

# STORMWATER QUALITY ANNUAL REPORT CORE AREA – 2007

## EXECUTIVE SUMMARY

### INTRODUCTION

The Capital Regional District (CRD) Stormwater, Harbours and Watersheds Program (SHWP) plans, promotes and coordinates the management of stormwater quality in the Core Area Liquid Waste Management Plan (LWMP) area, in consultation with the municipalities, Department of National Defence (DND) and First Nations. The CRD does not have the authority to directly implement any mitigative programs. This continues to be the responsibility of the municipalities, DND and First Nations.

This 2007 annual report covers five main areas of activity:

1. **Stormwater Discharge Surveys** – carried out along the entire coastline of the core area to investigate the public health and environmental concern of stormwater discharges.
2. **Upstream Investigations** – undertaken to identify the sources of contaminants in stormwater.
3. **Nearshore Marine Investigations** – carried out in Esquimalt Lagoon and Esquimalt and Victoria harbours to determine the health of the waterbodies and monitor for change over time.
4. **Stormwater Source Control** – promoted through the creation of a Model Storm Sewer and Watercourse Protection Bylaw and associated codes of practice (COP) for business sectors that have the potential to impact stormwater quality.
5. **Special Projects** – to improve stormwater quality in the region.

This annual report has been discussed with the seven core area municipalities, the two First Nations and the DND.

### RESULTS AND DISCUSSION

#### 1. Stormwater Discharge Survey

The stormwater discharge survey covers the coastline between the Colwood/Metchosin border in the west and the Saanich/Central Saanich border in the east, including Esquimalt Lagoon, Esquimalt Harbour, Victoria Harbour, Gorge and Selkirk waters, Portage Inlet and the City of Langford coastline along Saanich Inlet.

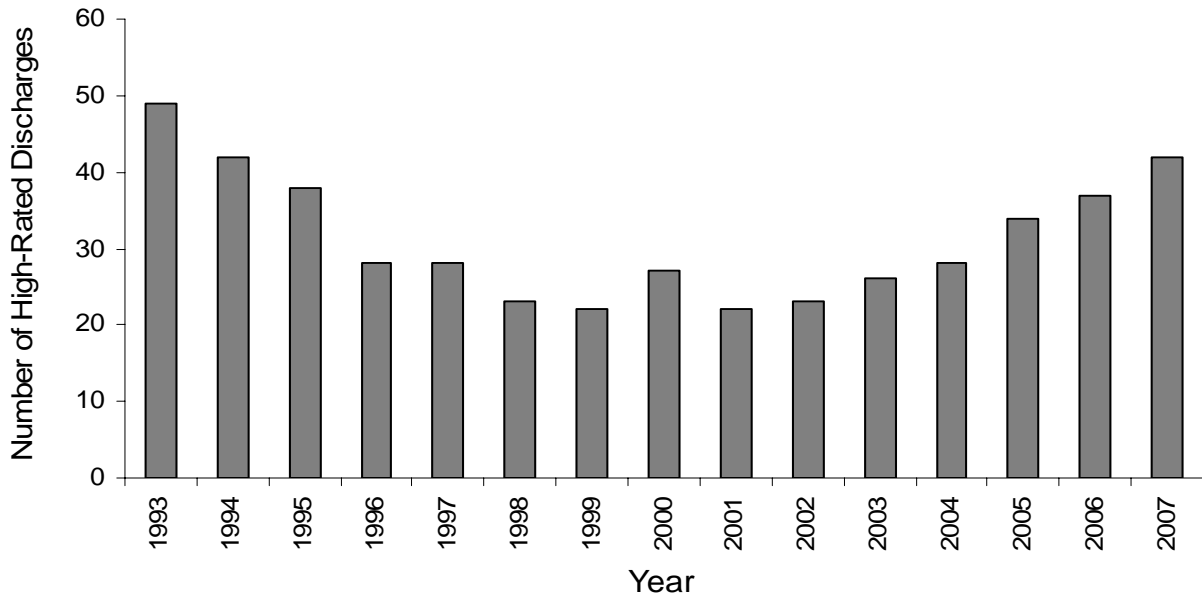
#### Public Health – Fecal Coliforms

Stormwater discharges are evaluated for public health concerns. This is done by sampling each discharge for fecal coliform bacteria and assigning a rating of high, moderate or low using the CRD's rating system. This allows the jurisdictions involved to better manage limited funds and undertake remedial measures where necessary.

In 2007, 175 stormwater discharges were rated for fecal coliform where flows allowed. Discharges were visited once during the winter and once during the summer to represent seasonal differences. Of the 175 discharges assessed, 41 were rated high for public health concern (refer to Table A, and Figures A and B), 87 were rated moderate and 47 were rated low.

From 1993 to 1999, the number of stormwater discharges assigned a high level of concern for public health dropped dramatically (from 49 to 22). Little change was seen from 1999 to 2001 and since then, the number of high priority discharges has been increasing (refer to Graph 1). In 2007, 41 of 175 stormwater discharges were assigned a high level of concern for public health and recommended for action (Figures A and B show the location of these discharges).

**Graph 1. Discharges Rated High for Public Health Concern from 1993 to 2007**



This 15-year pattern of the numbers of high priority discharges indicates that the municipalities and other jurisdictions have worked hard to reduce problem discharges and have addressed most of the stormwater discharges with obvious contaminant sources. The majority of the remaining discharges are difficult to address. The 2007 high priority stormwater discharges either have contaminant sources that are proving a challenge to identify or a new contaminant source has developed in the discharge. At the current levels of staffing and resources it is proving impossible to identify sources of contamination and the number of high-rated discharges is steadily increasing

The recent increase in high ratings has occurred primarily in the three municipalities of Esquimalt, Oak Bay and Victoria (Table A). These increases do not indicate a lack of effort on the part of these municipalities to identify and repair problems. What they do indicate is the larger infrastructure issues that these municipalities have to deal with. These municipalities have some of the oldest sewer and stormwater infrastructure in the region. Issues such as aging, collapsed and cracked pipes, old construction practices such as inadequate separation of sewer and storm sewer pipes, and cross-connections all can cause sewage contamination of stormwater. The other four core area municipalities tend to have newer infrastructure and this is probably the cause of the lower numbers of high ratings in those areas.

**Table A. Number of Discharges with a High Public Health Concern Rating from 1993 to 2007**

Area	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
City of Colwood	0	1	2	2	1	0	0	0	0	1	1	0	0	0	0
Town of View Royal	1	2	0	0	0	0	0	0	0	0	1	0	1	2	1
Township of Esquimalt	12	10	10	9	9	9	6	6	5	5	5	5	7	7	8
DND	0	1	0	1	2	1	1	1	0	0	0	0	0	0	0
District of Saanich	6	3	2	1	2	1	0	2	2	1	0	4	1	1	2
City of Victoria	22	18	17	12	10	9	11	13	9	8	13	14	14	15	15
City of Victoria private discharges <sup>1</sup>	*	*	*	*	*	*	*	*	*	*	*	*	2	3	5
District of Oak Bay	8	7	7	3	4	3	4	5	6	8	6	5	9	9	10
City of Langford <sup>2</sup>	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>49</b>	<b>42</b>	<b>38</b>	<b>28</b>	<b>28</b>	<b>23</b>	<b>22</b>	<b>27</b>	<b>22</b>	<b>23</b>	<b>26</b>	<b>28</b>	<b>34</b>	<b>37</b>	<b>41</b>

<sup>1</sup> Discharges that drain from private property do not fall under municipal jurisdiction. Starting in the 2006 report, discharges within the City of Victoria survey area that drain from private properties to the ocean are indicated separately. Other municipalities will be reported similarly in future annual reports.

<sup>2</sup> City of Langford stormwater discharges were sampled for the first time by the Stormwater Quality program in 1998.

\* = Private discharges included in the City of Victoria totals.

To address the upward trend in high priority stormwater discharges, CRD Scientific Programs staff held discussions with the municipal engineers from the seven core municipalities in June 2008. This group developed a proposal to refocus the CRD's Stormwater Quality program.

The refocused program would include:

- discontinuing the annual stormwater discharge sampling and rating from now until the end of 2010
- increasing the effort put into identifying contaminant sources
- working more closely with the municipalities to address the upward trend
- redirection of existing budget; no additional CRD funds would be required

This focused program of investigation will allow staff to apply significantly more time and resources on upstream investigations. In agreement with the municipalities, SHWP will scale back or suspend other components of the Stormwater Quality program and direct those resources towards investigative efforts at no additional cost to the municipalities. The rating of stormwater discharges and detailed annual reporting of the sampling program in the core area will be suspended for two years to free up some of these resources. As a result of suspending the rating and reporting for two years, the next Stormwater Quality Annual Report will be produced in 2012.

The timeline for these SHWP tasks is:

- 2008 current stormwater sampling program stopped and planning begins
- 2009 no annual report produced, intensive efforts are focussed on locating sources of contamination in high-rated discharges
- 2010 no annual report produced, intensive efforts are continued to locate sources of contamination in high-rated discharges
- 2011 the annual sampling program is restarted to survey stormwater discharges and determine public health ratings
- 2012 annual stormwater program reporting starts



**Figure A Core Area - 2007**  
 Stormwater Discharges Requiring Action  
 for Public Health and Environmental Concerns  
 (Metchosin to Esquimalt Border)

<p><b>Discharges Requiring Action</b></p> <ul style="list-style-type: none"> <li>■ High Public Health Rating</li> <li>▲ High Environmental Rating</li> <li>● High Env Contaminant</li> </ul>	<ul style="list-style-type: none"> <li>--- DND Boundaries</li> <li>— Major Roads</li> <li>■ Stormwater Monitoring Area</li> <li>~ Creeks and Rivers</li> <li>--- Municipal Boundaries</li> </ul>
--	--

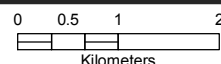


UTM Zone10N  
 NAD83



**Figure B Core Area - 2007**  
**Stormwater Discharges Requiring Action**  
**for Public Health and Environmental Concerns**  
**(Esquimalt to Central Saanich Border)**

- |                                    |   |
|------------------------------------|---|
| <b>Discharges Requiring Action</b> | --- DND Boundaries                                      |
| ■ High Public Health Rating        | — Major Roads   |
| ▲ High Environmental Rating        | ■ Stormwater Monitoring Area and Recommended for Action |
| ~ Creeks and Rivers                |   |
| --- Municipal Boundaries           |   |



UTM Zone10N  
NAD83

## Environment – Chemical Contaminants

Stormwater discharges are evaluated for environmental concerns based on the level of metals and organic contaminants identified in sediment from each flow. Discharges with high chemical contaminants are then prioritized for action based on environmental factors, including habitat sensitivity, discharge flow rate and the flushing characteristics of marine receiving waters. This prioritization is undertaken in consultation with the appropriate jurisdictions and may result in a detailed investigation to locate the sources of contamination. All chemical contaminant data from previous years were considered because sampling is discontinued at discharges consistently rated high for three years until some form of remediation is implemented. This allows limited funds to be reallocated for sampling other discharges while continuing to report the need for action in each annual report.

The 2007 sediment sampling program focused effort on 32 discharges in order to undertake upstream sampling in an attempt to locate sources of contaminants. These stormwater discharges were sampled for polycyclic aromatic hydrocarbons and metals and were assessed for environmental concern. Eleven of the 32 stormwater discharges received a high contaminant rating. Ten discharges received a moderate contaminant rating and eleven were rated low.

Based on the 2007 results and results from previous years, 22 discharges are recommended for action to determine the sources of contamination (up from 20 in 2006) now that repeated sampling has confirmed high contaminant levels at these locations. Figures A and B show the location of these 22 discharges and Table B presents the jurisdictional distribution of discharges recommended for action.

**Table B. Discharges Recommended for Action Due to Elevated Chemical Contaminant Levels**

<b>Jurisdiction</b>	<b>Number of Discharges Requiring Action</b>
City of Colwood	1
City of Langford	1
City of Victoria	9
DND	3
District of Oak Bay	2
District of Saanich	1
Parks Canada	0
Township of Esquimalt	2
Town of View Royal	3
<b>Total</b>	<b>22</b>

Sediments associated with stormwater discharges have been collected and analysed for chemical contaminants since 1993. To date, monitoring for environmental concern has been successful in defining problem areas. However, a review of the sampling program was started in 2006 and, if required, the program will be redesigned to measure the effectiveness of the municipal and SHWP source control initiatives.

## **2. Upstream Investigations**

Upstream investigations by municipal staff, VIHA and SHWP were undertaken in the catchment areas of 38 stormwater discharges. These investigations included both biological and chemical contaminant sampling. As a result of these investigations, the source of contamination was eliminated in three catchments although investigations continue in one catchment to locate a second potential source. Additional findings are shown in Table C. SHWP staff continue to work cooperatively with municipal staff, senior government and stakeholders to identify and reduce/eliminate contaminants at the source.

**Table C. Results of Upstream Investigations in 2007**

<b>Status</b>	<b>Number of Discharges</b>
Source eliminated	1
One source eliminated – investigating another source	6
Source location narrowed down – municipalities repairing	1
Source location narrowed down	17
No sources identified, contaminant levels have decreased over time	2
No sources identified, contaminant levels remain high	11
<b>Total</b>	<b>38</b>

### **3. Nearshore Marine Investigations**

Summer and winter surface water fecal coliform monitoring of Esquimalt Lagoon and Esquimalt and Victoria harbours was carried out to provide a general indication of fecal coliform levels and track changes in these waterbodies over time. In 2007, fecal coliform levels in the centre of the three waterbodies were generally low, indicating that there was no overall effect from fecal coliform present in stormwater flows. However, water quality adjacent to stormwater discharges may be affected by the discharge flows.

In 2007, no samples exceeded the SHWP guideline of 200 FC/100 mL. Two sampling locations in 2006 (near Selkirk Trestle and Bay Street Bridge) showed elevated levels of fecal coliform (1,400 and 1,300 FC/100mL respectively). At both of these stations, high levels were absent in follow-up sampling on the same day and other samples taken at later dates in 2006. Investigations in the area indicated that the source of bacteria was likely from birds. In 2007, low values were again confirmed and the one set of high values in 2006 is no longer a concern. All other monitoring stations sampled in 2007 showed fecal coliform results consistent with previous years and known distribution of birds.

### **4. Stormwater Source Control**

At the 22 November 2006 meeting, the CRD Core Area Liquid Waste Management committee approved an action plan prepared by staff in response to the recommendations in the Society of Environmental Toxicology and Chemistry (SETAC) review and of Jacques Whitford Limited in the audit of the LWMP. One of the recommended actions was to "initiate discussions with municipalities to identify needed changes to CRD or municipal authority to ensure stormwater protection and improvement". This recommendation came from the SETAC report's comment that the CRD appeared to be responsible for stormwater quality management but lacked the authority to enforce stormwater bylaws.

In 2007, SHWP investigated obtaining authority for stormwater source control in order to develop options to better protect the environment from stormwater-carried chemical contamination. As an initial step to determine how such a program will function on a regional scale, SHWP is moving forward with this approach on the Saanich Peninsula. In the core area, SHWP will focus attention on the immediate issue of locating contaminant sources that are resulting in steadily increasing numbers of discharges rated high for public health concern. A stormwater source control program will be evaluated on the Saanich Peninsula over the next two years and SHWP will continue to discuss stormwater source control with the core area municipalities.

### Model Stormwater Bylaw

In the LWMP, the CRD committed to coordinating a Stormwater Source Control program in cooperation with municipal partners. This program, initiated in 2001, is now primarily focused on the promotion of the Model Storm Sewer and Watercourse Protection Bylaw and associated COP. This regulatory framework is specifically targeted at activities that have the potential to impact stormwater quality.

In 2004, the province enacted the Community Charter. This, combined with a desire to produce a more streamlined version of the bylaw, resulted in a new draft of the model bylaw in the spring of 2006. The model bylaw is now ready for adoption and enforcement by the municipalities.

### Codes of Practice

The bylaw was designed to allow the incorporation of stormwater COP that set out municipal regulatory requirements under which various business sectors will be required to operate to prevent the pollution of stormwater.

The six COP, which have been completed and are ready for adoption, are as follows:

1. Code of Practice for Automotive and Parking Lot Operations
2. Code of Practice for Construction and Development Activities
3. Code of Practice for Streets and Roads
4. Code of Practice for Recreation Facilities
5. Code of Practice for Recycling Facilities
6. Code of Practice for Outdoor Storage Yards

### Best Management Practices

A best management practice (BMP) is a voluntary strategy for preventing stormwater pollution and often uses the same methods and strategies as in a code of practice but without the regulatory mechanism for compliance.

Two sector-specific BMP, which have been completed and are ready for region-wide use, are as follows:

1. Painting without Pollution
2. Power Washing without Pollution

It is hoped that municipalities will actively promote these BMP by making these information sheets available to those involved in these two activities.

### Outreach and Promotion Component

SHWP staff worked with representatives of the Bylaw Working group and municipal staff to update the bylaw and COP, discuss mechanisms for municipal adoption of the regulations and to plan future work related to regulatory tools for the protection of stormwater. Staff also hosted an information session for municipalities on the Riparian Areas Regulation.

The Stormwater, Harbours and Watersheds newsletter is produced to highlight watershed-related activities in the region and to promote activities that reduce stormwater contamination. SHWP staff continues to provide assistance to the municipalities, as required, with the adoption and implementation of the model bylaw and COP.

## **5. Special Projects**

In 2007, SHWP staff was involved with a number of special projects to improve stormwater quality in the region. These included the continued development of the Natural Areas and Harbours atlases, watershed management planning, working cooperatively with the Regional Source Control program and educational initiatives.

### **RECOMMENDATION**

In 2007, the upward trend in stormwater discharges rated high for public health concerns continued. A refocus of the Stormwater Quality program is proposed to reverse this trend. The program will increase efforts to find sources of contamination and work with municipal partners to remediate problems. Based on the information provided in this report it is recommended that SHWP staff work with the core area municipalities to modify the Stormwater Quality program to address the increasing number of stormwater discharges rated high for public health concern.