potential sources of I&I. A summary of the I&I sources will be compiled at the end of the winter season for remediation during more favourable construction conditions during dry weather.

Development continues in Sooke, with new connections being added to the system regularly. EPCOR assisted on a few inquiries from contractors connecting to the system.

- On June 25, a low pressure pump connection was broken during development work at 6929 West Coast Road, resulting in a release of raw wastewater. Approximately 100 L of wastewater was contained in a sump that had been excavated. The connection was repaired and the wastewater was removed. The release was reported to PEP (#100846).
- On September 15, a dye test was completed at the Sooke Elementary School to confirm the new connection to the collection system.
- Assistance was provided in late July for a new low pressure connection at 6441 Sooke Road. Work was coordinated with the contractor and a vacuum truck to enable the contractor to make the connection on July 26.

EPCOR responded to a report of sewer odours at the Sam Fedosenko Building in September. Upon further investigation it was concluded that the water in the floor drain traps had evaporated allowing odours to enter the building.

EPCOR and the District of Sooke assisted with a customer call of a plugged sewer line at #5 Maple Ridge Estates Trailer Park on November 2. The contractor that made the connections in the park was notified and they rectified the situation.

A broken inspection port cap was replaced on Maple Avenue after it was vandalized on November 15.

On December 28, EPCOR was notified of a major amount of wastewater exiting from a manhole on the corner of Eustace and Gatewood. On arriving at the site, the flow was estimated to be 50 L/min,

and approximately 4500 L was estimated to have been released by the time vacuum trucks arrived on site to remove wastewater from the manhole. PEP was notified of the spill (#102591).

The wastewater was contained in a partial storm ditch and all standing water in the adjacent ditch was removed with the aid of vacuum trucks. The cause of the plugged line was a round nosed shovel lodged in the line and jammed in a manhole at the corner of Aitken and West Coast Road. The handle had to be broken to get the blockage removed. The shovel could not be recovered because of the flow in the line that pushed it down the pipe. The West Coast Road line had to be videoed to locate and remove the shovel the next day.

Audits & Inspections

As part of EPCOR's commitment to quality, there are a variety of audits and inspections that are conducted as a regular part of the operations.

EPCOR Health and Safety specialists came to the Sooke facilities for three training and assessment visits in 2010; in January, April, and July. While onsite, the specialists complete training, inspections and assessments. The specialists also assist throughout the year in updating safety and emergency response procedures.

The Ministry of Environment conducted their annual inspection of the facilities on February 16, 2010 with the District of Sooke and EPCOR. The inspection went well and the only outstanding issue is the inaccurate registration with the MOE. This will be addressed when the Ministry of Environment approves the Liquid Waste Management Plan and the Operation Certificate is finalized.

The Department of Fisheries and Oceans met with the District of Sooke and EPCOR on March 12th to complete a final inspection of the outfall construction and rehabilitation work.

The laboratory analyses conducted onsite by the operators are part of an extensive Quality Assurance/Quality Control program. Weekly and monthly tests are completed throughout the year to ensure the accuracy of the lab data reported from the site. In addition, an annual visit by an EPCOR lab scientist is completed for lab equipment testing, training and a QA/QC audit. The 2010 audit was completed on March 18 and 19.

On June 14, a Worksafe BC inspector came to the Sooke plant for an unannounced annual inspection. The inspection went well and included reviews of new employee training programs and safety orientations. There were no issues documented for follow up.

The fire extinguisher and alarm system inspections were completed on July 2010.

An informal site inspection was completed by the Sooke fire department on November 15, 2010 while representatives were at the plant providing fire extinguisher training to EPCOR on site staff.

CUSTOMER SERVICE

Customer Inquiries

EPCOR operates a customer service phone line to address concerns and answer question for the public. In 2010, a total of 17 were received (summarized below).

2010 Customer Calls	
Connection Query	2
Pump Related Query	6
Odour Concerns	9
Total	17

- Connection Query – point of connection, issues connected to original construction
- Pumps – maintenance, noise issues
- General – info on contractors, permitting, hook-ups, inspections
- Odour Concerns – Residents living beside WWT Plant, odours from collection system

Community Involvement

EPCOR continues to be committed to investing in communities in numerous ways. These investments include direct contributions and sponsorships, employee volunteerism, and our support as a major contributor to the United Way.

One of the ways EPCOR supports the District of Sooke is by investigating opportunities in the community that provide us with chances to connect with customers. For example, we support annual sponsorships of the Sooke Branch of Royal Canadian Legion Poppy Campaign, the Sooke Salmon Enhancement Society fishing derby and the Rotary Club of Sooke.

In 2010, EPCOR supported SEAPARC Safe Halloween, Sooke Sox Midget A Fastball Tournament Fundraiser, as well as the Sooke Fine Arts Society.

In past years EPCOR has sponsored the Sooke Philharmonic Orchestra, Sooke Canada Day Society, Sooke Volunteer Firemen and the Sooke Chamber of Commerce.

APPENDICES

1. Monthly Data Summary
2. Influent Metal Samples
3. Sooke Outfall April 2010 - Environmental Monitoring Report
4. Sooke Outfall October 2010 - Environmental Monitoring Report

JANUARY 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC / CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC / CFU
Jan	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100/mL		mg/l	mg/L	mg/L	mg/l	mg/l	mg/L	100/mL
1	2200																									
2	2286																									
3	2216																									
4	3075	7.4				90	79	11			7.0				6	5	12	8								
5	2720											5														
6	2545	7.7		352							6.7	3	15													
7	2063											2							6.7							
8	2233	7.8	239								6.9	4														
9	2275																									
10	2175																									
11	3190											5						4								
12	2755											2														
13	2705	7.4	74	153							6.7	3							6.7							
14	2896			290								2	36													
15	3811											5														
16	2784																									
17	2543																									
18	2554											2														
19	2283											4														
20	1999	7.3		296							6.6	2	44													
21	1867										3.6															
22	1823								125			1														
23	1812																									
24	1822																									
25	1841																	3		3						
26	1603											6						7								
27	1830	7.4	120	355	360	116	125	26	551		6.6	4	47	70	8	6	23	18								
28	1728											5														
29	1621											8														
30	1700																									
31	1778																									
Min	1603	7.3	74	153	360	90	79	11	125		3.6	1	15	70	6	5	12	3		3						
Max	3811	7.8	239	355	360	116	125	26	551		7.0	8	47	70	8	6	23	18		3						
Avg	2282	7.5	144	289	360	103	102	19	338		6.3	4	36	70	7	6	18	7		3						

*Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

FEBRUARY 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent Flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU
Feb.	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100/mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100/mL
1	1723											12						54								
2	1784											9														
3	1657										6.4	11														
4	1615	7.0	203	488							6.5	13	51													
5	1833											10														
6	1635																									
7	1666																									
8	1616	7.1	188	438	450	170	187		537		6.5	3	54	80	10	4		2								
9	1526										6.5	6														
10	1505											4														
11	1750											2														
12	1552											4														
13	1708																									
14	1834																									
15	1801											6														
16	1844											4						4								
17	1891	6.6	91	229								4														
18	1793											1	29													
19	1656											3														
20	1702																									
21	1724																									
22	1700											6						1								
23	1672										6.2	6														
24	1698	6.9	177	312							6.2	3	42					8								
25	1650											8														
26	1623											6														
27	1748																									
28	1810																									
Min	1505	6.6	91	229	450	170	187		537		6.2	1	29	80	10	4		1								
Max	1891	7.1	203	488	450	170	187		537		6.5	13	54	80	10	4		54								
Avg	1704	6.9	165	367	450	170	187		537		6.4	6	44	80	10	4		5								

* Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

MARCH 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent Flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	CFU
March	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100/mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL
1	1810	6.7		340	310	125	91		605		6.2	2	69	70	6	4										
2	1770											6														
3	1646											3						<1								
4	1607											7														
5	1578																									
6	1603																									
7	1606																									
8	1556											6														
9	1690																	10								
10	1496	6.4	204	412							6.0	9	48													
11	1810											10														
12	1837											9														
13	1868																									
14	1878																									
15	1939	7.4	288	546	240	166	198	20	985		6.9	4	45	50	8	4	12	4								
16	1775											9														
17	1644	7.5	218	438							6.8	10														
18	1616																			5						
19	1766																									
20	1736																									
21	1671																									
22	1581																									
23	1799											7						5								
24	1537	8.2		300							7.4	9	59													
25	1474											6														
26	1879											6														
27	1643																									
28	1713																									
29	2135											5														
30	2513											6														
31	2235	7.7		331							7.0		31													
Min	1474	6.4	204	300	240	125	91	20	605		6.0	2	31	50	6	4	12	4		5						
Max	2513	8.2	288	546	310	166	198	20	985		7.4	10	69	70	8	4	12	10		5						
AVG	1755	7.3	237	395	275	146	145	20	795		6.7	7	50	60	7	4	12	6		5						

* Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

APRIL 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent Flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/ CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/ CFU
April	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL
1	2081											1														
2	1909																									
3	2208											3														
4	2095																									
5	2003																									
6	2026											3						3								
7	1722	7.7	209	428							7.0	5	29													
8	2020											3														
9	2043											4														
10	1869																									
11	1833																									
12	2003				360	158	190	20	475					60	4	<4	14	10								
13	1814																									
14	1670	7.7	160	410							7.1	5	48													
15	1576											5	54													
16	1602																									
17	1515																									
18	1538																									
19	1704											8						7								7
20	1608											7														
21	1670	7.6	225	526							6.9	5	44													
22	1601											9	47													
23	1743											1														
24	1640																									
25	1627																									
26	1750				630	228	238	25	604			2		60	4	<4	16	<2								
27	1654											3	56													
28	1635	7.7	204	540							7.1	4	46					9								
29	1506											4														
30	1424											3														
Min	1424	7.6	160	410	360	158	190	20	475		6.9	1	29	60	4	<4	14	1								7
Max	2208	7.7	225	540	630	228	238	25	604		7.1	9	56	60	4	<4	16	10								7
AVG	1770	7.7	199	476	495	193	214	23	540		7.0	4	46	60	4	<4	15	7								7

* Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

MAY 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/ CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/ CFU
May	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100 mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100 mL
1	1613																									
2	1536																									
3	2050		114	339	200	176	119	21	715			2	40	60	4	4	23	48								
4	2024											2														
5	1844											5														
6	1665	7.7									7.0	2														
7	1710											4														
8	1759																									
9	1753																									
10	1413											4						6								
11	1602												60													
12	1853	7.6	281	849							7.1	6	52													
13	1522											11	63							16						
14	1761											12														
15	1628																									
16	1719																									
17	1611	7.6	140	436							7.0	7	48													
18	1652											10														
19	1533	7.6	116	267	180	124	136	29	503		7.0	8	64	70	8	6	28	6								
20	1649											7						15								
21	1601											7														
22	1393																									
23	1617											4														
24	1670																									
25	1650			596								6	61					5								
26	1615	7.7	355	656							7.0	6	59													
27	1368										7.0	5	67													
28	1569											8														
29	1549																									
30	1608																									
31	1829																									
Min	1368	7.6	114	267	180	124	119	21	503		7.0	2	40	60	4	4	23	5								
Max	2050	7.7	355	849	200	176	136	29	715		7.1	12	67	70	8	6	28	48								
AVG	1657	7.6	201	524	190	150	128	25	609		7.0	6	57	65	6	5	26	11								

* Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

JUNE 2010 MONTHLY DATA

		INFLUENT									SBR 1								SBR 2							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU
June	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100 mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100 mL
1	1836	7.5	147	392	330	153	130	21			7.1	8	50	70	8	7	21	10								
2	1589											12														
3	1575											10	73													
4	1592											13														
5	1572																									
6	1597																									
7	1678	7.6	184	502		196	173	21			7.1	15	90		12	15	27	60								
8	1501											19														
9	1443											21	85													
10	1702											16														
11	1601											14														
12	1467																									
13	1532																									
14	1643											16						494		18						
15	1394											16								14	81					
16	1410											15								9						
17	1248	7.9	325	651															7.2	9	67					
18	1535											10								6						
19	1471																									
20	1588																									
21	2337	7.7	103	224		66	98	13	3410	1.02		12							7.1	7	53		8	<4	14	4
22	1581																			7						
23	1508											9								6						
24	1489																			7						
25	1413																			5						
26	1374																									
27	1351																									
28	1494											9								6						14
29	1428											8								8						
30	1557											9								7						
Min	1248	7.5	103	224	330	66	98	13	3410	1.02	7.1	8	50	70	8	7	7	10	7.1	5	53		8	<,4	14	4
Max	2337	7.9	325	651	330	196	173	21	3410	1.02	7.1	21	90	70	12	15	27	494	7.2	18	81		8	<4	14	14
AVG	1550	7.7	189	442	330	135	134	18	3410	1.02	7.1	13	75	70	10	11	24	67	7.2	8	67		8	<4	14	7

* Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

JULY 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduc-tivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU
July	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL
1	1357								605																	
2	1318																			9						
3	1355																									
4	1273																			9						
5	1467	7.7	209	540	410	140	103	32	577	3.28									7.0	10	64	70	8	9	9.0	112
6	1429																			9						
7	1414											17						112		7						
8	1356																			7						
9	1361											13								9						54
10	1253																									
11	1311											13														
12	1444											20								13						
13	1495				760	230	290	40	576	4.65		25								27						
14	1187		113	306	400	180	144	50	659	2.74										41	121	140	37	44	14.9	2000
15	1520			282					985			25	125													
16	1466		148	347								24														
17	1454		324	324								23														
18	1372																									
19	1364	7.7	208	662	400	178	121	28	582	3.04	7.3	29	72	120	21	18	48	4500								
20	1515											23								36						
21	1369											5						100								
22	1505	7.5	199	375	300	106	183	34	522	1.92	7.0	16	78	90	20	13	26	58								
23	1517											17						100								
24	1475											15														
25	1412																									
26	1426											12						20								
27	1341	7.5	142	371	420	133	193	51	518	2.41	7.0	13	73	80	8	4	30	20		10						
28	1371						220		533	3.74		12						20								
29	1349	7.6	245	565	440	170	168	52	547	2.25	6.9	14	78	50	9	4	23	20		11						
30	1281											17														
31	1292																			16						
Min	1187	7.5	113	282	300	106	103	28	518	2	6.9	5	72	50	8	4	23	20	7.0	7	64	70	8	9	9	54
Max	1520	7.7	324	662	760	230	290	52	985	5	7.3	29	125	120	21	18	48	4500	7.0	41	121	140	37	44	15	2000
AVG	1389	7.6	199	419	447	162	178	41	610	3	7.1	18	85	85	15	10	32	71	7.0	15	93	105	23	27	12	230

AUGUST 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU
Aug.	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL
1	1296																			11						
2	1369																			9						
3	1467		218	552	640	199	180		684	3.30										8	44	90	6	5		10
4	1457		226	620																11	77					40
5	1315																			11						
6	1325																			10						
7	1362																									
8	1347																									
9	1464		104	363	400	112	110	26												7	56	100	7	6	9.8	20
10	1432																		6.7	6	71					
11	1457																			6	27					
12	1490																			7						
13	1313																			9						
14	1221																									
15	1256																									
16	1434	7.4	94	408	410	150	45	37											6.7	6	59	90	6	10	9.0	8
17	1523																			6						
18	1416	7.4	144	492							6.6	10							6.8	4						
19	1480																			8						
20	1243																			4						
21	1281																									
22	1313																									
23	1502																			5						
24	1541	7.4	224	450	480	200	217	38	511			5							6.8	4	48	70	4	4	13.0	18
25	1486																			4						
26	1288																			5						
27	1372																			4						
28	1273																									
29	1314																									
30	1654																			4						
31	1455																			5						
Min	1221	7.4	94	363	400	112	45	26	511	3	6.6	5							6.7	4	27	70	4	4	9	8
Max	1654	7.4	226	620	640	200	217	38	684	3	6.6	10							6.8	11	77	100	7	10	13	40
AVG	1392	7.4	168	481	483	165	138	34	598	3	6.6	8							6.8	7	55	88	6	6	11	16

* Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

SEPTEMBER 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC/CFU
Sept.	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL
1	1392											5								4						4
2	1359																			3						
3	1450																			3						
4	1196																									
5	1246																									
6	1488																			4						
7	1498																									
8	1530	7.6	237	573	860	67	212	39	570	2.67		10							7.0	4	57	70	5	14	10	20
9	1461																			4						
10	1261																			4						
11	1288																									
12	1415																									
13	1532																			3						
14	1454																									8
15	1344																			3						
16	1304		350	701																4	44					
17	1591																			4						
18	1325																									
19	1501																									
20	1220																									
21	1729											13								20						
22	1514																			11						
23	1376	7.7	258	564		265	264	59	609										7.1	8	68		10	20	8	57
24	1448																			5						
25	1428																									
26	1898																									
27	1862																			2						
28	1600																			2						
29	1446		152	630																1	60					
30	1546																			4						
MIN	1196	7.6	152	564	860	67	212	39	570	2.67		5							7.0	1	44	70	5	14	8	4
MAX	1898	7.7	350	701	860	265	264	59	609	2.67		13							7.1	20	68	70	10	20	10	57
AVG	1457	7.6	249	617	860	166	238	49	590	2.67		9							7.0	5	57	70	8	17	9	14

* Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

OCTOBER 2010 MONTHLY DATA

October		INFLUENT							SBR 1 EFFLUENT								SBR 2 EFFLUENT								
		IN HOUSE			EXTERNAL				IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL					
		pH	TSS	COD	COD	BOD	TSS	NH_3	pH	TSS	COD	COD	TSS	BOD	NH_3	CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	CFU	
Date	Effluent flows		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100/mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100/mL	Conductivity
1	1546																	4							605
2	1416																								
3	1373																								
4	1378									2								3							
5	1523																	5							
6	1382	8	163	349	490	116	174	42.0									7.1	7	40	90	7	7	13.0	6	
7	1346																	6							
8	1569																	4							
9	1472																								
10	1403																								
11	1602																	5							
12	1610																	6						16	
13	1625																	4							
14	1603																	4						66	
15	1478																	3							985
16	1737			297																					
17	1282																								
18	1262																	6							
19	1521		297			305	300	40.0										5			6	5	13.0	20	
20	1288																	4							
21	1465																	4							
22	1252																	4							
23	1357																								
24	1350																								
25	1540																								
26	2355																	4							
27	2114		208	389						9						<10		4	38					<10	
28	1962																	5							
29	1872									4								4							
30	1616																								
31	1565																								
Min	1252	7.8	163	297	490	116	174	40.0		2						<10	7.1	3	38	90	6	5	13.0	<10	605
Max	2355	7.8	297	389	490	305	300	42.0		9						<10	7.1	7	40	90	7	7	13.0	66	985
AVG	1544	7.8	223	345	490	211	237	41.0		5						<10	7.1	5	39	90	7	6	13.0	19	772

* Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

NOVEMBER 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC /CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC /CFU
Nov.	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100mL
1	2377											4								7						
2	2318											5								3						
3	1947	7.4	98	205	310	104	110	21						70	7	6	9	30	6.9	5	47	70				
4	1768											3								6						
5	1666											2														
6	1655																									
7	1668																									
8	1897											3														
9	1820											4						8								
10	1607			436								5	55													
11	1726																									
12	1771											3								3						
13	1532																									
14	1573																									
15	1756											2														
16	2108											2														
17	2355	7.7	324	486	530	166	252	28	523		70	4	36	40	5	6	14	2		4						
18	2261											2														
19	1989											3														
20	1933																									
21	1806																									
22	1935											5								3						
23	1884											6						7								
24	1587	7.6	358	721							7.1	5	24													
25	1401																									
26	1732											10														
27	1962																									
28	1617																									
29	1616											10						10		32		130	32	42		50
30	2165											14							7.1	15	81					58
MIN	1401	7	98	205	310	104	110	21	523		7	2	24	40	5	6	9	2	7	3	47	70	32	42		50
MAX	2377	8	358	721	530	166	252	28	523		70	14	55	70	7	6	14	30	7	32	81	130	32	42		58
AVG	1848	8	260	462	420	135	181	25	523		39	5	38	55	6	6	12	8	7	9	64	100	32	42		54

* Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

DECEMBER 2010 MONTHLY DATA

		INFLUENT									SBR 1 EFFLUENT								SBR 2 EFFLUENT							
		IN HOUSE			EXTERNAL						IN HOUSE			EXTERNAL					IN HOUSE			EXTERNAL				
	Effluent flows	pH	TSS	COD	COD	BOD	TSS	NH_3	Conduct-ivity	Surfact-ants	pH	TSS	COD	COD	TSS	BOD	NH_3	FC /CFU	pH	TSS	COD	COD	TSS	BOD	NH_3	FC /CFU
Dec	m3/d		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm at 25 C	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100ml		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	100ml
1	2154	8	140	299	300	136	151	23.0	454.0										6.8	12	59	50	10	9	13	40
2	1864																			9						
3	1710																			7						
4	1837																			5						
5	1775																			4						
6	1542																			6						
7	1324																			11						<10
8	2118	8	224	421															6.8	4	32					
9	3004																			16						56
10	2559																			6						
11	2484																									
12	6442											20								14						
13	3439		92									17						90		8						<10
14	3534											17								4						
15	3206	7	93	295	230	58	97	13	361		6.8	8	17	60	14	8	9.3	38								
16	2667											10														
17	2437																			5						
18	2188																									
19	2236																									
20	2014																			5						
21	1935																									
22	1906		71	136																2	6					6
23	2046																			3						
24	2140																			4						
25	2106																									
26	2125																									
27	2165											6														
28	2138																									
29	2123		163	407						0.97										4	31					
30	1898																			4						
31	2021																									
Min	1324	7.4	71	136	230	58	97	13	361	0.97	6.8	6	17	60	14	8	9.3	38	6.8	2	6	50	10	9	13	<10
Max	6442	7.7	224	421	300	136	151	23	454	0.97	6.8	20	17	60	14	8	9.3	90	6.8	16	59	50	10	9	13	56
AVG	2359	7.5	130	312	265	97	124	18	408	0.97	6.8	13	17	60	14	8	9.3	58	6.8	7	32	50	10	9	13	24

*Limits being clarified with Ministry of Environment. Monthly average reported for fecal coliforms is a geometric mean.

INFLUENT METAL SAMPLES

Metals Total		July 05	July .13	July 14	July 19	July 22	July 27	July 28	July 29	Aug.03	Aug.9	Aug.11	Aug.16	Sept. 8	Sept. 29	Oct.6	Nov.3	Dec.29	Nominal Detection Limit
Calcium	mg/L/	13.8	13.5	15.1	12.5	15.5	12.9	13.4	15.0	14.0	12.2	16.3	12.7	3.02	18.1	16.0	17.8	16.1	0.05
Iron	mg/L	0.18	0.40	0.41	0.18	0.30	0.29	0.28	0.30	0.47	0.22	0.686	0.23	0.098	0.32	0.23	0.17	0.32	0.01
Magnesium	mg/L	4.4	3.8	5.0	4.1	4.6	3.9	3.5	4.2	4.5	4.3	4.8	4.0	1.12	5.48	5.0	5.30	5.23	0.05
Phosphorus	mg/L	6.30	7.48	7.56	5.78	5.32	6.52	6.38	7.18	7.40	4.58	11.2	5.38	1.28	<0.02	<0.02	<0.02	4.45	0.01
Potassium	mg/L	12	15	15	13	13	10	15	13	22	11	14	12	2.6	6.33	6.39	3.63	8.7	0.1
Silicon	mg/L	3.6	3.1	3.1	3.1	3.4	2.9	2.3	2.7	3.4	2.4	2.3	2.9	0.68	14	14	6.9	4.8	0.05
Sodium	mg/L	32.2	44.6	35.5	33.7	38.0	25.1	40.3	34.0	35.8	32.6	30.8	36.9	6.35	3.6	3.2	5.35	22.1	0.02
Sulfur	mg/L	6.8	6.1	6.2	6.6	1660	5.6	7.1	6.9	1620	7.1	7.7	8.2	290	33.7	30.3	21.4	6.5	0.1
Titanium	mg/L	<0.005	0.01	<0.005	0.01	0.03	<0.005	0.02	<0.005	0.02	0.02	0.03	0.04	0.004	8.6	8.7	6.9	<0.005	0.001
Aluminum	mg/L	0.24	0.65	0.25	0.22	0.26	0.27	0.45	0.33	0.36	0.30	0.56	0.20	0.37	<0.005	0.04	0.01	0.35	0.05
Antimony	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.24	0.23	<0.05	<0.001	0.001
Arsenic	mg/L	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Barium	mg/L	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	<0.001	<0.001	<0.001	0.01	0.005
Beryllium	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.01	0.009	0.008	<0.0002	0.0002
Boron	mg/L	0.17	0.33	0.19	0.12	0.45	0.10	0.29	0.13	0.16	0.13	0.12	0.16	0.15	<0.0002	<0.0002	<0.0002	0.07	0.02
Cadmium	mg/L	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.22	0.08	0.08	<0.0004	0.0004
Chromium	mg/L	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0004	<0.0004	<0.0004	<0.002	0.002
Cobalt	mg/L	0.0003	0.0005	0.0004	0.0003	0.0005	0.0004	0.0005	0.0004	0.0004	0.0003	0.0006	0.0001	0.0004	<0.002	<0.002	<0.002	0.0004	0.0001
Copper	mg/L	0.069	0.11	0.082	0.062	0.060	0.086	0.20	0.10	0.11	0.065	0.11	0.084	0.076	0.0004	0.0003	0.0004	0.04	0.005
Lead	mg/L	0.002	0.0052	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.004	0.002	0.002	0.05	0.05	0.03	0.001	0.0005
Lithium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.02	<0.005	<0.005	<0.005	<0.005	0.002	0.002	0.002	<0.005	0.005
Manganese	mg/L	0.037	0.040	0.037	0.033	0.035	0.034	0.036	0.038	0.048	0.032	0.0533	0.037	0.042	0.009	<0.005	<0.005	0.722	0.001
Molybdenum	mg/L	<0.0001	0.0011	0.0007	0.0002	0.0005	0.0006	0.0002	0.0002	0.0004	0.0001	0.008	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	0.0005	0.0001
Nickel	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005
Selenium	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003
Silver	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0004	<0.0002	<0.0002	0.0004	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	0.0002
Strontium	mg/L	0.050	0.053	0.063	0.05	0.064	0.05	0.058	0.066	0.054	0.054	0.070	0.067	0.058	0.055	0.052	0.057	0.066	0.005
Thallium	mg/L	<0.00005	<0.00005	<0.00005	<0.0000	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005
Thorium	mg/L	<0.002	,0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002
Tin	mg/L	0.0008	0.002	0.0007	0.0006	0.002	0.003	0.003	<0.0005	0.002	0.001	<0.0005	<0.0005	0.002	<0.0005	0.002	<0.0005	0.001	0.0005
Uranium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	,0.002	0.002
Vanadium	mg/L	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	0.0005	0.0006	<,0.0005	0.0007	0.0006	0.0006	<0.0005	<0.0005	0.0006	0.0009	0.0005
Zinc	mg/L	0.11	.06	0.13	0.080	0.076	0.14	0.14	0.14	0.13	0.084	0.17	0.11	0.12	0.12	0.097	0.078	0.068	0.005
Zirconium	mg/L	0.002	0.004	0.001	0.004	0.003	0.003	0.004	0.003	0.003	0.003	0.003	0.004	0.004	0.002	0.003	0.0008	0.002	0.0005

WATER SAMPLING FOR THE EPCOR WASTEWATER TREATMENT PLANT OUTFALL IN SOOKE BAY

April 2010

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Water Sampling for the Epcor Wastewater Treatment Plant Outfall in Sooke Bay

Sampling Date: April 6, 2010

Report Submission Date: April 15, 2010

Prepared for:

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EPCOR WATER SERVICES
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INTRODUCTION

The sampling site was located in off the coast from Sooke on the Juan de Fuca Strait, located approximately 35 km east of Victoria on the southwest coast of Vancouver Island, British Columbia (Figures 1 & 2). In 2005, Epcor Water Services was contracted to construct a wastewater treatment facility and outfall to accommodate present and future population growth in the municipality of Sooke. The facility began operations in December 2005. To comply with the regulations outlined by the Ministry of Environment; discharge of effluent must be monitored to ensure that the guidelines outlined in the *Municipal Sewage Regulation* are adhered to.

Effluent monitoring has consisted of water sampling on a pre-determined schedule of twice per year at 4 index sites. In October 2005, a pre-operational baseline survey was conducted to establish index sites and record water chemistry parameters which future sampling efforts could be compared against. Pacificus Biological Services was contracted to perform regular marine water sampling on the receiving waters at the outfall. The latest phase of sampling took place on April 6, 2010.

Figure 1: General Location of sample sites, Sooke Bay, British Columbia

Figure 2: Aerial view of Sooke Bay outlining location of wastewater outfall with reference to Sooke and the Epcor Office.

METHODOLOGY

SAMPLING LOCATIONS

Four index sampling sites were determined by Epcor and provincial ministry staff (figure 3). The four index sites were sampled before wastewater discharge began in 2005, and subsequently at regular intervals of twice a year. The site locations are as follows:

1. **Location of outfall diffuser** *48° 21' 15"N, 123° 46' 21"W*

2. **100m North of outfall** *48° 21' 17"N, 123° 46' 17"W*
   (Initial dilution zone 100m from outfall diffuser, as required by Ministry of Sustainable Resource Management)

3. **100m South of outfall** *48° 21' 13"N, 123° 46' 24"W*
   (Initial dilution zone 100m from outfall diffuser, as required by Ministry of Sustainable Resource Management)

4. **300m towards shore** *48° 21' 22"N, 123° 46' 11"W*
   (300m away from the outfall diffuser towards shore, as required by Environment Canada)

A Pacificus biologist (Andrew Taylor) navigated to the four sample locations using a handheld Garmin GPS (with pre-recorded sample site waypoints) and gathered water samples from a depth of 2m and a depth of 12m.

The sample design calls for the acquisition of samples at each sample location to be at 2m (to avoid any freshwater floating on the surface) and below the pycnocline where a plume would be likely to trap. A pycnocline is a layer of rapid change in water density with depth. In oceans, changes in water density are mainly caused by changes in water temperature and salinity. A study completed by Komex Environmental and Water Resource Engineering Ltd. found that the water profile data found homogeneity of the water column in Sooke Bay, indicating that the water is fully-mixed (unstratified) throughout the year. Therefore a pycnocline has not been present in the area, so in some previous sampling events only one sample was taken from each location. On the date that the latest phase of sampling occurred (April 6, 2010), the weather was windy with choppy seas. Therefore the water column was predicted to be unstratified at the time of sampling – similar to the previous sampling phases conducted in 2009. However, two samples were collected at each location – one shallow sample from 2m below the surface, and one deep sample from 12m below the surface.

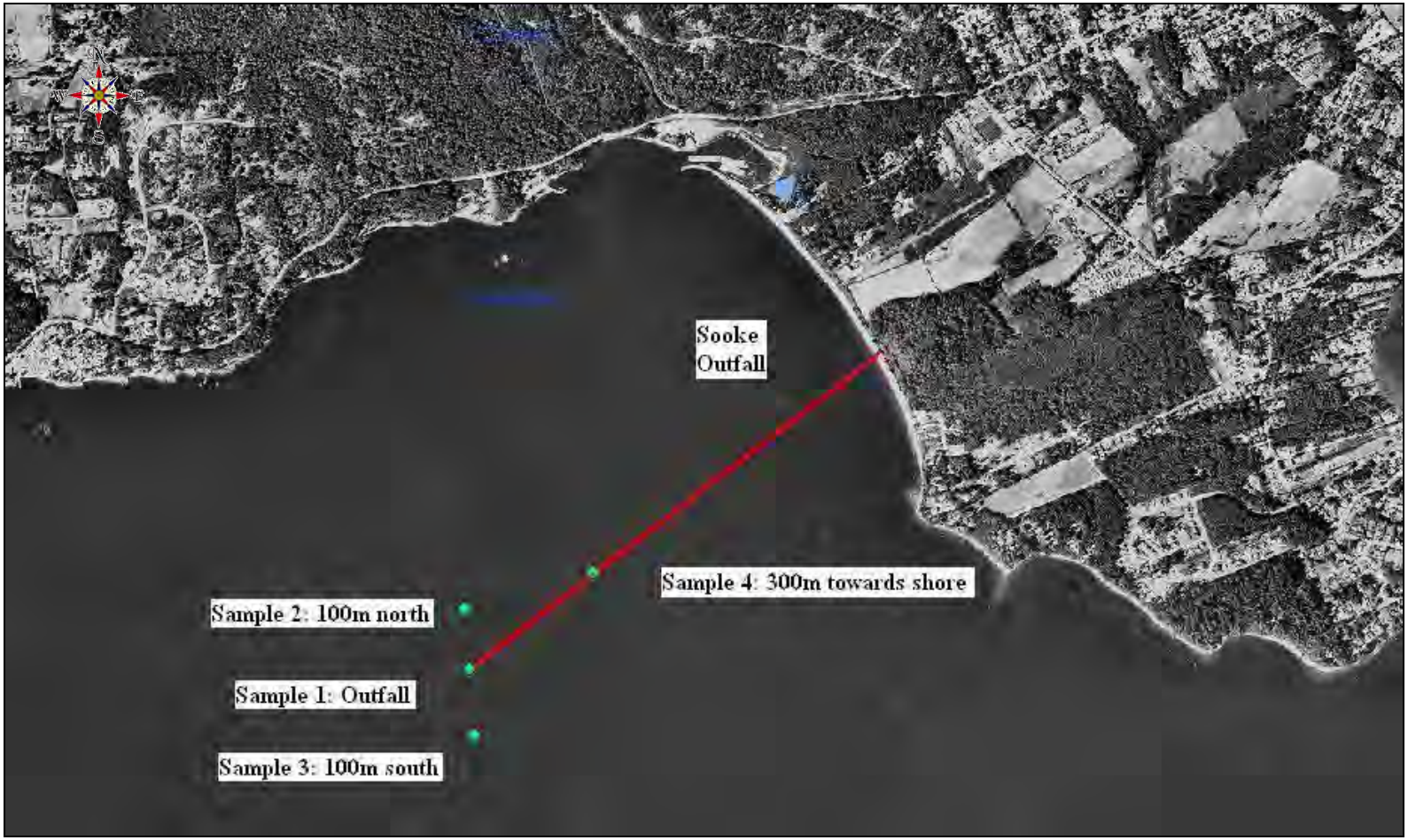

Figure 3: Sooke Bay receiving water-sampling locations (approximate).

TEST METHODS

The water sampling involved measuring the following parameters within the receiving waters environment:

Parameter
Biological Oxygen Demand
Total Suspended Solids
pH
Ammonia
Conductivity
Dissolved Oxygen
Salinity
Temperature
Fecal Coliforms

The following parameters were recorded on location:

- Temperature
- pH
- Conductivity
- Dissolved Oxygen
- Salinity

A YSI Model 85 handheld multi parameter testing system was used to measure oxygen, conductivity, salinity and temperature. The pH measurements were acquired using a pH colorimeter test kit. Field Sampling completed for the Receiving Waters Monitoring in Sooke Bay is in accordance to methodologies specified by the latest version of the *BC Field Sampling Manual for Continuous Monitoring, plus the collection of Air, Air-Emission, Water, Wastewater, Soil, Sediments and Biological Samples*.

For the following parameters, samples were collected in the field and transported in sealed and sterilized sample jars, then sent to Maxxam Laboratory in Victoria within 24 hours for analysis:

- Ammonia
- Biological Oxygen Demand (BOD)
- Fecal Coliforms
- Total Suspended Solids (TSS)

All testing completed for the Receiving Waters Monitoring in Sooke Bay were carried out using methodologies specified by the latest version of the *B.C. Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials* (2005 Edition) and *Standard Methods for the Examination of Water and Wastewater* (21st Edition 1998). Test methods for these samples were conducted as follows:

Ammonia in Water

Analysis was performed using Flow Injection Analysis where the aqueous sample is injected into a carrier stream which merges a sodium hydroxide stream. Gaseous ammonia is formed, which diffuses through a gas permeable membrane into an indicator stream. This indicator stream is comprised of a mixture of acid-base indicators, which will react with the ammonia gas; resulting in a colour shift which is measured photometrically at 590nm.

Conventional Parameters

Analyses performed at Maxxam's Victoria facility follow procedures based on those described in the most current editions of "British Columbia Environmental Laboratory Manual" and "Standard Methods for the Examination of Water and Wastewater".

Microbiological Parameters

Analyses were performed using procedures based on those described in "B.C. Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials (2005 Edition) and "Standard Methods for the Examination of Water and Wastewater", 21st Edition (1998). Analysis was performed at Maxxam Laboratory.

The detection limits for BOD, Fecal Coliforms and TSS are as follows:

BOD	5 mg/L
Ammonia	0.01 mg/L
Fecal Coliforms	1 Col./100mL
Total Suspended Solids	1 mg/L

Please contact Pacificus Biological Services Ltd. if more detailed information is required with respect to sampling methodologies and procedures.

RESULTS

Specific results for the April 6, 2010 sampling at each of the sites are listed in the table on the following page. A comparison of historic measurements (from the baseline in October 2005 until the previous phase in October 2009) at each of the index sites are listed in Appendix 1. The receiving waters surrounding the Sooke outfall contained acceptable levels of ammonia, BOD, fecal coliform, and total suspended solids in the latest phase of sampling.

CONCLUSION

The April 2010 environmental monitoring of the Sooke outfall receiving waters is complete. All analyzed parameters were within acceptable ranges. Continued monitoring at the regular schedule in 6 months time is recommended to ensure the plant is operating properly and the oceanic environment is not being negatively impacted.

Sooke Outfall Water Sampling Results - Spring 2010

Date: April 6, 2010 **Weather:** Overcast, windy, 0.5m waves
Time: 11:00 AM
Sampled by: Andrew Taylor, MSc. Pacificus Biological Services Ltd.

Sample No	Depth (m)	pH	Cond ($_u$S/cm)	D.Oxygen	Salinity (ppt)	Temperature ^oC	Fecal Col. Col/100mL	Bio. Oxygen Demand mg/L	Total Susp. Solid mg/L	Ammonia - N mg/L
# 1 Outfall	2	8.5	33.37	99% 8.5 mg/L	31.2	8.9	2	< 5	< 1	0.01
	12	8.5	33.24	105% 9.9 mg/L	30.8	9.1	< 1	< 5	< 1	0.03
# 2 100m north of outfall	2	8.5	33.15	120% 13.1 mg/L	30.8	9.1	< 1	< 5	< 1	0.08
	12	8.5	33.16	121% 11.3 mg/L	30.8	9.1	< 1	< 5	< 1	0.02
# 3 100m south of outfall	2	8.5	33.27	96% 9.0 mg/L	30.9	9.0	< 1	< 5	< 1	0.01
	12	8.5	33.26	95% 9.0 mg/L	30.9	9.1	< 1	< 5	< 1	0.02
# 4 300m south of outfall	2	8.5	33.25	97% 9.1 mg/L	30.8	9.2	< 1	< 5	< 1	0.05
	12	8.5	33.2	94% 9.0 mg/L	30.8	9.1	< 1	< 5	< 1	0.04

APPENDIX 1 – HISTORIC SAMPLING DATA

Table 1a: Historic data from Sooke Outfall water samples October 2005 – May 2007.

Date	Sample #	Depth (m)	pH	Cond ($_{m}$S/cm)	D.Oxygen %	Salinity (ppt)	Temperature °C	Fecal Col. CFU/100mL	BOD mg/L	TSS mg/L	Ammonia mg/L
October 2005 BASELINE	#1 Outfall	2	8.1	33.91	66%	30.7	9.9	2	<5.0	22	no data
		12	7.8	34.41	65.70%	31.6	9.6	2	<5.0	16	no data
	#2 100m north of outfall	2	8	33.7	66%	30.5	9.8	<2	<5.0	16	no data
		12	7.7	34.39	65.50%	31.8	9.6	<2	<5.0	15	no data
	#3 100m south of outfall	2	8.1	33.85	68%	30.6	9.9	5	<5.0	18	no data
		12	7.9	34.32	65.80%	31.7	9.5	<2	<5.0	22	no data
	#4 300m south of outfall	2	8	33.8	66%	30.5	9.9	<2	<5.0	17	no data
		12	7.6	34	66%	31.7	9.5	<2	<5.0	17	no data
	#5 Sook Harbour	2	8.1	34.2	67%	30.8	9.8	<2	no data	no data	no data
		12	7.8	34.5	66%	31.8	9.7	<2	<5.0	15	no data
April 2006	# 1 Outfall	2	8	32.98	9.75	30.4	9.4	<1	<5.0	38	<0.002
		9	7.9	33.04	9.22	30.7	9	<1	<5.0	23	0.042
	# 2 100m north of outfall	2	8.1	31.87	9.74	30.1	9.5	<1	<5.0	21	<0.002
		9	8	33.67	9.31	31.1	9.1	1	<5.0	32	0.056
	# 3 100m south of outfall	2	8.1	32.8	9.74	30.2	9.7	<1	<5.0	21	<0.002
		9	8.1	15.3	9.9	30.6	9.9	<1	<5.0	18	<0.002
	# 4 300m south of outfall	2	8.1	32.87	9.77	30.2	9.5	<1	<5.0	12	0.027
		9	8	18.95	9.87	30.9	9.2	<1	<5.0	43	<0.002
September 2006	# 1 Outfall	2	8.3	35.5	65.8	30.7	10.8	<1	<5.0	18	0.023
		12	7.9	35.29	63.5	31.7	10.5	45	<5.0	20	0.023
	# 2 100m north of outfall	2	7.9	35.56	66	30.6	10.8	4	<5.0	23	0.02
		12	7.8	35.34	60.7	31.8	10.5	39	<5.0	21	0.018
	# 3 100m south of outfall	2	7.8	35.48	63.1	30.5	10.7	104	<5.0	18	0.018
		12	7.8	35.39	60.1	31.2	10.5	36	<5.0	18	0.016
	# 4 300m south of outfall	2	7.8	35.59	63.6	31.1	10.9	56	<5.0	17	0.022
		12	7.8	35.38	59.4	31.8	10.5	52	<5.0	29	0.016
January 2007	# 1 Outfall	2	8.3	46.7	75.9	30	7.2	1	<5.0	<1	0.01
		12	7.9	31.4	75.6	30.4	7.3	2	<5.0	4	0.02 <.01
	# 2 100m north of outfall	2	8	31.52	75.8	30.9	7.1	<1	<5.0	4	<.01
		12	8	31.61	75.6	30.7	7.3	1	<5.0	5	<.01
	# 3 100m south of outfall	2	8	31.56	78.1	30.8	7.1	<1	<5.0	3	<.01
		12	8	31.59	79.2	30.7	7.3	1	<5.0	3	<.01
	# 4 300m south of outfall	2	8	31.62	76.9	30.3	7.2	2	<5.0	2	0.01
		12	7.9	31.58	79.3	30.4	7.4	2	<5.0	2	<.01
May 2007	# 1 Outfall	2	8.3	33.84	80.9	31.5	9	<2	<5.0	18	0.01
	# 2 100m north of outfall	2	8	33.63	77.3	31.5	8.9	<2	<5.0	11	0.05
	# 3 100m south of outfall	2	7.9	33.82	80.9	31.5	9	<2	<5.0	13	0.01
	# 4 300m south of outfall	2	8	33.8	83.6	31.6	9	<2	<5.0	24	0.01

Table 1b: Historic data from Sooke Outfall water samples September 2007 – October 2009.

Date	Sample #	Depth (m)	pH	Cond ($_m$S/cm)	D.Oxygen %	Salinity (ppt)	Temperature °C	Fecal Col. CFU/100mL	BOD mg/L	TSS mg/L	Ammonia mg/L
September 2007	**# 1 Outfall**	2	7.9	34.24	52.6	32.1	8.8	<1	<5.0	8	0.04
	# 2 100m north of outfall	2	7.6	35	52.8	31.8	8.7	<1	<5.0	8	0.05
	# 3 100m south of outfall	2	7.8	34.36	52.7	32	8.8	<1	<5.0	9	0.04
	# 4 300m south of outfall	2	7.5	33.69	52.8	31.9	8.7	<1	<5.0	8	0.04
March 2008	**# 1 Outfall**	2	7.9	47.31	102.9	30.4	7.1	<1	<5.0	13	0.04
	# 2 100m north of outfall	2	7.7	46.14	115.4	30.6	7.4	<1	<5.0	16	0.03
	# 3 100m south of outfall	2	8	49.22	116.5	30.1	7.4	<1	<5.0	14	0.03
	# 4 300m south of outfall	2	7.7	50.11	109.6	30.1	7.5	<1	<5.0	20	0.05
October 2008	**# 1 Outfall**	2	8.3	34.4	50.4	32.3	8.9	<1	<5	<1	0.02
	# 2 100m north of outfall	2	8.3	34.4	50.1	32.3	8.9	1	<5	6	<.0.01
	# 3 100m south of outfall	2	8.3	34.4	52.8	32.3	8.9	2	<5	2	<0.01
	# 4 300m south of outfall	2	8.3	34.38	56.1	32	9.1	1	<5	<1	0.01
March 2009	**Outfall**	2 m	7.8	32.20	82.1% 8.12 mg/L	31.6	7.0	1.0	6.0	< 5	0.02
	100m North of Outfall	8 m	7.8	32.15	83.8% 8.44 mg/L	31.6	7.0	1.0	9.0	< 5	0.02
		2 m	7.5	32.18	85.20% 8.39 mg/L	31.6	7.0				
	100m South of Outfall	2 m	8.0	32.22	80.6% 7.95 mg/L	31.6	7.0	1.0	10.0	< 5	0.02
	300m towards shoreline from Outfall	2 m	7.8	32.34	81.2% 7.97 mg/L	31.8	7.0	1.0	9.0	< 5	0.02
October 2009	**# 1 Outfall**	2	8.0	34.4	69.5	31.9	9.3	<1	<5	<1	0.06
	# 2 100m north of outfall	2	8.0	34.7	63.4	32.2	9.2	2	<5	<1	0.06
	# 3 100m south of outfall	2	8.0	34.7	63.5	32.1	9.3	<1	<5	5	0.05
	# 4 300m towards shoreline from outfall	2	8.0	34.7	63.5	32.2	9.2	<1	<5	<1	0.05

WATER SAMPLING FOR THE EPCOR WASTEWATER TREATMENT PLANT OUTFALL IN SOOKE BAY

October 2010

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Water Sampling for the Epcor Wastewater Treatment Plant Outfall in Sooke Bay

Sampling Date: Oct 20, 2010
Report Submission Date: Dec 3, 2010

Prepared for:

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INTRODUCTION

In 2005, Epcor Water Services was contracted to construct a wastewater treatment facility and outfall to accommodate present and future population growth in the municipality of Sooke. The facility discharges into Sooke Bay, which is located approximately 35 km east of Victoria on the southwest coast of Vancouver Island, British Columbia (Figures 1 & 2). The facility began operations in December 2005. To comply with the regulations outlined by the Ministry of Environment; discharge of effluent must be monitored to ensure that the guidelines outlined in the *Municipal Sewage Regulation* are adhered to.

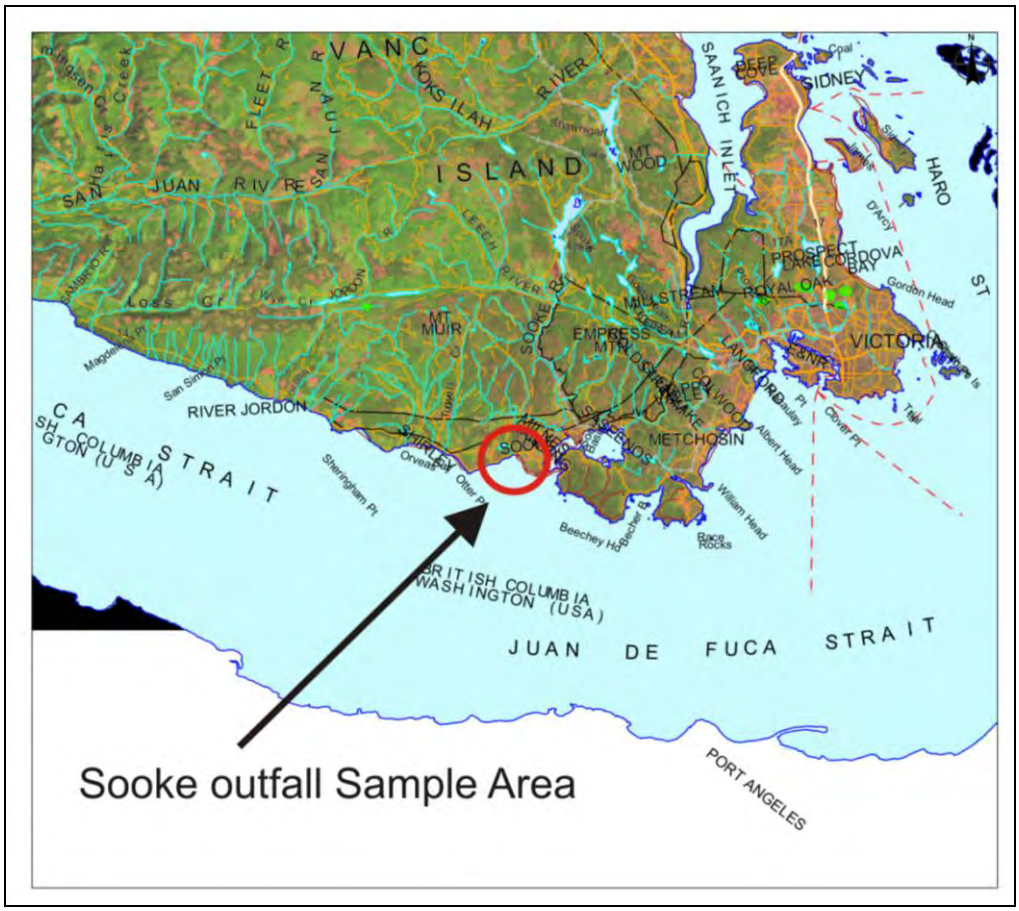

Figure 1: General location of sample sites, Sooke Bay, British Columbia

Figure 2: Aerial view of Sooke Bay outlining location of wastewater outfall with reference to Sooke and the Epcor Office.

Effluent monitoring has consisted of water sampling on a pre-determined schedule of twice per year at 4 index sites. In October 2005, a pre-operational baseline survey was conducted to establish index sites and record water chemistry parameters which future sampling efforts could be compared against. Pacificus Biological Services Ltd. was contracted to perform regular marine water sampling on the receiving waters at the outfall. The latest phase of sampling took place on October 20, 2010. The water sampling involved measuring the following parameters within the receiving waters environment:

Parameter
Biological Oxygen Demand
Total Suspended Solids
pH
Ammonia
Conductivity
Dissolved Oxygen
Salinity
Temperature
Fecal Coliforms

METHODOLOGY

Four index sampling sites were determined by Epcor and provincial ministry staff (Figure 3). The four index sites were sampled before wastewater discharge commenced in 2005, and subsequently at regular intervals. The site locations are as follows:

1. **Location of outfall diffuser** *48° 21' 15"N, 123° 46' 21"W*
2. **100m North of outfall** *48° 21' 17"N, 123° 46' 17"W*
   (Initial dilution zone 100m from outfall diffuser)
3. **100m South of outfall** *48° 21' 13"N, 123° 46' 24"W*
   (Initial dilution zone 100m from outfall diffuser)
4. **300m towards shore** *48° 21' 22"N, 123° 46' 11"W*
   (300m away from the outfall diffuser towards shore)

The sample design calls for the acquisition of samples at each sample location to be at 2m (to avoid any freshwater floating on the surface) and at the pycnocline where a plume would be likely to trap. A pycnocline is a layer of rapid change in water density with depth. In oceans, changes in water density are mainly caused by changes in water temperature and salinity. A study completed by Komex Environmental and Water Resource Engineering Ltd. found that the water profile data displayed homogeneity of the water column in Sooke Bay, indicating that the water is fully-mixed (unstratified) throughout the year. On the date that the latest phase of sampling occurred (Oct 20, 2010), the weather was clear skies and calm seas. The water column was predicted to be unstratified at the time of sampling; therefore, only one set of samples were gathered from each site, at a depth of 2m.

A Pacificus biologist (David Pratt) navigated to the sample sites using a handheld Garmin GPS (with pre-recorded sample site waypoints) and gathered water samples from a depth of 2m. Dissolved Oxygen, conductivity, salinity, pH and temperature readings were taken and recorded in the field. A YSI Model 85 handheld multi parameter testing system was used to measure oxygen, conductivity, salinity and temperature. The pH measurements were acquired using a pH colorimeter test kit.

Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Ammonia Nitrogen – N, and Fecal Coliform parameters were tested for by CanTest Laboratory in Victoria within 24 hours. Samples for each of these parameters were gathered and transported in sealed and sterilized sample jars. Sampling completed for the Receiving Waters Monitoring in Sooke Bay is in accordance to methodologies specified by the latest version of the *BC Field Sampling Manual for Continuous Monitoring, plus the collection of Air, Air-Emission, Water, Wastewater, Soil, Sediments and Biological Samples*.

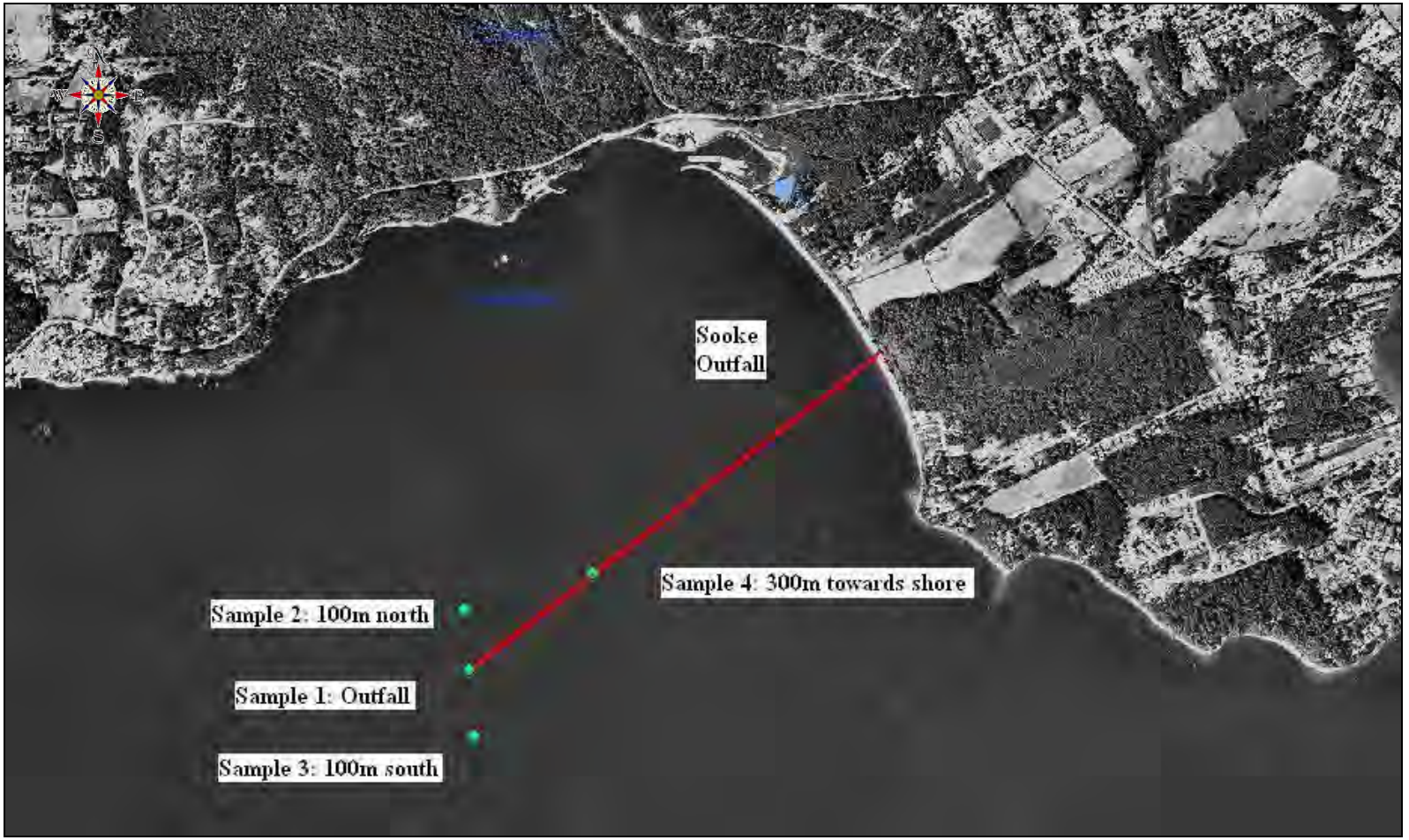

Figure 3: Sooke Bay receiving water-sampling locations (approximate).

TEST METHODS

Ammonia in Water

Analysis was performed using Flow Injection Analysis where the aqueous sample is injected into a carrier stream which merges a sodium hydroxide stream. Gaseous ammonia is formed, which diffuses through a gas permeable membrane into an indicator stream. This indicator stream is comprised of a mixture of acid-base indicators, which will react with the ammonia gas; resulting in a colour shift which is measured photometrically at 590nm.

Conventional Parameters

Analyses performed at CanTest's Victoria facility, follow procedures based on those described in the most current editions of "British Columbia Environmental Laboratory Manual" and "Standard Methods for the Examination of Water and Wastewater".

Microbiological Parameters

Analyses were performed using procedures based on those described in "B.C. Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials", (2005 Edition) and "Standard Methods for the Examination of Water and Wastewater", 21st Edition (1998). Analysis was performed at CanTest Ltd. Victoria Laboratory.

The detection limits for BOD, Fecal Coliforms and TSS are as follows:

BOD	5 mg/L
Ammonia	0.01 mg/L
Fecal Coliforms	1 Col./100mL
Total Suspended Solids	1 mg/L

Please contact CanTest Ltd. (1-800-865-8566) or Pacificus Biological Services Ltd. if more detailed information is required with respect to sampling methodologies and procedures.

All testing completed for the Receiving Waters Monitoring in Sooke Bay were carried out using methodologies specified by the latest version of the *BC Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediments, Biological Materials and Discrete Ambient Air Samples*.

RESULTS

Specific results for the October 20, 2010 sampling at each of the sites are listed in Table 1. A comparison of historic measurements (from the baseline in October 2005 until April 2010) at each of the index sites are listed in Tables 2, 3 and 4. The receiving waters surrounding the Sooke outfall contained acceptable levels of ammonia, BOD, fecal coliform, and total suspended solids in the latest phase of sampling.

CONCLUSION

The October 2010 environmental monitoring of the Sooke outfall receiving waters is complete. All analyzed parameters were within acceptable ranges. Additional monitoring is recommended in 6 months time to ensure the plant is operating properly and the oceanic environment is not being negatively impacted.

REFERENCES:

Komex International Ltd. 2005. *Dilution Modelling Report District of Sooke Treated Wastewater Outfall (9).*

Pacificus Biological Services Ltd. March 2009. *Water Sampling for the Epcor Wastewater Treatment Plant Outfall in Sooke Bay.*

Table 1: Water sampling results from the Epcor Sooke outfall October 20, 2010.

Sample No	Depth (m)	pH	Cond ($_u$S/cm)	D.Oxygen	Salinity (ppt)	Temperature ^{o}C	Fecal Col. Col/100mL	Bio. Oxygen Demand mg/L	Total Susp. Solid mg/L	Ammonia - N mg/L
# 1 Outfall	2	7.5	34.23	90.0% 8.69 mg/L	31.4	9.6	< 1	< 5	3	0.09
# 2 100m north of outfall	2	7.5	34.28	77.2% 7.18 mg/L	31.4	9.6	< 1	< 5	2	0.09
# 3 100m south of outfall	2	7.5	34.3	78.2% 7.45 mg/L	31.4	9.7	< 1	< 5	8	0.1
# 4 300m south of outfall	2	7.5	34.24	72.4% 6.73 mg/L	31.4	9.6	< 1	< 5	5	0.1

Table 2: Historic data from Sooke Outfall water samples October 2005 – May 2007.

Date	Sample #	Depth (m)	pH	Cond ($_m$S/cm)	D.Oxygen %	Salinity (ppt)	Temperature °C	Fecal Col. CFU/100mL	BOD mg/L	TSS mg/L	Ammonia mg/L
October 2005 BASELINE	#1 Outfall	2	8.1	33.91	66%	30.7	9.9	2	<5.0	22	no data
		12	7.8	34.41	65.70%	31.6	9.6	2	<5.0	16	no data
	#2 100m north of outfall	2	8	33.7	66%	30.5	9.8	<2	<5.0	16	no data
		12	7.7	34.39	65.50%	31.8	9.6	<2	<5.0	15	no data
	#3 100m south of outfall	2	8.1	33.85	68%	30.6	9.9	5	<5.0	18	no data
		12	7.9	34.32	65.80%	31.7	9.5	<2	<5.0	22	no data
	#4 300m south of outfall	2	8	33.8	66%	30.5	9.9	<2	<5.0	17	no data
		12	7.6	34	66%	31.7	9.5	<2	<5.0	17	no data
	#5 Sook Harbour	2	8.1	34.2	67%	30.8	9.8	<2	no data	no data	no data
		12	7.8	34.5	66%	31.8	9.7	<2	<5.0	15	no data
April 2006	# 1 Outfall	2	8	32.98	9.75	30.4	9.4	<1	<5.0	38	<0.002
		9	7.9	33.04	9.22	30.7	9	<1	<5.0	23	0.042
	# 2 100m north of outfall	2	8.1	31.87	9.74	30.1	9.5	<1	<5.0	21	<0.002
		9	8	33.67	9.31	31.1	9.1	1	<5.0	32	0.056
	# 3 100m south of outfall	2	8.1	32.8	9.74	30.2	9.7	<1	<5.0	21	<0.002
		9	8.1	15.3	9.9	30.6	9.9	<1	<5.0	18	<0.002
	# 4 300m south of outfall	2	8.1	32.87	9.77	30.2	9.5	<1	<5.0	12	0.027
		9	8	18.95	9.87	30.9	9.2	<1	<5.0	43	<0.002
September 2006	# 1 Outfall	2	8.3	35.5	65.8	30.7	10.8	<1	<5.0	18	0.023
		12	7.9	35.29	63.5	31.7	10.5	45	<5.0	20	0.023
	# 2 100m north of outfall	2	7.9	35.56	66	30.6	10.8	4	<5.0	23	0.02
		12	7.8	35.34	60.7	31.8	10.5	39	<5.0	21	0.018
	# 3 100m south of outfall	2	7.8	35.48	63.1	30.5	10.7	104	<5.0	18	0.018
		12	7.8	35.39	60.1	31.2	10.5	36	<5.0	18	0.016
	# 4 300m south of outfall	2	7.8	35.59	63.6	31.1	10.9	56	<5.0	17	0.022
		12	7.8	35.38	59.4	31.8	10.5	52	<5.0	29	0.016
January 2007	# 1 Outfall	2	8.3	46.7	75.9	30	7.2	1	<5.0	<1	0.01
		12	7.9	31.4	75.6	30.4	7.3	2	<5.0	4	0.02 <.01
	# 2 100m north of outfall	2	8	31.52	75.8	30.9	7.1	<1	<5.0	4	<.01
		12	8	31.61	75.6	30.7	7.3	1	<5.0	5	<.01
	# 3 100m south of outfall	2	8	31.56	78.1	30.8	7.1	<1	<5.0	3	<.01
		12	8	31.59	79.2	30.7	7.3	1	<5.0	3	<.01
	# 4 300m south of outfall	2	8	31.62	76.9	30.3	7.2	2	<5.0	2	0.01
		12	7.9	31.58	79.3	30.4	7.4	2	<5.0	2	<.01
May 2007	# 1 Outfall	2	8.3	33.84	80.9	31.5	9	<2	<5.0	18	0.01
	# 2 100m north of outfall	2	8	33.63	77.3	31.5	8.9	<2	<5.0	11	0.05
	# 3 100m south of outfall	2	7.9	33.82	80.9	31.5	9	<2	<5.0	13	0.01
	# 4 300m south of outfall	2	8	33.8	83.6	31.6	9	<2	<5.0	24	0.01

Table 3: Historic data from Sooke Outfall water samples September 2007 – October 2009.

Date	Sample #	Depth (m)	pH	Cond ($_m$S/cm)	D.Oxygen %	Salinity (ppt)	Temperature °C	Fecal Col. CFU/100mL	BOD mg/L	TSS mg/L	Ammonia mg/L
September 2007	# 1 Outfall	2	7.9	34.24	52.6	32.1	8.8	<1	<5.0	8	0.04
	# 2 100m north of outfall	2	7.6	35	52.8	31.8	8.7	<1	<5.0	8	0.05
	# 3 100m south of outfall	2	7.8	34.36	52.7	32	8.8	<1	<5.0	9	0.04
	# 4 300m south of outfall	2	7.5	33.69	52.8	31.9	8.7	<1	<5.0	8	0.04
March 2008	# 1 Outfall	2	7.9	47.31	102.9	30.4	7.1	<1	<5.0	13	0.04
	# 2 100m north of outfall	2	7.7	46.14	115.4	30.6	7.4	<1	<5.0	16	0.03
	# 3 100m south of outfall	2	8	49.22	116.5	30.1	7.4	<1	<5.0	14	0.03
	# 4 300m south of outfall	2	7.7	50.11	109.6	30.1	7.5	<1	<5.0	20	0.05
October 2008	# 1 Outfall	2	8.3	34.4	50.4	32.3	8.9	<1	<5	<1	0.02
	# 2 100m north of outfall	2	8.3	34.4	50.1	32.3	8.9	1	<5	6	<.0.01
	# 3 100m south of outfall	2	8.3	34.4	52.8	32.3	8.9	2	<5	2	<0.01
	# 4 300m south of outfall	2	8.3	34.38	56.1	32	9.1	1	<5	<1	0.01
March 2009	Outfall	2 m	7.8	32.20	82.1% 8.12 mg/L	31.6	7.0	1.0	6.0	< 5	0.02
	100m North of Outfall	8 m	7.8	32.15	83.8% 8.44 mg/L	31.6	7.0	1.0	9.0	< 5	0.02
		2 m	7.5	32.18	85.20% 8.39 mg/L	31.6	7.0				
	100m South of Outfall	2 m	8.0	32.22	80.6% 7.95 mg/L	31.6	7.0	1.0	10.0	< 5	0.02
	300m towards shoreline from Outfall	2 m	7.8	32.34	81.2% 7.97 mg/L	31.8	7.0	1.0	9.0	< 5	0.02
October 2009	# 1 Outfall	2	8.0	34.4	69.5	31.9	9.3	<1	<5	<1	0.06
	# 2 100m north of outfall	2	8.0	34.7	63.4	32.2	9.2	2	<5	<1	0.06
	# 3 100m south of outfall	2	8.0	34.7	63.5	32.1	9.3	<1	<5	5	0.05
	# 4 300m towards shoreline from outfall	2	8.0	34.7	63.5	32.2	9.2	<1	<5	<1	0.05

Table 4: Historic data from Sooke Outfall water samples April 2010.

Date	Sample #	Depth (m)	pH	Cond ($_m$S/cm)	D.Oxygen %	Salinity (ppt)	Temperature °C	Fecal Col. CFU/100mL	BOD mg/L	TSS mg/L	Ammonia mg/L
April 2010	# 1 Outfall	2	8.5	33.37	99% 8.5 mg/L	31.2	8.9	2	< 5	< 1	0.01
		12	8.5	33.24	105% 9.9 mg/L	30.8	9.1	< 1	< 5	< 1	0.03
	# 2 100m north of outfall	2	8.5	33.15	120% 13.1 mg/L	30.8	9.1	< 1	< 5	< 1	0.08
		12	8.5	33.16	121% 11.3 mg/L	30.8	9.1	< 1	< 5	< 1	0.02
	# 3 100m south of outfall	2	8.5	33.27	96% 9.0 mg/L	30.9	9.0	< 1	< 5	< 1	0.01
		12	8.5	33.26	95% 9.0 mg/L	30.9	9.1	< 1	< 5	< 1	0.02
	# 4 300m south of outfall	2	8.5	33.25	97% 9.1 mg/L	30.8	9.2	< 1	< 5	< 1	0.05
		12	8.5	33.2	94% 9.0 mg/L	30.8	9.1	< 1	< 5	< 1	0.04