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REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION MEETING OF THURSDAY, JUNE 20, 2013

SUBJECT SAANICH PENINSULA STORMWATER QUALITY MONITORING – 2012
ANNUAL REPORT

ISSUE

To present the results of the 2012 Saanich Peninsula Stormwater Quality Program.

BACKGROUND

The Capital Regional District (CRD) Integrated Watershed Management program (IWMP), formerly the Stormwater, Harbours and Watersheds Program, promotes and coordinates the management of stormwater quality in cooperation and consultation with the participating municipalities of the District of Central Saanich, the District of North Saanich and the Town of Sidney, First Nations and other stakeholders. This work is a commitment in the Saanich Peninsula Liquid Waste Management Plan and is reported annually.

The *Saanich Peninsula Stormwater Quality Annual Report – 2012* prepared by IWMP staff, details the results of the 2012 monitoring program. The executive summary, which includes recommendations for the 2013 program, is attached as Appendix A. The full report will be available on the CRD website after the Executive Summary is received by the commission. The report has been discussed directly with the jurisdictions involved.

ALTERNATIVES

That the Saanich Peninsula Wastewater Commission:

1. a) receive the executive summary of the *Saanich Peninsula Stormwater Quality Annual Report – 2012* for information;
 - b) endorse the program recommendations on pages vi and vii of the attached executive summary and encourage the jurisdictions involved to continue their stormwater quality improvement work; and
 - c) forward copies of the report *Saanich Peninsula Stormwater Quality Annual Report – 2012* to the participating municipalities of the District of Central Saanich, the District of North Saanich and the Town of Sidney.
2. not receive the executive summary of the *Saanich Peninsula Stormwater Quality Annual Report – 2012* and its recommendations.

FINANCIAL IMPLICATIONS

This program is funded from the Saanich Peninsula Stormwater Quality Program annual budget. The 2012 budget was \$60,340.

CONCLUSIONS

In 2012, IWMP staff continued to work cooperatively with participating municipalities and stakeholders to monitor stormwater quality, investigate upstream sources of contamination and move towards a CRD-led stormwater source control program for the Peninsula. The executive summary of the annual report presents recommendations for the 2013 program.

RECOMMENDATIONS

That the Saanich Peninsula Wastewater Commission:

1. receive the executive summary of the *Saanich Peninsula Stormwater Quality Annual Report – 2012* for information;
2. endorse the program recommendations on pages vi and vii of the attached executive summary and encourage the jurisdictions involved to continue their stormwater quality improvement work; and
3. forward copies of the report *Saanich Peninsula Stormwater Quality Annual Report – 2012* to the participating municipalities of the District of Central Saanich, the District of North Saanich and the Town of Sidney.



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Attachment: 1

STORMWATER QUALITY ANNUAL REPORT 2012 SAANICH PENINSULA

EXECUTIVE SUMMARY

INTRODUCTION

The Capital Regional District (CRD) Integrated Watershed Management program (IWMP), formerly the Stormwater, Harbours and Watersheds Program, works to promote and coordinate stormwater management, and water quality of the creeks and shorelines of the Saanich Peninsula that stormwater discharges drain to. 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, Town of Sidney and First Nations.

The 2012 annual report covers four main areas of activity:

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

Stormwater discharges are assessed along the Saanich Peninsula coastline. This assessment prioritizes stormwater discharges based on public health and environmental concern and strives to protect freshwater and nearshore marine ecosystems and resources. Source investigations are undertaken to identify causes of contamination in stormwater. IWMP staff are 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).

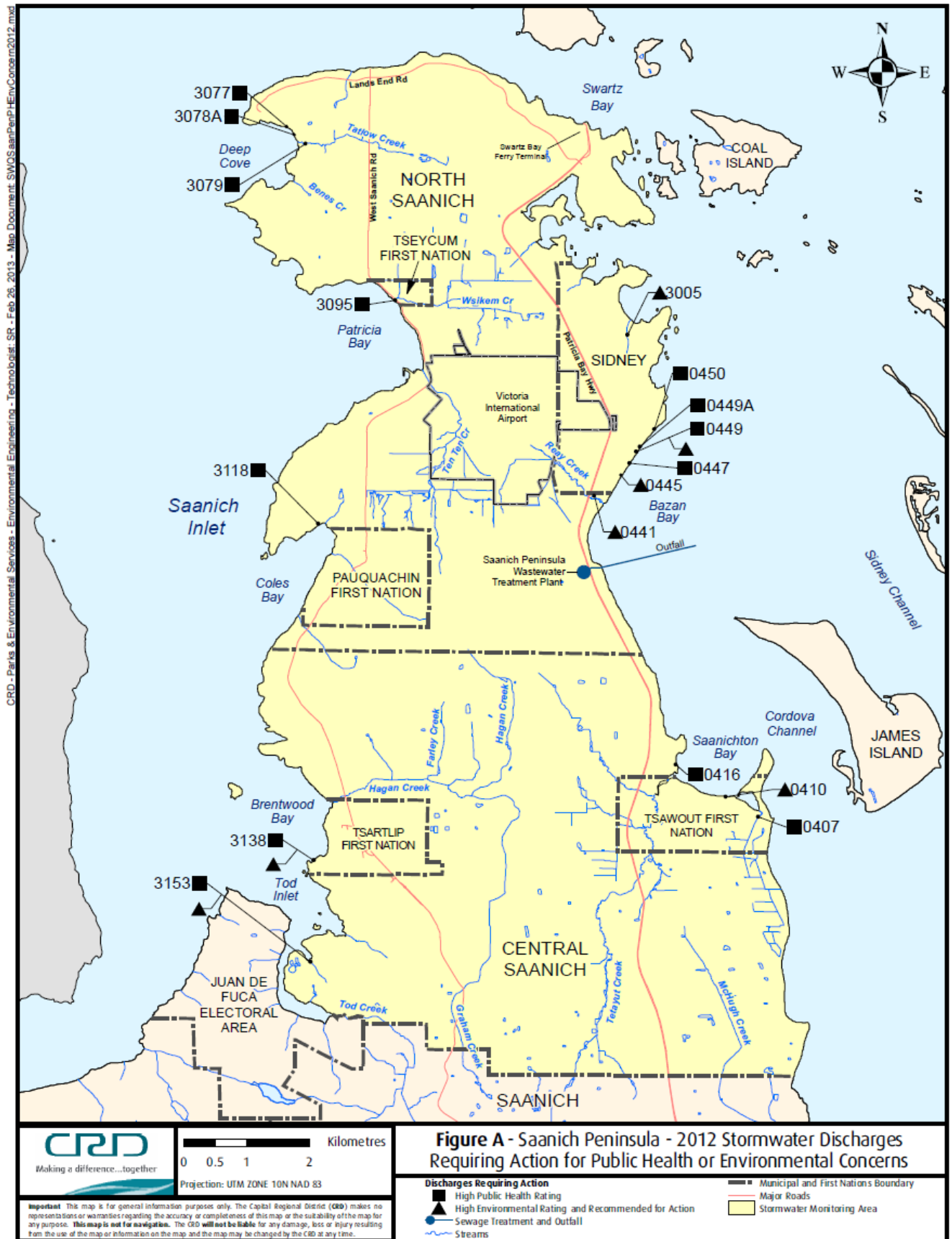
Public Health: Fecal Coliforms

In 2012, 109 stormwater discharges were evaluated for public health concerns. Each discharge was sampled for fecal coliform bacteria during the winter and summer, and then rated 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)

Discharge ratings allow jurisdictions to prioritize remedial measures where they will have the greatest benefit.

Of the 109 discharges assessed, 13 were rated high for public health concern (Figure A) and three of these have been of concern for the past five years. Table A provides the jurisdictional distribution of high-rated discharges in 2012. North Saanich and Sidney had the most high-rated discharges (four each), while Central Saanich had two, and Tsartlip First Nation, Tsawout First Nation and Tseycum First Nation one each.



The number of high-rated discharges went down considerably between 1999 (21) and 2002 (7), and has fluctuated between 11 and 13 high-rated discharges for the past seven years. Two of the 2012 high-rated discharges have been of concern for each of the past five years. Contamination remains in these discharges because the source is difficult to find, more than one source exists or mitigation is costly. Sources have been narrowed down in some of the high-rated discharges. Funds will be diverted in 2013 to increase investigative efforts in discharges of most concern to determine the sources of fecal coliform contamination.

Table A. Number of Discharges Rated High for Public Health Concern Over Time

Jurisdiction	Number of Discharges Rated High												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Central Saanich	1	0	2	1	3	2	0	1	1	1	1	2	2
North Saanich	6	5	4	4	10	10	7	2	5	5	6	4	4
Sidney	7	3	1	4	1	3	4	6	5	5	4	5	4
Pauquachin First Nation	0	0	0	0	0	0	0	0	0	0	0	0	0
Tsartlip First Nation	0	0	0	1	0	0	0	0	0	0	0	0	1
Tsawout First Nation	0	0	0	1	0	0	1	1	0	1	0	0	1
Tseycum First Nation	0	0	0	0	0	1	0	1	1	1	1	1	1
Total	14	8	7	11	14	16	12	11	12	13	12	12	13

Table B. Historical High Ratings for Discharges Rated High for Public Health Concern in 2012

Discharge	Jurisdiction	Number of high ratings 2008-2012
416	Central Saanich	5
3153	Central Saanich	1
3077	North Saanich	3
3078A	North Saanich	3
3079	North Saanich	2
3118	North Saanich	3
447	Sidney	1
449	Sidney	4
0449A	Sidney	3
450	Sidney	3
3095	Tseycum First Nation	5
3138	Tsartlip First Nation	1
407	Tsawout First Nation	1

Environment: Discharge Sampling for Chemical Contaminants

In 2012, 11 stormwater discharges along the Saanich Peninsula coastline were evaluated for environmental concern according to the level of chemical contaminants identified in discharge sediment. In addition, seven samples were collected upstream to narrow down sources of elevated contaminant concentrations. Contaminant ratings are determined by comparing the concentration of each contaminant [eight metals and 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 the contamination (usually initiated by IWMP 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 2012, two discharges received a high contaminant rating [441 (Reay Creek, North Saanich), and 410 (Saanichton Bay, Tsawout First Nation)]. One of these high-rated discharges, 441, plus three others (445, 449 and 3005) are recommended for corrective action based on consecutive high ratings. 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 2007-2012
441	Reay Creek – North Saanich	6
445	Foot of Frost Avenue – Sidney	1 (no sediment available to sample 2009-2012)
449	Tulista Park – Sidney	3
3005	Fifth Street – Sidney	4

IWMP and municipal staff efforts have allowed some sources to be narrowed down in these discharges. Investigations in discharges 3016 and 3138 have been suspended due to the challenges of finding a single point source of zinc, which enters storm drains from roadways due to particulate from vehicle brake pads, or from eroding storm drain pipes themselves. While integrated watershed management source investigations help narrow down sources of contamination, it has become clear that this approach has not been very successful at eliminating sources of contamination in stormwater sediment.

In 2007, IWMP proposed creation of a CRD-led stormwater source control program. This is a method of reducing contaminant inputs to the stormwater system by working with businesses to reduce or eliminate their contaminant discharge to stormwater. It requires staff to work cooperatively with businesses through a balanced approach of education and enforcement.

In 2010, CRD staff began work on updating the model Stormwater Source Control bylaw to harmonize with the newly adopted Central Saanich Surface Water bylaw. In 2012, the Province of British Columbia granted the CRD the powers necessary to create a stormwater source control service. CRD staff are preparing a service establishing bylaw for adoption in late 2013 and will be working throughout 2013 with municipalities and stakeholders to finalize the regulatory bylaw.

2. Contaminant Source Investigations

Fecal Coliform

Investigations to identify contaminant sources were undertaken by IWMP and municipal staff in the catchment area of five stormwater discharges in 2012. Source investigations included assessments of the catchment area land use, upstream sampling and bacterial source tracking (BST; analysis of bacterial DNA to determine if humans or other animals are the source). Once the origin of a source is narrowed down, the jurisdiction is notified to further isolate it or undertake corrective actions. A summary of the findings of these investigations in 2012 follows:

At least two sources exist, and more upstream investigation is needed, for two discharges (449 and 3095). Potential indications of the source of contamination at three discharges (449A, 450 and 3118).

Chemical Contaminants

In 2012, seven sediment samples were collected from the catchment area of four discharges as part of an investigative program (441, 449, 3016 and 3138). Zinc is the main contaminant of concern in discharges 3016 and 3138, and investigations for this contaminant will be suspended in 2013. High mercury levels were observed in discharge 441 (Reay Creek), and high arsenic levels in discharge 3005 (Mermaid Canal, Sidney). Investigations to find the source of mercury and arsenic in these discharges will proceed in 2013.

3. Major Watercourse Monitoring

In 2012, water quality parameters were measured in eight creeks on the Saanich Peninsula (Hagen, Reay, Tetayut, Tatlow, Tén Tén, Tod, Tsawout and Tseycum). These creeks are monitored for change and for impacts from both activities in the creeks and in watershed areas that drain to the creeks. Water quality in the streams has been consistent over the past five years, and is good in one creek (Tod Creek), fair in four creeks (Hagan, Reay, Tetayut and Tatlow), and poor in three creeks (Tén Tén, Tsawout and Tseycum). The parameters of most concern were fecal coliform bacteria, turbidity and phosphorus. Elevated levels of these parameters are likely the result of higher levels of human settlement or agricultural practices.

In 2013, IWMP staff will work with municipal staff to locate sources of fecal coliform contamination. As part of the overall stormwater education initiative on the Peninsula, IWMP will also educate property owners about methods to reduce the amount of sediment and phosphorus leaving their properties and ultimately ending up in the creeks.

4. Special Projects

The CRD IWMP has undertaken a number of special projects related to reducing and eliminating contaminants in watercourses and improving stormwater quality in the region. These are as follows:

Increase Communication between CRD and Municipal Planning Staff

IWMP staff worked cooperatively with municipal planning staff to plan and implement a Peninsula-wide stormwater source control program.

Review Chemical Contaminant Sampling

IWMP staff are evaluating the effectiveness of the current chemical sampling program and are investigating new methods of obtaining samples and interpreting the results. Upstream investigations for zinc are being suspended due to the difficulty of finding a single point source of this chemical. This will allow efforts to be focused on finding the source of chemicals such as mercury and lead. Other methods of evaluating the environmental risk of stormwater discharges, such as toxicology testing, are also being investigated.

Review Watercourse Sampling

IWMP staff evaluated the watercourse sampling program with the goal of revising sample design to complete more intensive sampling of creeks so that water quality parameters can more reliably be compared to provincial water quality guidelines. Streams will be sampled more intensively, but less frequently, beginning in 2014.

RECOMMENDATIONS

STORMWATER DISCHARGE SURVEYS

1. That sampling is continued by Integrated Watershed Management staff at all discharges with a high or moderate level of public health concern, and at selected low rated discharges, to confirm contaminant levels. In 2013, IWMP will decrease the number of discharges sampled in order to redirect funds to increased upstream investigations for those discharges that have been rated high for a number of years.
2. That annual sampling is discontinued at 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 changes.
3. That discharges functioning as sewage pump station overflows be treated as all other discharges and be rated based on fecal coliform count, rather than being given an automatic moderate rating. The reason for this recommendation is that current sampling of overflow discharges is unlikely to detect sewage overflows through chance alone. Also, overflows can be detected through CRD's SCADA flow monitoring system.
4. That sediment sampling and analysis be continued at high-rated discharges to confirm chemical contaminant levels and sources of contamination as required.
5. That sediment sampling and analysis be discontinued at discharges where low chemical contaminant levels have been confirmed.
6. That Integrated Watershed Management 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.

WATERCOURSE SAMPLING

1. That the watercourse sampling program be revised to produce data that can be reliably compared with provincial water quality guidelines, which are based on average concentrations from five samples collected within a 30-day period.
2. That one creek per year on the Saanich Peninsula is selected for intensive sampling as described above in 1.

UPSTREAM INVESTIGATIONS

1. That Integrated Watershed Management staff increase efforts in 2013 to find and eliminate the sources of high fecal coliform concentrations in those discharges rated high for public health concern. This can be accomplished by decreasing efforts used for routine stormwater discharge surveys and redirecting these funds to investigations.
2. That Integrated Watershed Management 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 Integrated Watershed Management program continues to undertake special projects as necessary to improve stormwater quality on the Peninsula.

GENERAL

The following are also recommended:

1. That Integrated Watershed Management 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.