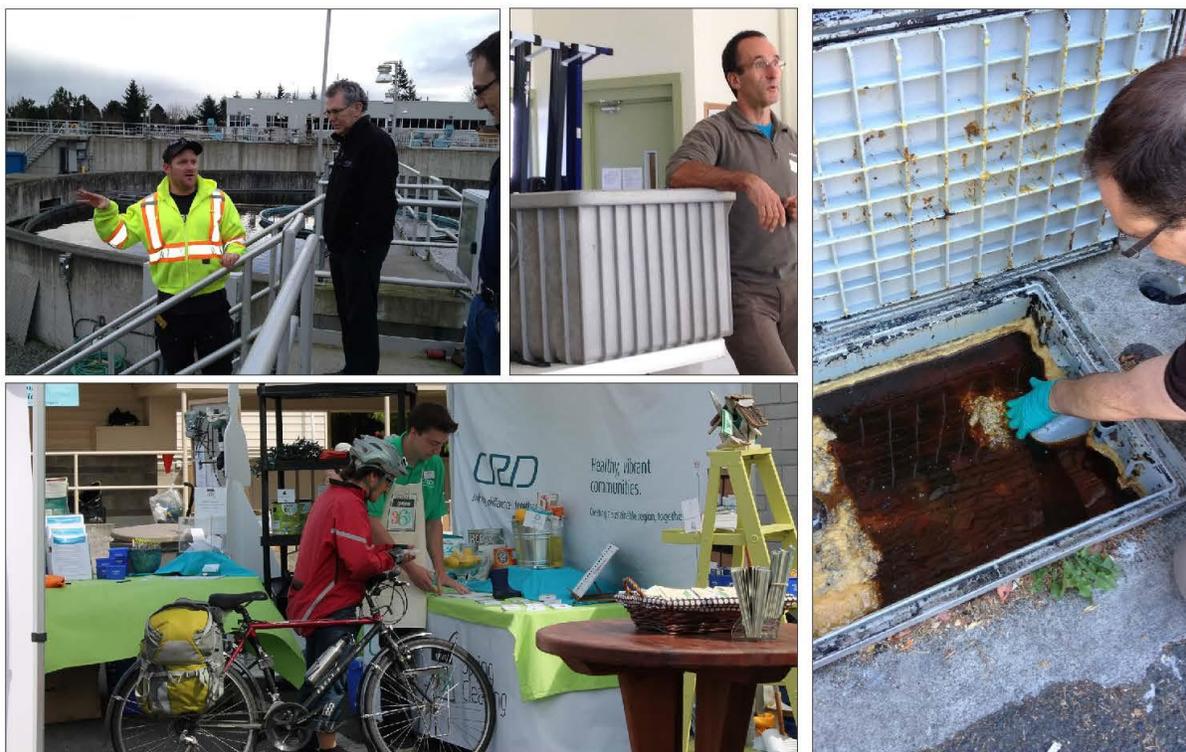




Making a difference...together

Regional Source Control Program 2013 Annual Report

Capital Regional District | Environmental Partnerships



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REGIONAL SOURCE CONTROL PROGRAM 2013 ANNUAL REPORT

EXECUTIVE SUMMARY

Introduction

The purpose of the Capital Regional District (CRD) Regional Source Control Program (RSCP) is to protect sewage collection and treatment facilities, public health and safety, and the marine receiving environment by reducing the amount of contaminants that industries, businesses, institutions and households discharge into the district's sanitary sewer systems.

The CRD adopted a Sewer Use Bylaw in 1994 to regulate sanitary sewer discharges. Implementation of a region-wide program began in 1995 with regulation of larger industries under a permit system, followed by adoption of the first regulatory codes of practice (COP) for commercial sectors in 1999. By the end of 2005, COP were developed, adopted and implemented to regulate discharges from approximately 2,000 businesses within 11 sectors. The RSCP works to ensure that the bylaw and its associated policies and procedures are applied consistently within all CRD sewage collection areas.

As part of the Environmental Partnerships Division (Partnerships), the RSCP shares a mission to deliver collaborative and responsible environmental services that engage and inspire changes in behaviour for the stewardship, protection and well-being of our region.

2013 Program Activities

Efforts to share information and coordinate inspections within Partnerships (Cross Connection Control and Demand Management), regulatory partners (Vancouver Island Health Authority (VIHA) and municipal inspectors) and other CRD divisions have been very successful, with 500 coordinated inspections being completed in 2013.

In 2013, the RSCP continued to apply the "sector-by-sector" approach to COP inspections, focusing on the fermentation, recreation facilities, dental, carpet cleaning, photographic imaging and food services sectors. This approach resulted in a greater number of inspections, repeat site visits and more comprehensive investigations in comparison to 2012. Overall, full compliance rates for COP, permitted industrial facilities and facilities operating under authorizations remained high in 2013.

A statistical assessment of local wastewater trends over the period 1990-2011 was undertaken in 2012. Trend results confirmed findings of previous studies, indicating stronger evidence of stable or decreasing loads in a range of priority substances in wastewater discharged from the region's main sewage outfalls. These continuing decreasing trends and recent changes in loads are thought to be largely due to a combination of the success of source control efforts at regulating contaminants, increasing public and industry awareness regarding product selection, and use of proper waste treatment practices. The next wastewater trend assessment is scheduled for 2015.

In 2013, outreach and education efforts focused on developing and delivering integrated messaging with other CRD programs but continued to maintain and adapt existing RSCP campaigns, while developing and initiating new campaigns. Integrated messaging included the development of eight industry videos and taking a lead role in the development of themed campaigns under the umbrella initiative "Green 365" and ensuring that new campaigns include linked key messaging.

The source control program continues to play an important role in achieving wastewater contaminant reductions and protecting sewage collection and treatment facilities throughout the region.

The 2013 annual report presents background information, a summary of program activities and accomplishments over the period January to December 2013, and a brief account of initiatives planned for 2014. The main activities and accomplishments of the program in 2013 are outlined below.

Industrial, Commercial and Institutional Liquid Waste Regulation

- COP inspections emphasized customer service in 2013 and a more qualitative “sector-by-sector” approach, with increased customer support – often requiring repeat site visits.
- Inspections focused on the fermentation, recreation facilities, dental, carpet cleaning, photographic imaging and food services sectors in 2013, providing an opportunity to review each sector and prepare for a future amendment of each COP.
- The overall inspection levels in 2013 (1254) were significantly higher than those recorded in 2012 (815), 2011 (577) and 2010 (657).
- A total of 627 food services operations were inspected in 2013, with an additional 290 follow-up visits for compliance and/or further support. For comparison, 133 dental inspections were carried out with 13 follow-up visits.
- A comprehensive investigation of the fermentation sector was launched including a review of code feasibility for solids diversion and emerging markets potentially not considered during the development of the original COP for fermentation operations in 2002-2003.
- The COP for recreation facility operations was reviewed to assess whether the code was effectively addressing contaminants of concern for the sector. The review recommended a revised best management practice (BMP) guideline for the sector along with the transfer of facilities with high volume sewer discharge and offsite waste management to authorizations in lieu of continued regulation through the code.
- Engagement with the carpet cleaning sector in 2013 included a telephone survey to help better direct and solicit industry cooperation for a thorough inspection schedule (to be conducted in 2014).
- RSCP inspectors worked with 86 facilities currently regulated under the photographic imaging code. Continued work within this sector is expected for 2014, with recommendations for modifications to the code to reflect current industry practice.
- RSCP staff initiated a pilot project to test the effectiveness of automatic grease recovery devices in the food services sector. Phase I of the study was completed in 2013 and Phase II is scheduled for 2014.
- Compliance issues related to undersized treatment works and application of alternative treatment works at three automotive facilities were resolved after a thorough review and modified operating practices resulting in all three facilities moving to regulation under authorizations.
- All permit inspections scheduled at the beginning of 2013 were completed within the year. Permits discharging priority contaminants received at least one or two additional inspections.

Monitoring

- Most monitoring targets set for 2013 were achieved.
- On average, there were two scheduled audit monitoring events per permit in 2013.
- COP monitoring focused on the food services sector in 2013, with replicate sampling of five different types of facilities over time to determine the effectiveness of grease interceptors at retaining grease between clean-outs. The results of this monitoring project were inconclusive; however, some recommendations for future action were made.

Enforcement

- One ticket was issued and paid under the CRD Ticket Information Authorization (TIA) Bylaw in 2013.
- Two warning notices were issued in 2013 under the TIA Bylaw.
- No charges were laid under the Sewer Use Bylaw.

Contaminants Management

- A consultant was retained to predict the environmental risks associated with specific emerging chemicals in local wastewater and identify the main sources and potential source control strategies to reduce these risks. The study focused on the emerging contaminants triclosan, nonylphenol (NP) and nonylphenol ethoxylates (NPEs). Project recommendations included: continuing periodic monitoring of wastewater levels of these chemicals; incorporation of information regarding avoidance of use of certain products and alternative product substitution in outreach initiatives; and continuing to keep informed regarding federal and international reduction efforts. A stand-alone source control campaign aimed at triclosan reduction was not recommended due to the significant reduction efforts currently underway at the federal level in both Canada and the US.
- A Royal Roads University project with the running title *Investigation of Floor Care Trade Wastes* reviewed strategies for reducing the amount of priority contaminants that are discharged into the sanitary sewer system by floor care service providers. The investigation included a literature review, an examination of standards and regulations from other areas in Canada and Australia and interviews with a number of floor care service providers. Recommendations included: development of a BMP document specifically for hard floor surface cleaning and maintenance, and development and implementation of a monitoring program.
- CRD staff undertook a stakeholder consultation process to assist with further development of BMPs for the arts and crafts sector in early 2013, including the preparation of a draft brochure for distribution within the sector. Engaged stakeholders supported forming a partnership with the CRD to deliver education and outreach materials to key groups within the sector and at associated events.

Contaminant Reductions

- Wastewater trend assessment results for Macaulay and Clover points and Saanich Peninsula wastewater treatment plant (SPWWTP) influent and effluent monitoring over the period 1990-2011 have confirmed findings of previous studies indicating stronger evidence of stable or decreasing loads in a range of priority substances in wastewater discharged from the region's main sewage outfalls.
- Loads of priority metals (those presenting the greatest concern regarding aquatic toxicity), including cadmium, chromium, copper, lead, mercury, manganese, nickel and zinc, exhibited significant decreases ranging from 1% to 19% per year in core area effluent.
- Organic compounds, including certain polynuclear aromatic hydrocarbons, 1,4-dichlorobenzene and tetrachloroethene, showed significant decreases in loads ranging from 2% to 16% per year in core area effluent.
- A significant decrease of 6% per year was also observed for total oil and grease at core area outfalls.
- The next full wastewater trend assessment for the Core Area and Saanich Peninsula is scheduled for 2015.
- For the fifth consecutive year, Ganges wastewater treatment plant mixed liquor results met the Class A criteria for all metals, including mercury. SPWWTP dewatered sludge monitoring commenced in March 2013. All of these results also met the Class A criteria for metals.

Significant Incident Response

- A new significant incident response procedure was developed by RSCP staff in 2013 for implementation in 2014. The implementation process will involve response training for Core Area and SPWWTP operations staff and RSCP inspectors. The report form and response procedure was reviewed in 2013 following an incident involving a significant spill of Bunker "C" fuel oil into the CRD's Lang Cove pump station.
- There were three incidents involving fats, oils and grease build-up and one involving oily waste in municipal sewer lines in 2013 that were investigated by RSCP staff.

Residential Outreach

- Point-of-sale outreach material was distributed at local pharmacies and staff continued to work collaboratively with VIHA to promote proper waste medication disposal to residents. The CRD continued to have one of the highest medication return rates per capita amongst regional districts in the province. Over 11.7 tonnes of medications were collected in the region during 2013, representing a 33% increase over the amounts collected in 2012.
- The program continued to foster and support integrated and collaborative messaging with external partners and initiatives to promote general and specific source control practices. “My Green Plan” and “Tap by Tap” were two new initiatives supported by the RSCP in 2013.
- The RSCP was the main lead in developing and piloting a departmental integrated environmental campaign: “Green 365”. In 2013, two Green 365 campaigns were launched: “Green 365 Outdoor Living” and “Green 365 Indoor Living”. The campaigns focused on promoting environmental practices associated with outdoor and indoor home improvement respectively. Two further themes will be implemented in 2014.

Business Outreach

- Inspectors continued to be the front line staff delivering RSCP outreach messaging to local businesses. Outreach included distribution of RSCP sector-based posters and guidebooks. Inspectors delivered messaging regarding cross connection protection, water use reduction, the regional kitchen scraps strategy and other CRD initiatives.
- RSCP staff, in partnership with VIHA, delivered two Medications Return Program education sessions in 2013 for community health care staff and private clinicians who work with home-care patients throughout the CRD.
- The 2013 CRD EcoStar award event was co-sponsored by RSCP and staff again participated in the evaluation committee for the Water Stewardship and Waste Reduction categories.
- Two industry educational videos were released in 2013, one for food services operations and the other for the automotive repair industry. Based on the positive feedback from stakeholders, 8 more videos (4 per sector) were developed in 2013 and targeted for release in 2014.
- RSCP staff continued to participate in business outreach events. Although there was only one applicable business venue available in 2013, which RSCP staff participated in, staff also presented directly to the BC Restaurant and Food Services Association and Victoria Chapter of the BC Hotel Association at their respective membership meetings.
- A survey of businesses was conducted in 2013 to evaluate how businesses are currently receiving information on environmental regulations and best management practices and how they would prefer to receive this information. The survey was designed to support developing tools for integrated messaging associated with environmental regulations and best management practices.

Education

- RSCP messaging was included in two training workshops for local educators in 2013.
- There were four youth and community engagement events in 2013 which included RSCP messaging and information.
- RSCP educational information was included in 30 Environmental Partnerships community outreach events held throughout 2013.
- In 2013, as part of the “My Green High School Plan” challenge, four high schools from across the region submitted plans that demonstrated a commitment to environmental stewardship by reducing their school’s eco-footprint, raising student awareness and changing behaviour. All four high schools received funding to implement their green plans and approximately 4000 students were engaged at participating schools.

Regional Source Control Program Website

- RSCP web pages continued to be a tool used by both residents and businesses to access source control information based on web page activity analysis. In 2013, most pages showed an increase in use over 2012.
- In conjunction with the launch of the new CRD corporate web site, RSCP web pages were significantly reorganized, redesigned and updated.

Partnerships Initiatives

- In total, an estimated 500 coordinated inspections were conducted in 2013. These inspections included:
 - Providing access, information and/or services for two other programs within the division (Cross Connection Control and Demand Management).
 - Representation of other CRD programs and initiatives to customers (e.g., Regional Kitchen Scraps Strategy)
 - Collaboration with other municipal or VIHA staff (including combined on-site inspections) to resolve sewer incidents, share discharge information and enhance reporting procedures.
- Partnerships with external agencies in 2013 included: Metro Vancouver, VIHA, Royal Roads University, Camosun College, School District 61, British Columbia Pharmacy Association, Health Products Stewardship Association, Shaw Ocean Discovery Centre and federal agencies.
- RSCP continued to integrate Demand Management Program (DM) water audits as an expanded inspection service and work collaboratively with the Integrated Water Services Department, delivering audits for a major recreation facility, a First Nations band office and a complex building.
- RSCP staff met with Onsite Wastewater Management Program (OWMP) staff on a bi-weekly basis to exchange information and identify synergies for sharing messaging and efforts to maximize efficiencies. Both programs collaborated on a fermentation sector review to inspect wineries, cider operations and distilleries using septic systems to provide cross messaging and confirm best management practices.

Data Management

- CRIMS Spatial, an integration of the RSCP regulatory database with the CRD geographic information system, was implemented in 2012. Operational integration of this application, for inspection planning purposes, continued throughout 2013.

Program Planning and Development

- The RSCP continued to meet the commitments outlined in the Core Area and Saanich Peninsula LWMPs in 2013.
- The RSCP annual report for 2012 was presented to the Core Area Liquid Waste Management Committee, as part of a consolidated annual report for all Liquid Waste Management Plan programs, in October 2013. Copies of the annual report were subsequently sent to the Ministry of Environment.
- A work plan was developed for the RSCP in January 2013 as part of a divisional initiative. This plan was updated throughout the year, assisting in setting timelines and defining responsibilities for activities and projects within the overall context of the five-year plan for the period 2011-2015.
- The next five-year independent review of the program is scheduled for 2014. The findings of this review will assist in the development of a new plan for the period 2016-2020.

Performance Measures

- The percentage of regulated businesses with proper waste treatment installed in 2013 was 97%.
- For the fifth consecutive year, the percentage of mixed liquor and dewatered sludge samples that meet Class A standards for metals was 100%.
- Percentage of priority contaminants showing no increase in loads to the core area environment was 95% – based on a recent trend assessment for 1990-2011 core area wastewater data.

Next Steps–2014/2015

The main areas of program development in 2014/2015 include:

- Continued implementation of the RSCP five-year plan for 2011-2015.
- COP inspections, monitoring and sector investigations will focus on the carpet cleaning, food services, automotive repair, photographic imaging and laboratory sectors in 2014.
- Collaboration with internal and external partners to develop the division's "one-window approach" to customer service for businesses.
- Implementation of two pilot "Green 365" campaigns ("Green 365 In the Kitchen" and "Green 365 Spring Cleaning") in 2014.
- Implementation of an arts and crafts environmental best management practices campaign in 2014.
- Continued research regarding priority and emerging contaminants.
- Initiation of Phase II of the automatic grease recovery device pilot project in 2014.
- Implementation of a new significant incident response procedure in 2014.
- Review and development of standard operating procedures for the RSCP.
- Review, update and amendment of the Sewer Use Bylaw.
- Preparation of a five-year review of the RSCP in 2014, covering the period 2009–2013.

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REGIONAL SOURCE CONTROL PROGRAM 2013 ANNUAL REPORT**

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CAPITAL REGIONAL DISTRICT REGIONAL SOURCE CONTROL PROGRAM ANNUAL REPORT 2013

1.0 INTRODUCTION

Source control is a waste management strategy that is aimed at reducing the amount of contaminants that industries, businesses, institutions and households discharge to sewers. The need for a Source Control Program within the Capital Regional District (CRD) was assessed during the period 1990-1992 and a commitment to develop a program followed in 1993.

Following discussions with municipal representatives in 1993, it was agreed that the CRD would assume full responsibility for regulating the quality of wastewater entering its trunk sewers and sewage treatment facilities by applying for designation as a sewage control area. In 1993, the CRD also committed to the development and implementation of a region-wide Source Control Program and adoption of a Sewer Use Bylaw under the *BC Environmental Management Act*. This bylaw was designed to serve as the main regulatory instrument for source control in sanitary sewer systems, creating a level playing field for businesses and institutions throughout the district.

The first phase of implementation of the Regional Source Control Program (RSCP) began in 1995, following adoption of the Sewer Use Bylaw in August 1994. This early phase (1995-1998) focused on identifying, inspecting, assessing and permitting larger industrial facilities operating within the CRD. In 1998, the focus of the program shifted toward development, adoption and implementation of codes of practice (COP) to regulate discharges from a large number of smaller commercial and institutional facilities. The first of these COP were adopted in 1999 and development and implementation of a total of 11 COP was achieved by early 2005.

A five-year internal review of the program was completed in 1999 and annual reporting on the achievements of the program was initiated the following year as one of the commitments in the Core Area Liquid Waste Management Plan (LWMP). The first independent five-year review of the RSCP was completed in 2005. The main recommendations from this review were incorporated into a five-year plan for the period 2006-2010. A comprehensive internal program review, with a focus on reducing priority contaminants, was undertaken in 2008. This led to the development of a revised work plan for 2009-2010, updating the five-year plan and including efforts to increase program efficiency. A second independent review of the program was completed in 2010. The findings of this review, covering the period 2004-2008, was used to develop a new five-year plan for 2011-2015 (see Table 14).

The objectives of the RSCP are documented in the 1996 Saanich Peninsula LWMP and the Core Area LWMP (July 2000). The program objectives, which were reviewed in 2008, are as follows:

- protect the marine receiving environment adjacent to the CRD's sewage outfalls
- protect sewage facilities belonging to the CRD and its member municipalities
- protect the health and safety of sewage workers and the general public
- protect the quality of sewage sludge and biosolids
- protect treatment plants against upsets
- consistently apply the program for all users of CRD sewage facilities

The Core Area and Saanich Peninsula LWMPs contain commitments to prepare an annual report on the RSCP for submission to the CRD Board and the BC Ministry of Environment (MOE). This annual report presents a summary of program activities and accomplishments over the period January-December 2013 and provides a brief account of initiatives planned for 2014.

The RSCP is a key component of effective wastewater treatment and will form an integral part of the core area wastewater treatment strategy. The current program meets or exceeds Canadian best practices for source control and the CRD is a nationally recognized leader in this field.

2.0 BACKGROUND

2.1 Program Components

The activities undertaken by RSCP staff in 2013 have been categorized under the following component headings:

- inspections
- monitoring
- enforcement
- outreach
- partnerships initiatives
- contaminants management
- data management
- planning and development

2.2 Policies and Procedures

The following policies and procedures are used to provide guidance and ensure fair and consistent application of the CRD Sewer Use Bylaw and associated enforcement, cost recovery and monitoring activities.

Policies Approved by the CRD Board

- Regional Source Control Program Enforcement Policy
- Regional Source Control Program Fees and Charges Policy
- Sewer Use Bylaw Process of Review
- Regional Source Control Program Code of Practice Management Policy–Food Services

Operating Procedures

- Sampling and Analysis Procedure Manual
- Analytical Result Reporting Procedure
- Non-domestic Waste Discharge Reporting Procedure
- Significant Incident Reporting Procedure
- Procedure for Managing Contaminated Water Produced During Firefighting Operations in the CRD

The policies and procedures are periodically updated to reflect changes within the program. The “Significant Incident Reporting Procedure” was reviewed in 2013 and re-written in 2014. The “Procedure for Managing Contaminated Water Produced During Firefighting Operations in the CRD” was updated in March 2013.

2.3 Sewage Collection Areas and Sewage Facilities

The CRD Sewer Use Bylaw applies to any discharge of non-domestic waste into a sewer that is connected to a sewage facility operated by the CRD. The RSCP is designed to ensure that the bylaw and its associated policies and procedures are applied consistently within the separate collection areas for these sewage facilities.

The CRD owns and operates eight wastewater treatment plants, as shown in Table 1. Four of these plants–Macaulay Point, Clover Point, Saanich Peninsula and Ganges–receive significant industrial, commercial or institutional wastewater flows, while the remaining four are small plants receiving mostly residential flows.

The sewage flows into each treatment plant are reported in the annual compliance monitoring reports for CRD sewage outfalls.

The ten CRD municipalities, three electoral areas and six other participating areas with sanitary sewers were regulated under the RSCP in 2013. Estimated annual sewage flows contributed by each participating area, over the period 1 October 2012 to 30 September 2013, are listed in Table 2. The annual sewage flows are used to calculate the municipal requisition for the RSCP (see Section 3.9).

Table 1: CRD Treatment Plants and Sewage Collection Areas–2013

CRD Sewage Treatment Plant	Sewage Collection Areas
Macaulay Point	Victoria (west), Esquimalt, Saanich (west), View Royal, Colwood, Langford, Department of National Defence, Esquimalt First Nation, Songhees First Nation
Clover Point	Victoria (east), Oak Bay, Saanich (east)
Saanich Peninsula	Sidney, Central Saanich, North Saanich, Pauquachin First Nation, Tseycum First Nation, Institute of Ocean Sciences
Ganges	Township of Ganges (Salt Spring Island Electoral Area)
Maliview	Maliview area (Salt Spring Island Electoral Area)
Schooner Way	Buck Lake area (Southern Gulf Islands Electoral Area)
Canon Crescent	Magic Lake Estates (Southern Gulf Islands Electoral Area)
Port Renfrew	Port Renfrew (Juan de Fuca Electoral Area)

Table 2: Annual Sewage Flows 2012-2013

Participant	Estimated Annual Flow (m ³ /year)*	Percentage of Total Flows
Saanich	10,062,457	27.84%
Oak Bay	2,824,022	7.81%
Victoria	13,455,282	37.22%
Esquimalt	2,360,338	6.53%
View Royal	570,489	1.58%
Colwood	1,092,703	3.02%
Langford	1,912,140	5.29%
Sidney	1,337,648	3.70%
Central Saanich	1,425,138	3.94%
North Saanich	454,197	1.26%
Esquimalt First Nation	6,540	0.02%
Songhees First Nation	208,039	0.58%
Pauquachin First Nation	31,790	0.09%
Tseycum First Nation	12,556	0.03%
Institute of Ocean Sciences	11,150	0.03%
Department of National Defence	87,164	0.24%
Ganges Sewer	163,544	0.45%
Maliview Sewer	17,866	0.05%
Magic Lakes Estates Sewer	92,450	0.26%
Port Renfrew Sewer	20,425	0.06%
Total Flow	36,145,938	100.00%

Note: *Yearly flows cover the period 1 October 2012 to 30 September 2013

3.0 REGIONAL SOURCE CONTROL ACTIVITIES AND ACCOMPLISHMENTS–2013

Regional source control activities and accomplishments in 2013 are discussed under the following broad groups of activities:

- industrial, commercial and institutional liquid waste regulation
- enforcement
- contaminants management
- contaminant reductions
- significant incident reporting
- outreach
- partnerships initiatives
- data management
- revenue and expenditures
- planning and development
- performance measures

3.1 Industrial, Commercial and Institutional Liquid Waste Regulation

3.1.1 Regulatory Background

The Sewer Use Bylaw serves as the main regulatory instrument for source control within CRD sanitary sewer systems. The bylaw specifies the various regulatory conditions under which facilities must operate if they discharge non-domestic waste into a sanitary sewer. The regulatory conditions for businesses include operation under waste discharge permits, authorizations or sector-specific COP.

Following adoption of the Sewer Use Bylaw in August 1994, the RSCP focused primarily on identifying, inspecting, assessing and permitting larger industrial facilities and preparing authorizations for smaller commercial and institutional dischargers operating within the district. This process was largely completed over the period 1995-1998. Waste discharge permits require ongoing management, inspection and periodic amendment to accommodate changes in site-specific processes, practices and discharge conditions. New businesses continue to be assessed for operation under permits or authorizations each year.

In 1998, the focus of the program shifted toward development, adoption and implementation of COP to regulate discharges from larger numbers of smaller commercial and institutional facilities operating in the district. The first regulatory COP, considered to be unique in North America, were adopted in 1999 and inspections and enforcement for these codes commenced the following year. By the end of 2003, 11 COP had been adopted under the Sewer Use Bylaw. All codes were developed using extensive stakeholder involvement to help ensure their practicality and acceptance within each sector. For further information on COP, see Section 3.1.4.

The Sewer Use Bylaw and its associated policies and procedures have been amended periodically during the first 12 years of the program—largely to accommodate adoption of COP, but also to add new restricted waste limits and a structure for cost recovery.

3.1.2 Waste Discharge Permits

Waste discharge permits are site-specific regulatory documents, issued to businesses or institutions under the CRD Sewer Use Bylaw, that outline requirements for wastewater pre-treatment, effluent quality, monitoring and reporting. Waste discharge permits are issued to facilities or operations that discharge significant non-domestic wastewater flows (greater than 10 m³/day) or wastewater containing high loads of restricted wastes or specified chemical contaminants into the sanitary sewer. Table 3 provides a summary of waste discharge permit activity in 2013.

Table 3: Summary of Waste Discharge Permit Activity in 2013

Waste Discharge Permit Activity	2013
Permits active (at year end)	33
New permits issued	2
Permits closed	2
Permits amended	4
Permit site inspections (including evaluations for new permits)	66

At the end of 2013, there were 33 active waste discharge permits being managed by RSCP staff. The majority of these permits were ongoing, with no expiry date. Two new permits were issued, four permits amended and two permits closed. The two new permits were issued for short-term discharges of seawater from a Department of National Defense (DND) ship-repair caisson. Both permits had set expiry dates.

Permit management activity includes reviewing discharger self-monitoring reports on a monthly or quarterly basis, preparation of compliance letters, meetings and regular phone contact with permittees and site inspections. Permit managers are also responsible for comparing CRD audit sampling data to permittee self-monitoring data and submitting permit fee billing information to CRD Finance and Technology Department, Financial Services Division.

All permit inspections scheduled at the beginning of 2013 were completed within the year. During 2014, inspection staff will continue to conduct investigations into new non-domestic waste dischargers to assess the need for regulation of dischargers either as permits or authorizations.

3.1.3 Authorizations

Letters of authorization are issued under the Sewer Use Bylaw in cases where overall contaminant loads to sanitary sewer are low or where discharges are predicted to have a minimal impact on collection and treatment systems and/or the receiving environment. Authorizations contain site-specific discharge requirements and best management practices (BMP) designed to decrease the impact of the discharge or limit the potential for illegal discharges. They are normally issued without expiry dates. Some authorizations have self-monitoring and/or reporting requirements.

Authorizations are commonly issued to regulate unusual discharges or discharges from small groups of similar operations, such as ship and boat waste facilities, laundromats and sani-dumps. They can also be issued to businesses where a COP is either planned or under development or where requirements differ from those specified in a code.

Inspections are carried out on a periodic basis by source control staff with an emphasis on those authorizations which had previously been regulated under permits or those which include operations discharging priority contaminants. Table 4 summarizes authorization activity in 2013.

Table 4: Summary of Authorization Activity in 2013

Authorization Activity	2013
Authorizations active (at year end)	87
New authorizations issued	10
Authorizations closed or transferred to codes or permits	7
Authorizations amended	0
Authorization site inspections (including evaluations for new authorizations)	33

Regular inspections were originally scheduled for 23 existing high priority authorizations in 2013. Overall, 33 inspections were completed for high priority and new authorizations by December 2013.

Examples of authorization activity in 2013 included the following:

- Three vehicle wash operations associated with automotive sales and repair facilities were issued authorizations to allow operation with alternate treatment works. These authorizations require effluent quality monitoring and reporting to demonstrate acceptable results.
- A hospital food services facility was issued an authorization to allow operation with a solids interceptor upstream of an undersized grease interceptor which was installed due to space constraints. This authorization requires effluent quality monitoring and reporting to demonstrate acceptable results.
- An authorization was issued for the treatment and disposal of surface water collected in an excavation for an above-ground storage tank.

3.1.4 Codes of Practice

Background

The CRD has made commitments in the Core Area and Saanich Peninsula LWMPs to the development and implementation of COP to regulate non-domestic waste discharges from commercial and institutional sectors to the district's sanitary sewers. The RSCP defines COP as "regulatory documents containing mandatory sanitary sewer discharge standards for specific industrial, institutional or commercial sectors."

RSCP staff began developing COP in 1996, following consultants' recommendations that this approach would be well-suited to the CRD's existing blend of small industrial facilities, commercial businesses and institutions. COP development and adoption became one of the main focal points of program activities over the period 1998-2003. Stakeholder task forces were formed for each code sector to guide the development process and to help ensure the practicality and effectiveness of the final product. By December 2003, the development and adoption process for COP had been completed on schedule. All codes had been fully implemented by January 2005. The adoption, amendment and effective dates of the 11 codes are summarized in Table 5.

Table 5: Summary of RSCP Codes of Practice Adoption and Effective Dates (Bylaw No. 2922)

Code of Practice	Adoption Date	Initial Effective Date (New Operations ¹)	Final Effective Date (Existing Operations ²)
Food Services Operations	24 November 1999 ³	1 January 2000	1 January 2003
Dry Cleaning Operations	24 November 1999 ⁴	1 January 2000	1 July 2004 ^{4,6}
Photographic Imaging Operations	24 November 1999	1 June 2000	1 June 2000
Dental Operations	22 November 2000	1 January 2001	1 July 2001
Automotive Repair Operations	12 December 2001 ⁴	1 January 2002	1 January 2004
Vehicle Wash Operations	12 December 2001 ⁴	1 January 2002	1 January 2005
Carpet Cleaning Operations	11 December 2002	1 July 2003	1 July 2003
Fermentation Operations	11 December 2002	1 January 2003	1 July 2003 ⁵
Printing Operations	11 December 2002	1 January 2003	1 January 2005
Laboratory Operations	10 December 2003	1 January 2004	1 July 2004 ⁶
Recreation Facility Operations	10 December 2003	1 January 2004	1 January 2005 ⁷

Notes Table 5:

- ¹ Businesses or institutions that commence operation within a specific code sector on or after the code's initial effective date.
- ² Businesses or institutions that were operating within a specific code sector before the code's initial effective date.
- ³ Code amended December 2001 and March 2003.
- ⁴ Code amended December 2003.
- ⁵ For fermentation operations producing waste containing yeast.
- ⁶ Spill response plans required.
- ⁷ Monitoring point installation required.

In general, COP include mandatory requirements for waste treatment, inspection, maintenance and record keeping for businesses and institutions discharging non-domestic wastes to sanitary sewer. They are believed to be among the first of their type to be adopted in North America. RSCP staff have prepared plain language guidebooks for each code sector explaining the applicable regulations and providing BMP to help businesses achieve compliance and improve environmental performance. These guidebooks are also accessible through the program's webpage.

Code of Practice Inspection Summary–2013

In 2013, RSCP continued to emphasize customer service and support as part of COP inspections, in addition to inspection targets. This direction was a result of the 2010 transfer of the RSCP into the Environmental Partnerships Division (Partnerships). The focus shifted to supporting customers in achieving compliance, sometimes at the cost of multiple visits to the same establishment.

Five inspectors conduct all of the COP inspections, in addition to managing the RSCP permits and authorizations. During front-line interactions with businesses, the inspectors also provide auditing and reporting services for other CRD programs, working proactively with stakeholders, providing technical services to other Environmental Services projects or programs as required, and participating in the development and implementation of outreach initiatives.

Efforts to inform businesses about other CRD programs, coordinate inspections with other regulators, and provide augmented services such as water audits have been successful. Regional Source Control Program inspectors provide customers with literature and contacts for Cross Connection Control, Trucked Liquid Waste, and current initiatives such as the Regional Kitchen Scraps Strategy.

Table 6 provides a summary of COP inspection activity in 2013. The sector estimates shown in the table are the numbers of active operations estimated within each sector at the beginning of each year. The total number of site inspections includes first (or primary) inspections within an inspection cycle and repeat (or follow-up) inspections to confirm compliance status. The overall inspection levels in 2013 (1254) were significantly higher than those recorded in 2012 (815), 2011 (577) and 2010 (657).

Table 6: Summary of Code of Practice Activity in 2013

Code of Practice	Est. Sector Size (2013)	# Site Inspections (2013)
Automotive Repair	148	15
Carpet Cleaning	21	37**
Dental	111	133
Dry Cleaning	13	1
Fermentation	29	37
Food Services	980	917
Laboratory	45	3
Photographic Imaging	115	86
Printing	25	3
Recreation Facility	11	15
Vehicle Wash	29	7
Total COP Operations	1527	
Total COP Site Inspections		1254

Note: * Includes both primary and repeat inspections.

**Numbers indicate surveyed businesses

As part of the customer service focus, inspection targets for selected sectors were set and thoroughly reviewed. The “sector-by-sector” review process includes inspecting all the businesses due for an inspection in each sector for baseline compliance status and reviewing the COP for any necessary amendments or updates. In 2013, the sectors focused on were the fermentation, recreation facilities, dental, carpet cleaning, photographic imaging and food services.

Since 2003, when the fermentation COP was written, the landscape of the fermentation industry has changed immensely. There has been a dramatic decline in the number of U-vint and U-brew operations and an increase in the number of microbreweries. As such, a comprehensive investigation of this sector was launched, including a review of code feasibility for solids diversion, consideration of emerging markets potentially not captured in the original code (e.g., spirits and cider distilling operations), and inspections of operations currently discharging to onsite septic systems – to prepare operations for potential future discharge to sanitary sewer, deliver onsite/source control cross messaging, and strengthen the partnership between the Onsite Wastewater Management Program and RSCP. In total, 33 U-Vint, microbrewery, U-Brew, vineyard (1), distillery (1) and cider house (1) facilities were inspected.

Similar to fermentation, the COP for recreation facility operations was reviewed to assess whether the code was effectively addressing concerns of high suspended solids such as ice paint and pool filter media along with high chlorine and chloride concentrations. Fifteen facilities were reviewed and categorized into facilities that operate a pool only, ice rink only, or both. The review recommended a revised Best Management Practice guideline for the sector along with the transfer of facilities with high volume sewer discharge and offsite waste management to authorizations in lieu of continued regulation through the code.

A stakeholder engagement process with the carpet cleaning sector, that included a telephone survey, was conducted in 2013 to help better direct and solicit industry cooperation for a thorough inspection schedule (to be conducted in 2014). The survey was designed to gain a better understanding of how the bylaw and COP requirements relate to carpet cleaning operations and to assess current industry practices. This sector is particularly difficult to regulate, as the majority of the businesses are mobile. Of the 106 businesses contacted, 23 completed the survey in whole or in part. Despite challenges with sector engagement, it was recommended that the status quo be maintained: conducting inspections on a 5-year cycle with periodic sampling to ensure consistent communication and current awareness of practices within the sector.

The photographic imaging sector is one that has undergone rapid change in recent years with the advent of digital photography, significantly decreasing discharges of silver to sanitary sewer. In 2013, RSCP inspectors worked with 86 facilities currently regulated under this code. Continued work within this sector is expected in 2014, with recommendations for modifications to the code to reflect current industry practices.

In 2013, 627 food services operations were inspected for a total of 917 inspections, including 290 follow-up visits for compliance and/or further support. For comparison, 133 dental inspections were carried out with 13 follow-up visits.

In 2013, RSCP staff initiated a pilot project to test the effectiveness of automatic grease recovery devices in the food services sector. The study measured fats, oil and grease removal efficiencies using two technologies which are not currently accepted for installation under the food services COP, against two conventional grease interceptors that are accepted under the same code. Phase I of the study (involving a craft burger restaurant) was completed in 2013 and Phase II (proposed at an Asian food restaurant) is scheduled for 2014.

Although the automotive and vehicle wash sectors were not targeted for inspection in 2013, there was a significant resolution of a previous compliance issue related to undersized treatment works and application of alternative treatment works at three separate operations. In each case, it was found that the treatment works, although technically non-compliant with the applicable COP, were thought to be adequate for sufficiently treating the wastewater. After a thorough review and modifications to operating practices, all three operations were moved to regulation under authorizations.

3.1.5 Coordinated Inspections

A primary goal of the Environmental Partnerships Division is to provide superior customer service to businesses regulated by three CRD bylaws (Sewer Use Bylaw No. 2922, Water Conservation Bylaw

No. 3061 and Cross Connection Control Bylaw No. 3516). The opportunity to provide better service in less time is achieved through a “water management” approach to business owners, combining wherever possible, services related to all three bylaws in fewer visits. Superior customer service is further achieved through collaboration with our external regulatory partners (e.g., Vancouver Island Health Authority (VIHA) and municipal inspectors) and other CRD divisions. Aligning with the Partnerships theme, other CRD Environmental Services programs have capitalized on the visibility and established relationships of RSCP inspectors with the business community. As such, inspectors have been called upon to represent a variety of programs with their inspections, helping customers to access information, services and grants or through provision of relevant information to customers on behalf of other CRD programs.

This approach required adoption of a “coordinated inspection” which was subsequently defined as:

Working with all our partners, Environmental Partnerships provides augmented inspection services that achieve superior customer service and promote high environmental performance within businesses.

In total, 500 coordinated inspections were completed in 2013. These inspections included:

- **Cross Connection Control (CCC) inspections – information sharing:** CCC inspectors attend RSCP bi-weekly meetings, as needed, for updates on targeted sectors. Both programs share information relevant to improving and aligning inspection strategies such as related renovations occurring, opening of new businesses, changes in ownership, and compliance observations.
- **VIHA applications for food facility forms:** VIHA admin staff direct hundreds of new food facility applicant forms to the RSCP inspection team via email. The forms indicate either a change of ownership or a new business, both of which are a priority for inspectors to communicate bylaw requirements and services available via a site visit, phone call or email.
- **CRD programming and initiatives:** Inspectors helped their customers to stay informed on CRD programs and initiatives that are relevant to their business such as the Regional Kitchen Scraps strategy. RSCP inspectors distributed brochures, engaged in dialogue, and connected their customers with primary contacts for these programs.
- **Multi-jurisdiction combined inspections:** On several occasions, RSCP inspectors combined site visits with one or more additional regulators from either VIHA or a municipality to assess compliance with multiple bylaws and/or regulations.
- **Multi-jurisdiction resource sharing:** On several occasions, RSCP inspectors worked with City of Victoria staff, sharing equipment, translating services, and inspection powers.

3.1.6 Monitoring

RSCP staff carried out the following types of monitoring in 2013: permit compliance, authorization compliance, code of practice and key manhole monitoring. All wastewater samples collected in 2013 were analyzed by a contract laboratory using standard analytical procedures specified in the *RSCP Sampling and Analysis Procedure Manual*. The RSCP monitoring program was reviewed in 2008 as part of the internal program review. The new RSCP work plan developed for 2009-2010 included a general refocusing of monitoring efforts on the identified priority contaminants and their sources. Monitoring of dewatered sludge produced at the SPWWTP commenced in March 2013. Table 7 provides a summary of RSCP monitoring activity in 2013.

Table 7: Summary of RSCP Monitoring Activity in 2013

Monitoring Events	2013
Permit compliance	56
Authorization compliance	14
Code of practice	24
Key manhole	14
SPWWTP influent	12
SPWWTP dewatered sludge	16
Ganges influent and mixed liquor	12

Permit Compliance Monitoring

Businesses operating under waste discharge permits are required to carry out self-monitoring of their wastewater for a range of parameters on a specified regular basis. This data is normally submitted to RSCP staff on a monthly or quarterly basis for compliance assessment. An important component of the RSCP is the collection and analysis of audit samples from each permitted site twice per year. This is done to verify compliance and confirm that the self-monitoring data being submitted are representative of discharges from each permitted site. RSCP staff normally collects these samples throughout the year following a pre-arranged schedule. Additional sampling events are carried out, as necessary, on suspected problem discharges from permitted sites.

The average number of scheduled audit events per permit in 2013, was two. The goal of collecting audit samples from each permitted site twice per year was achieved at all except one permit site. The sample was not collected due to a review of the operations of the permit site. One permit site was sampled three times to assist the site in becoming compliant.

The environmental science officer (ESO) responsible for managing a specific permit reviews the data submitted by the permittee. The ESO then compares contaminant loads; calculated using the two most recent audit sampling results, with the corresponding loads calculated using the previous 12 self-monitoring results from that site. This comparison is carried out using a non-parametric statistical test to determine if a significant difference exists between the two data sets at the 95% confidence level. If a significant difference is detected, the permittee is contacted and an investigation into the discrepancy is initiated.

The majority of all audit results obtained in 2013 were not significantly different from self-monitoring results reported from the same site. This indicated that most of the self-monitoring results being submitted by permittees had been collected and analyzed in an appropriate manner as required by each permit. Any discrepancies noted at a small number of sites were resolved early in 2014 following comparative sampling investigations.

Since RSCP audit monitoring is carried out in accordance with strict quality assurance procedures, it provides reliable information when calculating characteristic contaminant levels or loads for a particular industry or business type. This information is useful for planning purposes in specified collection areas.

Authorization Compliance Monitoring

Monitoring was also carried out in 2013 at twelve businesses operating under authorizations with self-monitoring requirements. The RSCP monitoring provides, at minimum, an annual check on the quality of effluent being discharged by businesses known to have reported restricted waste generation or handling on site. The results of this monitoring indicated that discharges from authorizations in 2013 were generally in compliance with Sewer Use Bylaw restricted waste limits.

Code of Practice Monitoring

A new sector-focused approach to COP monitoring was chosen for implementation in January 2012. The new approach involves focusing on fewer sectors per year but sampling the entire sector, where possible,

rather than a portion of it. This focused monitoring is coordinated with inspections in order to address any compliance issues which may influence monitoring results.

The new monitoring approach generates a comprehensive overview of the composition of the wastewater within each sector and provides information on the effectiveness of specified treatment works at reducing contaminant loads. The data generated also assists businesses in meeting the restricted waste criteria defined in the CRD Sewer Use Bylaw (Bylaw No. 2922).

Businesses operating under codes are not required to sample their own wastewater and report results to the RSCP. Compliance with a code is usually achieved by installing the required properly sized treatment works, carrying out regular maintenance and keeping records.

Food Services

In 2013, COP monitoring was carried out on one of the 11 regulated sectors (food services), with a total of five sites, each sampled three times. In past years, random samples had been taken at various types of food sectors such as fast food, family restaurant and pizza places. However, in 2013 it was proposed that three samples be taken at each of five different types of food service operation. These samples were taken at strategic times to give an indication of how well grease interceptors (GI) work when they are at various grease capacities.

The five locations chosen were an Indian restaurant, a fast food restaurant, a café, a burger restaurant, and a pizza place. Samples collected in 2013 were analysed for chemical oxygen demand (COD), total suspended solids (TSS), total oil and grease (TOG), pH, and temperature.

TOG is the primary parameter of concern in the food services sector, as it can have significant negative impacts on sanitary sewer infrastructure. Fifty percent of the time, the food services operations sampled in 2013 were not able to stay below the sewer use bylaw limit of 100mg/L. All of the food service types did have at least one result below the limit, except the burger restaurant, which had zero TOG results below 100mg/L.

The pH range of 5.5-11, set out in Bylaw No. 2922, was attainable by most food service sectors. It was proposed that the acidic pH detected at pizza places (average pH of 3.85) was due to the large volume of tomato sauce used within these establishments.

The TSS limit of 350mg/L was attainable for some of the food service types, but the Indian food and burger restaurants consistently were well above the limit. The COD limit was nearly impossible to meet for all of the food service types. Only one single sample result, at the café, was below the bylaw limit of 1000mg/L.

Overall, no correlations could be determined between grease levels within GI's and reduction of pH, TSS, TOG, and COD at various GI capacities.

Recommendations from this food services monitoring project included:

- That an investigation be carried out to determine possible measures that pizza places could employ to raise their pH levels to within the accepted limits.
- That further monitoring of this type be carried out at additional food service locations to increase the sample size and see if any further conclusions can be drawn regarding efficacy of GI's at various levels of capacity.
- That more sampling events are included between GI cleanouts to determine if any trends in GI efficiencies can be observed.

Key Manhole Monitoring

Key manhole monitoring is carried out to monitor for contaminants originating from sources within wide sanitary sewer collection areas. This includes monitoring at three residential sites and two DND sites within the Macaulay Point and Clover Point collection areas. It also includes one residential site and Victoria International Airport within the Saanich Peninsula wastewater treatment plant (SPWWTP) collection area.

- Residential Sites

Residential (or domestic) key manhole monitoring has been carried out by RSCP staff since 1996. This sampling has provided information on background levels of typical contaminants found in residential wastewater and the data have been used to predict contaminant loads from domestic sources for planning purposes.

The 2013 residential sampling program included sampling events at Dean Park (North Saanich), Harling Point pump station (Saanich) and Lang Cove pump station (Esquimalt) in April, July and October. All events included sampling and analysis for a wide range of parameters, including priority contaminants. No results were in exceedence of sewer use bylaw restricted waste limits at any of the sites sampled in 2013.

- DND Sites

In 2013, key manhole sampling was carried out at the Esquimalt pump station, serving the DND Dockyard area and at the DND Colwood pump station in April and October. No results were in exceedence of sewer use bylaw restricted waste limits at any of the sites.

- SPWWTP Collection Area Sites

Monitoring at the Airport #5 site was continued and samples were collected in April and October. No results were in exceedence of sewer use bylaw restricted waste limits.

Treatment Plant Influent Monitoring

Monthly grab samples (for metals analysis) and four composites (for metals and priority pollutant analysis) of SPWWTP influent have been collected annually by RSCP staff in past years. Monthly grab sampling was discontinued in June 2007, following a consultant's review of the plant's influent/effluent sampling program.

The monthly grab samples were replaced by quarterly triplicate composite sampling and analysis beginning in April 2008. This triplicate composite sampling, conducted by Marine Programs staff on behalf of RSCP, is now referred to as "quarterly plus" sampling. There were four "quarterly plus" sampling events at SPWWTP in 2013.

Eleven mixed liquor (treatment plant wastewater mixed with activated sludge) samples (for metals analysis) were also collected from the Ganges wastewater treatment plant (GWWTP) for analysis in 2013. Samples were collected on ten separate monthly occasions, with a duplicate sample taken in February. A single sample of influent was also collected during July for priority pollutant analysis.

The mixed liquor and influent data are routinely entered into the Environmental Services Information System (ESIS) database and used to identify contaminants of concern, provide ongoing information on contaminant variability, loads and trends at the treatment plants and provide input to planning initiatives.

3.2 Enforcement

The district has adopted a stepwise approach to enforcement of the Sewer Use Bylaw as outlined in the *Regional Source Control Program Enforcement Policy*. This enforcement policy classifies offences, outlines enforcement steps and includes use of cooperative measures, such as increased

communication, education and monitoring, to resolve issues of non-compliance. The policy was originally approved by the CRD Board in February 1997 and was last amended in November 2006.

The CRD Ticket Information Authorization (TIA) Bylaw contains fines (tickets) that have been set for specific offences under the Sewer Use Bylaw and its associated COP. This bylaw was last amended in December 2006.

Enforcement activities are directed at ensuring or restoring discharger compliance with the terms and conditions of the Sewer Use Bylaw, waste discharge permits, authorizations and COP. Enforcement action is applied in an escalating manner that is reasonable, fair, consistent and impartial. Warnings, tickets, orders and fines are issued, as necessary, in cases of continuing non-compliance.

The strategic direction and implementation approach outlined in the 2009 Service Delivery Review specified introduction of a more supportive, proactive and collaborative approach to enforcement within the Environmental Partnerships Division. This more collaborative approach has been applied by RSCP staff since 2010.

Operations Regulated By Waste Discharge Permit

Of the 33 active waste discharge permits in place at the end of 2013, 15 sites were in “full compliance” with their permits and the Sewer Use Bylaw. No sites were classified as dischargers under review (DUR). The remaining 18 sites were considered to be “in progress”, but still in compliance with their permits under the enforcement policy. The enforcement levels and numbers of permits at each level are summarized in Table 8.

Table 8: Summary of Waste Discharge Permit Compliance (2013)

Enforcement Level	Number of Permits
Full Compliance	15
Step 1	8
Step 2	2
Step 3	3
Staff Assessment	5
Discharger Under Review (non-compliant)	0

Above Step 3, a significant escalation of enforcement action occurs, including notification of compliance status by letter, increased inspection or monitoring frequency, staff assessment of treatment works or procedures and scheduling of meetings to discuss remedial actions. Commitments and requirements agreed to at these meetings are confirmed in a follow-up letter to the permittee. Further non-compliance incidents can result in elevation from staff assessment to DUR status. Dischargers at the DUR level or above are considered to be non-compliant with their permits.

Operations having DUR status must prepare and submit a detailed compliance plan for approval by the deputy sewage control manager (DSCM). A 90-day period is allowed for the preparation of this plan. This period of time allows for a discharger to hire a consultant to help determine appropriate actions to achieve compliance. Progress meetings are held with the discharger after 30 and 60 days to measure progress, fully communicate the intent of any requirements and clarify any outstanding issues. A compliance plan, once approved by the DSCM, becomes a compliance program that usually forms part of the discharger's waste discharge permit through an amendment.

If no acceptable compliance plan is received within the 90-day period, an order may be issued under the *Environmental Management Act* to set conditions for discharge, or a lawyer's letter is issued. Failure to comply with an order or a lawyer's letter will result in consideration of legal action.

Five permit sites classified above Step 3 were subject to assessment by RSCP staff in 2013. These sites included:

- A landfill site was assessed regarding sulfide exceedences in 2012 and 2013 which reportedly did not respond to the nitrate amendment procedure specified in the permit. A consultant's report was submitted in October 2013 regarding the circumstances which may have led to the exceedences. A contingency plan to install aeration in the lower leachate lagoon was developed in 2014.
- A dairy product manufacturer was elevated to staff assessment in November 2013 following exceedences of permitted total oil and grease limits. A staff assessment report was submitted in January 2014 outlining possible reasons for the exceedences and potential solutions.
- A septage disposal facility and an oily wastewater treatment facility continued to be placed under staff assessment for sulphide exceedences in 2012 and 2013. The permits for these sites were amended in January 2014 and April 2014 respectively to include sulphide reduction measures.
- A street waste treatment facility continued under staff assessment for exceedences of total suspended solids, chemical oxygen demand and total oil and grease in 2013. A report regarding the circumstances potentially leading to the exceedences and possible solutions was submitted in July 2013. Changes in operating procedures and maintenance of the treatment works are currently being implemented to address these exceedences.

No charges were laid against waste discharge permit holders under the Sewer Use Bylaw during 2013. The overall waste discharge permit compliance level was 100% ("full compliance" or "in progress").

Operations Regulated by Authorization

A small group of the total number of authorizations is scheduled for inspection each year based on the types of contaminants regulated, the contaminant levels, discharge volumes and the overall impact of discharges from these operations. Discharges from authorizations are considered to have a relatively minor impact in comparison to discharges from permitted facilities.

Thirty-three inspections were carried out at sites operating under authorizations in 2013. At the end of 2013, all but 10 of the inspected businesses were in full compliance with their authorizations. Two authorizations were classified as dischargers under review (DUR) at the end of 2013.

A ferry company continued to have exceedences of total sulphide levels in their ship and boat waste effluent resulting in an elevation of the status of the facility from staff assessment to DUR in November 2013. A compliance plan, including details regarding installation of odour control treatment works, was prepared and submitted to the deputy sewage control manager by the end of February 2014 in accordance with the RSCP enforcement policy. Odour control treatment was scheduled to be installed and operating by the summer of 2014.

A federally-owned ship and boat waste facility was classified as a DUR in October 2013 as a result of a discharge of prohibited waste (Bunker "C" fuel oil) into the CRD sanitary sewer system at Lang Cove pump station in September (see Section 3.5). A compliance plan was prepared by the authorized discharger and submitted to the deputy sewage control manager by the end of January 2014. Discussions regarding this significant incident were ongoing in 2014.

The overall compliance level ("full compliance" or "in progress") for the total 87 authorizations active at the end of 2013 was 98%.

Operations Regulated by Codes of Practice

The stepwise approach to achieve compliance is applied to all COP sectors in a similar way to dischargers operating under permits or authorizations as outlined in the enforcement policy. Dischargers are classified as being in "full compliance" if they have been inspected and no unsatisfactory issues are

identified. Dischargers having committed offences up to and including Step 3 are classified as being “in progress” and those at the DUR level and above are classified as being in “non-compliance” with the code. A summary of the COP enforcement results for inspections carried out from the implementation date of each code to 2013 is presented in Table 9.

Table 9: Codes of Practice Enforcement Summary—from implementation date to end of 2013

<i>Code of Practice</i>	<i>% Full Compliance¹</i>	<i>% In Progress²</i>	<i>% Non-Compliance³ (DUR)</i>
Automotive Repair	89	10	1
Carpet Cleaning	*68	32	0
Dental	87	13	0
Dry Cleaning	100	0	0
Fermentation	86	14	0
Food Services	87	12	1
Laboratory	91	9	0
Photographic Imaging	92	8	0
Printing	71	29	0
Recreation Facility	100	0	0
Vehicle Wash	88	12	0

Notes:

- ¹ Percentage of active operations, regulated within the sector and in compliance with all requirements of the code at the last inspection – including sites with required treatment works and those using offsite waste management.
 - ² Percentage of active operations, regulated within the sector classified at Step 1, 2 or 3 of the enforcement policy at the last inspection date.
 - ³ Percentage of active operations, regulated within the sector classified as DUR at the last inspection date.
- * Numbers based on 2014 findings to correspond with surveying done in 2013 within this sector.

Most COP enforcement actions to date have been associated with implementation of the food services code, which regulates one of the largest business sectors in the district. There has been good cooperation from this sector during application of the escalating approach to enforcement and approximately 12% of food services operations inspected were considered to be “in progress” and 1% were classified as DUR. The main non-compliance issues continued to be failure to install properly-sized grease interceptors and failure to maintain grease interceptors.

The vehicle wash sector had 12% of operations classified as “in progress” primarily for record keeping infractions; a decrease from 2012 (29%), likely due to the movement of several facilities to performance-based authorizations.

Progress on Proper Waste Treatment as Specified in Codes of Practice

Another measure of overall compliance levels can be obtained through the analysis of data related to proper waste treatment within each sector. This measure is based on the assumption that once properly-sized treatment works are proven, by inspection, to be installed at a site, they are unlikely to be removed by an operator at a later date. In addition, operations proven to be using offsite waste management on inspection can be assumed to be continuing to use this method of complying with the code. Data related to progress on waste treatment since full implementation of COP are presented in Table 10.

Table 10: Progress on Proper Waste Treatment since Full Code of Practice Implementation

Code of Practice	Date of Full Implementation	Percentage of Operations Properly Treating Waste ¹
Automotive Repair	1 January 2004	92
Carpet Cleaning	1 July 2003	95
Dental	1 July 2001	100
Dry Cleaning	1 July 2004	100
Fermentation	1 July 2003	97 ²
Food Services	1 January 2003	98
Laboratory	1 July 2004	100
Photographic Imaging	1 June 2000	98
Printing	1 January 2005	92
Recreation Facility	1 January 2005	100
Vehicle Wash	1 January 2005	72

Notes:

¹ Percentage of distinct regulated COP operations inspected since full implementation that had properly-sized treatment works in place, or were using offsite waste management, at the end of 2013.

² Compliance of treatment works based on solids diversion not manual pH adjustments.

For most code sectors, the percentages of operations properly treating waste remained approximately the same or higher in comparison to those reported in 2012.

3.3 Contaminants Management

Contaminants management represents a new phase for the RSCP, building on the program's successful regulatory approach, but involving a shift in focus towards avoidance, elimination or substitution of polluting products, processes or materials, in order to make reductions in specific priority contaminants that have proven difficult to control or treat. Contaminants management projects undertaken in 2013 are outlined below.

Source Control Strategies for Triclosan and Nonylphenols

One of the main findings of a project sponsored by the RSCP and undertaken by Royal Roads Environmental Science undergraduate students in 2012 was that triclosan, nonylphenols (NP) and nonylphenol ethoxylates (NPEs) were suitable for targeting for reduction by the RSCP. Consequently, in 2013, a consultant was retained to predict the environmental risks associated with these emerging chemicals in local wastewater, identify the main sources and potential source control strategies to reduce these risks.

The main findings of the consultant's report (Ecofish Research Ltd., 2014) included:

- Triclosan, an antimicrobial agent commonly included in a wide range of personal care products, is toxic to aquatic life (particularly algae) and is bioaccumulative.
- Local concentrations of triclosan in diluted effluent were predicted to be well below levels expected to be a risk to marine ecosystems.
- While Environment Canada prefers life cycle management and voluntary reduction in use of products containing triclosan to control discharges, the US Food and Drug Administration has proposed a new rule regarding antiseptic washes which may lead to more North American companies phasing out triclosan as an ingredient in such products.

- Triclosan is not currently being considered for source control actions in any Canadian jurisdictions.
- NPEs are non-ionic surfactants used in a variety of chemical detergents and other household and commercial products. NP are one of the final degradation products of NPEs and are also used in the manufacture of NPEs.
- Short-chain NPEs and NP have estrogenic properties and are toxic to aquatic organisms.
- Concentrations of NP and NPEs in local effluent are similar or less than typical levels in wastewater from other jurisdictions. Concentrations in diluted local effluent were predicted to meet marine water quality guidelines and risk to the local receiving environment was estimated to be low.
- Toronto and Winnipeg have established restricted waste limits for NP and NPEs in their sewer use bylaws. Metro Vancouver is proposing adoption of similar limits.
- The European Union has a conditional ban on NP/NPEs production. This, coupled with substitution with alcohol ethoxylates, has been identified as the most cost effective and recommended reduction strategy.

Report recommendations included:

- A stand-alone source control campaign aimed at triclosan reduction is not recommended due to the significant reduction efforts currently underway at the federal level in both Canada and the US. This strategy should be reassessed in five years to determine if federal reduction efforts have been effective.
- Monitor triclosan levels in wastewater discharged through CRD outfalls on a quarterly basis, three years and five years from now to provide information for the above reassessment.
- Information on avoiding the use of products containing triclosan, with substitution of alcohol-based sanitizers where practical, be included along with ongoing residential source control outreach initiatives.
- Continue research into NP and NPEs in support of the significant international and federal measures to reduce NP/NPEs levels in a range of products.
- Conduct a mass balance study to include NP/NPEs along with other contaminants of concern in order to determine the main sources of these compounds within the region.
- Develop and distribute BMPs to companies that supply the public with detergents and textiles, and industries most likely to contribute NP/NPEs to the sewer system.
- Increase awareness of companies that have adopted NPE reduction strategies.
- Continue implementation of ongoing outreach regarding surfactant reduction, including refresher outreach in use of common cleaning products and use of alternatives.
- Consider adoption of restricted waste limits for NP and NPEs within the CRD Sewer use Bylaw – following the example of three other Canadian jurisdictions.
- Reduce the purchase and use of products containing triclosan and NP/NPE within the CRD organization itself.

Arts and Crafts Waste Best Management Practices (BMPs)

Building on the results of a Royal Roads University (RRU) study on arts and crafts waste in 2012 and a subsequent consultant's survey and preparation of draft BMPs, CRD staff undertook a stakeholder consultation process to assist with further development of arts and crafts sector BMPs in early 2013, including the preparation of a draft brochure for distribution within the sector.

The key findings from the stakeholder consultation process were:

- A partnership with the CRD for delivery of the education and outreach materials was agreed to, or positively responded to, by all engaged stakeholders.
- Health was the predominant motivator for modifying procedures or materials choices.
- Convenience and efficacy were barriers for modifying procedures or materials choices.
- The draft brochure was considered an effective informational tool with just enough information to be useful, be retained for future reference and provide useful links to additional information.
- The concept of a "rack card" was mentioned as being too disposable to align with a sustainability message.
- "MyRecyclopeda" was considered a useful platform for providing recycling and disposal information on the wide range of arts materials in common use.
- The arts community utilizes social media as a communication tool to connect the diverse, disparate, and scattered individuals and communities and is considered a useful tool for disseminating information and receiving feedback.

The key recommendations of the report were:

- Develop outreach strategies targeting art education institutions, artist organizations, art supply businesses and artist events.
- Develop education and outreach materials and tools that include a brochure, MyRecyclopeda listings, CRD website, FAQs, pull-up banner, partnerships links, and social media distribution.
- Build partnerships with key stakeholders for distribution of education and outreach materials at community events such as neighbourhood studio tours and community art shows.

Investigation of Floor Care Trade Wastes

In 2013, the RSCP sponsored an investigation into floor care trade wastes, practices and regulations. The investigation was undertaken as a RRU Environmental Science undergraduate program "major project". CRD staff contributed to the project by developing the scope and providing technical expertise and guidance to the students. The investigation included a literature review, an examination of standards and regulations from other areas in Canada and Australia and interviews with a number of floor care service providers. A report, with a running title "Investigation of Floor Care Trade Wastes", and a presentation of the findings were delivered in August 2013.

The key recommendations of the report were:

- Development of a BMP document specifically for hard floor surface cleaning and maintenance.
- A reduction in the mesh size of the screen required in the code of practice for carpet cleaning operations from 0.25 mm to 0.01mm.

- Development and implementation of a sampling program to confirm the contaminants present in carpet cleaning wastewater and to determine if there are other contaminants of concern in wastewater generated by hard floor surface cleaning.

A review of the carpet cleaning sector, which includes hard floor surface cleaning, was scheduled for 2014.

3.4 Contaminant Reductions

3.4.1 Reduction Targets

The Core Area LWMP contains a commitment to develop “contaminant reduction targets” for existing and future waste discharge permit holders and COP sectors. Since the RSCP’s jurisdiction extends beyond the core area, staff were requested to develop contaminant reduction targets that would be applicable in all participating sewage collection areas within the CRD.

Waste Discharge Permit Targets

The contaminant reduction targets established for waste discharge permit holders are generally considered to be the individual permit discharge concentration limits that are established either during the initial permitting process or during permit reassessment.

Many permit holders have consistently met their permit discharge concentration limits since their permit was issued through application of good operating procedures. Other sites have met their target concentration limits following installation of treatment works and/or adoption of good operating procedures or pollution prevention measures. At the end of 2013, 49% of permitted sites were meeting their target concentration limits and 51% were in progress toward meeting their targets. These estimates are based on the number of outstanding non-compliance issues due to permit limit exceedences for all permits in place at the end of 2013.

There have been significant contaminant load reductions over the years as a result of permitted sites implementing changes to meet their concentration limit targets (see Appendix 1).

Code of Practice Targets

Contaminant reduction targets were prepared for each of the 11 existing COP using the year before the full implementation date as the “baseline” year. The general procedure for setting the targets and annual progress reports has been documented in previous annual reports. The degree of achievement of each COP target was assessed following the completion of the five-year inspection cycle following full implementation of each code.

In 2009, the end of the five-year inspection cycle was reached for the final three COP that were fully implemented in January 2005. By the end of 2011, all five-year reduction targets established for COP had been achieved.

3.4.2 Marine Outfall Contaminant Reductions

One of the main objectives of the RSCP is protection of the marine receiving environment. A specific goal associated with this objective, included in both the Core Area and Saanich Peninsula LWMPs, is “to maintain or reduce effluent contaminant loadings to the receiving environment”.

Core Area Outfall Effluent

CRD marine programs staff regularly monitor effluent quality at the Macaulay and Clover point outfalls for a wide range of substances. Several trend analysis of the data collected through core area effluent monitoring have been carried out in the past (PLA, 2002; PLA, 2004; Golder Associates Ltd., 2006; Golder Associates Ltd., 2009a) and results have been summarized in previous RSCP annual reports.

The most recent effluent trend analysis was undertaken in 2012 (Golder Associates Ltd., 2013). This report provided a statistical assessment of wastewater trends at Clover and Macaulay point outfalls over the period 1990-2011 and wastewater and biosolids trends at the SPWWTP from 2000-2011. The findings of this report for Clover and Macaulay points over the 21-year period of record included the following:

- Overall, the trend results for priority substances evaluated in previous studies were confirmed in this latest assessment. Changes observed indicated more evidence of stable or decreasing loads of substances in the wastewater stream.
- Over the period 2009-2011 the detection frequency for several parameters has decreased dramatically. These parameters, now classified as “infrequently detected” (detected in less than 50% of samples analysed), include: mercury, hexavalent chromium, 1,4-dichlorobenzene, tetrachloroethene (PCE) and xylenes.
- Loads of priority metals (those presenting the greatest concern regarding aquatic toxicity) including cadmium, chromium, copper, lead, mercury, manganese, nickel and zinc exhibited significant decreases ranging from 1% to 19% per year.
- Cobalt loads showed a decrease of 7% at Clover Point and an increase of 3% at Macaulay Point.
- Loads of weak acid dissociable (WAD) cyanide showed a 6% increase at Clover Point; however, a trend for this parameter could not be determined at Macaulay Point.
- Organic compounds, including certain polynuclear aromatic hydrocarbons (PAHs), 1,4-dichlorobenzene and PCE showed significant decreases in loads, ranging from 2% to 16% per year.
- A significant decrease of 6% per year was also observed for oil and grease at both outfalls. Loads of mineral oil and grease decreased by approximately 4% per year.
- Several individual PAHs (e.g., fluorene, phenanthrene, 2-methylnaphthalene) displayed significant decreases in loads over time (2% to 10% per year).
- Phthalate esters did not exhibit significant trends in loads over time with the exception of an apparent decrease of 3% for diethyl phthalate.
- In general, interpretation of trends for PAHs and phthalates was confounded by elevated analytical detection limits in recent years.
- Non-priority substances showing increasing trends in loads at Macaulay Point included dimethyl ketone and trichloromethane. The result for trichloromethane may also have been influenced by elevated detection limits.

The continuing decreasing trends and recent changes in loads for most parameters are thought to be largely due to a combination of the success of source control efforts at regulating contaminants, increasing public and industry awareness regarding product selection and use of proper waste treatment practices. For example, the reported load reductions for PCE, a solvent commonly used in the dry cleaning industry, is probably linked to the adoption of an amended COP for dry cleaning operations in 2003.

The reported significant decreases in loads of mercury and silver are likely attributable to the implementation of the dental and photo imaging codes in the core area over the past few years. Significant decreases in loads of oil and grease at both outfalls are probably associated with the continued implementation of the food services COP and increasing compliance levels.

The continuing decreases in a range of metals, significant decreases in certain individual PAHs and mineral oil and grease are likely partly attributable to the full implementation of the automotive repair COP and vehicle wash COP in recent years.

The significant reductions in 1,4-dichlorobenzene may, in part, be due to the success of ongoing business and institutional outreach regarding the use of less harmful alternatives to urinal deodorizers which contain this chemical.

The slight increase in cobalt at Macaulay Point may be linked to an identified source which discontinued discharge to sewer in June 2010. This increasing trend is expected to reverse over the next few years.

The apparent increase in WAD cyanide at Clover Point over recent years will require further investigation. Wastewater contaminant trends at Macaulay and Clover points will continue to be monitored over the next few years with the next full trend assessment scheduled for 2015.

Further information about core area effluent quality in 2013 can be found in the upcoming Macaulay and Clover Point Wastewater and Marine Environment Program (WMEP) annual report for 2013, to be completed in October 2014.

Saanich Peninsula Wastewater Treatment Plant Influent and Effluent

Influent and effluent data has been collected at the SPWWTP since the plant commenced operation in 2000. The first summary of trends in these data was reported in Hatfield Consultants Ltd, 2005. Golder Associates Ltd., 2009a included a statistical assessment of wastewater influent and effluent trends at the SPWWTP over the period 2000-2008. Golder Associates Ltd., 2013 provided an update of trends to 2011. The findings of this report over the 11-year period of record at the SPWWTP included the following:

- Trends in influent and effluent contaminants were similar to those described in Golder Associates Ltd., 2009a in terms of direction and significance.
- A higher number of significant trends were observed than in the previous study due to an increase in statistical power through the addition of three years of sampling data.
- Reductions in detection frequency for several parameters have occurred since the previous report. Hexavalent chromium, 1,4-dichlorobenzene and total low molecular weight PAHs are now classified as "infrequently detected" (detected in less than 50% of samples analysed) in both influent and effluent.
- Priority metals generally showed significant decreases in influent loads. The largest decreases were observed for total arsenic, cadmium, chromium, lead, mercury, nickel and silver (ranging from 4% to 26% per year).
- There were significant increases reported in influent loads for total manganese, molybdenum and zinc (2%, 3% and 1% per year respectively).
- Other priority contaminants such as oil and grease and strong acid dissociable (SAD) cyanide showed significant decreases in influent loads of 6% and 7% per year respectively. Conversely, influent loads of WAD cyanide increased by 9% per year.
- In general, there were no significant trends in influent loads of PAHs and phthalate esters; however, one phthalate (bis(2-ethylhexyl)phthalate) demonstrated a significant decrease (4% per year) in influent loads over the study period.
- Assessment of trends for PAHs and phthalates were confounded by elevated detection limits for some samples from recent years. The report noted that trend results for these parameters should be interpreted with caution.

Source control initiatives appear to have yielded benefits in terms of concentrations and loadings of priority contaminants in both influent and effluent at the SPWWTP. Influent loads of several of the key metals of interest (arsenic, cadmium, lead, mercury, nickel and silver) exhibited significant decreasing trends over the study period. The large decreases in total mercury and silver loads in influent are likely associated with the implementation of the dental and photo imaging COP. In addition, significant decreases in loads of oil and grease in influent are probably associated with the continued implementation of the food services COP and increasing compliance levels within that sector.

Observed increases in molybdenum loads could be associated with the continued use of molybdate corrosion inhibitors in heating and cooling systems, as identified in earlier annual reports. Further investigations into the use and effectiveness of alternative, metal-free, corrosion inhibition products has been included in the RSCP five-year plan for 2011-2015.

The apparent increase in WAD cyanide, despite decreasing levels of SAD cyanide, will require further investigation by RSCP staff. In addition to continuing WAD cyanide analysis in influent and effluent, WAD cyanide analysis was added to dewatered sludge analysis in March 2013 in order to monitor temporal trends for this parameter. An analysis of WAD Cyanide loads from potential sources, including two permitted electroplating operations located on the peninsula, is scheduled for 2014.

Wastewater contaminant trends at SPWWTP will continue to be monitored over the next few years with the next full trend assessment scheduled for 2015.

Further information about the trend analysis and SPWWTP influent and effluent quality in 2013 can be found in the SPWWTP Wastewater and Marine Environment Program annual report for 2013, to be completed in September 2014.

3.4.3 Biosolids, Sludge and Mixed Liquor Contaminant Reductions

Another important objective of the RSCP is the protection of sewage treatment plant biosolids, sludge and mixed liquor quality. Biosolids are stabilized sludge from wastewater treatment processes that have been treated to allow beneficial recycling in accordance with the requirements of the *Organic Matter Recycling Regulation of British Columbia* (OMRR). Mixed liquor is the term used for a mixture of wastewater and activated sludge produced at a sewage treatment plant. The specific goal associated with this objective, included in both the Core Area and Saanich Peninsula LWMPs, is “to meet BC standards for Class A biosolids as outlined in the OMRR”. More specifically, these are the standards established for Class A compost set out in Schedule 4 of the OMRR and the Class A biosolids standards for maximum acceptable metal concentrations specified in Table II of Canadian Food Inspection Agency Trade memorandum T-4-93 (CFIA, 1997).

Lime and heat-treated biosolids produced at the SPWWTP have been monitored for a range of metals and other substances on a regular basis since the plant was commissioned in 2000. This monitoring ended in April 2011 following CRD Board direction to cease land application of biosolids. Monitoring of dewatered sludge produced at the SPWWTP commenced in March 2013. Monitoring of the mixed liquor produced at the smaller GWWTP began in 1994 and continued in 2013.

Saanich Peninsula Wastewater Treatment Plant Biosolids and Sludge

The quality of SPWWTP biosolids consistently met the most stringent (Class A) criteria for all parameters over the period 2000-2011. Biosolids trend analysis at SPWWTP (reported in Hatfield Consultants Ltd, 2005) confirmed that there were significant downward trends in mercury, chromium, barium and manganese concentrations over the period 2000-2004.

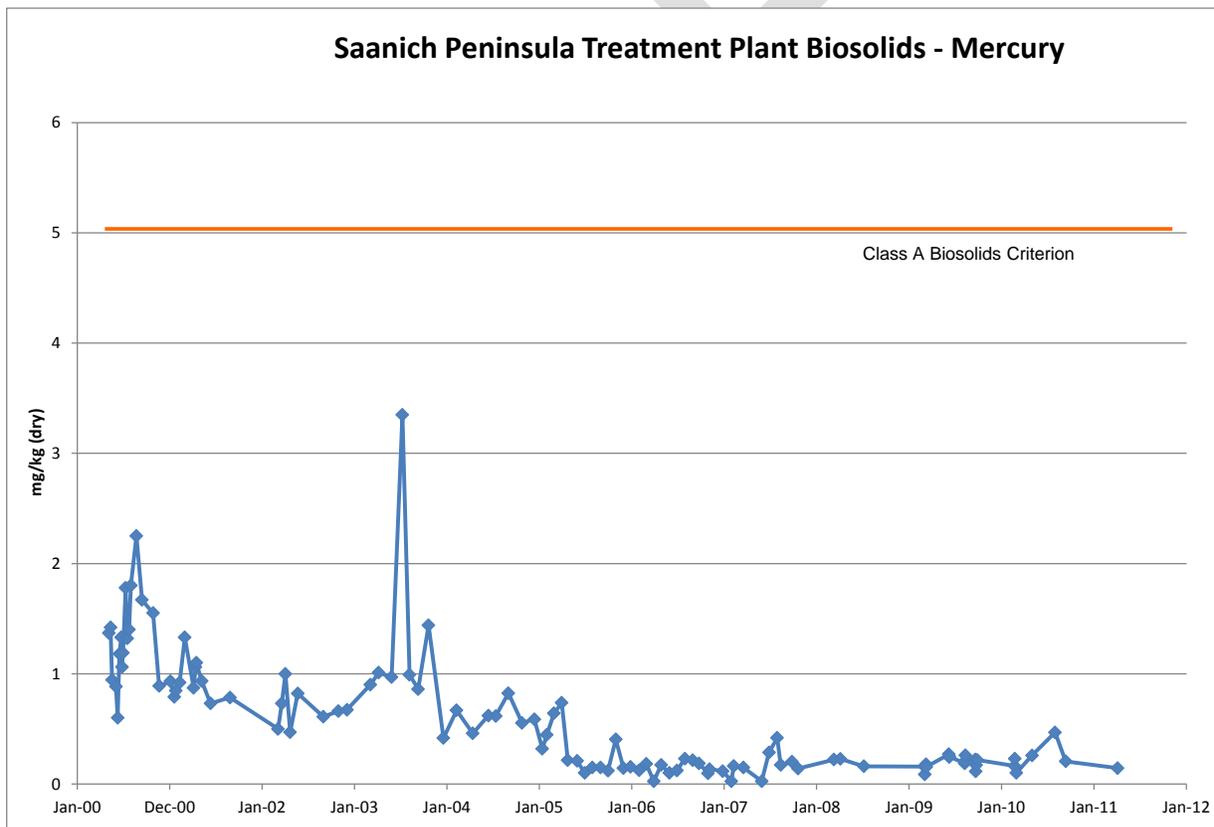
The Golder Associates Ltd., 2009a report included a reassessment of biosolids trends at the SPWWTP over the period 2000-2008 and Golder Associates Ltd., 2013 provided an update for the period 2000-2011. The main findings of this report included the following:

- Significant decreases in the detection frequency of a number of priority metals, including arsenic, cadmium, chromium, nickel and selenium were observed in the last three years.
- The detection frequency for lead and molybdenum increased significantly over the same period. This was largely attributable to a decrease in detection limit for these parameters in recent years.
- Significant decreases, ranging from 4% to 21% per year, were observed for concentrations of a range of priority metals including chromium, copper, manganese, mercury and zinc.
- The only substances for which a significant increase in concentration was observed were the unregulated, non-priority, elements calcium and strontium.

Many of the above observed decreases are likely a result of the application of source control regulations within the SPWWTP sewage catchment area, as previously noted for SPWWTP influent and effluent.

Mercury levels in SPWWTP biosolids met the Class A criterion of 5 mg/kg over the period 2000-2011 and have been less than 0.5 mg/kg since April 2005 (see Figure 1). These very low and relatively stable results confirm the continuing success of the implementation of the dental COP in July 2001 in reducing and controlling mercury levels in SPWWTP biosolids.

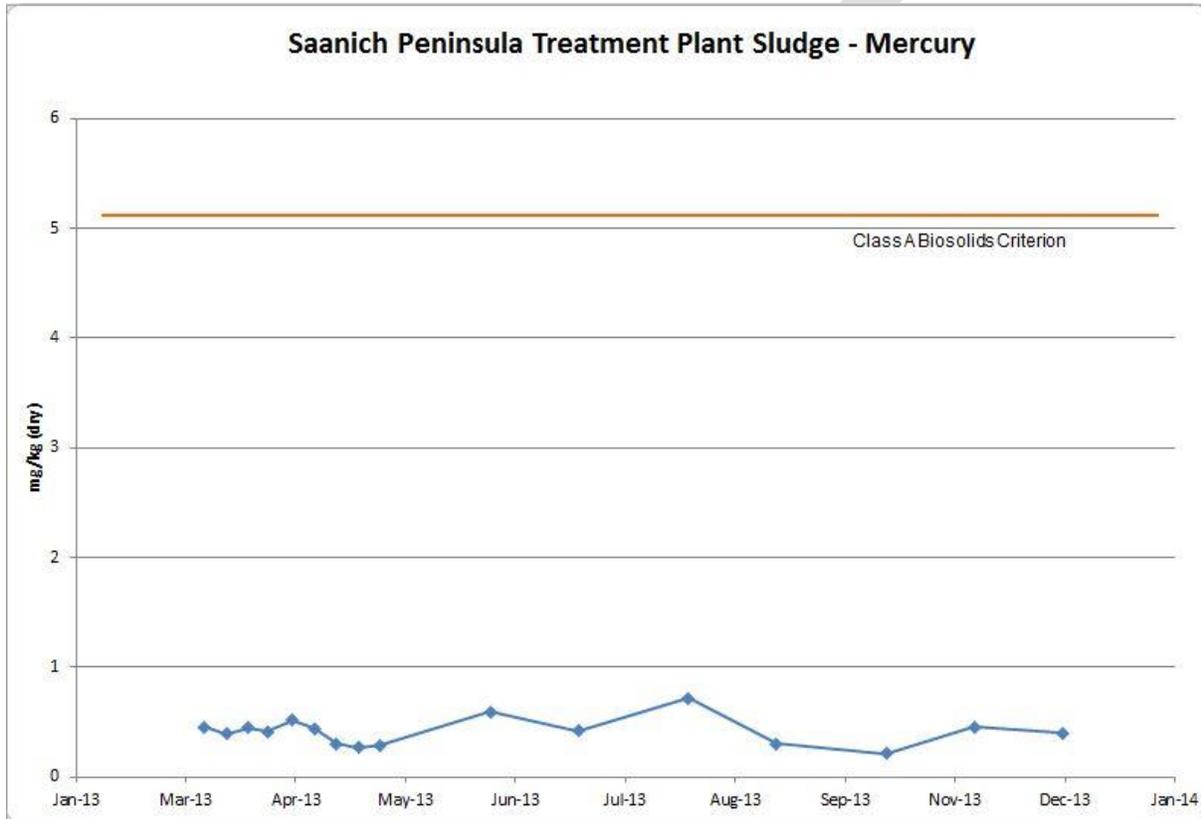
Figure 1: Mercury in Saanich Peninsula Wastewater Treatment Plant Biosolids (2000-2011)



Following CRD Board direction to cease land application of biosolids, SPWWTP produced only dewatered sludge after April 7, 2011. This sludge was not sampled or analysed prior to disposal at Hartland landfill as a controlled waste throughout the period April 2011 to February 2013.

A SPWWTP dewatered sludge monitoring plan was developed and implemented in March 2013. The dewatered sludge is not a biosolids product as defined by the OMRR. The sludge is sampled and is assessed using the Class A biosolids quality criteria for comparison purposes to evaluate overall metal concentrations and end-product quality. This monitoring is not intended to characterize the material as a biosolids product. The first year's results for mercury in dewatered sludge are presented in Figure 2.

Figure 2: Mercury in Saanich Peninsula Wastewater Treatment Plant Sludge (2013)



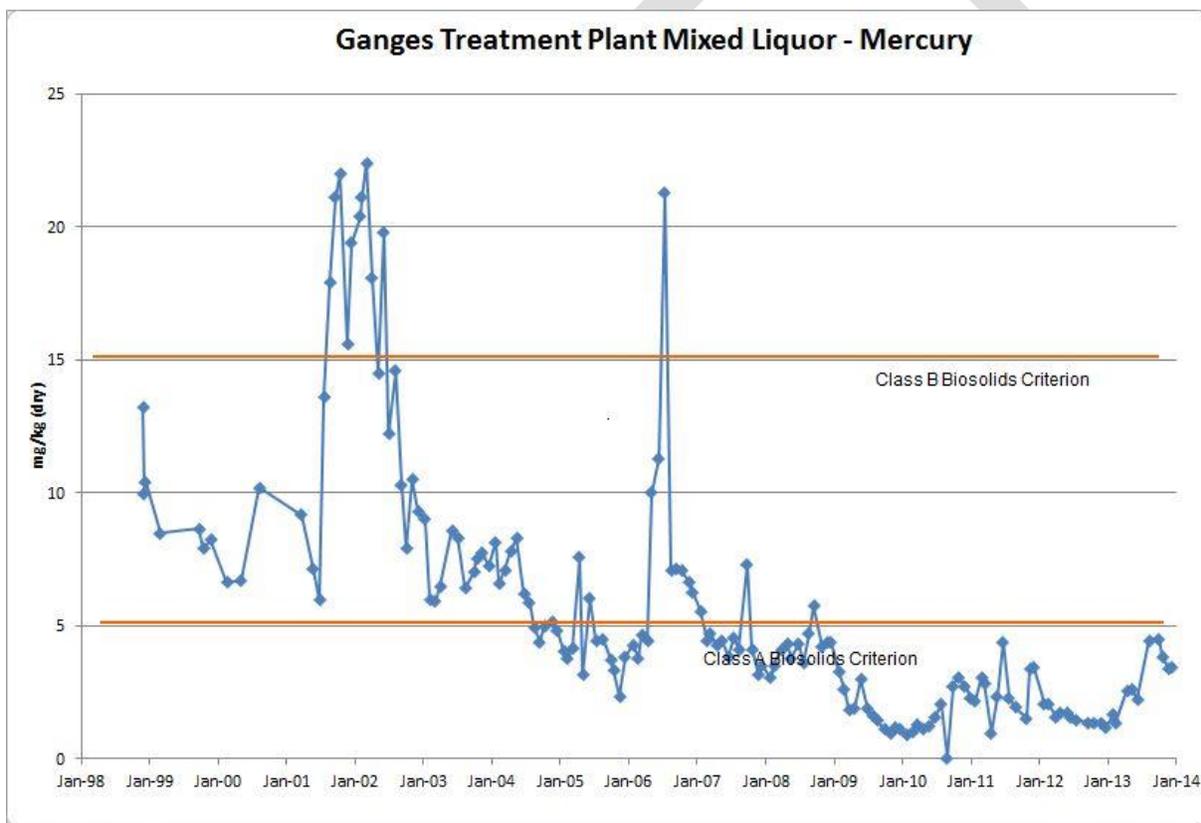
Ganges Wastewater Treatment Plant Mixed Liquor

The GWWTP process produces a mixed liquor product, not a biosolids product as defined by the OMRR. The mixed liquor is sampled and is assessed using the Class A biosolids quality criteria for comparison purposes to evaluate overall metal concentrations and end-product quality. This monitoring is not intended to characterize the material as a biosolids product. The GWWTP mixed liquor has met Class A quality criteria for all parameters except mercury (and occasionally molybdenum, once for cadmium) since monitoring began in 1994.

Mercury levels in Ganges mixed liquor show a different temporal pattern than that for SPWWTP biosolids; however, the overall trend is toward lower levels (see Figure 3). Historic trends for Ganges mixed liquor levels have been summarized in previous RSCP annual reports. Implementation of the dental COP is also thought to be the main reason for the reductions in mercury concentrations at the GWWTP.

For the fifth consecutive calendar year, the 2013 GWWTP mixed liquor results met the Class A criteria for all metals, including mercury.

Figure 3: Mercury in Ganges Wastewater Treatment Plant Mixed Liquor (1999-2013)



3.5 Significant Incident Reporting

CRD operations and municipal engineering department staff communicate periodically with RSCP staff regarding sanitary sewer wastewater quality problems, suspicious discharges or significant incidents leading to contamination of the district's collection and treatment systems. A "significant incident report form" was initially developed in 2000 to record operational problems within all trunk sewers and treatment plants operated by the CRD. The report form and response procedure was reviewed in 2013 following an incident involving a spill of Bunker "C" fuel oil into the CRD's Lang Cove pump station. A new significant incident response procedure has been developed by RSCP staff for implementation in 2014. Training

sessions for Core Area and SPWWTP operations staff regarding the new procedure have been conducted by RSCP staff in January and February 2014.

Table 11 provides a summary of incidents reported in 2013 that impacted, or had the potential to impact, the environment, sewerage works, sewage treatment facilities or public health and safety. Notes on incident follow-up were summarized from CRD significant incident reports; municipal grease reports; complaint forms; memos; e-mails; conversation records and other notes on file. There were no incidents reported that affected the operation of CRD sewage treatment plants in 2013.

Table 11: Summary of Reported Sewer System Incidents (2013)

Contaminant	Nature of Incident	Potential Impact	Incident Follow-up
oily waste	CRD Operations staff reported a black oily substance with a strong hydrocarbon odour in the Lang Cove wet well. (September)	marine environment, sewer infrastructure, worker health and safety	CRD Operations and RSCP staff sampled waste. Analytical results showed it to be similar to Bunker "C" fuel oil. Area source: Esquimalt Graving Dock. No specific source identified following investigation by Public Works and Government Services Canada (PWGSC). Approximately 1.2 m ³ of oil recovered – no release to marine environment.
fats, oils and grease (FOG)	City of Victoria staff reported recurring excess grease build-up in sewer lines from multi-unit residential buildings (MURBs), Wark St. and Hillside Ave. (March)	sewer back-ups (health risk), increased maintenance of municipal sewer lines	RSCP staff met with City staff to discuss possible solutions. RSCP to consider outreach efforts at specific MURBs as a first step.
fats, oils and grease (FOG)	City of Victoria staff reported grease accumulation in Courtenay St. sewer lines. (December)	sewer back-ups (health risk), increased maintenance of municipal sewer lines	RSCP staff followed up with inspections of four food service operations. Two operations were found to be out of compliance and were subject to enforcement action for excess FOG. All four operations had new owners and were provided education on maintenance requirements.
fats, oils and grease (FOG)	City of Victoria staff reported grease accumulation at Queens St. and Hillside Ave. (December)	sewer back-ups (health risk), increased maintenance of municipal sewer lines	RSCP staff followed up with inspections of four food service operations. Two operations were found to be out of compliance and were subject to enforcement action for excess FOG.

3.6 Outreach

RSCP staff continued to develop and maintain program-specific outreach and education messaging throughout 2013. Where appropriate, source control messaging was also integrated with other initiatives, campaigns and community outreach events held throughout the year across the region.

Key source control initiatives and campaigns for 2013 are summarized below under separate sections for residential and business outreach, education and the RSCP website.

Residential Outreach

- In partnership with the BC Pharmacy Association (BCPhA) and the Health Products Stewardship Association, “point of sale” tools including shelf signs and flyers were created and distributed to 65 pharmacies (BCPhA members) within the Capital Region to promote of the Medication Return Program. Seventy percent of the region’s pharmacies are members of the BCPhA.
- In 2013, the CRD continued to have one of the highest medication return rates per capita amongst regional districts in the province (second highest in 2013). Approximately 11.7 tonnes of medications were collected in the region during 2013. This represented a 33% increase over the amount collected in 2012.
- “My Green Plan” project support. The RSCP, with BC Hydro and other CRD programs provided technical and financial support to the Community Social Planning Council to develop and operate an online interactive tool to encourage households to select and prioritize sustainability actions they want to undertake. It is also a resource for those who want to learn more about any specific topics offered by the participating partners.
- “Tap by Tap” campaign support. The campaign aimed to support multi-unit residential buildings (MURBs) in saving money, conserving energy and water, and taking action on climate change.
- Continued integration of RSCP with the CRD Onsite Wastewater Management Program, including cross messaging on outreach material, webpages and advertisements.
- RSCP resources and staff were used to develop and pilot integrated messaging from several CRD environmental programs in two themed campaigns: “Green 365 Outdoor Living” and “Green 365 Indoor Living”.
 - “Green 365 Outdoor Living” was a summer campaign, which ran from June through September 2013. The focus was on promoting environmental practices related to outdoor home improvement. Much of the source control messaging was related to proper disposal of chemicals (pesticides, waste paint and cleaners).

The source control related communication objectives were: “to increase awareness that all drains lead to local streams, creeks or the ocean” and “to promote proper and safe disposal of waste”.

Source control key messages were integrated with other messages, such as: “Put your landscape to work. Drought-tolerant plants and compost reduce water consumption and require less upkeep without pesticides”; “Remember to properly dispose of your waste. Visit myrecyclopedia.ca to find a proper disposal location near you”; and “We all live in a watershed – remember that all drains lead to streams, creeks and ocean. Avoid harmful chemicals and prevent grit from going down the drain.”

- “Green 365 Indoor Living” was a fall campaign, which ran from October through December 2013. The focus was on promoting environmental practices related to indoor home improvement. The indoor focus provided more opportunities to highlight source control

messages, including reduced surfactant use and the proper disposal of fats, oils and grease, waste medications and household cleaners.

The source control related communication objectives were: “to increase awareness that all drains lead to local streams, creeks or the ocean” and “to promote proper and safe disposal of solid and liquid waste where reuse or recycle options are not available”.

Key source control messages included: “Be mindful of what you pour down the drain because all drains lead to streams, creeks or the ocean”; “Check out myrecyclopedia.ca to find out how to dispose of household hazardous waste, cooking grease and medications”; and promotion of the use of “My Green Plan”.

Business Outreach

Inspectors continued to be the front line staff delivering RSCP outreach messaging to local businesses. Outreach included distribution of RSCP sector-based posters and guidebooks. In addition, inspectors worked with business owners to highlight the benefits associated with protection against cross connections (protection of public health), reducing water use (potential cost savings), kitchen scraps collection programs and other CRD initiatives. See Section 3.1.5 (Coordinated Inspections) for additional information.

In 2013, RSCP staff continued to maintain outreach to local businesses through the following activities:

- CRD staff undertook a stakeholder consultation process to assist with further development of the arts and crafts sector BMPs in early 2013, including the preparation of a draft brochure for distribution within the sector. (See Section 3.3 for more information).
- Stakeholder outreach meetings were held with the BC Restaurant and Food Services Association in April and with the Victoria Chapter of the BC Hotel Association in March 2013. The session provided the associations with updates on activities and regulations related to the RSCP and also provided an opportunity to share updates on Cross Connection Control, Water Demand Management and Kitchen Scraps.
- The 2013 CRD EcoStar award event was supported by RSCP and staff again participated in evaluation committees. The EcoStar awards have, since 2000, highlighted businesses, organizations and individuals who have incorporated positive environmental practices into their operations or activities. RSCP participation focused on two categories: waste reduction and water stewardship. The 2013 Waste Reduction category was awarded to Monk Office and Lansdowne Middle School’s Eco Action Team; however, there were no successful applicants for the Water Stewardship Award in 2013.
- Two educational videos were released for automotive repair and food services owners and operators in 2013. The videos were based on consultation with stakeholders input in previous years. Eight new videos will be available for viewing in 2014, four for each sector. The food services sector video will focus on sizing, installing and maintaining grease interceptors and bylaw requirements. The automotive repair video will focus on oil-water separator maintenance and function, how to become a dry shop, managing hazardous waste and preparing for spills.
- A “One-Window” approach is the concept of having all environmental regulations and best management practices applicable to businesses and institutions available through one source. To assist with development of this concept, an industry survey was implemented in 2013. The survey explored how businesses are currently receiving information on environmental regulations and best management practices and how they would prefer to receive this information.
- “Living the New Economy” hosted by the Healing Cities Institute, was an opportunity to reach out to new and current businesses operating in the Capital Region. Staff used the event to highlight tools

and services available to businesses to help them adopt environmental best management practices and comply with regulations.

Education

- RSCP messaging was included in two educator training workshops in 2013: University of Victoria Curriculum Integration Days (involving 30 pre-service teachers) and School District 61 Professional Development day (involving 12 regional educators). Educators were also made aware of applicable environmental action grants.
- There were several youth and community engagement events in 2013 which included RSCP messaging and information: Stelly's High School Green Team's Community Fair (60 Students); Campus Views Green Team's Earth Fest Community Fair (300 youth, public and educators); Island Children's festival (350 booth visitors); and Claremont High School CC350 community event (50 students).
- RSCP educational information was included in 30 Environmental Partnerships community outreach events held throughout 2013.
- The "My Green High School Plan" challenge supports the CRD's "Green 365" project, which is comprised of four campaigns promoting sustainable behaviour changes in and around the home. High school students were asked to propose ways of reducing their school's eco-footprint, raise student awareness and change behaviour.
 - In 2013, four high schools from across the region submitted plans that demonstrated a commitment to environmental stewardship and included: prioritized sustainability actions, actions planned for the 2013/14 school year, recommended actions and goals for future classes and actions that could be accomplished with funds from January to April 2014.
 - All four high schools received funding (ranging from \$250-\$1500) to implement their green plans. A total of 3,949 students were engaged at participating schools.

Regional Source Control Program Website

The CRD launched a new corporate website in December 2013. RSCP webpages were transitioned to the new platform and RSCP information was highlighted in the outreach and education section of the website in addition to the services section. The new platform also provided an opportunity to redesign and reorganize source control information.

Table 12 represents website activity on the old corporate website in 2013. Note that these results only represent 11 months of activity because the new corporate website was launched December 10, 2013.

Table 12: Summary of RSCP Web Page Activity – 2012 and 2013

RSCP Primary Web Pages	2012	2013	% Increase
RSCP Main Page: http://www.crd.bc.ca/wastewater/sourcecontrol/index.htm	1578	1753	11
RSCP Residential General: http://www.crd.bc.ca/wastewater/sourcecontrol/residents/index.htm	1312	1587	20
RSCP Residential Medications Return Program: http://www.crd.bc.ca/wastewater/sourcecontrol/residents/medications.htm	1339	1220	- 9
RSCP Residential Surfactant Reduction: http://www.crd.bc.ca/wastewater/sourcecontrol/residents/detergentreduction.htm	549	633	15
RSCP Residential Fats, Oils and Grease Diversion: http://www.crd.bc.ca/wastewater/sourcecontrol/residents/fats-oils-grease.htm	1511	2055	36
RSCP Business General: http://www.crd.bc.ca/wastewater/sourcecontrol/business/index.htm	1325	1721	30
RSCP Automotive Repair Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/automotive.htm	897	981	9
RSCP Food Services Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/food-services.htm	942	1264	34
RSCP Dental Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/dental.htm	723	842	17
RSCP Dry Cleaning Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/drycleaning.htm	873	924	6
RSCP Fermentation Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/fermentation.htm	793	927	17
RSCP Laboratory Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/laboratory.htm	739	781	6
RSCP Photographic Imaging Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/photo.htm	598	650	9
RSCP Printing Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/printing.htm	635	651	3
RSCP Recreation Facility Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/recreation.htm	571	626	10
RSCP Vehicle Wash Operations: http://www.crd.bc.ca/wastewater/sourcecontrol/business/vehicle.htm	751	747	- 1

Most web pages showed increased activity in 2013 compared to 2012 with the exception of the residential medication return program and vehicle wash operations pages. Web page activity is based on external use (sorted by internet protocol address) and excludes all use by CRD employees.

3.7 Partnerships Initiatives

Since its inception, the RSCP has worked with many agencies to develop bylaws, COP, policies and procedures or to resolve problems of mutual concern. These agencies have included MOE, federal agencies (e.g., DND and PWGSC), regional districts, municipalities, VIHA and local academic institutions.

In 2013, there were continued collaborative efforts between RSCP staff, other Environmental Services programs and external partners to enhance a “one-window approach” to providing augmented inspection services and superior customer service and to promote high environmental performance within businesses.

Some examples of both internal and external collaborative partnerships initiatives undertaken in 2013 are outlined below.

Water Audits

RSCP continued to integrate Demand Management Program (DM) water audits as an expanded inspection service and work collaboratively with the Integrated Water Services Department. One of the more complex water audits in 2013 was for a large recreation facility. This audit identified major financial and water savings, as well as identifying a “smoking gun” for water loss through a leaking cooling tower valve. Additionally, inspectors conducted water audits for a First Nation band office as well as a complex building resulting in major retrofits from equipment using once-through cooling water to air-cooled equipment.

Onsite Wastewater Management Collaboration

RSCP staff met with Onsite Management Program (OMP) staff on a bi-weekly basis to exchange information and identify synergies for sharing messaging and efforts to maximize efficiencies. As the messaging for infrastructure, human and environmental health are virtually identical for both sewer use and onsite septic systems, there are opportunities for increasing economies of scale and addressing grey areas (e.g., RSCP regulates businesses on sewer; OMP regulates residents on septic – there are some businesses on septic that aren’t officially targeted by either program). As a result, the fermentation sector inspections were expanded to include wineries, cider operations and distilleries on septic to cross message and confirm best management practices.

Additional septic system inspection training and a RRU onsite “source control” research project are slated for 2014.

Onsite wastewater management outreach staff were crossed-trained on messaging associated with sanitary sewer source control practices. This helps ensure consistent messaging between the two programs. Equally important, the crossed-trained outreach staff provides cost efficiency by sharing costs between two programs which allows both programs to attend more events within existing budgets.

Kindergarten to Grade 12 Education

In 2013, the RSCP contributed to funding for an Environmental Education Development Coordinator to develop source control specific lesson plans and resources for adoption by teachers. The current focus is on curriculum for students pursuing career development in the automotive repair and food services industry; however, the learning outcomes will also benefit those interested in environmental practices.

CRD Inter-Departmental Partnerships

The RSCP was a major sponsor for integrating messaging from across divisions within the Parks & Environmental Services Department. Four campaigns were developed in 2013; two were piloted in 2013 while the other two are scheduled for 2014. The 2013 campaigns piloted were “Green 365 Outdoor

Living” and “Green 365 Indoor Living”. The campaigns combine key residential messages from Parks & Environmental Services programs into themed campaigns with a holistic approach.

The theme of “Green 365 Outdoor Living” focused on activities associated with outdoor home improvements, while the theme of “Green 365 Indoor Living” focused on activities associated with indoor home improvements. An example of a holistic approach in the Outdoor Living campaign was messaging around gardening, which provided an opportunity to promote practices related to climate change adaptation, waste pesticide management (household hazardous waste and source control), water conservation (demand management), water quality protection (cross connection control) and organics recycling (composting).

The purpose of the pilot campaigns was an effort to: increase efficiency in communications objectives, deliver comprehensive messaging to the identified audiences and decrease overall costs by combining messaging.

Metro Vancouver FOG Workshop

In January 2013, staff from Metro Vancouver travelled to CRD Headquarters to attend a workshop on strategies for FOG reduction - hosted by RSCP staff. Subjects discussed included:

- Effective goals and targets
- Tracking progress and measuring outcomes
- Identifying failures and successes of existing programs
- Establishing priority inspections
- Creating effective outreach and education materials
- Maintaining consistency with other regional districts

VIHA Collaboration

RSCP and VIHA staff continued their information sharing efforts in 2013 through an administrative practices agreement whereby VIHA administrative staff commenced forwarding all “application for food facility” forms to RSCP staff. The forms provide contact and operating details for new food service businesses, enabling RSCP staff to work with new applicants more proactively, and dramatically improving RSCP data quality. The forms are forwarded to CCC staff so that, wherever possible, Cross Connection Control inspections can be conducted quickly for new businesses, and in some cases jointly with RSCP inspections, saving the businesses money and time for inspection visits.

RSCP staff in partnership with VIHA delivered two Medication Return Program (MRP) education sessions in January 2013 for VIHA community health care staff within the CRD. The presentations highlighted the background to the MRP, the impact of improper medication disposal and the important role that health care staff can play in education regarding medications return.

Assistance with Regional Kitchen Scraps Strategy

RSCP inspectors played a large role in facilitating discussions and providing accurate information pertaining to the region’s kitchen scraps strategy to food services businesses. With 917 food services code of practice inspections conducted in 2013, there were many opportunities for engaging in discussions regarding this diversion strategy. RSCP inspectors assisted businesses in understanding the timeline, incentives/disincentives and diversion options and directed them to CRD Environmental Resource Management staff when needed.

Collaboration with Academic Institutions

The RSCP also developed various partnerships with educational institutions in 2013, sponsoring one undergraduate research project with Royal Roads University (RRU) Environmental Science students: “Investigation of Floor Care Trade Wastes”.

RSCP inspectors and outreach staff presented workshops to both RRU Environmental Science and Camosun College Environmental Technology students. In the former workshop, RSCP staff co-presented with CRD Regional Planning staff to help students gain perspective on higher level regional issues and provide context for a detailed workshop on the RSCP.

Municipal Collaboration

Since 1999, municipal staff have been encouraged to issue waste discharge assessment forms (WDAFs) to persons applying for new building licenses or new sewer connections for businesses that have the potential to discharge non-domestic waste to sewer. Completed forms are forwarded by the municipality to the CRD for evaluation. In addition, businesses or plumbers contracted to perform upgrades at COP operations directly contact RSCP staff regarding COP requirements. Letters copied to municipal plumbing or licensing contacts are sent directly to the COP operations outlining specific requirements and providing information. In 2013, a total of 47 cases were submitted by municipalities for evaluation by RSCP staff.

In the past year, RSCP staff worked with municipal staff to resolve various oil and grease blockages in sewers. Municipal staff continued to provide plumbing and building information, flow data and other information to RSCP staff to assist in the preparation of permits, authorizations and COP treatment works installations in 2013.

3.8 Data Management

The RSCP portion of the Cross Connection and Regional Source Control Information Management System (CRIMS) was integrated with the CRD geographic information system (GIS) in 2012; operational integration for inspection planning continued throughout 2013. The integrated product, CRIMS Spatial, makes CRIMS regulatory database viewable via a GIS web mapping application, allowing RSCP inspectors to have access to enhanced spatial relationships regarding all facilities regulated under the Sewer Use Bylaw. The integration allowed RSCP staff to take advantage of other available spatial data (e.g., sewer lines, flow direction and manhole locations). CRIMS Spatial is designed to assist with compliance tracking, inspection planning, tracking implementation plans, providing ad hoc and regular statistics and assisting with spill or incident response.

3.9 Revenue and Expenditures

A summary of revenue and expenditures for the RSCP in 2013 is provided in Table 13.

A portion of program revenue is provided through the imposition of fees and charges on businesses and institutions under the Source Control Local Service Establishment Bylaw. The total waste discharge permit fees and fines (tickets) collected in 2013 amounted to \$101,247.

Table 13: Regional Source Control Program Revenue and Expenditures–2013

Description	Revenue (\$)	Expenditure (\$)	
Fees, fines, grants, surplus, other	205,603		
Requisition	1,192,187		
Total Program Revenue	1,397,790		
Program Expenditures		1,375,069	
Administration Expenditures		19,124	
Total Program Expenditure		1,394,193	
Carry Forward to 2014			3,597

Waste Discharge Permit Fees

The RSCP waste discharge permit fee structure was developed in 1997 in consultation with stakeholders to reflect the size and impact of the discharge from each business type. The fee structure is outlined in the Sewer Use Bylaw and the RSCP fees and charges policy governs the administration of the fees. In addition to a fixed annual administration fee, permittees pay discharge fees in proportion to the loads of specific contaminants discharged, based on their own self-monitoring results. Permit application and amendment fees are also charged in order to offset administrative costs.

3.10 Planning and Development

The following is a summary of the main activities and achievements related to the management, planning and administration of the RSCP in 2013.

- The RSCP continued to meet the commitments outlined in the Core Area and Saanich Peninsula LWMPs in 2013.
- The RSCP annual report for 2012 was presented to the Core Area Liquid Waste Management Committee (CALWMC) as part of a consolidated annual report, for all Liquid Waste Management Plan (LWMP) programs, on October 9, 2013. Copies of the annual report were sent to MOE on March 14, 2013.
- The findings of the third five-year independent review of the program for the period 2004-2008 (Morrison Hershfield, 2010) were used to develop a five-year plan for the RSCP covering the period 2011-2015. This five-year plan is summarized in Table 14.
- A work plan was developed for the RSCP in January 2013 as part of a divisional initiative. This plan was updated throughout the year, assisting in setting timelines and defining responsibilities for activities and projects within the overall context of the five-year plan.
- The next five-year independent review of the program is scheduled for 2014. The findings of this review will assist in the development of a new plan for the period 2016-2020.

Table 14: Regional Source Control Program–Five-Year Plan (2011 to 2015)

The RSCP five-year implementation plan consists of four main strategies which are aligned with the main elements of the Environmental Partnerships Strategic Plan and Business Plan. The five-year plan is designed to assist in the delivery of Environmental Partnerships’ mandate and to help the CRD prepare for the initiation of advanced sewage treatment in the core area.

Main Strategies and Activities	Timeline
1. Coordinated Outreach and Education	
<ul style="list-style-type: none"> • Develop, through stakeholder consultation, new business outreach materials for industrial, commercial and institutional sectors incorporating a “one-window” approach to service delivery. 	2011-2015
<ul style="list-style-type: none"> • Enhance and update four existing “Clean Water Begins at Home” residential outreach campaigns, including: <ul style="list-style-type: none"> - Medications return–expand to home and community care and investigate container labelling - Launch Source Control 201, “Sustainable U”, social media campaign 	2011-2015 2011 2012
<ul style="list-style-type: none"> • Develop and launch new “Clean Water Begins at Home” initiatives, including: <ul style="list-style-type: none"> - Promote alternative household cleaners through “Clean Green” - Promote proper hazardous waste and hobby waste disposal 	2011-2015 2011 2013
<ul style="list-style-type: none"> • Develop education plans for K-12, post-secondary and trade schools, incorporating RSCP themes and information from other CRD programs 	2012
<ul style="list-style-type: none"> • Enhance relationships with municipal and other agency staff by establishing procedures that facilitate efficient information exchange 	2012
<ul style="list-style-type: none"> • Update business and residential components of RSCP website, incorporating interactive features and a “one-window” approach 	2015
2. Coordinated Inspections and Monitoring	
<ul style="list-style-type: none"> • Coordinate inspections and audits for all Partnerships’ programs <ul style="list-style-type: none"> - Demand Management, Cross Connection Control, Onsite Systems, Stormwater Source Control (Saanich Peninsula) 	2012
<ul style="list-style-type: none"> • Focus inspection efforts on priority industrial, commercial and institutional sources <ul style="list-style-type: none"> - Hospitals, metal platers, ship waste treatment, vehicle washing, photo imaging, printing 	2011-2015
<ul style="list-style-type: none"> • Enhance all RSCP monitoring plans (annual reviews) for: <ul style="list-style-type: none"> - Permits, authorizations, codes of practice, key manholes 	2011-2015
3. Program Review and Metrics	
<ul style="list-style-type: none"> • Maintain existing program components to ensure Liquid Waste Management Plan commitments are met 	2011-2015
<ul style="list-style-type: none"> • Review program measures of success 	2012
<ul style="list-style-type: none"> • Review, develop and adopt standard operating procedures for all RSCP activities 	2013
<ul style="list-style-type: none"> • Review, update and amend the Sewer Use Bylaw (coordinate with reviews of other program bylaws) 	2014
<ul style="list-style-type: none"> • Coordinate data management and database development with all Partnerships’ programs 	2015
4. Research and Emerging Technologies	
<ul style="list-style-type: none"> • Research priority contaminants, sources, reduction strategies and targets <ul style="list-style-type: none"> - Investigate use of molybdenum-based corrosion inhibitors in heating/cooling systems and potential local impacts - Develop a reduction plan for phthalates (plasticizers) - Research use of copper-based algaecides and local impacts - Investigate local use of nano-silver products and potential impacts 	2011-2015 2011 2012 2013 2014
<ul style="list-style-type: none"> • Research and pilot test new pre-treatment technologies for effectiveness at achieving contaminant reductions and meeting regulations 	2011-2015

3.11 Performance Measures

Three program performance measures were developed over the period 2004-2006. These measures have been incorporated in RSCP “program budgets” since 2007 and were included in the scope of the five-year review undertaken in 2009. The performance measures are as follows:

- Percentage of regulated businesses with proper waste treatment installed. This measure is associated with the RSCP objective of consistent application of the program for all users of CRD sewage facilities.
- Percentage of priority contaminants showing no increase in loads to the core area environment. This measure is associated with the RSCP objective of protecting the marine environment adjacent to the CRD’s sewage outfalls.
- Percentage of biosolids and sludge samples that meet Class A standards for metals. This measure is associated with the RSCP objective of protecting the quality of sewage sludge and biosolids.

The method of calculating each performance measure is described in Appendix 3, using 2013 data as an example. The results of performance measure calculations for the period 2005-2013 are summarized in Table 15.

Table 15: Results of RSCP Performance Measures (2005-2013)

Performance Measure	2005	2006	2007	2008	2009	2010	2011	2012	2013
1. Percentage of regulated businesses with proper waste treatment installed.	80	85	87	93	95	96	97	90	97
2. Percentage of priority contaminants showing no increase in loads to the core area environment.	92	N/M	N/M	79	N/M	N/M	95	N/M	N/M
3. Percentage of biosolids and sludge samples that meet Class A standards for metals.	92	67	88	93	100	100	100	100	100

Note: N/M = Not measured

Performance measure #1 was not able to be calculated prior to 2004 due to the lack of complete data on the installation of proper waste treatment for COP. Steady progress had been recorded for this measure over the period 2005-2011.

Performance measure #2 is based on the “yearly trend” in loads at both Macaulay and Clover point outfalls for 39 priority contaminants, as documented in the most recent trend assessment report (Golder Associates Ltd, 2013). This report found that there were significant decreasing trends, or no significant trend, in 36 of the 39 priority contaminants listed in Appendix 2. Increasing trends were recorded for cobalt at Macaulay Point and WAD cyanide at Clover Point, resulting in a 95% rating for this performance measure in 2011.

Long-term analysis of effluent trends for the core area outfalls is only undertaken every three years. This measure cannot be calculated for the two years in between. The next analysis, including data from 1990-2014, is scheduled for 2015.

The final performance measure has shown some variability over the years, largely due to the mixed liquor metals results from the GWWTP exceeding Class A criteria for biosolids. However, for the fifth consecutive year, the 2013 GWWTP mixed liquor results met the Class A criteria for all metals, including mercury. SPWWTP dewatered sludge monitoring commenced in March 2013. All of these results also

met the Class A criteria for metals. The combined results from the two plants provided an overall 100% rating for this performance measure in 2013.

Since 2010, when RSCP became part of the Environmental Partnerships Division, an emphasis has been placed on RSCP inspectors representing other CRD programs and initiatives during inspections, and where possible, collaborating with other jurisdictions to co-inspect facilities for the benefit of reducing the number of overall site visits received per customer.

A new suite of qualitative performance measures for RSCP permit, authorization and codes of practice inspections was developed in 2013, including:

- number of dialogues relating to other CRD initiatives (e.g., regional kitchen scraps initiative)
- number of information resources distributed (e.g., Cross Connection Control Program rack card)
- number of co-inspections, i.e., an inspection attended by an RSCP inspector and either an external partner (e.g., health authority official) or another CRD program inspector (e.g., Cross Connection Control inspector).

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APPENDIX 1

Summary of Contaminant Load Reductions Achieved by Waste Discharge Permit Holders

Permit Holder	Baseline Year	Comparison Year	Priority Contaminants	Load Reduction (%)	Comments
Brewery #1	2010	2012	COD	24	Permit issued 1995. An increase in business combined with water use reduction led to an increase in wastewater strength in 2010. Under staff assessment for COD in 2011. Solids removal plan and improved waste reduction practices implemented. Improvements decreased effluent strength despite a 25% increase in business over that time. Permit amended in late 2012.
			BOD	11	
			TSS	60	
Groundwater Remediation Site			TSS	75	Filtration, neutralization, flocculation, carbon adsorption installed in 1992, additional carbon adsorption in 1996. EcoStar award winner in 2003. Phase II site remediation was completed in 2006. No exceedences 2009-2011.
			O&G	90	
			BETX	>99	
			PAH	>99	
			Metals	30->99	
Metal Plater #1	1998	2000	Copper	69	Improved operating practices in 1999. Compliance plan completed in 2006, following a permit assessment. Permit further amended in July 2011. Additional copper and cadmium drag outs installed.
			Nickel	47	
Metal Plater #2	1997	2000	Cadmium	43	Improved operating practices in 1998. Water usage reduction of 70% in 2010 by using spray misters and reducing water turnover in final rinsing bath. Increased water consumption in 2011 due to contamination problems associated with reduced water turnover.
			Chromium	76	
			Copper	32	
Metal Plater #3	2000	2007	Cadmium	>99	Oil-water separation, flocculation/filtration installed in 2001. Evaporation equipment installed in 2006. Discharge to sewer virtually eliminated in 2007. No discharge to sewer from plating operation in 2009 and 2010. New treatment works installed and permit amended in 2012.
			Chromium	>99	
Electronic Component Manufacturer	2000	2001	COD	47	Flocculation/filtration system installed in mid-2000. EcoStar award winner in 2001.
			TSS	89	
			Metals	43->99	
Septage Disposal Facility	1991	2002	BOD	96	De-watering equipment and dissolved air flotation (DAF) installed in 1999. Bio-reactor added in 2001. Business owner changed in 2005, equipment and procedure changes followed. Compliance plan completed in 2006. Following staff assessment, permit limits were amended in 2010. Site had new air sparging equipment installed in 2012. Site continued to have high sulphide discharge problems throughout 2013.
			TSS	99	
			O&G	>99	
			MOG	>99	
			Metals	85->99	
			Phenols	48	

Appendix 1, continued

Permit Holder	Baseline Year	Comparison Year	Priority Contaminants	Load Reduction (%)	Comments
Regional Bus Transportation Facility	1998	1999	COD	33	DAF unit installed in 1999. Permit amended in 2006 and 2010. Operation under staff assessment for part of 2011 due to exceedences associated with use of soap instead of solvents to clean oily metal parts. Investigation ongoing to reduce use of soap or find an alternative.
			MOG	39	
			Lead	61	
			PAH	58	
Chemical Manufacturer	1997	2010	pH	in control	Installed pH control works in 1998. Permit amended in 2005. Excellent compliance record.
Street Waste Facility #1 in Victoria	2001	2007	TSS	>99	Solids settling and oil-water separator. DUR in 2005 for TSS exceedences. New treatment works installed under compliance plan in 2006. Stormwater inflow reduced by installation of a roof in 2008. Operation under staff assessment in 2011/12 for excess COD, and under staff assessment in 2013 for excess TSS, MOG, and COD due to maintenance frequency issues.
			MOG	>99	
			Metals	>99	
Street Waste Facility #2 in Saanich	2001	2002	TSS	98	Filtration and oil-water separator. Permit amended in 2005 to include modifications to treatment works. EcoStar award winner in 2005. Permit amended in 2010 to add new monitoring point for equipment wash pad.
			MOG	97	
			Metals	61-96	
			MOG	89	
Chocolate Manufacturer	2006	2012	COD	22	Grease interceptor installed in 2001, pH control works installed 2003. Permit amended in November 2003. Modifications to pH control works in 2007. Improved operating practices to reduce product going to sewer. Permit amended in 2009.
			TSS	80	
			O&G	58	
Industrial Laundry #1	2008	2011	COD	27	Shaker screen and oil skimmer installed in 1999. DUR in 2009 for MOG exceedences. In compliance by December 2010 following adoption of improved operating practices. Reductions in priority contaminants concurrent with a 41% reduction in water usage.
			TSS	26	
			MOG	34	
Dairy Product Manufacturer	2007	2012	COD	71	DAF treatment works installed in November 2008. Permit amended in March 2010. Source capture of re-workable product completed in July 2010. Completed automating DAF chemical and polymer addition in late 2012. Under staff assessment for O&G in 2013 due to change in ice-cream recipe concurrent with a 26% reduction in water usage.
			TSS	90	
			O&G	95	

Industrial Laundry #3	2005	2011	MOG	100	Permit issued in 2005. DUR in 2005 due to exceedences. Eliminated high strength feed stock and adjusted operating procedures. Voluntarily installed a shaker screen in December of 2011.
Oily Wastewater Treatment Facility	2002	2002	MOG	>99	Permit issued 1999 and last amended 2013. Filtration, primary separation, neutralization, oxidation and activated carbon adsorption. Bioxide addition for odours in 2005. Increased activated carbon adsorption in 2006 and 2010. Continued to be under staff assessment during 2013 for high sulphide results.
Meat Processor	1996-1997	2003	BOD/COD	91/89	Grease interceptor installed, operating practices changed, permit amended in 2003.
			TSS	94	
			O&G	97	
Food Commissary	2006	2010	COD	48	DAF treatment works installed in August 2007. System optimization completed by mid-2009. Permit amended in December 2009. pH control works installed in 2010.
			TSS	66	
			O&G	91	

Note:

BOD = biochemical oxygen demand; COD = chemical oxygen demand; DUR = discharger under review; O&G = oil and grease; TSS = total suspended solids; BETX = benzene, ethylbenzene, toluene, xylene; PAH = polycyclic aromatic hydrocarbons; MOG = mineral oil and grease; pH = acidity or basicity

APPENDIX 2

RSCP Priority Contaminant List (2013)

TOTAL METALS
arsenic (As)
cadmium (Cd)
chromium (Cr)
cobalt (Co)
copper (Cu)
lead (Pb)
manganese (Mn)
mercury (Hg)
molybdenum (Mo)
nickel (Ni)
selenium (Se)
silver (Ag)
zinc (Zn)
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs)
Total PAHs
Low molecular weight PAHs
naphthalene
acenaphthylene
acenaphthene
fluorene
phenanthrene
anthracene
fluoranthene
High molecular weight PAHs
pyrene
benzo(a)anthracene
chrysene
benzo(b)fluoranthene
benzo(k)fluoranthene
benzo(a)pyrene
dibenzo(a,h)anthracene
indeno(1,2,3-cd)pyrene
benzo(g,h,i)perylene
Phthalates
bis(2 ethylhexyl)phthalate
di-n-butyl phthalate
Miscellaneous
1,4-dichlorobenzene
Cyanide - weak acid dissociable (WAD)
Cyanide - strong acid dissociable (SAD)
phenol
total oil and grease

APPENDIX 3

Calculation Methods for RSCP Performance Measures

The following methods are used to calculate the three RSCP performance measures referred to in Section 3.11.

RSCP Performance Measure #1:

“Percentage of regulated businesses with proper waste treatment installed”

This measure is associated with the RSCP objective of consistent application of the program for all users of CRD sewage facilities.

In 2005, a new method of reporting ongoing, overall compliance levels for COP operations was developed. Proper waste treatment was defined as: use of properly-sized treatment works, or offsite waste management, at a regulated operation to comply with a COP – as confirmed through an RSCP inspection.

This measure is based on the assumption that once properly-sized treatment works are proven by inspection to be installed at a site, they are unlikely to be removed by an operator at a later date. In addition, operations proven to be using offsite management on inspection can be assumed to be continuing to use this method of complying with the code. It should be noted that this performance measure is not influenced by other “variable” compliance issues, such as poor maintenance of treatment works or lack of record keeping, which may be noted during inspections.

The measure uses current inspection information stored in the RSCP database. For COP, the key data are the total number of discrete operations inspected in each sector since implementation of the COP, and the number of those operations using proper waste treatment.

The data for COP operations can be combined with similar information for permits and authorizations to provide a single measure of overall compliance for all RSCP regulated businesses.

Performance Measure Calculation–2013

The 2013 data (Table 10 of this report) related to progress on waste treatment since full implementation of COP are presented below.

Progress on Proper Waste Treatment since Full Code of Practice Implementation

Code of Practice	Date of Full Implementation	Percentage of Operations Properly Treating Waste¹
Automotive Repair	1 January 2004	92
Carpet Cleaning	1 July 2003	95
Dental	1 July 2001	100
Dry Cleaning	1 July 2004	100
Fermentation	1 July 2003	97
Food Services	1 January 2003	98
Laboratory	1 July 2004	100
Photographic Imaging	1 June 2000	98
Printing	1 January 2005	92
Recreation Facility	1 January 2005	100
Vehicle Wash	1 January 2005	72

Notes:

¹ Percentage of distinct regulated COP operations inspected since full implementation that had properly-sized treatment works in place, or were using offsite waste management, at the end of 2013.

The percentage of COP operations properly treating waste is calculated from the database using total number of discrete operations inspected in each sector since implementation of the COP and the number of those operations which have been confirmed, through inspection, to be using proper waste treatment. The 2013 information is shown in the following table:

Code of Practice	% Operations Properly Treating Waste	Estimated Sector Size (2013)	# Operations Properly Treating Waste
Automotive Repair	92	148	136
Carpet Cleaning	95	21	20
Dental	100	111	111
Dry Cleaning	100	13	13
Fermentation	97	29	28
Food Services	98	980	960
Laboratory	100	45	45
Photographic Imaging	98	115	113
Printing	92	25	23
Recreation Facility	100	11	11
Vehicle Wash	72	29	21
Total COP Operations		1527	1481

Information from the database for businesses operating under waste discharge permits and authorizations can be combined with the COP data to provide an overall measure of regulated business compliance. For permits and authorizations, any operation classified under the RSCP Enforcement Policy as a “discharger under review” for “exceeding permit limits” is, for the purposes of this calculation, assumed to be not properly treating waste. The data for 2013 is as follows:

Regulatory Tool	Total # Operations	# Operations Properly Treating Waste	% Overall Operations Properly Treating Waste
Code of Practice	1527	1481	
Waste Discharge Permit	33	33	
Authorization	87	85	
Overall Total Operations	1647	1599	97%

As a result, the “Percentage of regulated businesses with proper waste treatment installed” in 2013 is 97%.

RSCP Performance Measure #2

“Percentage of priority contaminants showing no increase in loads to the core area environment”

This measure is associated with the RSCP objective of protecting the marine environment adjacent to the CRD’s sewage outfalls.

CRD Environmental Protection Division’s Marine Programs group has collected samples of wastewater from the Macaulay and Clover point outfalls since 1988. Wastewater samples have been analysed for over 200 parameters, including priority substances and conventional parameters. Statistical analysis have been conducted periodically in the past to evaluate long-term trends in concentrations and loads of these substances in wastewater. The most recent trend assessment (Golder Associates Ltd., 2013), utilizing data from the period 1990-2011, updates the previous assessment (Golder Associates Ltd., 2009a), which included data from 1990-2008.

In 2008, the RSCP prepared a list of core area priority contaminants based on information provided by Marine Programs and other sources. The following table shows the current list of 39 RSCP priority

contaminants (Appendix 2 of this report). Most of these contaminants have been targeted for reduction by RSCP, either through regulation or outreach, or a combination of initiatives.

Performance measure #2 is based on the “yearly trend” in loads at both Macaulay and Clover point outfalls for the above 39 priority contaminants, as documented in the most recent trend analysis report. All RSCP priority contaminants showing either a decrease or “no significant trend” in loads at either Macaulay or Clover point outfalls are identified and reported as a percentage of the 39 listed priority contaminants. Note that trends for “total” metals, not “dissolved”, are used in the calculation. For PAHs, trends for individual PAHs, LMW, HMW and Total PAHs are used in the calculation.

Performance Measure Calculation

The following table shows how performance measure #2 was calculated for 2005, 2008 and 2011–based on information provided in Golder Associates Ltd., 2006, 2009a and 2013. Note: Only the contaminants for which a significant increasing trend was reported are shown – all other contaminants showed either a “significant decrease”, no “significant trend” (ns) or “could not be calculated” (nc).

RSCP Priority Contaminant	Yearly Trend (1990-2005) Core Area Loads	Yearly Trend (1990-2008) Core Area Loads	Yearly Trend (1990-2011) Core Area Loads
TOTAL METALS			
arsenic (As)		Increase	
cadmium (Cd)			
cobalt (Co)			Increase (Macaulay only)
chromium (Cr)			
copper (Cu)			
lead (Pb)			
molybdenum (Mo)	Increase (Clover only)	Increase (Macaulay only)	
manganese (Mn)			
mercury (Hg)			
nickel (Ni)			
selenium (Se)		Increase	
silver (Ag)			
zinc (Zn)			
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs)			
Low molecular weight PAHs			
naphthalene			
acenaphthylene			
acenaphthene		Increase	
fluorene			
phenanthrene			
anthracene			
fluoranthene		Increase	

RSCP Priority Contaminant	Yearly Trend (1990-2005) Core Area Loads	Yearly Trend (1990-2008) Core Area Loads	Yearly Trend (1990-2011) Core Area Loads
High molecular weight PAHs	Increase	Increase	
pyrene			
benzo(a)anthracene			
chrysene			
benzo(b)fluoranthene			
benzo(k)fluoranthene			
benzo(a)pyrene			
dibenzo(a,h)anthracene			
indeno(1,2,3-cd)pyrene			
benzo(g,h,i)perylene			
Total PAHs		Increase (Macaulay only)	
Phthalates			
bis(2 ethylhexyl)phthalate	Increase	Increase (Macaulay only)	
di-n-butyl phthalate			
Miscellaneous			
1,4-dichlorobenzene			
phenol			
total oil and grease			
Cyanide - WAD			Increase in WAD Cyanide (Clover only)
Cyanide - SAD			
Total # Increase	3	8	2
Total # Decrease or “ns”	35	30	36
% of 39 Priority Contaminants	92%	79%	95%

RSCP Performance Measure #3

“Percentage of biosolids and sludge samples that meet Class A standards for metals”

Performance measure #3 is linked to the RSCP objective of protecting the quality of sewage sludge and biosolids.

Composite samples of biosolids produced at the SPWWTP were analysed on a regular basis during periods of production from May 2000 – April 2011. Samples were analysed for metals, moisture, pH, nutrients and microorganisms. Analytical results for metals were assessed using Class A Biosolids Standards as specified in *Canadian Food Inspection Agency Trade memorandum T-4-93 Table II* (see below).

Following CRD Board direction to cease land application of biosolids, SPWWTP has produced only dewatered sludge since April 2011. The dewatered sludge was landfilled as controlled waste throughout 2012 without routine sampling and analysis. Consequently, there was no 2012 SPWWTP dewatered sludge data available for input to this performance measure. SPWWTP dewatered sludge monitoring commenced in March 2013.

Class A Biosolids Standards, Maximum Acceptable Metal Concentrations*

Metal	Concentration (mg/Kg dry weight)
Arsenic	75
Cadmium	20
Cobalt	150
Mercury	5
Molybdenum	20
Nickel	180
Lead	500
Selenium	14
Zinc	1,850

*From: Canadian Food Inspection Agency Trade memorandum T-4-93 Table II

The GWWTP produces a mixed liquor product, and the SPWWTP produces dewatered sludge. Neither of these are biosolids products by definition. Grab samples of GWWTP mixed liquor are analysed for metals and moisture on a monthly basis. Composite samples of SPWWTP dewatered sludge are submitted for metals cyanide and moisture analysis initially on a weekly, and finally on a monthly, basis. The results are assessed using the Class A Biosolids standards referred to above.

The performance measure is calculated using the ratio of the annual number of samples of both dewatered sludge and mixed liquor that were compliant with Class A standards and the total annual number of samples collected and analyzed – expressed as a percentage.

Performance Measure Calculation – 2013

The following table illustrates how performance measure #3 is calculated, using 2013 data as an example.

Treatment Plant	# Samples (2013) ¹	# Compliant (2013) ²
Ganges WWTP (Mixed Liquor)	11	11
Saanich Peninsula WWTP (Dewatered Sludge)	16	16
Totals	27	27
Percentage Compliant		100%

Notes:

¹ the number of dates on which discrete samples were submitted for analysis.

² the number of samples with results that were fully compliant with Class A Biosolids standards for nine metals. Results for any field duplicates taken on the same date are averaged. If the standards are exceeded for one or more of the nine metals, a "failure" is recorded for the entire sample.

The overall percentage of biosolids and sludge samples that met Class A standards for metals in 2013 was **100%**.