

Regional Source Control Program



Annual Report 2009

Environmental Sustainability Department

Environmental Partnerships Division



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**CAPITAL REGIONAL DISTRICT
REGIONAL SOURCE CONTROL PROGRAM ANNUAL REPORT 2009**

EXECUTIVE SUMMARY

The purpose of the Capital Regional District (CRD) Regional Source Control program (RSCP) is to protect sewage collection and treatment facilities, biosolids quality, public health and safety, and the 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. COP were developed, adopted and implemented by the end of 2005 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.

The annual report demonstrates that the RSCP achieved some significant milestones in 2009. The overall percentage of regulated businesses with proper waste treatment installed reached 95%, the highest level achieved to date. Sectors operating under COP maintained high levels for installation and use of proper waste treatment measures. Permitted industrial facilities and facilities operating under authorizations also maintained high compliance levels. Overall inspection levels for COP and permits were the highest yet recorded.

Results of sewage effluent data collected in the core area since the last trend analysis (2008) suggest that previously reported decreasing trends for key contaminants have continued, or reached a point of no significant change. The percentage of treatment plant biosolids and mixed liquor samples that met Class A standards for metals achieved a record high level of 100%. This was a result of significant reductions in metals levels in Ganges wastewater treatment plant mixed liquor.

There were no significant incidents reported at CRD sewage treatment plants in 2009.

Promotion of the residential outreach initiative "Clean Water Begins at Home" was enhanced by the addition of a groundbreaking social media campaign ("Sustainable U" Source Control 101), production of five website videos and development of a hands-on display in partnership with the Shaw Ocean Discovery Centre in Sidney. Information obtained through a telephone survey and from the provincial Medications Return Program has shown that the residential outreach messaging is being successfully delivered.

The observed significant decreasing trends in contaminants are a result of the ongoing consistent application of source control regulations, inspections and promotion of best management practices through program outreach initiatives. This highlights the important role that the source control program plays, and will continue to play, in achieving wastewater contaminant reductions and protecting sewage collection and treatment facilities throughout the region, particularly in view of the initiation of core area sewage treatment in 2016.

The 2009 annual report presents background information, a summary of program activities and accomplishments over the period January to December 2009 and a brief account of initiatives planned for 2010. The main activities and accomplishments of the program in 2009 are outlined as follows.

Industrial, Commercial and Institutional Liquid Waste Regulation

- 100% use of proper waste treatment measures was maintained in seven code sectors (treatment works installed or offsite waste management used): photographic imaging, dental, laboratory, dry cleaning, carpet cleaning, fermentation and recreation.

- A record high level of proper waste treatment was attained in the food services sector (92%); this was a 3% increase over that reported in 2008. Full compliance with the COP (85%) was the highest recorded to date for this sector.
- A new COP inspection plan focusing on businesses discharging priority contaminants to sewer was successfully implemented.
- The overall primary inspection levels for COP in 2009 were higher than those in 2008 and most of the new inspection targets were met or exceeded.
- All permit inspections scheduled at the beginning of 2009 were completed within the year.

Monitoring

- First year of new monitoring plan focusing on priority sectors and contaminants—all new monitoring targets were met.
- The goal of collecting audit samples from each permitted site twice per year was achieved.
- Higher number of COP and key manhole monitoring events in 2009 than in 2008.

Enforcement

- Six tickets were issued under the CRD Ticket Information Authorization Bylaw as a result of seven COP sector investigations by bylaw enforcement staff—all within the food services sector.
- No charges were laid under the Sewer Use Bylaw in 2009.

Contaminants Management

- A mass balance and inventory of priority contaminant discharges to the core area and Saanich Peninsula sewage collection systems was completed in 2009. The results of this study and subsequent investigations into sources of residential contaminants will assist in the preparation of a contaminants management plan in 2010.

Contaminant Reductions

- Preliminary results of Macaulay and Clover Point effluent and Saanich Peninsula wastewater treatment plant influent and effluent monitoring in 2009 generally indicate similar concentrations and loads of contaminants to those reported in the 2008 trend assessment. This suggests that previously reported trends are either continuing or levelling off.
- For the first time since sampling began in 1994, the 2009 Ganges wastewater treatment plant mixed liquor results met the Class A criteria for all metals, including mercury. This finding may be related to an increased level of business inspection and compliance in the Ganges collection area in 2009.
- Biosolids quality at Saanich Peninsula wastewater treatment plant continued to meet Class A criteria. Mercury concentrations in biosolids were maintained at a very low level, likely as a result of the continued implementation of the dental COP since 2001.
- Five-year contaminant reduction targets have been successfully achieved for all COP sectors with the exception of the vehicle wash sector, one of the last codes to be fully implemented.

Significant Incident Response

- There were no significant incidents reported at CRD sewage treatment plants in 2009. There were two minor incidents in CRD trunk sewers. Three blockages were reported in municipal sewers that were related to build-up of fats, oils and grease. These incidents were all investigated by RSCP staff.

Residential Outreach

- RSCP staff continued the promotion of the three "Clean Water Begins at Home" campaigns (Fats, Oils and Grease Reduction, Surfactant Reduction and Medications Return) through print, radio advertisements and events at both schools and downtown shopping malls.

- In 2009, the CRD recorded the highest medication return rate of all regional districts in the province. Almost seven tonnes of medications were collected—representing a 130% increase over the amount collected in 2007, the year before the CRD Medications Return campaign was launched.
- A telephone survey to measure the success of all three "Clean Water Begins at Home" campaigns within the CRD was completed in February 2009. Results of this survey have shown that the residential outreach messaging is being successfully delivered.
- A social media campaign, "Sustainable U" Source Control 101, was developed and initiated in September 2009 to make source control messaging available to males 18-34 years of age throughout the CRD. This was the first social media campaign to be piloted by the CRD.
- The importance of source control as a critical first step in sewage treatment was highlighted at a series of "Wastewater Made Clear" open houses and other events held throughout the core area.
- Five videos highlighting "Clean Water Begins at Home" and general source control information were developed in November 2009 to explain the need for, and importance of, residential source control practices, particularly with the move toward sewage treatment in the core area.
- In November 2009, RSCP staff formed a partnership with the Shaw Ocean Discovery Centre in Sidney to develop a hands-on display linking common household activities with potential impacts on the marine receiving environment and highlighting the protective role of source control. The display will be targeted at school programs and the general public.

Business Outreach

- A revision of the dental operations guidebook was completed and an "information postcard" designed and mailed to all dentists.
- Local service providers were consulted regarding COP requirements and ongoing maintenance and repair of pre-treatment systems in the dental and printing sectors.
- The 2009 CRD EcoStar award event was co-sponsored by RSCP and staff participated in the evaluation committee for the Waste Reduction, Lifetime Achievement and Youth Achievement categories.

Data Management

- Development of a combined business database, in collaboration with CRD Water Services, continued in 2009. The completion and implementation of this enhanced, more secure and updated business database is now scheduled for 2010.

Program Planning and Development

- A second independent review of the program was initiated in 2009. The findings of this review, covering the period 2004 to 2008, will be used to develop a new five-year plan for 2011-2015.

Performance Measures

- Highest percentage of regulated businesses with proper waste treatment installed to date (95%).
- Highest percentage of biosolids and mixed liquor samples that meet Class A standards for metals to date (100%).
- Percentage of priority contaminants showing no increase in loads to the core area environment (79%)—based on last trend analysis for 1990-2008 data.

Next Steps—2010/11

The main areas of program development in 2010/2011 include:

- Completion of a contaminants management plan based on the findings of the mass balance report, subsequent investigations into sources of residential contaminants and the RSCP five-year review.
- Implementation of a new COP inspection plan for 2010, including actions to resolve compliance issues within the vehicle wash sector.

- Implementation of a COP monitoring plan focusing on the automotive repair, vehicle wash, dental and food services sectors.
- Stakeholder workshops to plan outreach for the food services and automotive repair sectors.
- Enhanced residential key manhole monitoring program.
- Increased collaboration with municipalities, business groups, institutions and other agencies.
- Implementation of RSCP-related components of the Service Delivery Review:
 - transfer of RSCP to the new Environmental Partnerships division
 - closer collaboration with demand management, cross-connection control, onsite sewage treatment and integrated outreach programs
 - development of a one-window approach to inspections and audits
- Development of a new RSCP five-year plan for the period 2011-2015.

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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 to 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.

An internal five-year 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 commissioned in 2009. The findings of this review, covering the period 2004 to 2008, will be used to develop a new five-year plan for 2011-2015.

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 sewerage 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 Board and the BC Ministry of Environment (MOE). This annual report presents a summary of program activities and accomplishments over the period January to December 2009 and provides a brief account of initiatives planned for 2010.

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 2009 have been categorized under the following component headings:

- inspections
- monitoring
- enforcement
- outreach
- 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 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—Communications Protocol

The policies and procedures are periodically updated to reflect changes within the program.

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.

Ten member municipalities, three electoral areas and six other participating areas with sanitary sewers were regulated under the RSCP in 2009. Estimated annual sewage flows contributed by each participating area, over the period 1 October 2008 to 30 September 2009, are listed in Table 2. The annual sewage flows are used to calculate the municipal requisition for the RSCP (see Section 3.8).

Table 1 CRD Treatment Plants and Sewage Collection Areas—2009

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 2008/2009

Participant	Estimated Annual Flow (m ³ /year)*	Percentage of Total Flows
Saanich	10,612,050	28.08%
Oak Bay	3,060,997	8.10%
Victoria	14,489,023	38.34%
Esquimalt	2,420,003	6.40%
View Royal	615,284	1.63%
Colwood	1,043,141	2.76%
Langford	1,653,420	4.38%
Sidney	1,338,694	3.54%
Central Saanich	1,459,035	3.86%
North Saanich	397,959	1.05%
Esquimalt First Nation	6,540	0.02%
Songhees First Nation	251,283	0.66%
Pauquachin First Nation	35,376	0.09%
Tseycum First Nation	15,777	0.04%
Institute of Ocean Sciences	7,647	0.02%
Department of National Defence	93,444	0.25%
Ganges Sewer	172,118	0.46%
Maliview Sewer	16,537	0.04%
Magic Lakes Estates Sewer	80,390	0.21%
Port Renfrew Sewer	21,640	0.06%
Total Flow	37,790,358	100%

Note:

*Yearly flows cover the period 1 October 2008 to 30 September 2009

3.0 REGIONAL SOURCE CONTROL ACTIVITIES AND ACCOMPLISHMENTS—2009

Regional source control activities and accomplishments in 2009 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
- 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 focussed 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 to 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 10m³/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, comparing 2009 with the previous year.

Table 3 Summary of Waste Discharge Permit Activity in 2008 and 2009

Waste Discharge Permit Activity	2008	2009
Permits active (at year end)	34	34
New permits issued	6	4
Permits closed	7	4
Permits amended	4	3
Permit site inspections (including evaluations for new permits)	96	69
Permit meetings	17	13
Self-monitoring events reviewed	426	347
Permit enforcement letters written	142	134

At the end of 2009, there were 34 active waste discharge permits being managed by RSCP staff. The majority of these permits were ongoing, with no expiry date. Four new permits were issued, three permit amendments were made and four permits were closed in 2009. Some permits issued for short-term discharges have set expiry dates. This accounts for a variable portion of permit activity each year. In 2009, one permit was issued for a short-term discharge from a pilot sewage treatment plant using an alternative technology to treat residential wastes and another permit was issued for a short-term discharge from a contaminated site remediation project.

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 Corporate Services department, Finance division.

All permit inspections scheduled at the beginning of 2009 were completed within the year. Permits discharging priority contaminants received at least one additional inspection. Permit management staff will continue to conduct investigations into new non-domestic waste dischargers in 2010 to assess the need for regulation of dischargers under 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 and generally have no sampling or reporting requirements.

Authorizations are commonly issued to regulate unusual discharges or 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 compares authorization activity in 2009 with that in the previous year.

Table 4 Summary of Authorization Activity in 2008 and 2009

Authorization Activity	2008	2009
Authorizations active (at year end)	95	103
New authorizations issued	7	10
Authorizations closed or transferred to codes or permits	0	2
Authorizations amended	0	3
Authorization site inspections (including evaluations for new authorizations)	36	33

Regular inspections were scheduled for 26 existing high priority authorizations in 2009, 23 of these were completed by December 2009. In addition, there were a further 10 inspections undertaken within the year to follow up on issues at high priority sites or evaluate the need for, and issue, new authorizations.

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 to 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 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:

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.

Notes Table 5 continued

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.

CODE OF PRACTICE INSPECTION SUMMARY—2009

Table 6 provides a summary of COP inspection activity, comparing 2009 with the previous year. 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.

Table 6 Summary of Code of Practice Activity in 2008 and 2009

Code of Practice	Est. Sector Size (2008)	# Site Inspections* (2008)	Est. Sector Size (2009)	# Site Inspections* (2009)
Automotive Repair	178	120	186	122
Carpet Cleaning	46	14	46	7
Dental	120	93	120	46
Dry Cleaning	13	11	13	6
Fermentation	39	5	39	2
Food Services	1,143	750	1,150	817
Laboratory	45	12	45	17
Photographic Imaging	202	172	202	82
Printing	28	26	28	16
Recreation Facility	9	1	9	1
Vehicle Wash	38	31	42	37
Total COP Operations	1,861		1,880	
Total COP Site Inspections*		1,235		1,153

Note:

*Includes both primary and repeat inspections.

Primary Inspections

A review of inspection frequencies for COP was included in the 2008 internal program review. A new plan for inspection frequencies was tested in 2009. This plan included classification of each of the 11 COP sectors as high, medium or low priority regarding the potential for discharge of priority contaminants to sewer. Dischargers within the following six sectors were identified for a higher frequency of inspection: auto repair, vehicle wash, dental, food services, photo imaging and printing. Based on priority rating and estimated number of businesses at the end of 2008, each of these sectors was given a proposed inspection cycle (either an annual, two-, three- or five-year cycle) and inspection targets were set for 2009. The fermentation, carpet cleaning, dry cleaning and recreation sectors, all rated low priority, were given a five-year inspection cycle.

The 2009 inspection targets and the number of primary inspections completed for operations with required treatment works are outlined in Table 7. A primary inspection, under the new approach, is defined as the first inspection carried out at a business within the inspection cycle set for the respective business sector.

Table 7 Code of Practice Primary Inspection Summary for Operations with Required Treatment Works (2009)

Code of Practice	Inspection Cycle	Sector Size ¹	Annual Inspection Target	# Primary Inspections (2009) ²	% of Annual Target
Automotive Repair	1-year	30	30	23	77
Carpet Cleaning	5-year	46	9	7	78
Dental	2-year	120	60	46	77
Dry Cleaning	5-year	13	3	5	167
Fermentation	5-year	39	8	2	25
Food Services	3-year	1,143	381	493	129
Photographic Imaging	1-year	25	25	25	100
Printing	1-year	12	12	12	100
Recreation Facility	5-year	9	1	1	100
Vehicle Wash	3-year	38	12	12	100
TOTAL		1,475	541	626	

Notes:

¹ Based on the estimated number of operations within each sector with required treatment works (at the end of 2008).

² Number of primary inspections of operations with required treatment works in 2009.

Within some of the above sectors, a number of businesses use only offsite waste management to control contaminant discharges. These sub-groups were set at a lower level of inspection frequency than those having requirements for onsite treatment works.

There are no specific requirements for installation of treatment works in the laboratory COP. All laboratory operations are required to use offsite waste management to control waste discharges to sewer. This sector, consisting of three sub-groups with high (analytical laboratories), medium (institutional laboratories) or low (veterinary and school laboratories) inspection priorities, was split into one-, three- and five-year inspection cycles, respectively.

The 2009 inspection targets and the number of primary inspections completed for operations using only offsite waste management are outlined in Table 8.

Table 8 Code of Practice Primary Inspection Summary for Operations Using Offsite Waste Management (2009)

Code of Practice	Inspection Cycle	Sector Size ¹	Annual Inspection Target	# Primary Inspections (2009) ²	% of Annual Target
Automotive Repair	3-year	148	49	79	161
Photographic Imaging	5-year	177	35	34	97
Printing	3-year	16	5	4	80
Laboratory (analytical)	1-year	7	7	7	100
Laboratory (institutional)	3-year	12	4	7	175
Laboratory (veterinary and school)	5-year	26	5	3	60
TOTAL		386	105	134	

Notes:

¹ Based on the estimated number of operations within each sector using only offsite waste management (at the end of 2008).

² Number of primary inspections of operations using only offsite waste management in 2009.

The overall primary inspection levels in 2009 were higher than those in 2008 and most of the new inspection targets were met or exceeded. The main exceptions for operations with required treatment works were in the automotive repair, carpet cleaning, dental and fermentation sectors.

A new COP inspection frequency plan, with modifications based on the results for 2009, has been prepared for implementation in 2010 as part of the overall RSCP work plan.

Repeat Inspections

In addition to primary inspections, there were 393 repeat inspections carried out by RSCP and bylaw enforcement staff in 2009 to confirm compliance status following initial inspections. These repeat inspections are summarized in Table 9.

The majority of RSCP repeat inspections (324) were carried out within the food services sector, since it is the largest sector regulated under a code. As in previous years, there was a high level of repeat inspection for this sector, indicating a relatively high number of compliance issues requiring resolution.

Table 9 Code of Practice Repeat Inspection Summary—2009

Code of Practice	# Repeat Inspections (2009)*
Automotive Repair	20
Carpet Cleaning	0
Dental	0
Dry Cleaning	1
Fermentation	0
Food Services	324
Laboratory	0
Photographic Imaging	23
Printing	0
Recreation Facility	0
Vehicle Wash	25
TOTAL	393

Note:

* Number of repeat inspections by RSCP and bylaw enforcement staff carried out to follow up on non-compliance issues recorded during primary inspections.

3.1.5 Monitoring

RSCP staff carried out the following types of monitoring in 2009: permit compliance, authorization compliance, COP, key manhole and treatment plant influent/mixed liquor monitoring. All wastewater samples collected in 2009 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. All monitoring targets set for 2009 were achieved. Table 10 provides a summary of RSCP monitoring activity, comparing 2009 with the previous year.

Table 10 Summary of RSCP Monitoring Activity in 2008 and 2009

Monitoring Events	2008	2009
Permit compliance	66	63
Authorization compliance	8	4
Code of practice	30	58
Key manhole	22	27
SPWWTP Influent	10	12
Ganges influent and mixed liquor	13	13

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. These data are 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 collect 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 completed per permit in 2009, was two. This was a slightly higher level of audit sampling than that carried out in 2008. The goal of collecting audit samples from each permitted site twice per year was achieved.

The environmental science officer responsible for managing a specific permit checks the data and 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. A computerized method of performing this statistical test has been developed to facilitate and standardize this procedure.

All audit results obtained in 2009 were not significantly different from self-monitoring results reported from the same site. This indicated that the self-monitoring results being submitted by permittees had been collected and analyzed in an appropriate manner, as required by each permit.

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 2009 at a small number of businesses operating under authorizations which include 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.

In 2009, sampling was completed at four of five sites originally scheduled for monitoring. The results of this monitoring indicated that discharges from authorizations were generally in compliance with Sewer Use Bylaw restricted waste limits.

CODE OF PRACTICE MONITORING

Another type of monitoring undertaken by RSCP staff is COP monitoring. 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 required treatment works, carrying out regular maintenance and keeping records.

RSCP staff carry out COP monitoring for a limited number of parameters at a small number of discharging operations per year. Grab samples are generally collected from discharging operations that have properly-sized treatment works. Exceedence of contaminant limits specified in a code can indicate failure of a treatment works or lack of proper maintenance. Site-specific investigations or outreach may follow receipt of results that are above specified contaminant limits.

COP monitoring results are useful in characterizing the typical waste stream of an operation within a code sector. This information can be used for planning purposes and also for identifying contaminants of concern in some sectors.

In 2009, COP monitoring was carried out, as planned, within four of the 11 regulated sectors (photographic imaging, printing, food services and dental operations) and a total of 58 samples were collected.

Dental

Five dental operations were sampled in 2009. Only one type of amalgam separator was able to be sampled due to the lack of monitoring points for other types of separators. Results showed high mercury, copper and zinc levels in amalgam separator effluent at three sites and a high silver level at one site. These elevated results appeared to be related to higher suspended solids in these samples, possibly indicating a decrease in separation efficiency as collecting containers become full. This finding supports increased outreach efforts stressing the importance of regular amalgam separator maintenance.

In 2010, another five dental operations will be selected for monitoring. Efforts will be made to collect samples from operations using different types of amalgam separators that have been properly maintained.

Photographic Imaging

Twenty-five photographic imaging operations were sampled in 2009. This constituted all of the discharging operations within this sector in the district. Three sites sampled had unusually high levels of silver, which is the target contaminant for this sector. Two of these sites also showed high levels of other priority metals in treated effluent, which may have been due to analytical challenges related to the high silver result or specific chemical after-treatment procedures. The silver recovery units at these locations were either due for replacement or were inadequate for the application. The facility with the highest silver results reported that they had upgraded their treatment works in December 2009 after the sampling event. Further investigations or and/or outreach will be required in 2010 to help resolve any remaining issues at these three sites. The entire sector will be re-sampled in 2014.

Printing

Seven printing operations that discharge wastewater to sanitary sewer were sampled in 2009. This constituted all dischargers identified within the sector. All operations showed effluent contaminant concentrations that were below standards set out in the COP. Minor exceedences were noted for either pH or total suspended solids (TSS) at two sites. Overall, pre-treatment system performance within this sector was good and re-sampling is not recommended until 2014. Specific outreach to discharging operations is planned for 2010.

Food Services

Twelve separate food services operations were sampled in 2009. Samples were obtained from 21 grease interceptors at these operations using an improved two-stage cleaning and sampling procedure. Results from 12 grease interceptors exceeded the discharge regulations specified in the COP (exceedences of limits for either pH and/or TSS). The number of exceedences for these two parameters was higher than in the previous year.

The target parameter for this sector is total oil and grease (TOG). Although there is no TOG limit specified in the COP, five of 21 results exceeded the Sewer Use Bylaw limit for this parameter. This is a similar percentage to that found in 2008; however, mean TOG results were lower in 2009. Two operations with high TOG results in 2008 were re-sampled and showed some improvement in 2009.

Ten food services operations are scheduled for sampling in 2010 and site-specific outreach will be used at the two operations having the highest TOG results in 2009.

In addition to the food services and dental sampling planned for 2010, the entire automotive repair (discharging operations only) and vehicle wash sectors will be sampled.

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 four residential sites, two Department of National Defence (DND) sites and three sites with mixed flows (residential, commercial and industrial) within the Saanich Peninsula Wastewater Treatment Plant (SPWWTP) collection area. Additional sampling was conducted at four sites in Ganges on Salt Spring Island in 2009.

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 2009 residential sampling program included sampling events at Dean Park (North Saanich) in February and June; Harling Point Pump Station (Saanich) in March and June; and Vantreight Pump Station (Saanich) in March and October. All events included sampling and analysis for a wide range of parameters, including priority contaminants.

Additional residential samples were taken at a manhole on Cameo Street (Saanich) in February and June. Sampling at this site was initially undertaken in 2006 to provide baseline information on typical surfactant (methylene blue active substances) levels in wastewater for residential outreach performance measurement purposes. In 2009, the parameter list was expanded to match that at the other three sites.

An exceedence of the restricted waste limit for TOG was found at the Vantreight Pump Station in November. None of the other residential samples collected in 2009 contained concentrations of contaminants above restricted waste limits.

DND Sites

In 2009, key manhole sampling was carried out at the Esquimalt Pump Station, serving the DND Dockyard area, in January and June and at the DND Colwood (Rosebank) Pump Station in February and June. The 2009 sampling showed an exceedence of the restricted waste limit for total sulphide at the DND Colwood site in March and an exceedence for chloride at the DND Dockyard site in January. These exceedences were brought to the attention of DND staff at CRD/DND working group meetings in 2009. The discharge of wastewater with elevated sulphide concentrations has been observed in past sampling events at DND Dockyard. Working group investigations into potential sources will be continued in 2010.

SPWWTP Collection Area Sites

In past years, there has been a number of sewage treatment plant upsets reported at the SPWWTP during fall and winter months. Monitoring within the SPWWTP sewage collection area was increased in 2006. Two new sites, Keating pump station and Sidney pump station, were added to the ongoing monitoring at Victoria Airport manhole #5. Since the majority of SPWWTP incidents have occurred over weekends in the fall and winter, baseline monitoring was carried out at all sites on weekends in February and November, collected over a three-day period.

The 2009 SPWWTP key manhole monitoring program included weekend monitoring at Victoria Airport #5, Keating, Sidney and Hagan (new in 2009) pump stations in February and November. There were no exceedences of restricted waste limits at all sites sampled in 2009.

Following recommendations made in Golder Associates Ltd., (2009b), the following changes will be made in the key manhole program in 2010: Residential monitoring frequency will increase to quarterly at four sites [Harling Point, Vantreight, Lang Cove (new in 2010) and Dean Park] and SPWWTP collection area monitoring will be discontinued.

Ganges Metals Monitoring

Key manhole monitoring was carried out at four locations in Ganges on Salt Spring Island in August 2009, as part of a continuing investigation into sources of elevated metals levels in the mixed liquor at the Ganges Wastewater Treatment Plant (GWWTP). The sampling locations were: Manson Road pump station, Seaview Road manhole, McPhillips Road manhole and Kanaka Road manhole. The results of this sampling are discussed in Section 3.3.

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 is now referred to as "quarterly plus" sampling. There were four "quarterly plus" sampling events at SPWWTP in 2009. Four "quarterly plus" sampling events are scheduled for 2010.

Twelve mixed liquor (treatment plant wastewater mixed with activated sludge) samples (for metals analysis) and a single sample of influent (for priority pollutant analysis) were also collected from the GWWTP for analysis.

The influent and mixed liquor data are routinely entered into the Environmental Services Information System (ESIS) database and are 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 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 Service Delivery Review (November 2009) supported a more supportive, proactive and collaborative approach to regulation within the new Environmental Partnerships division, which will include the RSCP in 2010.

WASTE DISCHARGE PERMIT HOLDERS

Of the 34 active waste discharge permits in place at the end of 2009, 15 sites were in "full compliance" with their permits and the Sewer Use Bylaw. Seven sites were listed at Step 1, five sites at Step 2 and three sites at Step 3 of the enforcement policy. In addition, there were two sites undergoing assessment by RSCP staff. These 17 sites are considered to be "in progress", but still in compliance with their permits under the enforcement policy.

At 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 of Step 3 sites to discharger under review (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.

Two of the 34 sites operating under waste discharge permits were classified as DUR at the end of 2009. Both sites submitted the required compliance plans within the year and are currently working at implementing these plans.

One site, a dairy product manufacturer, was considered a DUR on August 31, 2007, due to failure to install required treatment works. After installation of treatment works, in November 2008, good progress was made in 2009 in optimizing the system, capturing product for re-use and removing high-strength wastes for offsite treatment. Full permit compliance was achieved by December 2009 and a permit amendment was issued in 2010.

No charges were laid against waste discharge permit holders under the Sewer Use Bylaw during 2009.

The overall waste discharge permit compliance level for 2008 was 94% ("full compliance" or "in progress") slightly lower than that for 2008 (97%).

OPERATIONS REGULATED BY AUTHORIZATION

A small group of the total number of authorizations (103) 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 relatively minor in comparison to discharges from permitted facilities.

Twenty-seven inspections were carried out at sites operating under authorizations in 2009. At the end of 2009, all inspected businesses were in compliance with their authorizations.

An on-going investigation into the effectiveness of treatment works was proceeding at one site, which was considered to be progressing towards compliance. Another site, which was subject to an investigation following an unreported bypass of authorized treatment works in May 2008, was issued a waste discharge permit in 2010.

The overall compliance level for authorizations ("full compliance" or "in progress") was 100%, since no businesses operating under authorizations were classified as DUR at the end of 2009.

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 2009 is presented in Table 11.

Table 11 Codes of Practice Enforcement Summary—From Implementation Date to End of 2009

Code of Practice	# Regulated Operations Inspected¹	% Full Compliance²	% In Progress³	% Non-Compliance⁴ (DUR)
Automotive Repair	175	89.5	10	0.5
Carpet Cleaning	29	93	7	0
Dental	120	91	9	0
Dry Cleaning	12	100	0	0
Fermentation	30	93	7	0
Food Services	1,109	85	14	1
Laboratory	45	87	13	0
Photographic Imaging	202	96	4	0
Printing	27	81.5	18.5	0
Recreation Facility	9	100	0	0
Vehicle Wash	27	59	41	0

Notes:

¹ Number of distinct regulated COP operations inspected since the implementation date where there was an enforcement finding at the end of 2009.

² Percentage of operations in compliance with all requirements of the code at the last inspection—including sites with required treatment works and those using offsite waste management.

³ Percentage of operations classified at Step 1, 2 or 3 of the enforcement policy at the last inspection date.

⁴ Percentage of operations classified as DUR at the last inspection date.

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. In general, there has been good cooperation from this sector during application of the escalating approach to enforcement.

A high percentage of non-compliant food services businesses needed additional follow-up, resulting in 324 repeat inspections by RSCP and bylaw enforcement staff within this sector in 2009 (see Table 9). As a result, approximately 14% of food services operations inspected were considered to be "in progress" and 1% were classified as DUR. The percentage of food services operations classified as DUR was lower than that reported in 2008 (3%) and the percentage in full compliance (85%) was the highest recorded to date for the sector. The main non-compliance issues continued to be failure to install properly-sized grease interceptors and failure to maintain grease interceptors.

For most of the remaining sectors, full compliance rates remain high. The one exception was the vehicle wash sector where 41% of operations were classified as "in progress" due to undersized vehicle wash interceptors or record keeping infractions. This sector will be a priority for inspections in 2010.

Bylaw enforcement staff investigated seven enforcement cases within the food services sector in 2009. As a result of these investigations, six businesses were issued tickets under the CRD TIA Bylaw. Common offences in this sector were failure to install a grease interceptor, accumulation of excess grease and failure to upgrade a grease interceptor. No charges were laid under the Sewer Use Bylaw in 2009.

As in the past, RSCP staff worked closely with CRD bylaw enforcement staff and legal counsel in carrying out these enforcement actions.

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 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 12.

Table 12 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	98
Carpet Cleaning	1 July 2003	100
Dental	1 July 2001	100
Dry Cleaning	1 July 2004	100
Fermentation	1 July 2003	100
Food Services	1 January 2003	92
Laboratory	1 July 2004	100
Photographic Imaging	1 June 2000	100
Printing	1 January 2005	93
Recreation Facility	1 January 2005	100
Vehicle Wash	1 January 2005	74

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 2009.

For most code sectors, the percentages of operations properly treating waste increased or remained approximately the same in comparison to those reported in 2008. The largest increase, in proper waste treatment was demonstrated in the food services sector, which rose from 89% to 92% in 2009.

The vehicle wash sector was the only sector showing a significant decrease in comparison to 2008 results, dropping from 81% to 74%. This was due to further identification of undersized vehicle wash interceptors at a number of smaller vehicle wash operations during inspections in 2009. This issue will continue to be investigated in 2010.

Many sectors were already demonstrating high levels of proper waste treatment within three years of full implementation of their respective codes. Factors likely responsible for these high levels include a relatively low cost of treatment (carpet cleaning, fermentation and recreation facilities), ready availability of offsite treatment options (automotive repair, photographic imaging and printing) and adoption of new federal regulations (dry cleaning).

In comparison, progress within the food services sector has been relatively slow, but steady, over the past seven years. This is likely attributable to the large size of this sector, the relatively high cost of installing properly-sized treatment works and the impracticality of offsite treatment. A large number of food services operations inspected to date have had treatment works (grease interceptors) in place; however, a portion of them have not been correctly sized.

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.

Following the preparation of a list of priority contaminants in February (see Appendix 2), and approval of additional funding for contaminants management in March 2008, an important step toward the development of a contaminants management plan was initiated. A consultant was selected to prepare an inventory of priority contaminant discharges to the Core Area and Saanich Peninsula sewage collection systems. The main objective of this project was to develop a mass balance of priority contaminant discharges to the sanitary sewer, research likely sources and develop recommendations for reduction measures. A secondary objective was to analyze all residential key manhole data collected to date (see section 3.1.5) to identify trends and develop recommendations for future monitoring. The inventory project was completed in November 2009.

The main findings of this study were as follows:

- Approximate balance was achieved between estimated residential and business inputs and known outputs of priority contaminants, as measured at the three outfalls.
- Residential inputs were the most important sources of priority contaminants in all three collection areas.
- Residential key manhole data collected over the period 1995-2008 within the Clover Point catchment area did not show any temporal trends for most priority contaminants (contrasting with the generally decreasing trends for these contaminants at Clover Point outfall).
- Decreases observed at Clover Point are likely attributable to decreases in contaminants from non-residential sources.
- Polycyclic aromatic hydrocarbons (PAH) from residential sources present a relatively low risk of adverse ecological effects and should not be a focus for future source control activities.
- Some uncharacterized or consistently underestimated sources of priority contaminants may require further investigation.

Recommendations from this study included:

- Research into specific household activities or products that result in release of priority pollutants to sewer.
- Addition of a residential key manhole site in the Macaulay Point collection area and increased frequency and consistency of sampling at all sites.
- Additional sampling of permitted and COP discharges to reduce uncertainty and characterize variability in discharge quality and flow.
- Research into potential sources of contaminants for which outputs greatly exceed total known inputs.

Subsequent investigations into residential sources of mercury and PAHs were carried out by consultants in early 2010. An additional residential key manhole site within the Macaulay Point collection area was added in 2010 and monitoring frequency was increased.

The results of the mass balance report and additional investigations will assist in the preparation of a contaminants management plan in 2010.

The following summarizes other contaminants management projects undertaken by RSCP staff in 2009.

Ganges Metals Monitoring

Key manhole monitoring was carried out at four locations in Ganges on Salt Spring Island in August 2009 as part of a continuing investigation into sources of elevated metals levels in the mixed liquor at the GWWTP. The focus of this monitoring was to confirm whether dental operations, with installed amalgam separators, were the main sources of mercury within the catchment area, or whether other sources were contributing to mixed liquor mercury concentrations at the treatment plant. The sampling locations were: Manson Road pump station, Seaview Road, McPhillips Road and Kanaka Road manholes. Single 24-hour composite samples of sewage were collected from each location. Manson Road and Seaview Road sampling locations included discharges from dental offices and McPhillips Road and Kanaka Road did not.

Sampling results at three of the sites showed generally low levels of mercury and other metals. Results from the Seaview Road manhole, located directly downstream from a dental operation, were approximately 10 times higher than results from the other sites for concentrations of mercury and silver—suggesting a potential influence from treated dental wastewater. Although limited in scope, this sampling event showed that levels of mercury and silver at the other three sites were generally within the range of typical residential wastewater and that the main identifiable source of these metals in GWWTP mixed liquor is likely to be dental operations. Further investigations may be considered in future if Ganges mixed liquor metals levels show increasing trends.

Non-Perc Dry-cleaning Investigation

An investigation into CRD dry-cleaning operations, which do not use "perc" (tetrachloroethene or PCE) as a solvent, was conducted in early 2009. The main findings and recommendations of this investigation were:

- Only three non-perc businesses were in operation within the district, two using petroleum solvent and one using wet-cleaning techniques based on use of "natural" surfactants.
- The wet cleaning operation does not discharge restricted waste and will not require regulation under the Sewer Use Bylaw.
- Dry-cleaners using petroleum solvent will require regulation if they discharge restricted waste to sanitary sewer.

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 re-assessment.

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 2009, 56% of permitted sites were meeting their target concentration limits and a further 38% 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 2009.

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).

CODES OF PRACTICE TARGETS

Contaminant reduction targets have been prepared for each of the 11 existing COP. The general procedure for setting the targets has been documented in previous annual reports. The degree of achievement of each COP target is assessed following the completion of the five-year inspection cycle following full implementation of each code. The five-year contaminant reduction targets for each COP sector are summarized in Table 13, along with estimates of reductions up to the end of 2009.

Table 13 Contaminant Reduction Targets for Sectors Operating Under CRD Codes of Practice

Code Sector	Baseline Year	Target Year	Contaminant(s)	Target % Reduction	2009 Reduction Estimates (%)
Photographic Imaging	2000	2005	Silver	86	99
Dental	2001	2006	Mercury, Copper, Zinc, Silver	86	96
Food Services	2002	2007	Oil and Grease	77	84
Carpet Cleaning	2002	2007	Suspended Solids	57	66
Fermentation	2002	2007	Suspended Solids	84	88
Automotive Repair	2003	2008	Mineral Oil and Grease Copper, Lead, Nickel, Zinc	90 60	97 88
Laboratory	2003	2008	Wide range of restricted and prohibited wastes	95	>95
Dry Cleaning	2003	2008	Tetrachloroethene (PERC)	>99	99
Vehicle Wash	2004	2009	Mineral Oil and Grease Copper, Lead, Nickel, Zinc	90 30	67 22
Printing	2004	2009	Mineral Oil and Grease BETX	88	90
Recreation Facility	2004	2009	Suspended Solids	81	85

In 2009, the end of the five-year inspection cycle was reached for the final three COP that were fully implemented in January 2005. All five-year reduction targets have now been successfully achieved with the exception of the vehicle wash sector, one of the last codes to be fully implemented. As discussed in Section 3.2, compliance levels for the vehicle wash sector have been lower than expected due to several smaller operations having undersized vehicle wash interceptors in place. This sector will be the focus of further investigations in 2010.

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 analyses of the data collected through core area effluent monitoring have been carried out in the past (PLA, 2002; PLA, 2004; Golder Associates Ltd., 2006) and results have been summarized in previous RSCP annual reports.

The most recent effluent trend analysis was undertaken in 2009 (Golder Associates Ltd., 2009a). This report provided a statistical assessment of wastewater trends at Clover and Macaulay point outfalls over the period 1990 to 2008 and wastewater and biosolids trends at the SPWWTP from 2000 to 2008. The findings of this report for Clover and Macaulay points over the 18-year period of record included the following:

- The broad temporal trends for key parameters were similar at both outfalls.
- Significant reductions in detection frequency for several parameters were noted in recent years [the pesticide lindane, di-n-octyl phthalate, mercury, xylenes, tetrachloroethene (perchloroethene or PCE) and mineral oil and grease are now infrequently detected].
- Priority metals such as chromium, mercury, cadmium, lead, nickel, silver and zinc have shown significant decreases in loads, ranging up to a 26% decrease per year (some of these were new trends). There were, however, significant increases in loads of arsenic, molybdenum, dissolved cobalt and selenium (at either one or both outfalls) ranging from 2-10% per year.
- Organic compounds, including 1,4-dichlorobenzene, PCE, toluene and xylenes, have shown significant decreases in loads, ranging from 6-18% per year.
- Significant decreases of 3% and 9% per year were also observed for oil and grease and cyanide (reversing an increasing trend for cyanide reported in PLA, 2004).
- Some individual PAHs (e.g., fluorene, phenanthrene, 2-methylnaphthalene) have displayed significant decreases in loads over time (3-8% increase per year). These trends were not evident in previous assessments.
- Other individual PAHs (e.g., acenaphthene, fluoranthene), two phthalates, total high molecular weight PAHs and total PAHs exhibited apparent increasing trends in loads, some of which may be artifacts of elevated detection limits in recent years.
- Non-priority substances showing increasing trends in loads included dimethyl ketone and trichloromethane.
- General trend results from previous years analyses were confirmed; any differences were likely attributable to the higher statistical power in the recent study resulting from the inclusion of three additional years of sampling data.

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. For example, the recently reported load reductions for tetrachloroethene (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. This code, amended following introduction of new federal regulations regarding the use of PCE, requires installation of new treatment works that virtually eliminate the discharge of PCE to the sanitary sewer.

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, new significant decreases in certain PAHs, xylenes and toluene, and the lower frequency of detection of mineral oil and grease in recent years 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 apparent increases for some individual PAHs (e.g., acenaphthene, fluoranthene) and some phthalates appear to be linked to elevated detection limits in recent years. The trend report has recommended the use of lower detection limits for selected organic substances in future monitoring at both outfalls.

Preliminary results of Macaulay and Clover point effluent monitoring in 2009 generally indicate similar concentrations and loads of contaminants to those reported in Golder Associates Ltd, (2009a). This suggests that previously reported trends are either continuing or leveling off. Statistical confirmation of these results will be undertaken as part of the next long-term analysis of effluent trends scheduled for the core area outfalls in 2012.

Further information about core area effluent quality in 2009 can be found in the upcoming Macaulay and Clover Point Wastewater and Marine Environment Program (WMEP) annual report for 2009, to be completed towards the end of 2010.

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. This report identified a significant reducing trend in influent loads of TOG over the five-year period, which is probably linked to the full implementation of the food services COP in 2003. There were few meaningful trends in influent loads of other contaminants; however, there was an increasing trend reported for loads of high molecular weight PAHs over the same period.

As mentioned above, Golder Associates Ltd., (2009a) included a statistical assessment of wastewater influent and effluent trends at the SPWWTP over the period 2000 to 2008. The main findings of this report for the SPWWTP included the following:

- Trends in influent and effluent contaminants were similar in terms of direction and significance.
- Significant reductions in detection frequency for several parameters were noted in recent years (the pesticide lindane, several PAHs, and tetrachloroethene (PCE) are now less frequently detected in influent).
- Priority metals generally showed significant decreases in influent loads; the greatest decreases were observed for chromium VI, mercury, lead and silver (ranging from 7 to 31% per year). The lead and mercury decreases had not been previously identified.
- There was a significant increase in manganese and molybdenum reported in influent (3% and 12% per year respectively).
- Other priority contaminants such as 1,4-dichlorobenzene and cyanide showed decreases in influent loads that had not been previously identified.
- Total PAHs and total low molecular weight PAHs exhibited apparent increasing trends in influent loads, which may be artifacts of elevated detection limits in recent years.
- One phthalate (butyl benzyl phthalate) also demonstrated a significant increase in influent loads over the study period.
- A higher number of significant trends were observed than in the study by Hatfield Consultants Ltd, 2005, likely due to an increase in statistical power through the addition of four years of sampling data.

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. Concentrations of several of the key metals of interest (cadmium, chromium VI, mercury, silver and lead) 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.

Observed increases in molybdenum loads could be associated with the wide use of molybdate corrosion inhibitors in heating and cooling systems, as identified in the 2008 annual report. Further work on educating businesses and institutions about the use and effectiveness of alternative, metal-free, corrosion inhibition products is needed in future to help reverse this trend.

The specific cause for the increasing trend for butyl benzyl phthalate in SPWWTP wastewater is unknown. Phthalates are ubiquitous contaminants associated with a variety of plastics and are not specific to any industry or business sector.

Preliminary results of the SPWWTP influent and effluent monitoring in 2009 indicate very similar concentrations and loads of contaminants to those reported in Golder Associates Ltd., (2009a). This suggests that previously reported trends are either continuing or leveling off. Statistical confirmation of these results will be undertaken as part of the next long-term analysis of wastewater trends for the SPWWTP tentatively scheduled for 2012.

Further information about the trend analysis and SPWWTP influent and effluent quality in 2009 can be found in the SPWWTP Wastewater and Marine Environment Program annual report for 2009, to be completed toward the end of 2010.

3.4.3 Biosolids and Mixed Liquor Contaminant Reductions

Another important objective of the RSCP is the protection of sewage treatment plant biosolids 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 contaminants on a regular basis since the plant was commissioned in 2000. Similar monitoring has been carried out on the mixed liquor produced at the smaller GWWTP since 1994.

SAANICH PENINSULA WASTEWATER TREATMENT PLANT BIOSOLIDS

The quality of SPWWTP biosolids has consistently met the most stringent (Class A) criteria for all parameters since 2000. Biosolids trend analyses 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 to 2004.

The Golder Associates Ltd., (2009a) report included a re-assessment of biosolids trends at the SPWWTP over the period 2000 to 2008. The main findings of this report included the following:

- Significant decreases in the detection frequency of nickel and silver were observed.
- Significant decreases ranging from 4 to 30% per year were observed for concentrations of a range of metals including chromium, mercury, cadmium, zinc and copper. Most of these trends have become apparent since 2004.

- There was an apparent increase in arsenic since 2004; however, the true trend was uncertain due to use of elevated detection limits over the period 2006-2008.
- Many parameters which did not show significant trends in the previous assessment showed significant trends in this study (over 70% of these trends were decreases) due to an increase in statistical power and the inclusion of four additional years of sampling data.

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

Mercury levels in SPWWTP biosolids have met the Class A criterion of 5 mg/kg since 2000 showing a decline to the current low levels over the period 2000-2006 (see Figure 1). Mercury levels in SPWWTP biosolids have been less than 0.5 mg/kg since April 2005. These very low, and relatively stable, results confirm the continuing success of the implementation of the dental COP in July 2001 (requiring installation of amalgam separators at all dental offices) in reducing and controlling mercury levels in SPWWTP biosolids.

As was the case in 2008, there was a reduced volume of biosolids production in 2009. Consequently, only batches produced in March, June, August and September of 2009 were sampled and analyzed. All analytical results again met the Class A criteria for metals.

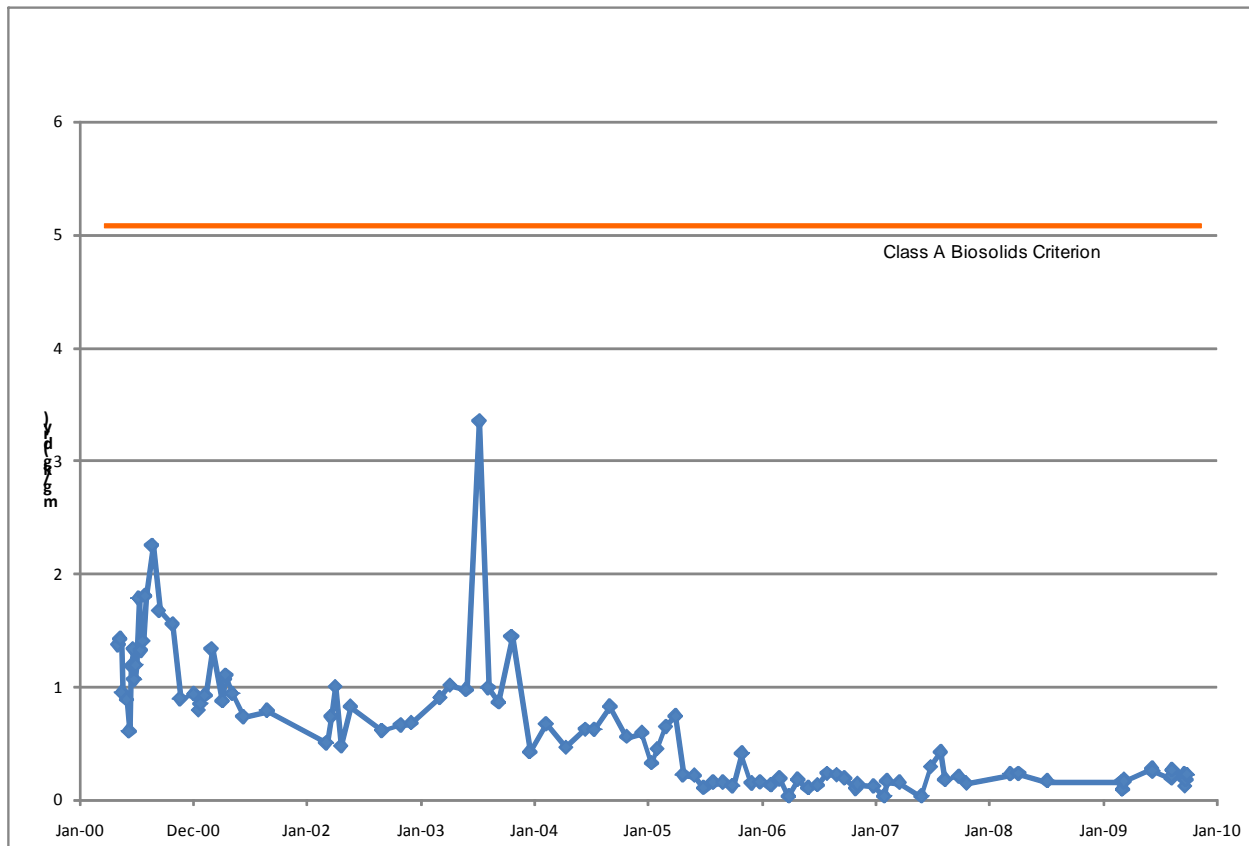


Figure 1 Mercury in Saanich Peninsula Wastewater Treatment Plant Biosolids (2000-2009)

GANGES WASTEWATER TREATMENT PLANT MIXED LIQUOR

The GWWTP process produces a mixed liquor product and 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. 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 2). 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 first time since sampling began in 1994, the 2009 GWWTP mixed liquor results met the Class A criteria for all metals, including mercury. This finding may be related to an increased level of business inspection in the Ganges collection area in 2009. Of 50 businesses inspected, all dental, photographic and laboratory operations connected to sewer were found to be fully compliant with the respective COP. All of the automotive repair operations inspected were also compliant, or in progress toward compliance. By the end of 2009, only one food services operation, of 39 inspected, was found to be non-compliant with the COP.

The historically low levels of mercury in Ganges mixed liquor in 2009 may be directly related to improved maintenance of dental amalgam separators resulting from the above increase in inspection activity.

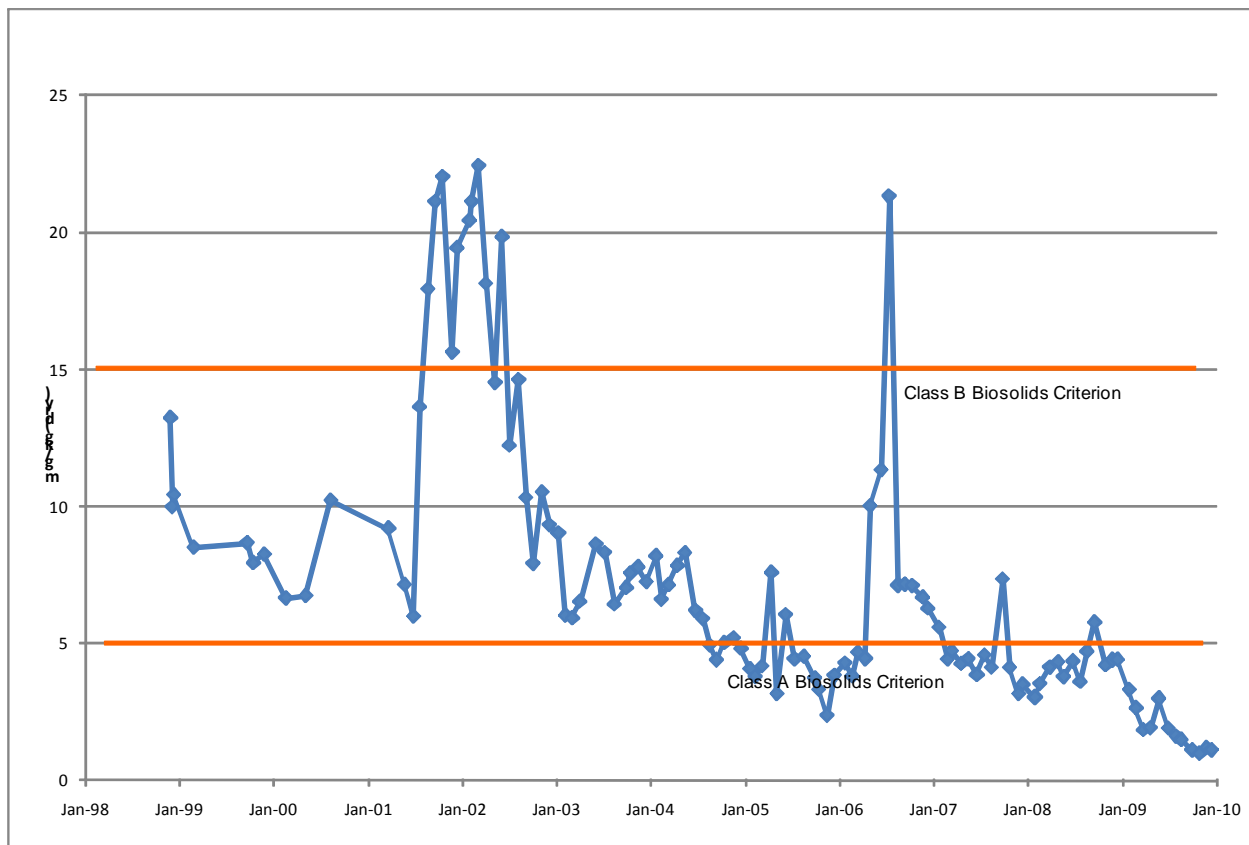


Figure 2 Mercury in Ganges Wastewater Treatment Plant Mixed Liquor (1998-2009)

3.5 Significant Incident Reporting

CRD operations and municipal engineering department staff communicate regularly 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. Completed copies of the CRD's significant incident report form, outlining the nature of the incident and a description of the response, are sent to engineering contacts within the municipality where the incident occurred. This form was developed in 2000 to record operational problems within all trunk sewers and treatment plants operated by the CRD.

Table 14 provides a summary of incidents reported in 2009 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, City of Victoria Grease Reports, complaint forms, memos, e-mails, conversation records and other notes on file. There were no significant incidents reported at CRD sewage treatment plants in 2009; however, there were two significant incidents reported within the CRD's sewage collection systems and three incidents reported in the City of Victoria's collection systems.

Table 14 Summary of Reported Sewer System Incidents (2009)

Contaminant	Nature of Incident	Potential Impact	Incident Follow-up
Obstructive Waste	Needles found in CRD Trent Street pump station wet well downstream from Hospital (Royal Jubilee): February	Blockage of pumps, health hazard to sewer workers.	Discussed at meeting with VIHA (Royal Jubilee Hospital) staff. No further occurrences reported.
Volatile Organic Compounds (VOCs)	Paint thinner vapours detected in CRD Clover Point wet well: August	Worker health and safety.	Emergency exhaust fan activated. Workers evacuated screening room for two hours. Grab samples to be taken during all repeat incidents to help identify sources.
Fats, Oils and Grease (FOG)	City of Victoria reported a sewer lateral blockage due to FOG build-up on tree roots (Cormorant Street): February	Sewer back-ups (health risk), increased maintenance of municipal sewer lines.	Food services inspections by RSCP—grease interceptors not installed, undersized or not properly maintained.
FOG	City of Victoria reported a sewer lateral blockage due to FOG build-up (Quebec Street): March	Sewer back-ups (health risk), increased maintenance of municipal sewer lines.	Food services inspections by RSCP—grease interceptors not installed, undersized or not properly maintained.
FOG	City of Victoria reported a sewer main blockage due to FOG build-up in a large catchment area (Chatham Street): June	Sewer back-ups (health risk), increased maintenance of municipal sewer lines.	Extensive food services inspections by RSCP—grease interceptors not installed, undersized or not properly maintained.

3.6 Outreach

RSCP staff continued to develop and maintain an outreach and education presence throughout 2009, building on the residential outreach components launched in 2007 and 2008 under the catchphrase "Clean Water Begins at Home". This initiative has overall goals of linking common household practices with their potential impacts, promoting personal action to improve those practices and reducing the amount of contaminants discharged to sewer by the residential sector. Community-based social marketing techniques that help people make positive changes by providing them with clear, desirable practices that can be easily accomplished are built into this new approach.

Key initiatives for 2009 are summarized below under separate sections for residential and business outreach.

RESIDENTIAL OUTREACH

RSCP staff continued the promotion of the three "Clean Water Begins at Home" campaigns (Fats, Oils and Grease reduction, Surfactant reduction and Medications return) through print and radio advertisements from January to December 2009. The launch of these campaigns is described in detail in previous annual reports.

A telephone survey to measure the success of the three "Clean Water Begins at Home" campaigns within the CRD was carried out by Innovative Research Inc., in February 2009, and a report was produced summarizing the results in April. The key findings of this report were:

- The public is supportive of the goals of the RSCP. Public responses to "environmental protection" questions ranked source control practices highest in importance out of four related conservation actions (Power Smart, recycling, composting and source control practices). This indicates that the public is largely persuaded of the arguments for source control and that outreach can now focus on maintaining awareness.
- There are important differences in responses between groups, particularly by age and gender. Respondents were generally aware of, and willing to adopt, source control practices. However, 75% of males 18-34 years of age were less aware and, apparently, not receiving or responding to source control messaging.
- There was a significant drop in the disposal of medications down the drain: from 14% in 2008 to 6% in 2009; however, disposal of medications in the garbage increased. Seventy-five percent of residents who were aware of the medications return program were returning medications to a pharmacy.
- Almost 75% of residents are using less detergent than recommended by manufacturers. The remaining 25% indicate that, with awareness of the CRD's soft water, they will likely use less detergent in future.
- There was a marginal increase in the number of people reporting that they dispose of FOG down drains (from 8% in 2008 to 10% in 2009). Men and respondents in the 18-34-year-old age group are two-three times as likely as women and the elderly to dispose of FOG down kitchen drains.
- Almost 33% of those surveyed believe that source control practices will no longer be important once sewage treatment is implemented in the core area.

The survey findings were important for the design and implementation of several residential outreach initiatives in 2009. A similar survey is planned for 2011 to help gauge the success of RSCP outreach campaigns and guide the development of future initiatives.

Key residential outreach initiatives and events in 2009 included:

- Sooke School District's Diversity Fair (February): General residential source control practices were introduced to 1,500 Belmont Secondary School students (Westshore).
- A second general residential outreach event was held in the Westshore in August, this time in partnership with Ashley Furniture.
- "Wastewater Made Clear" and Core Area Sewage Treatment Events (February-December): The importance of source control as a critical first step in sewage treatment was highlighted at a series of open houses and other events held throughout the core area.
- Earth Day (April): Approximately 200 members of the general public visited the source control booth at an Earth Day event held at the Bay Centre. This was the second year of RSCP's participation at this location highlighting the three "Clean Water Begins at Home" initiatives.
- "Sustainable U" (September 2009-April 2010): Acting on some of the findings of the above telephone survey, a social media campaign was developed and implemented to make source control messaging available to males 18-34 years of age throughout the CRD. The outreach media utilized in this campaign included: web-based tools (i.e., Facebook, YouTube and Twitter); print; outdoor LED screen (at Save-On-Foods Memorial Arena); booths at sporting and recreational events (e.g., outdoor show, Victoria Highlanders soccer, University of Victoria basketball, Salmon Kings hockey). This was the first corporately supported social media campaign developed and launched as a pilot by the CRD. A number of external business and institutional partners helped support the campaign with prizes and co-promotions. The results of this campaign will be assessed and reported in 2010.
- Five videos were developed, in November 2009, to explain the need for, and importance of, residential source control practices particularly with the move toward sewage treatment in the core area—in response to some of the findings of the above telephone survey. The three "Clean Water Begins at Home" themes were highlighted, as well as some general source control information. These videos are now posted on the corporate website and in core area sewage treatment web pages.
- In November 2009, RSCP staff formed a partnership with the Shaw Ocean Discovery Centre (SODC) to develop a hands-on display for the centre linking common household activities with potential impacts on the marine receiving environment and highlighting the role of source control, watershed management, recycling, climate action and other practices in mitigating these impacts. The display is targeted at school programs and the general public and it is estimated that about 10,000 people will be exposed to this messaging each year.

Update on the Medications Return Campaign

Based on information collected by the provincial Medications Return program in 2009, the CRD had the highest medication return rate of all regional districts within the province. Almost seven tonnes of medications were collected—representing a 130% increase over the amount collected in 2007, the year before the CRD Medication Return campaign was launched.

BUSINESS OUTREACH

In 2009, RSCP staff continued to maintain outreach to local businesses through the following activities:

- A revision of the dental operations guidebook was completed and an "information postcard" was designed and mailed out to all dentists. The revised guidebook outlines the COP requirements in plain language and the "information postcard" was a reminder that amalgam separator cartridges require regular replacement in order to maintain separator efficiency.

- A meeting was held with local dental equipment service providers in 2009 to discuss dental COP requirements and identify common issues related to pre-treatment within the sector.
- Local service providers were consulted regarding COP requirements and ongoing maintenance and repair of pre-treatment systems in the printing sector.
- In October 2009, RSCP staff participated in a display booth at a business services show hosted by the Victoria Chamber of Commerce. The display, staffed in partnership with CRD Demand Management and Regional Planning, highlighted mandatory requirements, best management practices and services offered by the RSCP and other CRD programs. Approximately 500 business representatives attended the show.
- The 2009 CRD EcoStar award event was co-sponsored by RSCP and staff participated in the evaluation committee for the Waste Reduction, Lifetime Achievement and Youth Achievement categories. The EcoStar awards have, since 2000, highlighted businesses, organizations and individuals who have incorporated positive environmental practices into their operations or activities. The 2009 Waste Reduction category was awarded to Royal Oak Middle School for their solid and semi-liquid (e.g., fats, oils and grease) waste reduction and diversion.
- A brochure containing information on the RSCP and other CRD programs was completed for distribution to business sectors and municipal staff. It is hoped that this "one-window" approach will increase awareness of the RSCP and other CRD programs and facilitate the flow of accurate and up-to-date information.

REGIONAL SOURCE CONTROL PROGRAM WEBSITE

RSCP staff continued to work, in cooperation with Corporate Communications and Information Technology staff, to update residential and business web pages in 2009—including addition of the five residential source control videos that were developed in 2009.

PARTNERSHIPS WITH OTHER AGENCIES

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, DND, regional districts, municipalities, Vancouver Island Health Authority and local academic institutions.

Following the implementation of the CRD's Service Delivery Review and re-structuring of the RSCP into the new Environmental Partnerships division in early 2010, it is anticipated that there will be increased collaboration with municipalities, business groups, institutions and other agencies in 2010 and beyond.

Some of the longer term RSCP partnerships that were continued in 2009 are outlined below.

Municipalities

Since 1999, municipal staff have been encouraged to issue waste discharge assessment forms (WDAFs) to persons applying for new building licences 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. A total of 19 WDAFs were submitted in 2009 for evaluation by RSCP staff (mostly from City of Victoria). This represented a significant decrease compared to the number of forms submitted in 2008 (79). The main reason for this was that a new procedure was tested in 2009, whereby businesses or plumbers contracted to perform upgrades at COP operations, directly contacted RSCP staff regarding COP requirements. Staff was alerted to a further 61 new businesses (mostly food services operations in Victoria or Saanich) which required assistance in this way. Letters, copied to municipal plumbing or licensing contacts, were sent directly to the COP operations outlining specific requirements and providing information.

Municipal staff continued to provide wastewater flow data and other information to RSCP staff during, and following, preparation of waste discharge permits and authorizations in 2009.

Department of National Defence (DND)

In 2000, a working group on liquid waste pollution prevention was established between the CRD and DND. The objective of this group was to facilitate the sharing of information on wastewater quality, stormwater quality and pollution prevention measures at DND facilities that discharge into municipal and CRD wastewater collection and treatment systems.

RSCP staff have participated in quarterly working group meetings since 2000. Meetings have also included representatives from Public Works and Government Services Canada and, more recently, CRD Stormwater, Harbours and Watersheds and CRD Water Services. The terms of reference for this group were reviewed in 2007 and the agreement was re-signed by CRD and DND representatives in early 2008. Regular meetings were re-scheduled to a bi-annual frequency in 2009. Activities in 2009 included: open exchange of liquid waste information and monitoring data, discussion of odour and corrosion control issues and reduction of priority contaminants. Regular working group meetings will continue to be held in 2010.

3.7 Data Management

RSCP staff continued to use the RSCP database to track and update compliance information for operations regulated by permits, authorizations and COP throughout most of 2009. In addition, the database includes information on all facilities operating under BMPs.

The database was taken offline in the fall of 2009 to facilitate migration of data to the new Cross Connection and Regional Source Control Information Management System (CRIMS) which had been under development by the CRD's Information Technology department since 2008. CRIMS is an enhanced, more secure and updated business database which combines data from the RSCP with that collected by the Cross Connection Control program.

The migration of RSCP data included data conversion (management and classification) and testing to ensure that data was transferred correctly and without loss. This was a time-consuming, but necessary, process to ensure data consistency and lack of duplication. As a result, the database was unavailable for data entry for several months. New inspection records and compliance information was recorded manually by inspection staff during this period. Field testing, entry of manually recorded data and full implementation of CRIMS is now scheduled for 2010.

3.8 Revenue and Expenditures

A summary of revenue and expenditures for the RSCP in 2009 is provided in Table 15.

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 2009 amounted to approximately \$84,251.

Table 15 Regional Source Control Program Revenue and Expenditures—2009

Description	Revenue (\$)	Expenditure (\$)	
Fees, fines, grants, surplus, other	175,854		
Requisition	1,079,419		
Total Program Revenue	1,255,273		
Program Expenditures		1,176,623	
Administration Expenditures		18,679	
Total Program Expenditure		1,195,302	
Carry Forward to 2010			59,971

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.

3.9 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 2009.

- The third five-year review of the RSCP was carried out by a consultant in the last quarter of 2009 to cover the period 2004-2008. The main objectives of the review included:
 - assess status of LWMP source control commitments
 - determine if previous review recommendations had been addressed
 - determine if Canadian Best Management Practices for wastewater source control had been adopted
 - review progress made in each program component area focusing on achievements, utility needs, effectiveness and efficiency of delivery
 - assess progress in meeting program objectives
 - identify innovative source control programs and regulatory practices in other North American jurisdictions, and assess applicability within the CRD

The final report for the review was delivered in March 2010. The findings of this report will be used to develop the next RSCP five-year plan for the period 2011-2015. The current five-year plan is summarized in Table 16.

- The RSCP annual report for 2008 was presented to the Core Area Liquid Waste Management committee (CALWMC), the Environment committee, the Saanich Peninsula Wastewater committee and the CRD Board over the period May to July 2009. Copies of the report were sent to MOE in June.
- The RSCP continued to meet the commitments outlined in the Core Area and Saanich Peninsula LWMP in 2009.

Table 16 Regional Source Control Program—Five-Year Plan (2006 to 2010)

Program Component	Sub-component	Main Activities	2006	2007	2008	2009	2010
Planning and Development		Review objectives and goals					
		Review and amend bylaw and policies					
		Annual budget preparation					
		Annual report and program performance assessment					
		Five-year Review (2004-2008)					
Inspections	Permits	Inspect all permits 2x/year (3x/year for priority contaminant dischargers) prepare compliance letters, undertake follow-up inspections, investigate and assess new dischargers					
	Codes	Inspect between 20% and 100% of each sector/year (based on priority contaminant dischargers), prepare compliance letters, undertake follow-up inspections, investigate new dischargers					
Monitoring	Permits	Audit all permits 2x/year					
	Other Monitoring	Review, schedule and complete monitoring annually for codes, key manholes and treatment plant influent					
Enforcement	Permits and Codes	Enforce bylaw requirements, follow policies, referrals to Bylaw Enforcement, gather and present evidence, obtain legal counsel					
		Review, amend Ticket Information Authorization Bylaw					
Outreach	Business	Continue annual plan implementation, including stakeholder updates, outreach materials and EcoStar awards					
		Evaluate/revise plan (annually)					
	Residential	Implement expanded plan, including priority contaminant reduction strategy, outreach materials and special events					
		Evaluate/revise plan (annually)					
Contaminants Management		Develop plan					
		Implement plan and strategies					
		Evaluate/revise plan (annually)					
Data Management		RSCP database maintenance, quality control and custom data report preparation					
		ESIS management for RSCP data					
		GIS integration with RSCP dbase					
Special Projects		Municipal information meetings					
		Review restricted waste limits					
		Mercury reduction study					

3.10 Performance Measures

Three program performance measures were developed over the period 2004 to 2006. These measures have been incorporated in RSCP "program budgets" since 2007 and have been 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 2009 data as an example, where available. The results of performance measure calculations for the period 2004-2009 are summarized in Table 17.

Table 17 Results of RSCP Performance Measures (2004-2009)

Performance Measure	2004	2005	2006	2007	2008	2009
1. <i>"Percentage of regulated businesses with proper waste treatment installed"</i> .	N/M	80	85	87	93	95
2. <i>"Percentage of priority contaminants showing no increase in loads to the Core Area environment"</i> .	N/M	92	N/M	N/M	79	N/M
3. <i>"Percentage of biosolids and sludge samples that meet Class A standards for metals"</i> .	83	92	67	88	93	100

Note: N/M: Not measured.

Performance measure #1 was not able to be calculated in 2004 due to the lack of data on the installation of proper waste treatment for COP in that year. Steady progress was recorded for this measure over the period 2005-2009 with the highest overall percentage being recorded in 2009.

Performance measure #2 is based on the "yearly trend" in loadings at both Macaulay and Clover point outfalls for 38 priority contaminants, as documented in the most recent trend analysis report. 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 to 2011, is scheduled for 2012. Despite these limitations, this measure indicates that loadings of the majority of priority pollutants to the core area environment have remained stable or decreased regardless of the fact that core area population and sewage flows have increased by more than 10% during the same period.

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 first time since sampling began in 1994, the 2009 GWWTP mixed liquor results met the Class A criteria for all metals, including mercury—resulting in an overall 100% rating for this performance measure.

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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
Seafood Processor #1	1997	2001-2002	COD	93	Screens installed in 2000, improved operating practices. EcoStar award winner in 2002. Composite sampling started in 2006. Business closed in 2008.
			O&G	92	
			TSS	87	
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.
			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.
			Nickel	47	
Metal Plater #2	1997	2000	Cadmium	43	Improved operating practices in 1998.
			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.
			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. Currently under staff assessment.
			TSS	99	
			O&G	>99	
			MOG	>99	
			Metals	85->99	
			Phenols	48	
Transportation Facility	1998	1999	COD	33	DAF unit installed in 1999. Permit amended in 2006.
			MOG	39	
			Lead	61	
			PAH	58	
Chemical Manufacturer	1997	2002	pH	in control	Installed pH control works in 1998.
Gasoline Station Remediations	2002	2002	TSS	98-99	Data represents results from two typical sites in 2002 with bag (solids) and carbon filters installed.
			BETX	32-97	
			MOG	75	
			Lead	81-85	
Street Waste Facility #1	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.
			MOG	>99	
			Metals	>99	
Street Waste Facility #2	2001	2002	TSS	98	Filtration and oil-water separator. Permit amended in 2005 to include modifications to treatment works. EcoStar award winner in 2005.
			MOG	97	
			Metals	61-96	
			MOG	89	

continued

Appendix 1, continued

Permit Holder	Baseline Year	Comparison Year	Priority Contaminants	Load Reduction (%)	Comments
Chocolate Manufacturer	2006	2009	COD	15	Grease interceptor installed in 2001. pH control works installed 2003. Permit amended, November 2003. Modifications to pH control works in 2007.
			TSS	80	
			O&G	77	
Industrial Laundry #1	2008	2009	COD	17	Shaker screen and oil skimmer installed in 1999. Operating procedure modifications in 2003 improved effluent quality. Assessment in 2006 resulted in equipment modifications. Currently DUR for exceedences.
			TSS	13	
			O&G	44	
			MOG	46	
Industrial Laundry #2	1997	2003	BOD/COD	64/46	Shaker screen installed in 1999. Met permit limits. Business closed in 2004.
			TSS	49	
			O&G	69	
			MOG	98	
Dairy Product Manufacturer	2007	2009	COD	48	DAF treatment works installed in November 2008. System optimization and waste minimization measures completed by December 2009. Permit amended March 2010.
			TSS	89	
			O&G	92	
			pH	in control	
Brewery	1998-1999	2004	BOD/COD	61/61	No treatment installed. Solids removal plan and improved waste reduction practices implemented. Permit amended in April 2003.
			TSS	68	
Oily Wastewater Treatment Facility	2002	2002	MOG	>99	Filtration, primary separation, centrifugation, neutralization, oxidation and activated carbon adsorption. Permit amended April 2003. Bioxide addition for odours in 2005, increased activated carbon adsorption in 2006.
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	2009	COD	43	DAF treatment works installed in August 2007. System optimization completed by mid-2009. Permit amended in December 2009.
			TSS	61	
			O&G	80	

Note:

BOD = biochemical oxygen demand; COD = chemical oxygen demand; 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 (2009)

TOTAL METALS
arsenic (As)
cadmium (Cd)
cobalt (Co)
chromium (Cr)
copper (Cu)
lead (Pb)
molybdenum (Mo)
manganese (Mn)
mercury (Hg)
nickel (Ni)
selenium (Se)
silver (Ag)
zinc (Zn)
POLYNUCLEAR AROMATIC HYDROCARBONS (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
phenol
total oil and grease
cyanide

APPENDIX 3

Calculation Methods for RSCP Performance Measures

The following methods are used to calculate the three RSCP performance measures referred to in Section 3.10.

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—2009

The 2009 data related to progress on waste treatment since full implementation of COP are presented below (Table 12 of this report).

"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	98
Carpet Cleaning	1 July 2003	100
Dental	1 July 2001	100
Dry Cleaning	1 July 2004	100
Fermentation	1 July 2003	100
Food Services	1 January 2003	92
Laboratory	1 July 2004	100
Photographic Imaging	1 June 2000	100
Printing	1 January 2005	93
Recreation Facility	1 January 2005	100
Vehicle Wash	1 January 2005	74

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 2009.

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 2009 information is shown in the following table:

Code of Practice	% Operations Properly Treating Waste	Total # Operations Inspected ¹	# Operations Properly Treating Waste
Automotive Repair	98	175	172
Carpet Cleaning	100	29	29
Dental	100	120	120
Dry Cleaning	100	12	12
Fermentation	100	30	30
Food Services	92	1,109	1,020
Laboratory	100	45	45
Photographic Imaging	100	202	202
Printing	93	27	25
Recreation Facility	100	9	9
Vehicle Wash	74	27	20
Total COP Operations		1,785	1,684

Notes:

¹ Number of distinct regulated COP operations inspected since the implementation date where there was an enforcement finding at the end of 2009.

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 2009 is as follows:

Regulatory Tool	Total # Operations Inspected (to end of 2009)	# Operations Properly Treating Waste	% Overall Operations Properly Treating Waste
Code of Practice	1,785	1,684	
Waste Discharge Permit	34	32	
Authorization	103	103	
Overall Total Operations	1,922	1,819	95%

As a result, the "Percentage of regulated businesses with proper waste treatment installed" in 2009 is **95%**.

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 Scientific Programs, Marine Programs group has collected samples of wastewater from the Macaulay and Clover point outfalls since 1988. Wastewater samples have been analyzed for over 200 parameters, including priority substances and conventional parameters. Statistical analyses 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 analysis (Golder, 2009), utilizing data from the period 1990-2008, updates the previous analysis (Golder, 2006), which included data from 1990-2005.

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 38 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 loadings at both Macaulay and Clover point outfalls for the above 38 priority contaminants, as documented in the most recent trend analysis report. All RSCP priority contaminants showing either a decrease or "no significant trend" in loadings at either Macaulay or Clover point outfalls are identified and reported as a percentage of the 38 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 table on the following page shows how performance measure #2 was calculated for 2005 and 2008—based on information provided in Golder, 2006 and Golder, 2009. Note: Only the contaminants for which a significant increasing trend was reported are shown—all others showed either a "significant decrease" or no "significant trend" (ns).

RSCP Priority Contaminant	Yearly Trend (1990-2005) Core Area Loads	Yearly Trend (1990-2008) Core Area Loads
TOTAL METALS		
arsenic (As)		Increase
cadmium (Cd)		
cobalt (Co)		
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
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		
Total # Increase	3	8
Total # Decrease or "ns"	35	30
% of 38 Priority Contaminants	92%	79%

Note that for 2008, the trend assessment for PAHs and phthalates were confounded by the reporting of elevated detection limits for some parameters in the years 2006—"potentially masking true decreasing trends and by identifying increasing trends that are likely an artifact of the elevated non-detected values in recent years" (Golder, 2009).

This measure cannot be calculated for 2009 since the next long-term analysis of effluent trends for the core area outfalls is not scheduled until 2012.

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 are analyzed on a regular basis during periods of production. The samples are analyzed for metals, moisture, pH, nutrients and microorganisms. The volume of biosolids produced has been variable over the past three years. Analytical results for metals are assessed using Class A Biosolids Standards as specified in Canadian Food Inspection Agency Trade memorandum T-4-93 Table II (see below).

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

The GWWTP produces a mixed liquor product, not a biosolids product, and duplicate grab samples of this product are analyzed for metals and moisture on a monthly basis. The results are assessed using the Class A Biosolids referred to above.

The performance measure is calculated using the ratio of the annual number of samples of both biosolids 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—2009

The following table illustrates how performance measure #3 is calculated, using 2009 data as an example.

Treatment Plant	# Samples (2009) ¹	# Compliant (2009) ²
Ganges WWTP (Mixed Liquor)	12	12
Saanich Peninsula WWTP (Biosolids)	15	15
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 metals (nine). 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 2009 was **100%**.