



Making a difference...together

## REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION MEETING OF THURSDAY, SEPTEMBER 20, 2012

---

**SUBJECT** SAANICH PENINSULA WASTEWATER AND MARINE ENVIRONMENT PROGRAM 2011 ANNUAL REPORT AND UPDATE ON TECHNICAL WATER QUALITY REVIEW PANEL ACTIVITIES

### **ISSUE**

The Capital Regional District (CRD) discharges municipal wastewater from the Saanich Peninsula treatment plant (SPTP). Regulatory requirements include assessment of potential impacts of the outfall on the marine receiving environment by the Wastewater and Marine Environment Program (WMEP). This report presents the results of the 2011 WMEP.

As well, in 2011, the Commission designated the Marine Monitoring Advisory Group (MMAG) as the Technical Water Quality Review Panel (TWQRP) with the mandate to review the need for effluent disinfection at the SPTP. This report also presents a brief update on TWQRP activities to date.

### **BACKGROUND**

The Saanich Peninsula Liquid Waste Management Plan (LWMP) contains a commitment to carry out a monitoring program for the SPTP and report on this program to the Ministry of Environment (MOE). The program was developed in collaboration with the MMAG and implemented in 2004. The 2011 WMEP consisted of the following components:

- regular (daily, weekly and monthly) analysis of wastewater for regulatory compliance parameters, treatment plant performance and quarterly analysis for priority substances
- monthly analysis of biosolids for fecal coliforms, golden nematodes and metals (only when produced)
- monthly monitoring of receiving waters for fecal coliforms and nutrients

The executive summary of the report, *Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program - 2011 Annual Report*, by the CRD Environmental Protection Division, is attached as Appendix A. The complete report is available on request from the CRD Environmental Sustainability Department and on the CRD website.

There is also a commitment in the LWMP to establish a technical review panel to evaluate the need for disinfection of SPTP effluent. The original TWQRP was formed around the time of SPTP commissioning (i.e., 1999 to 2001). During that time, the panel reviewed the results from the water quality component of the pre- and post-discharge monitoring programs (i.e., analysis of surface waters around the outfall for fecal coliform bacteria) and compared the results to guidelines set to protect human health (i.e., primary contact recreation guidelines). The panel completed their original assessment in May 2001 and recommended that there was no need to disinfect the effluent to meet the primary contact recreation guideline. They also identified

**Saanich Peninsula Wastewater Commission – September 20, 2012**  
**Saanich Peninsula Wastewater and Marine Environmental Program 2011 Annual Report 2**

---

situations that, in the future, would warrant re-evaluation of the need for effluent disinfection and trigger resurrection of the TWQRP. In 2011, this occurred: specifically, that it was ten years since the SPTP started operation.

At the September 22, 2011 meeting, the Saanich Peninsula Wastewater Commission recommended that the TWQRP terms of reference be updated, that MMAG be designated as the current technical review panel, and that MMAG/TWQRP membership be enhanced by extending invitations to representatives from Environment Canada, local First Nations and/or other relevant agencies. Staff are supporting MMAG with this responsibility.

To support the technical review, staff commissioned a consultant to do a detailed statistical assessment of SPTP surface water results to determine whether there were any increasing or decreasing trends in bacteriological indicators over time and space. The panel reviewed the draft assessment and asked for additional tide and current information to be included. Staff are working with the consultant to finalize the report in light of this request. Further updates about the review progress will be provided at a future commission meeting, along with the updated draft TWQRP terms of reference and a summary of efforts to invite additional participants.

### **ENVIRONMENTAL IMPLICATIONS**

The current WMEP has been reviewed and approved by the MMAG and has been deemed appropriate for monitoring the effects of the outfall on the marine receiving environment. As such, the same WMEP design will be used in 2012. However, in conjunction with MOE, staff recently reviewed the adequacy of the WMEP design, from an environmental assessment perspective, and a number of changes have been recommended. These changes will be confirmed with MOE staff at a meeting scheduled for September 26, 2012. The recommended changes will also be reviewed by the MMAG. Changes could be implemented as early as the fourth quarter 2012.

Preliminary TWQRP review of the draft consultant assessment report did not uncover any need for disinfection. However, as previously mentioned, the panel requested additional oceanographic data, without which they cannot make any recommendations around the need for disinfection.

### **ECONOMIC IMPLICATIONS**

The routine components of the WMEP are included in the annual budget. The seafloor monitoring component (required every four years) is due in 2012 and is also included in the annual budget. The WMEP review was undertaken within the confines of the existing budget. As such, the recommended WMEP revisions will not lead to any budget increases. All TWQRP activities, including the ongoing consultant assessments, are included in the annual budget.

### **CONCLUSION**

The 2011 SPTP effluent quality met operating certificate compliance requirements on all sampling dates. Effluent quality monitoring indicated low potential for negative effects from the SPTP discharge on the marine receiving environment. Biosolids quality was within Class A limits. Surface water fecal coliform data indicated low potential for health effects from

**Saanich Peninsula Wastewater Commission – September 20, 2012**  
**Saanich Peninsula Wastewater and Marine Environmental Program 2011 Annual Report 3**

---

recreational activities or shellfish harvesting near the outfall. Nutrient concentrations showed no effect from the discharge and were within expected ranges.

Further data analyses are required before the TWQRP can make any recommendations regarding the need for disinfection at the SPTP and staff are working on providing this information.

**RECOMMENDATIONS**

That the Saanich Peninsula Wastewater Commission:

1. receive the Technical Water Quality Review Panel progress update for information;
2. receive the Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program 2011 Annual Report for information; and
3. forward a copy of this report to the Ministry of Environment.

---

Glenn Harris, Ph.D., R.P.Bio.  
Senior Manager, Environmental Protection

---

Dan Telford, P.Eng.  
Senior Manager, Environmental Engineering  
Concurrence

CL:cam

Attachment: 1

**SAANICH PENINSULA TREATMENT PLANT  
WASTEWATER AND MARINE ENVIRONMENT PROGRAM  
2011 ANNUAL REPORT**

**EXECUTIVE SUMMARY**

The Capital Regional District (CRD) has been operating the Saanich Peninsula treatment plant (SPTP) since February 2000. The treatment plant serves North Saanich, Central Saanich and the Town of Sidney as well as the Victoria International Airport, the Institute of Ocean Sciences and the Tseycum and Pauquachin First Nations communities. It is a conventional secondary level wastewater treatment plant which has periodically produced Class A biosolids. The plant has been in operation since 2000. The treatment plant discharges into the marine receiving environment (Bazan Bay) through an outfall located approximately 1,580 metres from the shoreline at a depth of 30 metres.

As part of the Saanich Peninsula Liquid Waste Management Plan (LWMP), the CRD committed to develop a long-term monitoring program. CRD Environmental Sustainability staff reviewed the pre-discharge monitoring data (1999) in conjunction with the post-discharge monitoring results (2000 to 2003) and developed the long-term monitoring program in consultation with the Marine Monitoring Advisory Group. This program has been in place since 2004. A more recent review of the program was initiated in 2011 and is anticipated to be completed by the end of 2012.

The 2011 Wastewater and Marine Environment Program consisted of the following components:

- daily, weekly and monthly analysis of wastewater for compliance monitoring and treatment plant performance parameters, and quarterly analysis for priority substances
- monthly biosolids monitoring for fecal coliforms, golden nematodes and metals
- monthly surface water monitoring for fecal coliforms and nutrients

**WASTEWATER MONITORING**

**Compliance Monitoring and Treatment Plant Performance**

The CRD conducted wastewater monitoring on a regular basis to profile the chemical and physical constituents of influent and effluent. Parameters monitored for compliance with the operational certificate under the Saanich Peninsula LWMP were below the effluent regulatory limits. Influent and effluent quality was within expected ranges and met all treatment plant operating objectives and regulatory requirements.

**Priority Substances**

In addition to the compliance and treatment plant performance monitoring, over 200 substances were analyzed in the SPTP influent and effluent. More than half of these (~60%) were below chosen analytical detection limits in 2011. Substances that were detected above analytical detection limits in more than 50% of samples included most of the conventional variables, metals (both total and dissolved), total phenols and some polycyclic aromatic hydrocarbons (PAHs). Most substances were below BC and Canadian Water Quality Guidelines (WQG) even in undiluted effluent. These guidelines must be met outside of the initial dilution zone (IDZ) and estimated minimum initial dilution factors were applied to all parameters to predict levels at the edge of the IDZ. All substances were below WQG after the application of this dilution factor, including those substances that were above guidelines in undiluted effluent (i.e., weak acid dissociable cyanide, pH, cadmium, copper, iron and zinc). As a result, it is not likely that significant effects on aquatic life will occur from the substances being discharged.

A detailed statistical trend assessment was undertaken for the 2000 to 2011 dataset. Statistically significant decreases or no significant trends in concentrations and loadings were observed for the vast majority of wastewater parameters. A number of these reductions can be partially attributed to efforts of the Regional Source Control Program (RSCP). A number of parameters exhibited increasing trends. These trends will continue to be monitored and if the frequency of exceedances of WQGs concurrently increases, further action will be taken either by the RSCP or through review of the treatment plant operational parameters.

#### **BIOSOLIDS MONITORING**

Biosolids were analyzed for fecal coliforms, golden nematode and metals in 2011. All biosolids results were below the BC Ministry of Environment Organic Matter Recycling Regulations (OMRR) Class A limits, indicating they could be applied to land with an approved land application plan. However, no biosolids were distributed from the facility in 2011; all were disposed of at the CRD's Hartland Landfill. Alternative beneficial uses, beyond land application and landfilling, for the treatment plant sludges and biosolids are being sought.

A long-term trend assessment of the biosolids data from 2001 to 2011 identified significant decreasing trends over time for the majority of metals that were assessed. While some of the decreasing trends are indicative of successes of the RSCP, others are indicative of increased input into the system or changes in treatment plant efficiency. Calcium increased in both biosolids and wastewaters and this is solely an indication of increased input (i.e., increased residential, institutional and/or business use) into the system. The RSCP will be investigating potential programs to reduce the input of this metal into the wastewater system.

#### **SURFACE WATER MONITORING**

##### **Fecal Coliforms**

Similar to previous years, fecal coliform results were low, with annual geometric means of 1 CFU/100 mL for each station in 2011. There were no elevated fecal coliform concentrations (e.g., above 200 CFU/100 mL) observed at any station on any sampling date in 2011.

Overall, results indicate that adverse health effects from recreational primary contact activities and shellfish harvesting are not expected. However, an area of approximately 3.75 km<sup>2</sup> around the outfall is closed for shellfish harvesting as standard Fisheries and Oceans Canada (DFO) procedure near industrial and sanitary wastewater outfalls. Shellfish closures have a minimum radius around an outfall of 300 m. Closure areas are usually larger near bigger urban centers, such as for the SPTP outfall, where there are other potential sources of bacterial contamination (e.g., stormwater discharges) in addition to the wastewater outfall.

##### **Nutrients**

There were no distinguishable differences in nutrient concentrations in 2011 between the station immediately above the outfall terminus and the reference station. Results were within the ranges measured in previous years and those of the pre- and post-discharge assessment programs. As was observed in previous monitoring years, high variability, both spatially and temporally, was evident in the data. Fluctuations in nutrient concentrations are attributed to natural variation in the study area. Overall, there was no evidence of an effect on nutrient concentrations in the receiving environment from the SPTP discharge.