

STORMWATER QUALITY ANNUAL REPORT 2009 SAANICH PENINSULA

EXECUTIVE SUMMARY

INTRODUCTION

The Capital Regional District (CRD) Stormwater, Harbours and Watersheds program (SHWP) works to promote and coordinate the management of stormwater quality and surface water resources on the Saanich Peninsula. This program is a component of the Saanich Peninsula Liquid Waste Management Plan (LWMP) and is undertaken in cooperation and consultation with the participating municipalities: District of Central Saanich, District of North Saanich, and the Town of Sidney, and First Nations.

The 2009 annual report covers four main areas of activity:

1. Stormwater Discharge Assessments
2. Source Investigations
3. Watercourse Monitoring
4. Special Projects

Stormwater discharges are assessed along the Saanich Peninsula coastline. This assessment identifies public health and environmental concern associated with stormwater discharges and strives to protect freshwater and nearshore marine ecosystems and resources. Source investigations are undertaken to identify causes of contamination in stormwater. The SHWP staff is also involved in a number of special projects to improve stormwater quality on the Peninsula.

RESULTS AND DISCUSSION

1. Stormwater Discharge Assessments

The study area covers the marine coastline from the Saanich-Central Saanich border on the east coast to the Central Saanich-Juan de Fuca electoral area border on the west coast of the Peninsula (Figure A).

Public Health: Fecal Coliforms

In 2009, 102 stormwater discharges were evaluated for public health concern. This was done by sampling each discharge for fecal coliform bacteria during the winter and summer where flow was sufficient, and then rating each using the SHWP rating system. Each discharge is rated as high, moderate, or low concern for public health based on the level of contamination in the stormwater and potential for human contact using the following parameters:

- fecal coliform concentrations in stormwater discharges
- discharge flow
- location of the discharge (below or above the marine waterline)
- public use of the shoreline (such as swimming, fishing or walking on the beach)

The rating of discharges allows the jurisdictions involved to prioritize remedial measures where they will have the greatest benefit. The evaluation of discharges rated high is done in consultation with the jurisdictions involved.

Of the 102 discharges assessed, thirteen were rated high for public health concern (Figure A). Twenty-five discharges were rated with a moderate level of public health concern and 64 were rated low. Table A provides the distribution of discharges rated high for public health concern in 2009 by jurisdiction. Table B gives the number of historical high ratings for these discharges.

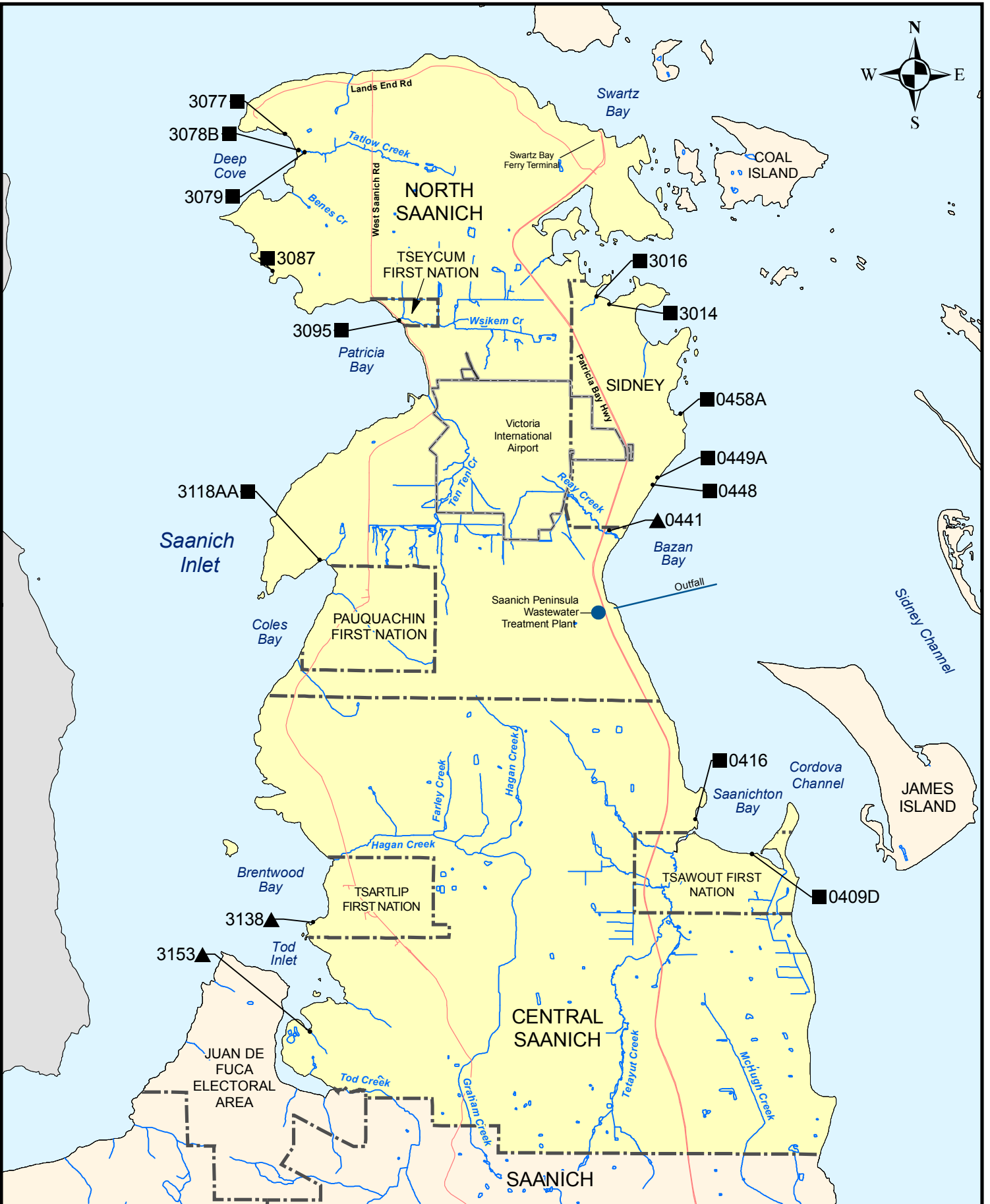


Figure A - Saanich Peninsula - 2009 Stormwater Discharges Requiring Action for Public Health or Environmental Concerns

CRD
Making a difference...together

0 0.5 1 2 Kilometres

Projection: UTM ZONE 10N NAD 83

Discharges Requiring Action

- High Public Health Rating
- ▲ High Environmental Rating and Recommended for Action
- Sewage Treatment and Outfall
- ~ Streams

--- Municipal and First Nations Boundary
 --- Major Roads
 ■ Stormwater Monitoring Area

Important This map is for general information purposes only. The Capital Regional District (CRD) makes no representations or warranties regarding the accuracy or completeness of this map or the suitability of the map for any purpose. **This map is not for navigation.** The CRD **will not be liable** for any damage, loss or injury resulting from the use of the map or information on the map and the map may be changed by the CRD at any time.

The number of discharges assigned a high public health concern rating went down considerably between 1999 (21) and 2002 (7). Since then, the number has remained relatively the same (ranges from 11 to 16). A number of the 2009 high-rated discharges have been of concern for a number of years: six were high-rated in 2007 and 2008, and ten have had three or more high ratings since 2000 (Table B). Contamination remains in these discharges because sources have been difficult to find, more than one source exists or mitigation is costly.

Table A. Comparison of the Number Discharges Rated High for Public Health Concern

| Jurisdiction | Number of Discharges Rated High | | | | | | | | | | |
|-------------------------|---------------------------------|-----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
| Central Saanich | 3 | 1 | 0 | 2 | 1 | 3 | 2 | 0 | 1 | 1 | 1 |
| North Saanich | 9 | 6 | 5 | 4 | 4 | 10 | 10 | 7 | 2 | 5 | 5 |
| Sidney | 9 | 7 | 3 | 1 | 4 | 1 | 3 | 4 | 6 | 5 | 5 |
| Pauquachin First Nation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tsartlip First Nation | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tsawout First Nation | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| Tseycum First Nation | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 |
| Total | 21 | 14 | 8 | 7 | 11 | 14 | 16 | 12 | 11 | 12 | 13 |

Table B. Historical High Ratings for Discharges of High Public Health Concern in 2009

| Discharge | Jurisdiction | Number of high ratings 2000-2008 |
|-----------|-----------------|----------------------------------|
| 416 | Central Saanich | 6 |
| 3077 | North Saanich | 6 |
| 3078B | North Saanich | 0 |
| 3079 | North Saanich | 1 |
| 3087 | North Saanich | 5 |
| 3118AA | North Saanich | 4 |
| 448 | Sidney | 4 |
| 449A | Sidney | 4 |
| 458A | Sidney | 8 |
| 3014 | Sidney | 3 |
| 3016 | Sidney | 5 |
| 409D | Tsawout | 0 |
| 3095 | Tseycum | 7 |

SHWP staff will continue to monitor discharges rated high or moderate and investigate sources of contamination.

Environment: Discharge Sampling for Chemical Contaminants

In 2009, twelve stormwater discharges along the Saanich Peninsula coastline were evaluated for environmental concern according to the level of chemical contaminants identified in discharge sediment. Contaminant ratings are determined by comparing concentration of each contaminant (eight metals and 15 polycyclic aromatic hydrocarbons (PAH)) with the CRD marine sediment quality guidelines (MSQG). The MSQG are concentrations above which adverse effects may occur to marine life. Ratios of concentration to MSQG for each contaminant are summed to account for potential effects caused by combining the contaminants.

Discharges with consistently high ratings require corrective action, beginning with investigation of the source of contamination (usually initiated by SHWP staff). High-rated discharges are prioritized, in consultation with jurisdictions involved, considering habitat sensitivity, discharge flow rate and flushing characteristics of the marine receiving environment.

Sampling is discontinued at discharges rated high for three consecutive years until corrective action is implemented. This allows limited funds to be reallocated for sampling other discharges. However, discharges that require action continue to be reported in each annual report.

In 2009, two discharges received a high contaminant rating (441 and 3138). Another discharge received a high rating, but is no longer of concern due to removal of contaminated sediment before entry into the marine environment. The 2009 high-rated discharges, plus four others are recommended for corrective action based on consecutive high ratings (441, 3138, 445, 449, 3005, 3016). Locations of these discharges are shown in Figure A.

Table C. Historical High Contaminant Ratings for Discharges Recommended for Corrective Action

| Discharge | Location/Jurisdiction | Number of high ratings 2000-2008 |
|-----------|--------------------------------|----------------------------------|
| 441 | Reay Creek – North Saanich | 5 |
| 445 | Foot of Frost Avenue – Sidney | 2 |
| 449 | Tulista Park – Sidney | 2 |
| 3005 | Fifth Street – Sidney | 4 |
| 3016 | White Birch at Resthaven Drive | 4 |
| 3138 | Tsartlip boat launch– Tsartlip | 7 |

The number of discharges recommended for action increased from 2005 to 2008 (four to seven) but was reduced in 2009 (six) due to corrective actions taken by The Butchart Gardens (for discharge 3153). It is anticipated that contaminant levels will be further reduced in 2010 due to corrective action completed in 2009 and 2010: Victoria Airport Authority has removed contaminated sediments in Reay Creek (441; lower contaminant levels were measured in 2009) and Sidney has upgraded pipes in the catchment area of 445. SHWP staff will confirm contaminant levels and continue source investigations in 2010.

While source investigations have sometimes helped narrow down the source of contamination, this approach has had limited success in locating and eliminating sources of contamination in stormwater sediments. In a 2006 review of the stormwater component of the LWMP by Downstream Environmental Consulting Ltd., the lack of effective initiatives to reduce contaminants in stormwater was identified as “the most significant program component requiring attention and improvement.”

As a result, SHWP proposed the creation of a CRD-led stormwater source control program in 2007. This is a method of reducing contaminant inputs to the stormwater system by working with businesses to limit their contaminant discharge to stormwater. This requires staff to work cooperatively with businesses through a balanced approach of education and enforcement. CRD staff are seeking authority through the provincial government to initiate a source control program in 2011 (discussed further in Special Projects).

2. Contaminant Source Investigations

Fecal Coliform

Investigations to identify contaminant sources were undertaken by SHWP and municipal staff in the catchment area of nineteen stormwater discharges. Sources of contamination were found in three catchments (458A, 3016 and 3118AA); municipal staff will be working to address the contamination and repairs may be completed by 2011. An area of contamination was narrowed down in one catchment area, the genetic source (human or other) of bacteria was identified in six catchment areas and investigations were inconclusive in nine others. SHWP staff will continue to work with the jurisdictions involved to reduce fecal coliform contamination in stormwater by assisting in the identification of locations for remedial measures to be implemented by municipalities or property owners.

Chemical Contaminants

In 2009, seven catchment areas were sampled upstream (16 samples were collected). Through investigations two sources were identified, the area of contamination was narrowed down for three discharges, and contamination appears no longer present at two discharges. Quarterly samples were collected from two upstream stations in Reay Creek to monitor for change in contaminant levels over time. Cadmium and zinc are the contaminants of concern. Victoria Airport Authority (VAA) removed contaminated sediment and surrounding soil from Reay Creek from 2007 to 2009. As a result, lower contaminant levels were measured in 2009.

3. Major Watercourse Monitoring

In 2009, water quality parameters were measured in eight creeks on the Saanich Peninsula (Hagen, Reay, Tetayut/Sandhill, Tatlow, Ten Ten, Tod, Tsawout and Wsikum) as part of a program to monitor the creeks for change, impacts from activities in the creeks and contamination from areas that drain to the creeks. Reay, Tetayut and Tod Creek had the fewest exceedences of the water quality guidelines, while Wsikum Tsawout, Tatlow and Tén Tén creeks had the most exceedences. The parameters of most concern were fecal coliform, turbidity and phosphorous. Elevated levels of these parameters are likely the result of higher levels of human settlement or agricultural practices.

In 2010, SHWP will work with municipal staff to locate sources of fecal coliform contamination. As part of the overall stormwater education initiative on the Peninsula, SHWP will also educate property owners about methods to reduce the amount of sediment and phosphorous leaving their properties and ultimately ending up in the creeks.

4. Special Projects

In 2009, SHWP was involved with a number of special projects to improve stormwater quality on the Peninsula. These projects included:

Natural Areas Atlas

The Natural Areas Atlas is a comprehensive, web-based information tool about natural areas in the CRD. It is meant for use by anyone interested or involved in land-use planning or stewardship in the region. The goal of the atlas is to promote and aid in well-informed land-use decision making. This will, in turn, have positive, long-term effects on the protection and restoration of terrestrial and aquatic habitat and other natural areas.

Layers of the atlas were updated in 2008 as new data became available. The CRD also continued to refine an updated viewer with performance enhancements, new tools and improved functionality. New high-resolution orthophotos will be taken in 2009 and, after processing, will be available to the public in 2010.

Action Plans to Reduce the Number of Discharges Rated High for Public Health Concern

SHWP worked to develop informal action plans with the three Peninsula municipalities to attempt to reduce the number of stormwater discharges rated high for public health concern. This planning process identified opportunities for SHWP and the municipalities to work together on targeted efforts to identify and remediate sources of contamination. Program staff will continue to work with municipal staff on these plans in 2009. In Central Saanich and North Saanich, the goals were to keep the number of high-rated discharges low, while in Sidney, a plan was being developed to resolve the contamination in three discharges draining to the west side of All Bay.

Source Control

In February 2008, SHWP presented the Saanich Peninsula Wastewater Commission (SPWWC) with detailed information on a stormwater source control program and SHWP was then directed to proceed with the option of a CRD-led stormwater source control program on the Saanich Peninsula. In the summer of 2008, the concept was presented to the three municipal councils. The councils each gave approval for the project. The next steps are for CRD staff to seek the required authority through the province and initiate a source control program in 2011.

Increase Communication between CRD and Municipal Planning Staff

SHWP staff worked cooperatively with municipal planning staff to discuss the options for a Peninsula-wide stormwater source control program. SHWP staff also discussed with the District of Central Saanich the renaming of Tetayut/Sandhill Creek and invited staff from the three Peninsula municipalities to training sessions and watershed management planning sessions.

Review Chemical Contaminants Sampling

The SHWP staff is evaluating the effectiveness of the current chemical sampling program and are investigating new methods of obtaining samples and interpreting the results. A revised sampling protocol will help support stormwater source control activities by providing more useful contaminant information.

RECOMMENDATIONS

Stormwater Discharge Surveys

1. That sampling is continued by Stormwater, Harbours and Watersheds program staff at all discharges with a high or moderate level of public health concern, and at selected low rated discharges, to confirm contaminant levels.
2. That annual sampling is discontinued at the discharges rated low for public health concern but that they are sampled at least once every five years as part of a long-term strategy to monitor for future changes.
3. That sediment sampling and analysis be continued at high rated discharges to confirm chemical contaminant levels as required.
4. That sediment sampling and analysis be discontinued at discharges where low chemical contaminant levels have been confirmed.
5. That Stormwater, Harbours and Watersheds program staff continue to evaluate the effectiveness of the current sediment sampling program and make changes as required to protect watercourses and the nearshore marine environment.

Upstream Investigations

1. That Stormwater, Harbours and Watersheds program staff work with the jurisdictions involved to investigate and eliminate the sources of high fecal coliform concentrations for those discharges rated high for public health concern.
2. That Stormwater, Harbours and Watersheds program staff work with the jurisdictions involved to determine the sources of contamination for the discharges with a confirmed rating of high environmental concern.

Special Projects

1. That the Stormwater, Harbours and Watersheds program continue to undertake special projects as necessary to improve stormwater quality on the Peninsula.

General

The following are also recommended:

1. That Stormwater, Harbours and Watersheds program staff, in cooperation with the Ministry of Environment, Environment Canada and community groups, develop and promote education and best management practices for the protection of stormwater quality.
2. That, where appropriate, municipalities and First Nations investigate spills and other incidents that may lead to the contamination of storm drains, watercourses and the marine environment, and that these incidents be reported to the Provincial Emergency Program.