

Regional Source Control Program

2023 Report

Capital Regional District | Parks, Recreation & Environmental Services, Environmental Protection



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REGIONAL SOURCE CONTROL PROGRAM 2023 REPORT

EXECUTIVE SUMMARY

Source control is the first step in wastewater treatment. The Capital Regional District (CRD) Regional Source Control Program (RSCP / the “program”) goals are to protect sewage collection and treatment facilities, public health and safety, and the receiving marine environment by reducing the amount of contaminants that industries, businesses, institutions and households discharge into the CRD’s sanitary sewer systems. Source control is widely accepted as a cost-effective and essential first step in sewage treatment in all major urban areas throughout North America.

The program regulates over 2,000 businesses through industrial wastewater discharge permits, authorizations and 10 sector-specific codes of practice. In 2023, the percentage of businesses with a rating of “overall compliance” was 90% and the percentage of mixed liquor and dewatered sludge samples that met Class A standards for metals was 100% for the 15th consecutive year.

The CRD undertakes monitoring and regulating as outlined in the Core Area and Saanich Peninsula Liquid Waste Management Plans (LWMP) and reports annually to the BC Ministry of Environment and Climate Change Strategy (ENV) about program activities and results.

From January to December 2023, the program continued to apply a “sector-by-sector” approach to code of practice inspections, focusing on the automotive (mechanical) repair, fermentation, food services, laboratory services and vehicle wash sectors. Overall compliance rates were 90% for codes of practice, permitted industrial facilities and facilities operating under authorizations. The main activities and accomplishments of the program in 2023 include:

- industrial, commercial and institutional liquid waste regulation
- monitoring
- enforcement
- contaminants management and reductions
- significant incident response
- residential and business outreach
- program and planning development

Additional initiatives of the program in 2023 include:

- Co-chaired Source Control Community of Practice meetings, with facilitation by the BC Water & Waste Association (BCWWA).
- Participated in the Canadian Water and Wastewater Association Flushable Products Committee to share information and contribute towards development of a national flushability standard.
- Continued to adjust source control inspection goals to support McLoughlin Point Wastewater Treatment Plant (e.g., increased food service inspections to reduce fats, oils and grease loading).
- Continued fats, oils, and grease (FOG) and obstructive waste mailouts.
- Increased focus on food service inspections with a 14% increase in facilities inspected over the previous year and 29% increase over 2020, for a total of 945 unique facilities visited and 431 repeat inspections.
- Continued implementation of the updated regulatory approach for microbreweries in advance of amending the fermentation sector Code of Practice (CoP), and continued creation of authorizations for the larger facilities.
- CRD staff completed a review of available analytical data on organotin compounds in wastewater including a comparison of reported data from permitted facilities and key manhole results.
- Completed a review for nonylphenol in the odour control products utilized by the CRD, permitted municipalities and permitted businesses.
- Collaborated with municipal business licensing staff to share new business information for review against permitting requirements.

- Participated in the Cross Connection Control program plumbing inspector roundtable to update municipal inspectors on bylaw changes, treatment works at height and confined spaces, and other common issues found during inspections.

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2023 REPORT**

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REGIONAL SOURCE CONTROL PROGRAM 2023 REPORT

1.0 INTRODUCTION

Source control is the first step in wastewater treatment. It is a waste management strategy that reduces the amount of contaminants that industries, businesses, institutions and households discharge to sewers. In 1993, the Capital Regional District (CRD) committed to the development and implementation of a region-wide source control program and adoption of a Sewer Use Bylaw (Bylaw No. 2922) under the *BC Environmental Management Act*. The bylaw is the main regulatory instrument for source control in sanitary sewer systems, creating a level playing field for businesses and institutions throughout the CRD. The program also develops fact sheets, provides technical guidance and promotes best management practices.

The goals and objectives of the CRD's Regional Source Control Program (RSCP / the "program") are documented in the Saanich Peninsula Liquid Waste Management Plan (1996) and the Core Area Liquid Waste Management Plan (2000). The most recent independent review of the program (SES 2022), covering the period of 2016-2020, was completed in early 2022.

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

The program goals are as follows:

- protect the marine receiving environment adjacent to the CRD's sewage outfalls
- protect sewage infrastructure 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

This report meets the CRD's commitments in the Core Area and Saanich Peninsula Liquid Waste Management Plans to prepare an annual report on the program for submission to ENV, presents a summary of program activities and accomplishments for the period of January to December 2023, and highlights some initiatives planned for 2024.

The information in this report is used by CRD staff to evaluate the performance and future direction of source control program activities and by municipal staff to understand trends in discharge of contaminants from residential and business sources.

2.0 BACKGROUND

2.1 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.

2.1.1 Policies Approved by the CRD Board

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

2.1.2 Operating Procedures

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

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

A Communicable Disease Safety Plan was developed and implemented in 2021 to protect the public and workers. Those inspection safety protocols continue to be included in field level hazard assessments.

2.2 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 program 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.

With the addition of the McLoughlin Point Wastewater Treatment Plant (WWTP) in December 2020, the CRD now owns and operates seven wastewater treatment plants, as shown in Table 1. Three of these plants (McLoughlin Point, Saanich Peninsula and Ganges) receive significant industrial, commercial or institutional wastewater flows, while the remaining four are small plants receiving mostly residential flows. McLoughlin Point WWTP now receives and processes the flows from the former Clover Point and Macaulay Point treatment plants which have been converted to pump stations.

The sewage flows into each treatment plant are reported in the annual compliance monitoring reports for CRD sewage outfalls. Estimated annual sewage flows contributed by each participating area, over the period October 1, 2022 to September 30, 2023, are listed in Table 2. Flows for this cycle were lower than in previous years - this is attributed to lower than normal rainfall during this period which reduced inflow and infiltration in the sanitary sewer system.

Table 1 CRD Treatment Plants and Sewage Collection Areas

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

Table 2 Annual Sewage Flows 2022-2023

Participant	Estimated Annual Flow (m ³ /year)*	Percentage (%) of Total Flows
Central Saanich	1,334,016	3.97
Colwood	1,124,967	3.35
Esquimalt	2,040,215	6.07
Esquimalt Nation	25,307	0.08
Ganges Sewer	162,536	0.48
Institute of Ocean Sciences	4,131	0.01
Langford	3,501,060	10.42
Magic Lakes Estates Sewer	93,530	0.28
Maliview Sewer	18,004	0.05
North Saanich	568,579	1.69
Oak Bay	2,499,492	7.44
Pauquachin First Nation	35,511	0.11
Port Renfrew Sewer	15,785	0.05
Saanich	8,617,797	25.64
Sidney	1,260,382	3.75
Songhees First Nation	221,365	0.66
Tseycum First Nation	14,134	0.04
Victoria	11,290,931	33.59
View Royal	785,662	2.34
Total Flow	33,613,404	100%

Note: *For the period October 1, 2022 to September 30, 2023

3.0 REGIONAL SOURCE CONTROL ACTIVITIES AND ACCOMPLISHMENTS - 2023

Program activities and accomplishments in 2023 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 CRD Sewer Use Bylaw (Bylaw No. 2922) serves as the main regulatory instrument for CRD sanitary sewer system source control. 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 codes of practice. Under the program enforcement policy, staff make reasonable efforts to resolve issues through cooperative measures. Where education proves ineffective, punitive measures are available, including tickets under the bylaw.

Following adoption of the Sewer Use Bylaw in August 1994, the program focused primarily on identifying, inspecting, assessing and permitting larger industrial facilities, and preparing authorizations for smaller commercial and institutional dischargers operating within the CRD. This process was largely completed between 1995 and 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. For further information on permits and authorizations, see Sections 3.1.2 and 3.1.3.

In 1998, the focus of the program shifted toward development, adoption and implementation of codes of practice, each as a separate schedule in the Sewer Use Bylaw, which regulate discharges from larger numbers of smaller commercial and institutional facilities operating in the CRD. The first regulatory codes of practice, considered 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 codes of practice had been adopted. All codes were developed using extensive stakeholder involvement to help ensure their practicality and acceptance within each sector. For further information on codes of practice, see Section 3.1.4.

The Sewer Use Bylaw and its associated policies and procedures were amended periodically during the first 12 years of the program, largely to accommodate adoption of codes of practice, and also to add new restricted waste limits and a structure for cost recovery. Updates to the bylaw were completed in 2022, approved in early 2023 and were consolidated into the bylaw in March 2023. The recreation code of practice was repealed, and Schedule “R” was reserved for future use, leaving 10 codes of practice. In 2023, staff continued the process of assessing and reviewing the Sewer Use Bylaw to ensure it continues to provide an adequate level of protection.

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, which outline requirements for wastewater pre-treatment, effluent quality, monitoring and reporting. Waste discharge permits are issued to facilities or operations that discharge significant non-domestic wastewater flows (greater than 10 m³/day) or wastewater containing high loads of restricted wastes or specified chemical contaminants into the sanitary sewer. Table 3 provides a summary of waste discharge permit activity in 2023.

Table 3 Summary of Waste Discharge Permit Activity in 2023

Waste Discharge Permit Activity	2023
Permits active (at year end)	37
New permits issued	5
Permits closed	3
Permits amended	8
Permit site inspections (including evaluations for new permits)	54

At the end of 2023, there were 37 active waste discharge permits being managed by staff. The majority of these permits were ongoing with no expiry date. One new temporary excavation dewatering permit was issued and one residual treatment facility was converted from an authorization to a permit in 2023. There were also three new cruise ship temporary discharge permits.

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

Most permit inspections scheduled at the beginning of 2023 were completed within the year. Two permits did not discharge, and so were not inspected, and two permits with consistent compliance were visited only once due to staff turnover. Throughout 2023, inspection staff continued their permit confirmation process, which is an ongoing activity. This includes conducting investigations into potential new non-domestic waste discharge permits or authorizations in known hot spots within the region (e.g., industrial parks), or those identified through municipal engineering department contacts or business licensing staff.

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 designed to decrease the impact of the discharge or limit the potential for illegal discharges. They are normally issued without expiry dates. Some authorizations have self-monitoring and/or reporting requirements.

Authorizations are commonly issued to regulate unusual discharges or discharges from small groups of similar operations, such as ship and boat waste facilities, funeral homes and sani-dumps. They can also be issued to businesses where a code of practice is either planned or under development, or where requirements differ from those specified in a code (e.g., an alternative treatment technology, such as an automatic grease recovery device in a food services business, rather than a grease interceptor).

Inspections are carried out on a periodic basis with an emphasis on authorizations which had previously been regulated under permits or those with operations discharging priority contaminants. Table 4 summarizes authorization activity in 2023.

In 2016, all recreation facilities that were previously regulated under the Code of Practice for Recreation Facility Operations were moved to authorization. This move was due to the high variety of discharge practices occurring and this code was removed from Sewer Use Bylaw No. 2922 in the recent amendment.

Table 4 Summary of Authorization Activity in 2023

Authorization Activity	2023
Authorizations active (at year end)	99
New authorizations issued	8
Authorizations closed or transferred to codes or permits	9
Authorizations amended	14
Authorization site inspections (including evaluations for new authorizations)	64

At the end of 2023, there were 99 active waste discharge authorizations being managed. The majority of these were ongoing with no expiry date. Eight new authorizations were issued over the year: one for short-term discharges of wastewater created during the installation of cure-in-place lining for municipal water pipelines, two for temporary minor excavation dewatering discharges, one temporary authorization for large volume discharges from the military dockyard, two new microbreweries, one boat hull manufacturer, and one bin washing facility formerly discharging to storm that was moved to sanitary sewer. The four short-term authorizations expired, three facilities with alternative treatment works were deemed compliant and managed under code instead of authorization, one concrete manufacturer moved out of region, and one military facility was decommissioned.

3.1.4 Codes of Practice

3.1.4.1 Background

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

Table 5 lists the 10 codes of practice in effect for 2023. All the facilities under the recreation code have been issued authorizations and the code was removed in a 2023 bylaw amendment.

Codes of practice 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. Staff have prepared plain language guidebooks for each code sector explaining the applicable regulations and providing best management practices to help businesses achieve compliance and improve environmental performance. These guidebooks are also accessible through the program's webpage.

Table 5 Summary of Codes of Practice (Bylaw No. 2922)

Code of Practice	Adoption Date
Food Services Operations	November 24, 1999 ¹
Dry Cleaning Operations	November 24, 1999 ²
Photographic Imaging Operations	November 24, 1999
Dental Operations	November 22, 2000
Vehicle Wash Operations	December 12, 2001 ²
Carpet Cleaning Operations	December 11, 2002
Fermentation Operations	December 11, 2002
Printing Operations	December 11, 2002
Laboratory Operations	December 10, 2003

Notes:

¹ Code amended December 2001 and March 2003

² Code amended December 2003

3.1.4.2 Code of Practice Inspection Summary

In 2023, the CRD continued to emphasize customer service and support during code of practice inspections, in addition to ensuring compliance with code requirements. This involves making every effort to educate regulated operations, provide guidance, and in some cases feedback through laboratory analysis of effluent quality and multiple visits to the same establishment.

Five full-time inspector positions conduct the code of practice inspections, in addition to managing the permits and authorizations. During front-line interactions with businesses, the inspectors can also provide auditing and reporting services for other CRD programs, technical services for other Parks, Recreation & Environmental Services projects or programs as required, and participate in the development and implementation of outreach initiatives.

Table 6 provides a summary of code of practice inspection activity in 2023. 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 (1,531 in 2023) includes first (or primary) inspections within an inspection cycle. An additional 465 repeat (or follow-up) inspections were conducted to confirm the compliance status of 2,100 businesses.

Table 6 Summary of Code of Practice Activity in 2023

Code of Practice (Estimated Sector Size)	% of Sector Inspected
Automotive Repair (181)	29%
Carpet Cleaning (39)	0%
Dental (134)	6%
Dry Cleaning (8)	38%
Fermentation (27)	48%
Food Services (1,529)	90%
Laboratory (83)	47%
Photographic Imaging (27)	11%
Printing (28)	4%
Vehicle Wash (44)	82%

The sector-by-sector review process includes inspecting businesses due for an inspection in each sector for baseline compliance, reviewing the code of practice for any necessary amendments or updates, and updating data for new and/or newly sewer facilities. Sectors of focus in 2023 were automotive (mechanical) repair, fermentation, food services, laboratory services and vehicle wash sectors. Both discharging and non-discharging businesses (those sending business waste for off-site treatment, operating as a storefront, or not producing regulated wastes) in the food services and laboratory sectors were inspected, while in the automotive (mechanical) sector, vehicle wash and fermentation sectors, only dischargers were inspected.

Each inspector in the inspection team is assigned a geographic area and inspects the majority of codes in their area. Some codes are part of a sector sweep or more detailed investigation, which may be conducted by one 'code expert', for example carpet cleaning and fermentation. The businesses inspected were comprised of those within the existing regional source control information management system database, and facilities identified through an online search, drive-through of the area, cross-referencing other CRD databases, BC Assessment code query, and new municipal business licenses.

Starting in 2016, dischargers operating treatment works on-site were inspected on a schedule based on risk associated with priority contaminants: automotive and vehicle wash (annually), dental (biennially), dry cleaning (annually starting in 2018) and laboratory (biennially). The non-discharging businesses in these sectors (i.e., sending business waste for off-site treatment or operating as a storefront) are inspected every three to five years. The carpet cleaning and fermentation sectors are inspected every five years. Based on risk, photographic imaging and printing sectors were inspected every three years, but in 2022 it was decided they should be inspected every two years for optimal scheduling.

Rigorous food service inspections are performed every year due the sector's large size (1,529 regulated businesses) and potential to impact sewer infrastructure through grease blockages. In 2023, 945 food service businesses were inspected with 431 repeat inspections required to address non-compliance issues. Many of those repeat inspections focused on assisting the facility to comply with regulatory requirements, such as proper maintenance of existing grease interceptors and providing WorkSafe compliant access for inspections and maintenance.

A contaminant characterization of the microbrewery sector finalized in 2020 recommended that microbreweries be managed under authorizations to facilitate the collection of more substantial contaminant concentration and flow data. Wastewater from fermentation operations alters the pH in the sewer system and contains total suspended solids (TSS) and chemical oxygen demand (COD) that, in high concentrations can impact sanitary sewer infrastructure, aquatic life, and the environment. Authorization requirements, including self-monitoring and reporting will be scaled based on the facility's annual production of saleable product.

In 2021, details for the new approach for microbreweries were finalized including installation of an approved monitoring point and minimum composite sampling requirements for facilities that produce over 250 hL per year, flow monitoring for facilities that produce over 1,000 hL per year, and keeping records for pH, off-spec product disposal and production volumes for all facilities. A letter informing facilities of the new approach, asking for preliminary information and requesting to schedule site visits occurred in 2021. Site visits starting with the larger microbreweries to assist them with the transition and to collect data required to write the authorizations began in 2022 and continued throughout 2023.

3.1.5 General Bylaw

In addition to permits, authorizations and codes, the Sewer Use Bylaw specifies various regulatory conditions under which recreational vehicle waste, ship and boat waste, and kitchen equipment cleaning facilities must operate if they discharge non-domestic waste into a sanitary sewer. While recreational vehicle and ship and boat waste facilities have historically been managed under authorizations, kitchen equipment cleaning facilities were primarily using off-site waste management, and so had not required further regulation.

A review of these facilities was conducted in 2021 and found that two facilities out of seven were discharging in contravention of Section 2.12 of the bylaw. One of the two facilities underwent further inspection and investigation in 2022, and an authorization was issued. The remaining facility was found to no longer be operating.

3.1.6 Coordinated Inspections

3.1.6.1 Coordinated Significant Incident Responses

There were five significant incidents formally reported in 2023. Four involved a build-up of FOG reported by CRD or municipal staff, one was an incident involving obstructive wastes reported by municipal staff. Further details of each incident can be found in Table 10.

3.1.7 Monitoring

Staff carried out the following types of monitoring in 2023: permit compliance, authorization compliance, code of practice, and key manhole monitoring. All wastewater samples collected in 2023 were analyzed by a contract laboratory using standard analytical procedures specified in the RSCP Sampling and Analysis Procedure Manual.

Table 7 provides a summary of monitoring activity in 2023. Sampling instances are the total number of samples taken and managed from collection to data entry. This number includes field replicate samples and multiple samples taken from the same site throughout the year.

Table 7 Summary of RSCP Monitoring Activity in 2023

Monitoring Events	Total Sampling Instances in 2023
Permit compliance	66
Authorization compliance	25
Code of Practice	0
Key manhole	26
Assessment monitoring	2
Miscellaneous sampling project	0
Significant incidents	10
Source Control storm water monitoring	1
Saanich Peninsula WWTP influent	12
Saanich Peninsula WWTP dewatered sludge	12
Ganges WWTP influent	12
Ganges WWTP mixed liquor	12

3.1.7.1 Permit Compliance Monitoring

Businesses operating under waste discharge permits are required to carry out self-monitoring of their wastewater for a range of parameters on a specified regular basis. This data is normally submitted to the CRD on a monthly or quarterly basis for compliance assessment. An important component of the program 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. 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.

Thirty-two businesses operating under authorizations were monitored in 2023. The average number of scheduled audit events per permit in 2023 was two. The goal of collecting audit samples from each permitted site twice per year was achieved at all but six sites. Some samples were unobtainable due to seasonal scheduling constraints and staff turnover in the Sampling Technician position.

Staff responsible for managing a specific permit review the data submitted by the permittee. If a significant difference is detected between permittee self-monitoring results and CRD audit results, the permittee is contacted and an investigation into the discrepancy is initiated. The majority of all audit results obtained in 2023 were not significantly different from self-monitoring results reported from the same site. This indicated that most self-monitoring results being submitted by permittees had been collected and analyzed in an appropriate manner, as required by each permit.

Since CRD 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.

3.1.7.2 Authorization Compliance Monitoring

Thirty-eight businesses operating under authorizations were monitored in 2023, 29 of which have self-monitoring requirements.

The CRD monitoring provides, at minimum, an annual check on the quality of effluent being discharged by businesses known to have reported restricted waste generation or handling on-site. The results of this monitoring indicated that most discharges from authorizations in 2023 were in compliance with the Sewer Use Bylaw restricted waste limits.

3.1.7.3 Code of Practice Monitoring

A sector-focused approach to code of practice monitoring was implemented in January 2012. The approach involves focusing on fewer sectors per year, but inspecting and sampling the entire sector, where possible. This focused monitoring is coordinated with inspections, in order to address any compliance issues, which may influence monitoring results.

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

There are no wastewater self-monitoring and reporting requirements for businesses operating under code of practice. Code of practice compliance is achieved by installing the required, properly sized treatment works, regular maintenance of the treatment works and record keeping.

3.1.7.4 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 two residential sites and two Department of National Defence sites within the Macaulay Point and Clover Point collection areas. It also includes one residential site and one Victoria International Airport site within the Saanich Peninsula WWTP collection area.

The program was enhanced to capture a wider range of parameters at more locations on a four-year cycle, in order to better understand trends in contaminants from various land use types and collect data to evaluate program efforts against the operational needs of the McLoughlin Point WWTP, which was commissioned in December 2020, as well as the other CRD treatment facilities across the region. The next round of this sampling will begin in 2024 and a trend analysis will be done on the two datasets.

RESIDENTIAL SITES

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

The 2023 residential sampling program included sampling events at Dean Park (North Saanich) and Harling Point pump station (Oak Bay) in January, May, July and October. There were no exceedances of Sewer Use Bylaw restricted waste limits in 2023.

DEPARTMENT OF NATIONAL DEFENCE SITES

In January, May, July and October 2023, staff sampled two key manholes located at Lang Cove, downstream of Department of National Defence (DND) facilities at HMCS Naden and HMCS Dockyard, immediately upstream of the Dockyard pump station. Two samples were collected at the Colwood pump station in May and October; however, the January and July samples for Colwood were not obtained due to equipment limitations and flow conditions. All parameters were within Sewer Use Bylaw restricted waste limits. Due to the difficulty in collecting samples at these DND sites, staff will review the effectiveness of these locations and consider new sites for the 2025 sampling program.

SAANICH PENINSULA WASTEWATER TREATMENT PLANT COLLECTION AREA SITES

Samples were collected in January, May, July and October at the Victoria International Airport site. All parameters were within Sewer Use Bylaw restricted waste limits.

3.1.7.5 Saanich Peninsula Wastewater Treatment Plant Influent and Dewatered Sludge Monitoring

Every year, four composite samples of influent from the Saanich Peninsula WWTP are collected each quarter by CRD staff for metals and priority pollutant analysis. In 2023, 24-hour composite sampling occurred in January, April, July and October.

Twelve composite dewatered sludge samples were also collected by CRD staff for analysis in 2023, as well as one field replication sample. Daily samples were combined into weekly composites which were submitted for moisture, metals and weak acid dissociable cyanide analysis on a monthly basis. The results are discussed in Section 3.4.2.

3.1.7.6 Ganges Wastewater Treatment Plant Influent and Mixed Liquor Monitoring

As in past years, a single (grab or composite) sample of influent was collected at the Ganges WWTP. The 24-hour composite sample collected in July 2023 was submitted for priority pollutant analysis.

In 2023, ongoing sampling for compliance monitoring occurred and twelve mixed liquor (treatment plant wastewater mixed with activated sludge) samples were collected for analysis. Grab samples were collected monthly and were submitted for moisture and metals analysis. The results are discussed in Section 3.4.2.

The data 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

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 codes of practice. 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 CRD has adopted a stepwise approach to enforcement of the Sewer Use Bylaw, as outlined in the program enforcement policy. This policy classifies offences, outlines enforcement steps and includes the use of cooperative measures such as increased communication, education and monitoring, to resolve issues of non-compliance. The policy was originally approved by the CRD Board in February 1997 and was last amended in November 2006.

Minor first infractions result in a Step 1 enforcement status. This step is typically triggered by a routine inspection finding or a missed reporting requirement and involves a written letter that alerts a discharger to

an infraction. In general, the impact of this stage is not significant, and it is often quickly resolved through education and guidance with the discharger.

Step 2 is triggered by a major first infraction or a second repeated minor infraction. Letters issued under this step are more strongly worded than Step 1, including a reminder of potential escalation by actions such as ticketing and may direct the discharger to submit a preliminary investigation report. CRD staff will also perform a more detailed inspection and undertake follow-up communication.

Step 3 is also called Staff Assessment and is an escalation of Step 2, typically resulting from third infractions, as well as from bylaw violations (more serious offenses than infractions). At this point, a Deputy Sewage Control Manager is involved to review the actions during the previous enforcement steps and to review staff recommendations for further enforcement. Depending on the offense, dischargers are either ticketed or required to submit a written report detailing the circumstances causing the violation and options for resolution. Inspection staff will perform a detailed review of collected data, perform an impact assessment of continued non-compliance, and conduct follow-up inspections.

During Staff Assessment, permitted and authorized facilities may be subject to increased inspection or monitoring frequency and meetings to discuss remedial actions. Operations at this status must prepare and submit a detailed compliance plan for approval by a Deputy Sewage Control Manager. A 90-day period is typically allowed for the preparation of this plan. This period allows 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 a Deputy Sewage Control Manager, becomes a compliance program that, if followed, will result in the discharger becoming compliant with the Sewer Use Bylaw.

Failure to meet commitments and requirements under Staff Assessment can result in elevation to Discharger Under Review (DUR) status. 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.

The CRD Ticket Information Authorization Bylaw contains a list of fines that have been set for specific offences under the Sewer Use Bylaw and its associated codes of practice. These fines were last reviewed in January 2018.

3.2.1 Operations Regulated by Waste Discharge Permit

Of the 37 active waste discharge permits in place at the end of 2023, 23 sites were in “full compliance” with their permits and the Sewer Use Bylaw. Five permits were at Step 3 (“Staff Assessment”), one site remained at “DUR”, and eight sites were at Steps 1 or 2, but still in compliance with their permits under the enforcement policy. The enforcement levels and numbers of permits at each level are summarized in Table 8.

Table 8 Summary of Waste Discharge Permit Compliance – 2023

Enforcement Level	Number of Permits
Full Compliance	23
Step 1	4
Step 2	4
Step 3 (Staff Assessment)	5
Discharger Under Review (DUR)	1

Five permit sites classified at Step 3 reached Staff Assessment by RSCP staff and one permit site remained under DUR status in 2023:

- A septage disposal facility was escalated to DUR level for chemical oxygen demand (COD) exceedances in November 2018. The permittee submitted a compliance plan detailing improved maintenance and repairs in August 2020 and substantial improvements in effluent quality were observed. Effluent strength continued to be improved through 2021 but issues arose again in 2022. An updated compliance plan was submitted outlining additional treatment works as well as several operational changes. Significant improvements were seen in 2023 and the permit was amended bringing the facility into full compliance in early 2024.
- A public works yard was escalated to Step 3 and under Staff Assessment for sulphide in the last quarter of 2022. A written report was received in early 2023 with plans to adjust maintenance and work procedures. Results were improved throughout the majority of 2023 and the permit was amended bringing the facility into compliance in the spring of 2024.
- Another public works yard was escalated to Step 3 and under Staff Assessment for toluene in late 2023. A written report outlining the suspected cause of the exceedances and proposed mitigation measures was submitted in February 2024. Staff monitored to confirm reduced effluent strength was maintained through the warmer season when exceedances tend to increase.
- A hazardous wastewater treatment facility was escalated to Step 3 for mineral oil and grease (MOG) and polycyclic aromatic hydrocarbons (PAH) in early 2023. A written report was submitted in July 2023 with plans for procedural improvements including increased maintenance of the treatment works. However, exceedances continued in the second half of the year prompting staff to require submission of an updated report with additional measures to improve effluent quality.
- A shipyard remained under Step 3 and Staff Assessment for total organotin exceedances in early 2023. A written report was received in September 2023 which included plans to adjust maintenance and work procedures. The plan implementation was fairly successful in reducing effluent strength during the winter months, however, the facility was kept under assessment to confirm the improvements were sufficient to prevent exceedances during the summer months.
- A permitted brewery was escalated to Step 3 for biochemical oxygen demand (BOD) and COD in spring 2023. A written report was requested and submitted in January 2024 with plans to implement new procedures to reduce waste product going to the sanitary sewer.

No charges were laid against waste discharge permit holders under the Sewer Use Bylaw during 2023.

3.2.2 Operations Regulated by Authorization

Some authorized facilities are scheduled for inspection each year, while some are inspected on a biannual or other rotating schedule, based on the types of contaminants regulated, the contaminant levels, discharge volumes and the overall impact of discharges from these operations. Discharges from authorizations are considered to have a relatively minor impact in comparison to discharges from permitted facilities.

There were 64 inspections carried out at sites operating under authorizations in 2023. At the end of 2023, 81 of the total 99 businesses were in full compliance with their authorizations, six were at Step 1, six were at Step 2, four were at Step 3 and one was DUR. One was a composting facility with continued high-strength organics in their wastewater, however, levels continue to improve over the years and an amendment is pending to move them off Staff Assessment status. A recycling facility exceeded three times for TSS and is in the process of implementing mitigation procedures. A powder coating facility with COD exceedances submitted a report outlining improvements which were successful at reducing effluent strength and brought them into compliance within the year.

The overall compliance level for the 99 active authorizations at the end of 2023 was 88%.

3.2.3 Operations Regulated by Codes of Practice

The stepwise approach to achieve compliance is applied to all code of practice 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 are classified as being in “non-compliance” with the code. A summary of the code of practice enforcement results for inspections carried out in 2023 is presented in Table 9.

Table 9 Code of Practice Enforcement Summary

Code of Practice	% Full Compliance ¹ (%)	% Not Assessed ² (%)	% In Progress ³ (%)	% Non-Compliance ⁴ (DUR) (%)
Automotive Repair	96	2	3	0
Carpet Cleaning	80	10	10	0
Dental	86	0	19	0
Dry Cleaning	75	13	13	0
Fermentation	82	15	4	0
Food Services	85	6	9	0
Laboratory	83	2	4	0
Photographic Imaging	74	11	4	0
Printing	89	4	7	0
Vehicle Wash	82	2	18	0

Notes:

¹ Percentage of active operations, regulated within the sector and in compliance with all requirements of the code at the last inspection, including sites with required treatment works and those using off-site waste management.

² Percentage of active operations, regulated within the sector classified as not assessed, typically those identified through business licence sharing agreements near the end of the year.

³ Percentage of active operations, regulated within the sector classified as not yet assessed, Step 1, 2 or 3 of the enforcement policy at the last inspection date.

⁴ Percentage of active operations, regulated within the sector classified as “discharger under review” at the last inspection date.

Most code of practice enforcement actions to date have been associated with implementation of the food services code, which regulates one of the largest business sectors in the CRD. This sector has been very cooperative during application of the escalating approach to enforcement, and approximately 9% of food services operations inspected were considered to be “in progress”, with no facilities classified as “discharger under review”. The main non-compliance issues continue to be failure to maintain a grease interceptor and failure to install a properly sized interceptor.

There were two tickets issued by the CRD to food services operations in 2023 - one was waived upon demonstration of completing the requirements, and one was paid.

The automotive (mechanical) sector had 96% of the facilities in full compliance and 3% of the facilities “in progress” in 2023, which equates to five of the 181 regulated facilities, mainly for lack of records. Only 2% of the facilities had not been assessed before year-end.

In the fermentation sector, full compliance was 82% with 4% “in progress” which equates to one facility. 15% of facilities were “not assessed” at the end of 2023 which equates to four facilities, all of which were very small operations. A contaminant characterization of the microbrewery sector finalized in 2020 recommended that microbreweries be managed under authorizations to facilitate the collection of more substantial contaminant concentration and flow data. A letter informing impacted facilities of the new approach was sent in 2021, and the focus in 2022 and 2023 was in transitioning the larger microbreweries.

Both total compliance and overall compliance for the food services sector were not as high as previous years, at 85% and 89% respectively. The increased focus on this sector is likely the main factor in the compliance levels, with an additional 16% of facilities inspected over the previous year. The majority of the 9% facilities “in progress” were due to excess grease. A total of 6% of facilities were marked not assessed

while waiting for construction or renovations to be completed or were not accessible at the time of inspection.

The laboratory sector had 94% of the facilities in full compliance and 4% “in progress”, which equates to four of the 83 regulated facilities, due to lack of maintenance or records. Two facilities needed further investigation to confirm compliance (2%) so were not assessed before year end.

Overall compliance increased for the vehicle wash sector compared to the previous year, reaching 90%. Full compliance was 80%. Eight of the 44 regulated facilities (18%) were “in progress”, all for lack of maintenance or records. Only one facility was not assessed due not being fully investigated before year-end.

In 2023, 90% of all facilities regulated under program codes of practice achieved overall compliance.

3.3 Contaminants Management

Contaminants management builds on the program's successful regulatory approach to make reductions in specific priority contaminants that have proven difficult to control or treat. This involves a focus towards avoidance, elimination or substitution of polluting products, processes or materials. Contaminants management projects initiated or completed in 2023 are outlined below.

3.3.1 Trucked Liquid Waste

In 2020, the CRD's Trucked Liquid Waste (TLW) service was transferred to the Regional Source Control Program. This service complements the program's efforts by coordinating the collection and disposal of trucked liquid waste. This type of waste represents the resulting source control diversion of non-domestic liquid waste that is prohibited from discharge to sanitary sewer or stormwater systems and must be transported by truck to a permitted disposal facility. The types and sources of wastes managed range from stormwater catch basins, car washes and restaurant grease interceptors to pit toilets, as well as septage from recreational boats and commercial ships.

The program goals are achieved primarily through outreach and education as well as waste diversion as a result of RSCP inspections and regulation. A web-based service provider directory is maintained by staff to allow waste generators to find hauling and disposal options for many different types of TLW.

Advertisements

Staff continued to update web-based information, respond to TLW inquiries, and monitored the effectiveness of the program during this time.

Performance Measures

Performance of TLW programs is assessed through annual waste disposal volumes. Trends in TLW quantities deposited at regional facilities are used as a key performance indicator of the program's success. In general, increasing disposal volumes among waste type shows a positive trend and indicates that waste is being properly disposed of at treatment facilities. However, decreasing volumes can also indicate positive performance measures as well. For example, decreasing volumes associated with municipal lift station pump outs can be linked with priority objectives of source control initiatives such as reduction of residential obstructive waste, and diversion and recycling of fats, oils and grease (FOG) from households and restaurants.

Data available from public and private TLW disposal facilities are assessed annually, however, an unknown volume of waste is disposed of at out-of-region facilities and those volumes are not available for assessment. Waste received at local septage/TLW disposal facilities were reviewed in 2023 and this data contributes to inform regional planning efforts and outreach activities.

Overall waste volumes (Figure 1) disposed and treated in 2023 are increased over the trend of the previous four years. Disposal of FOG primarily from restaurants (Figure 2) is continuing to gradually increase to

normal levels after a sharp decline during the COVID-19 pandemic. Waste from sanitary sewer lift stations (Figure 2) has shown a consistent level since 2019 indicating relatively static infrastructure and associated maintenance costs due to accumulation of obstructive waste.

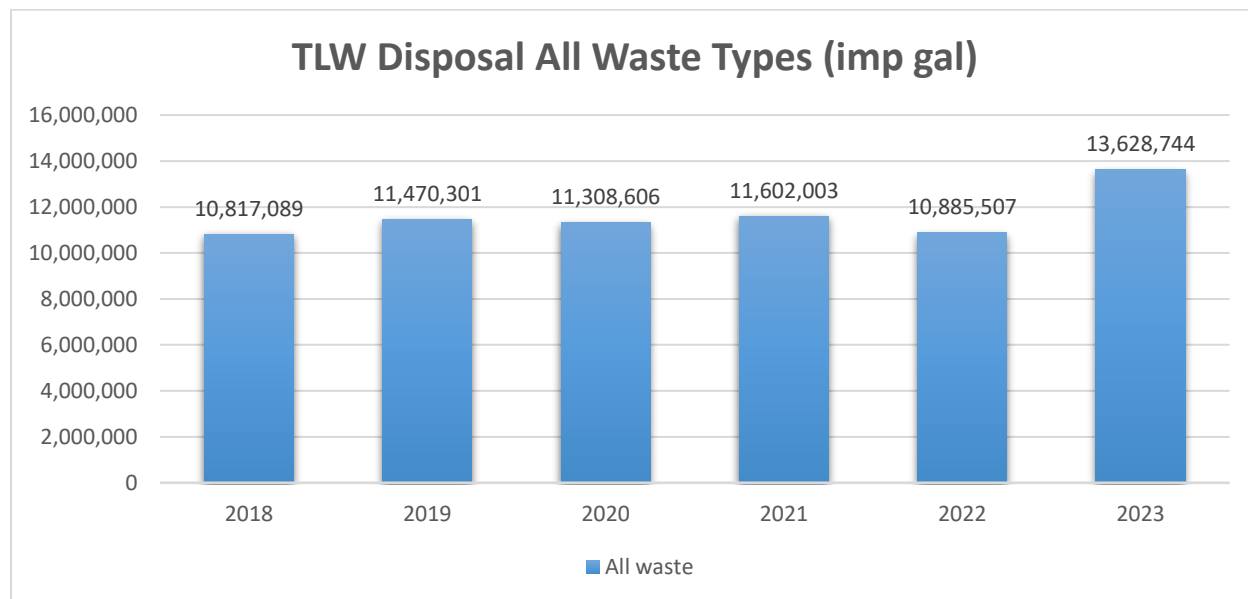


Figure 1 Trucked Liquid Waste Disposal Volumes of All Waste Types

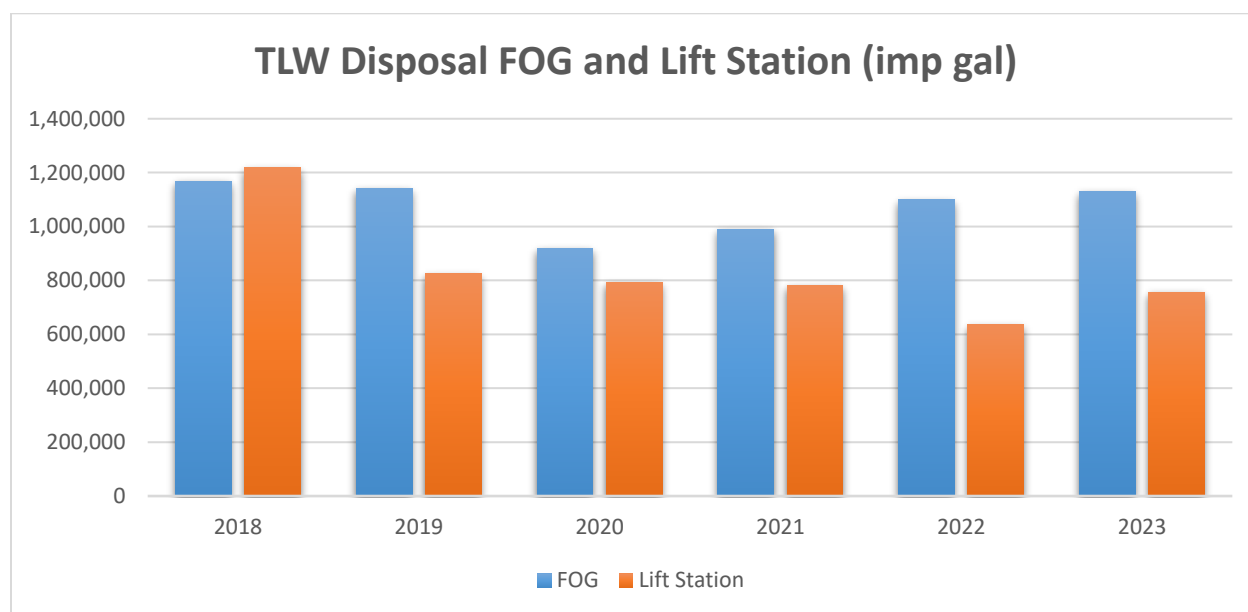


Figure 2 Trucked Liquid Waste Fats, Oil and Grease (FOG) and Lift Station Waste Volumes

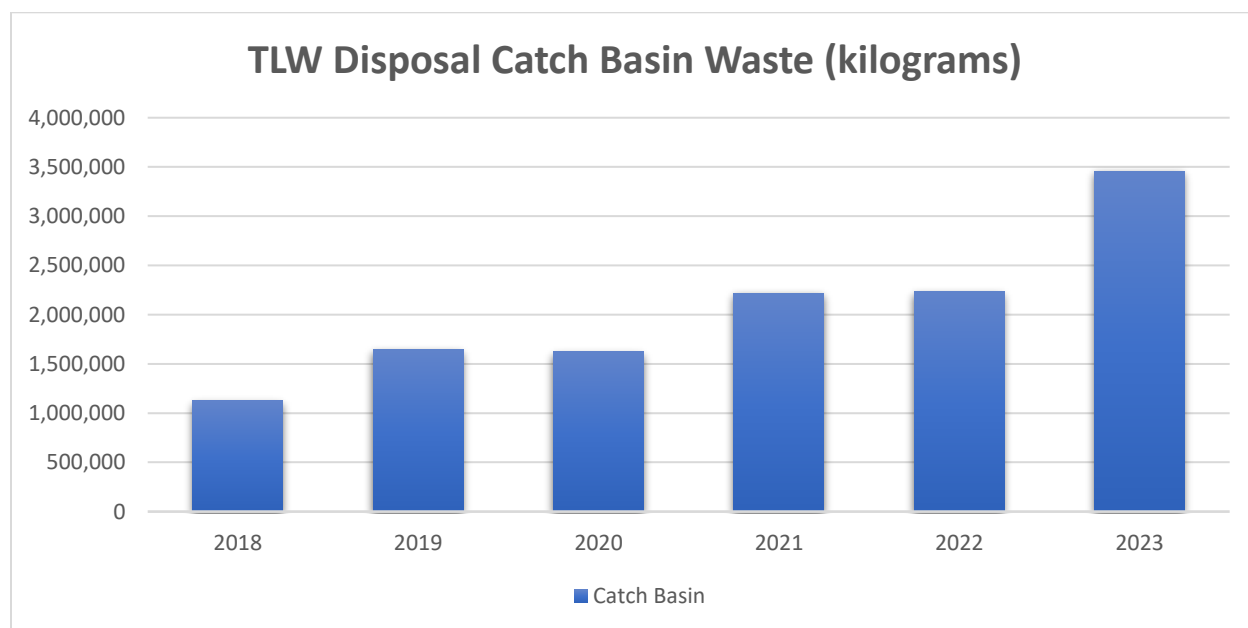
A substantial increase in the disposal volume of catch basin waste (Figure 3) was recorded in 2023 showing a continuing trend upwards indicating improved municipal maintenance activities which protect stormwater and the nearshore marine environment.

This increase in catch basin waste volumes was largely due to Stage 14 amendments of the BC *Contaminated Sites Regulation*, implemented in June 2022. Previously, the most practical disposal

methods included blending with landscaping materials and as an amendment for road asphalt - two uses that are not captured within TLW data.

With the regulation change introducing enhanced testing requirements for soils (including catch basin sediments), TLW companies are preferring to dispose of catch basin waste as controlled waste at Hartland Landfill, and therefore this waste is now being included in CRD's TLW reporting. Hartland Landfill only accepts catch basin waste with a controlled waste permit based on established physical qualities. Testing against numerical standards is only required if contamination is evident.

The District of Oak Bay also saw a significant rise (700,000 kg) in catch basin waste disposal. This increase was attributed to the municipality's purchase of a new Hydro-Vac vehicle. The Hydro-Vac spent most of its operational hours cleaning Oak Bay's municipal catch basins, a task that the previous street sweeping machine could not handle as effectively.



Note: Totals include quantities from different sources and may be reported by volume or by weight. Catch basin waste is highly variable therefore density is assumed to be 8.7 kg per imperial gallon for comparison between years.

Figure 3 Trucked Liquid Waste Annual Catch Basin Waste Disposal Quantities

3.3.2 Source Control of Organotin Compounds

CRD staff conducted a review of the management of organotin compounds. The project was intended to research common sources, environmental impacts and recommend future actions to mitigate discharges in wastewater.

Organotin compounds are classified as containing one or more tin carbon bond (Sn-C). These compounds commonly exist in the form of R_4SnX_4 ; Where R can be any alkyl group and X can be a halide, hydroxyl or ester group. Due to changes in molar mass and steric effects as the R group changes, tin complexes can settle into sediment or diffuse into the water. As the number and size of the R group increases, the ability to settle into sediment increases.

While all organotins are endocrine disruptors, tri-R group complexed organotin compounds are the most toxic. Under the *Pest Control Products Act* in Canada, mono- and di- organotins are not regarded as hazardous substances, but tri-organotins are, and thus their use has been prohibited. The *Water Quality Guidelines for the Protection of Aquatic Life* reports an allowable concentration of tributyltin (TBT) to be 0.008 µg/L and 0.001 µg/L in fresh and marine waters, respectively.

Mono- and di-organotin compounds are used as stabilizers in rigid polyvinyl chloride (PVC) products, including sewer and water lines. The main use of TBT is for pesticides or biocides, historically as the active ingredient in antifouling paint used on ships and fishing equipment. Due to its prohibition, TBT is no longer used in antifouling paints but can be still found in the paint of older ships/boats. The strong biocide properties of tri-alkylated tins make it a popular bactericide in industries where biofilm build up is an issue. TBT is also used in wood preservation, as slimicide on masonry, as biocides for cooling systems, inside cooling towers, pulp and paper mills, breweries, leather processing and textile mills.

Schedule “B” of the Sewer Use Bylaw classifies organotins as a “restricted waste” but does not set any specific discharge concentration limit on it. There are two permits that have discharge limits for organotins. Historically, these businesses were regulated on TBT concentrations, however, in recent years, permit managers argued that since total organotins are regulated under the bylaw, it is better to align permitted limits with that wording. However, mono and di-butyltins observed may come from different sources such as leachate from PVC pipes.

The review recommended using TBT rather than all organotins for the discharge limit, as it would be fairer to permitted facilities being the contaminant of concern. Further, mono- and di-organotin compounds may leach from PVC sewer and water lines. Limited data is available from permitted facilities for total organotins and further analysis is also recommended to determine total loadings.

3.3.3 Preliminary Investigation of Nonylphenol Loadings

CRD source control staff completed a review for nonylphenol in the odour control products utilized by the CRD, permitted municipalities, and permitted businesses.

There are two main products utilized for wastewater infrastructure odour control by the CRD, permitted municipalities, and permitted businesses. These hydrogen sulphide (H₂S) odour control products are predominantly a mixture of inorganic and organic salts (calcium nitrate, ammonium nitrate) in aqueous solution.

These odour control products work by offering the bacteria within the wastewater infrastructure a source of nitrate for anoxic respiration. The nitrate acts as an intermediate electron energy source between naturally solubilized oxygen and sulphates found in the sewage. If the excess nitrate was not dosed, the aerobic bacteria would consume all the oxygen (oxidation/reduction reactions), then consume what little nitrate was naturally available, and then change their metabolism to reduce sulphates to H₂S. By dosing excess nitrate into the wastewater infrastructure, the sewage conditions remain anoxic and H₂S is not generated. Instead, the by-product of anoxic respiration is nitrogen gas.

Nonylphenols and their ethoxylated compounds are used in surfactants to reduce surface tension of water, increasing the amount of solution that remains on the surface. This increases the amount of the odour control solution that adheres to the wastewater infrastructure, thus increasing the efficiency of the product to provide nitrate to the bacteria at that source, keeping the environment anoxic, and reducing the production of H₂S.

Discussions with the two companies that produce these chemicals indicated one contains 0.001% - 0.002% nonylphenol as part of the proprietary ingredients, the other has changed their formulation and no longer contains nonylphenol.

Canadian Water Quality Guidelines for the Protection of Aquatic Life for nonylphenol in freshwater is 0.001 mg/L and for marine waters, 0.0007 mg/L. Current permitted and authorized facilities using odour control chemicals at maximum dosing rates are estimated to discharge a maximum loading of 15 g/day of nonylphenol (equates to approximately 0.0002 mg/L per day). Influent loading data for 2023 shows nonylphenols are approaching BC Water Quality guidelines. More attention will be given to this parameter over the next few years to assess risk and determine if source control is needed.

3.4 Contaminant Reductions

3.4.1 Marine Outfall Contaminant Reductions

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

3.4.1.1 Core Area Outfall Effluent

In 2020, significant upgrades took place at the Macaulay Point and Clover Point pump stations to redirect flows to the new McLoughlin Point WWTP.

CRD staff formerly monitored effluent quality regularly at the Macaulay Point and Clover Point outfalls, and now the McLoughlin Point outfall for a wide range of substances. The most recent effluent trend analysis was undertaken in 2017. That report provided a statistical assessment of wastewater trends at Clover Point and Macaulay Point outfalls from 1990 to 2015. The findings of this report for Clover and Macaulay points over the 25-year period were discussed in previous RSCP annual reports and the next trend analysis will be discussed in this section when complete.

Total oil and grease is of particular interest to the program due to both the impacts on effluent quality and blockages in sewage infrastructure. The 2017 trend analysis showed a decreasing concentration over time. 2019 and 2020 data are unsuitable for trend analysis, but an assessment of the 2021 and 2022 data shows the decreasing trend is continuing. The program gives a high priority towards efforts to work with businesses and to educate the public about the source control of fats, oils and grease.

Pharmaceuticals and personal care product monitoring began mid-way through the trend analysis period in 2014, and a full trend analysis of pharmaceuticals and personal care product data will be part of the next study in approximately two years.

These results are used to assess opportunities to reduce input of these contaminants to the sewage system. Further information about core area effluent quality in 2023 can be found in the *Core Area Wastewater Facilities Environmental Monitoring Program 2023 Report* available on the CRD website.

3.4.1.2 Saanich Peninsula Wastewater Treatment Plant Influent and Effluent

Influent and effluent data has been collected at the plant since the plant commenced operation in 2000. The first summary of trends in these data was reported in the Hatfield Consultants Ltd. 2005 report. The Golder Associates Ltd. 2009a report included a statistical assessment of wastewater influent and effluent trends at the plant over the period 2000-2008. The Golder Associates Ltd. 2017 report provided an update of trends to 2015. The findings of this report over the 14-year period of record at the plant were discussed in previous RSCP annual reports and the next trend analysis will be discussed in this section when complete.

Total oil and grease is of particular interest to the program due to both the impacts to effluent quality and blockages in sewage infrastructure. The 2017 trend analysis showed a decreasing concentration over time. The program gives a high priority towards efforts to work with businesses and to educate the public about the source control of fats, oils and grease.

Pharmaceuticals and personal care product monitoring began mid-way through the trend analysis period in 2014, and a full trend analysis of pharmaceuticals and personal care product data will be part of the next study in approximately two years.

Further information about plant influent and effluent quality in 2023 can be found in the *Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program 2023 Report* available on the CRD website.

3.4.2 Sludge and Mixed Liquor Contaminant Reductions

Another important objective of the program is the protection of sewage treatment plant sludge quality.

Monitoring of dewatered sludge produced at the Saanich Peninsula WWTP commenced in March 2013 and continued in 2023. Monitoring of the mixed liquor produced at the smaller Ganges WWTP began in 1994 and continued in 2023.

Prior to the construction of the McLoughlin WWTP in 2021, these analyses were not performed in the core area due to primary screening not producing sludge. It is anticipated that solids from the plant will be analyzed similarly to the Saanich Peninsula WWTP for the 2024 report.

3.4.2.1 Saanich Peninsula Wastewater Treatment Plant Sludge

A dewatered sludge monitoring plan was developed and implemented in March 2013. The dewatered sludge is not a biosolids product, as defined by the *Organic Matter Recycling Regulation*. The sludge is sampled and assessed using the Class A biosolids quality criteria for comparison purposes to evaluate overall metal concentrations and end-product quality. This monitoring is not intended to characterize the material as a biosolids product.

Mercury levels have been consistently well below the maximum acceptable concentration for Class A biosolids in the last five years of production. Weak acid dissociable cyanide, first monitored in 2013 to confirm increasing trends in Saanich Peninsula WWTP influent, has remained low, as have silver levels.

Cadmium and molybdenum levels in the plant dewatered sludge generally continued at levels similar to biosolids in the last few years of production. Results were all below the respective biosolids criteria. The levels of two electroplating metals, chromium and nickel, appear to be closely correlated with one another, as would be expected, as they are both used in the electroplating process at two facilities in the catchment area.

Previous reports flagged occasional exceedances for mercury, silver and weak acid dissociable cyanide in the last few years. CRD's Environmental Monitoring and Regional Source Control programs investigated these and did not find clear trends or sources upstream in the sewage infrastructure. A review of data revealed that the peaks were the result of samples that had very different laboratory detection limits than past years and the data analysis technique of calculating averages with non-detected parameters assigned a value of 0.5 times the detection limit. For source control analysis, treating non-detected results as "zero" gives a more useful benchmark to assess program performance and not accidentally flag parameters of concern.

3.4.2.2 Ganges Wastewater Treatment Plant Mixed Liquor

The Ganges WWTP process produces a mixed liquor product, not a biosolids product, as defined by the *Organic Matter Recycling Regulation*. The mixed liquor is sampled and assessed using the Class A biosolids quality criteria for comparison purposes to evaluate overall metal concentrations and end-product quality. This monitoring is not intended to characterize the material as a biosolids product. The plant 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 and silver levels in the Ganges mixed liquor show an overall trend is toward lower levels for both metals. Implementation of the dental and photo imaging codes of practice is thought to be the main reason for the reductions in mercury and silver concentrations at the plant. Continued enforcement of the codes of practice and a shift to digital imaging is likely contributing to the continued lower levels of these metals.

There has been a decrease in the levels of cadmium and molybdenum in plant mixed liquor over time. Prior to 2008, molybdenum levels were high and variable, sometimes exceeding the Class A criterion. This may have been due to the use of molybdate corrosion inhibitors in heating and cooling systems within the collection area. More recent levels suggest that there may have been a change to molybdate-free products in at least some situations.

Table 10 Summary of Reported Sewer System Incidents (2023)

Contaminant	Month	Nature of Incident	Potential Impact	Incident Follow-up
Fats, Oils and Grease (FOG)	February	District of Central Saanich operations staff reported liquid grease in the Kirkpatrick Pump Station	Grease blockages can lead to overflows in municipal sewer pipes and mains – maintenance and health concerns	<ul style="list-style-type: none"> A total of 36 businesses operate in the catchment feeding the pump station. No businesses reported or observed any dumping that could have led to the oily material accumulation and no observable evidence was found during the investigation. A mailout was sent to the businesses in the area and no further reports of issues have been received since.
	May	District of Saanich engineering staff reported ongoing grease buildup in a lateral located on Garnet Street		<ul style="list-style-type: none"> Staff followed up with inspections of the one food service facility connected to the lateral. The facility was compliant, and all grease interceptors were shown to be functioning properly, however, further inspections are planned to follow up and confirm continued compliance.
	July	City of Victoria public works staff reported a blocked sewer lateral due to FOG		<ul style="list-style-type: none"> Staff followed up with inspections of the connected food service facility identified in the catchment. The facility had missed a cleaning of their main grease interceptor, but build-up in the lateral was likely due a second floor sink that wasn't connected until 2022.
	October	City of Victoria engineering staff reported a near blockage in a main line on Courtney Street		<ul style="list-style-type: none"> Municipal staff identified the lateral where the FOG came from and CRD staff inspected the business. A week prior, they had a blockage in their grease interceptor and had jetted the unit and their lines pushing the grease downstream. The facility was required to increase their maintenance to prevent future blockages, and several follow ups were conducted to ensure compliance.
Obstructive wastes	August	CRD Operations staff found small pellets accumulating in the Clover Point force main bleeder valves	Obstructive wastes can lead to blockages and overflows – maintenance and health concerns	<ul style="list-style-type: none"> Staff investigation matched the material with perlite and slow-release fertilizer balls. Nine potential large users and distributors of potting mixture and perlite in the entire Clover Point wastewater collection area were identified and either contacted or visited, but no point source was identified. Due to the bleeder valves only being inspected and cleaned on a six-month schedule and the large size of the catchment that feeds clover force main, it was unclear if the material accumulated slowly over time or from a single release event. A contributor could be the disposal of potting soil into the combined storm and sanitary sewer systems in the Uplands area. A mailout is being considered to advise residents within this catchment of the obstructive nature of these products.

3.5 Significant Incident Reporting

CRD and municipal engineering staff communicate periodically regarding sanitary sewer wastewater quality problems, suspicious discharges or significant incidents leading to contamination of the CRD's collection and treatment systems. A significant incident report form was initially developed in 2000 to record operational problems within all trunk sewers and treatment plants operated by the CRD. The report form and response procedure were reviewed in 2013, following an incident involving a spill of Bunker "C" fuel oil into the CRD's Lang Cove pump station, and a new significant incident response procedure was developed by CRD staff for implementation in 2014. Staff develop detailed sewer catchment area maps, as needed, to support potential investigations.

Table 10 provides a summary of incidents reported in 2023 that impacted, or had the potential to impact, the environment, sewerage works, sewage treatment facilities or public health and safety. Notes on incident follow-up were summarized from CRD significant incident reports, municipal grease reports, complaint forms, memos, emails, conversation records and other notes on file. There were no incidents reported that affected the operation of CRD sewage treatment plants in 2023.

3.6 Outreach and Partnerships Initiatives

Staff continued to develop and maintain program-specific outreach and education messaging throughout 2023. Where appropriate, source control messaging was also integrated with other initiatives, campaigns and community outreach events held throughout the year, across the region. New campaigns are under development to promote source control actions to protect wastewater quality, the operation of existing sewage infrastructure and the new McLoughlin Point WWTP.

Key source control initiatives and campaigns for 2023 are summarized below under separate sections for residential and business outreach.

3.6.1 Residential Outreach

General outreach initiatives

CRD staff produced a "What You Put Down the Drain Matters!" brochure in 2020 intended to address the survey results indicating that 92% of the public believe the new tertiary wastewater treatment will deal with whatever is put down the toilet or sink making source control practices irrelevant. Outreach initiatives have continued every year since, with the goal of educating the public that tertiary treatment does not remove all contaminants and that contaminants are often removed into the biosolids (leading to quality concerns of that resource). Initiatives also highlighted that other sewage treatment plants in the CRD were previously protected by source control and continued to treat sewage.

Campaigns that contained source control messaging in 2023 were incorporated through the CRD's Live Green Campaign. These included "Live Green in the Bathroom/Laundry Room" which brought in messaging around obstructive waste and non-toxic cleaning products, and "Live Green in the Kitchen" which brought in messaging about proper disposal of FOG. Information for these campaigns was distributed through social media and advertising, an in-person event, and 10 unique static displays at recreation centers, community centers and hardware stores.

Targeted mailouts

FOG and unflushable waste have received attention since 2020 as infrastructure maintenance frequencies have been increasing in some parts of the region. A new approach was tested in late 2020 where letters were mailed directly to residents in one small sewer catchment. The letters informed residents of issues at the pump station serving their neighborhood, the potential financial implications to their sewer rates and best practices to reduce the strain on the treatment plant, including to only to flush the "three Ps" (pee, poo and toilet paper).

CRD and municipal staff investigate catchments together and identify residential pump stations requiring a focused approach involving direct mailing to residents that encourages proper disposal of waste (such as FOG, wipes and dental floss) and to flush only the “three Ps”.

In 2023 residential mailouts were sent to four catchments:

- Mermaid Creek (Town of Sidney) was in response to a stormwater significant incident where dolomite lime was found in the stormwater system. 828 letters were sent out and the problem seemed to be resolved.
- Kirkpatrick Pump Station (District of Central Saanich), also in response to a significant incident. In 2022 there was a significant incident with obstructive wastes in this pump station, then in 2023 there was a significant incident with oily grease. 36 letters were sent out in 2023 and the issue was resolved.
- Two of the mailouts in District of Saanich (Alpine Crescent and Craigflower Municipal Pump Station) were in response to ongoing FOG problems in the area. 129 and 152 letters, respectively, were sent at the end of 2023. Alpine Crescent will be inspected in the third quarter of 2024. A reduction in FOG was noted in the Craigflower catchment in early 2024 following the mail-out.

Medication Return Program

The CRD has promoted medication return delivered by the Health Products Stewardship Association’s Medication Return Program (MRP) annually as a strategy to keep pharmaceuticals out of the wastewater stream. The CRD is consistently one of the top performing BC regional districts for per capita medication return quantities. Outreach to pharmacies continued throughout the region and 33 pharmacies were directly visited, updated posters and “What you put down the drain matters” bags were dropped off. The 2023 Annual Report for the BC portion of the MRP indicates CRD return of 13,242 kg at 105 collection locations and second overall per capita return rate among BC regional districts.

Outreach in 2024 will expand its scope to include senior care facilities, walk-in clinics and natural supplement suppliers as well as increasing tools for display in participating pharmacies.

3.6.2 Business Outreach

Inspectors continued to be the front-line staff delivering RSCP outreach messaging to local businesses. In addition, inspectors worked with business owners to highlight the benefits associated with protection against cross connections (protection of public health), water conservation (potential cost savings), solid waste diversion best management practices and other CRD initiatives.

In 2023, RSCP staff continued to maintain outreach to local businesses through the following activities:

- As a follow up to the “Clear the FOG” campaign that ran in 2022, the RSCP developed some industry specific outreach materials for food service operations (FSOs). The key messages of the campaign were that proper FOG management will save money, reduce risks, and protect their business and the environment. Materials developed and distributed in 2023 include updated grease interceptor stickers, new FOG information sheet, updated website materials and a postcard reminder about FOG best management practices (BMPs) and grease interceptor maintenance (distributed to 1,547 FSOs in the CRD). A large “Catch Basin Maintenance” campaign was launched for a five-week period in the fall of 2023, serving as a reminder for catch basin clean out and inspection. This saw a 25-fold rise in web traffic to CRD catch basin and truck liquid waste pages. Continued development of the website user experience and other identified outreach materials will happen in 2024, including a toolkit for FSOs with guide sheets listing bylaw updates and basic information for business owners. These tools support RSCP inspectors in their work towards achieving compliance.

In 2023, there were continued collaborative efforts between staff and external partners to provide augmented inspection services, superior customer service, and to promote high environmental performance within businesses.

3.6.3 Partnership Initiatives

Since its inception, the CRD has worked with many agencies to expand program reach and effectiveness, improve services and resolve problems of mutual concern. These agencies have included ENV, federal agencies such as the Department of National Defence and Public Services and Procurement Canada (formerly Public Works and Government Services Canada), regional districts, municipalities, Island Health and local academic institutions.

In 2023, there were continued collaborative efforts between staff and external partners to provide augmented inspection services, superior customer service, and to promote high environmental performance within businesses.

Some examples of both internal and external collaborative partnerships initiatives undertaken in 2023 are outlined below.

3.6.4 2023 Collaborations

In 2023, CRD staff undertook the following collaborative activities:

- Continued to leverage the CRD's standing as one of the oldest and most comprehensive source control programs in Canada to share information and promote the development of source control programs throughout BC and Alberta, while co-hosting the Source Control Community of Practice, in partnership with the BC Water and Waste Association.
- Participated in the Canadian Water and Wastewater Association Flushables Committee to share information and contribute towards development of a national flushability standard.
- Participated in the Cross Connection Control Municipal Plumbing Inspector Roundtable to discuss bylaw changes, give an update on treatment works at height and confined spaces, and share other common issues found during inspections.
- Continued to work with Island Health staff and other CRD program staff, including Cross Connection Control and Onsite Wastewater Management, to share information, maintaining a strong partnership between the program and Island Health inspectors.
- Continued the Business Licensing Municipal Working Group to share new businesses licence information for CRD inspection and permitting purposes (seven municipalities established information sharing procedures and negotiations continue with three remaining municipalities).

3.6.4.1 Island Health Collaboration

Staff continued to work with Island Health inspectors, sharing information on difficult food service establishments, planning co-inspections where necessary, and dealing with mobile food facilities.

Island Health administrative staff continued their information sharing efforts in 2023, forwarding Application for Food Facility forms to the CRD. The forms provide contact and operating details for new food service businesses, enabling CRD staff to work with new applicants more proactively, dramatically improving the accuracy of program business data.

3.6.4.2 Municipal Collaboration

Since 1999, municipal staff have been encouraged to issue Waste Discharge Assessment Forms to persons applying for new building licenses or new sewer connections for businesses that have the potential to discharge non-domestic waste to sewer. Completed forms should be forwarded by the municipality to the CRD for evaluation. In addition, businesses or plumbers contracted to perform upgrades at code of practice operations contact CRD staff directly regarding code of practice requirements. Letters copied to municipal plumbing or licensing contacts are sent directly to code of practice operations outlining specific requirements and providing information.

In 2023, CRD staff worked with municipal staff to resolve various FOG blockages in sewers. Municipal staff continued to provide plumbing and building information, flow data and other information to CRD staff to assist in the preparation of permits, authorizations and code of practice treatment works installations.

A particularly strong partnership was developed with View Royal and Colwood municipalities at the end of 2020. CRD and municipal staff investigated catchments together and identified several residential pump stations requiring a focused approach involving direct mailing to residents encouraging proper disposal of waste (such as FOG, wipes and dental floss) and only to flush the “three Ps” (pee, poo and toilet paper). Initial improvements in maintenance frequency reported by View Royal and Colwood was encouraging, and this work was expanded into other municipalities in 2023. Results are discussed above in Section 0.

3.7 Performance Measures

Three program performance measures are used to assess RSCP performance:

- Overall compliance with the CRD Sewer Use Bylaw. The method of calculating each performance measure is described in Appendix 2.
- Percentage of priority contaminants showing no increase in loads to the core area environment (this measure is associated with the program 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 program objective of protecting the quality of sewage sludge and biosolids).

Table 11 Results of Program Performance Measures (2015-2023)

Performance Measure	2015	2016	2017	2018	2019	2020	2021	2022	2023
Overall Compliance ¹	97%	98%	96%	93%	95%	93%	93%	92%	90%
Priority Contaminants ²	--	92%	--	--	97%	--	--	--	---
Biosolids and Sludge ³	100%	100%	100%	100%	100%	100%	100%	100%	100%

Notes:

¹ Percentage of businesses compliant with bylaw

² Percentage of priority contaminants showing no increase in loads to the core area environment (preliminary result from draft report). Study performed every three to five years.

³ Percentage of biosolids and sludge samples that meet Class A standards for metals.

“Proper Waste Treatment” was modified in 2014 to “Overall Compliance”, as a better indicator of effective contaminants diversion. An enforcement status of “Compliant” or “Step 1” indicates proper treatment works or that an acceptable performance-based treatment arrangement has been made, though not necessarily compliant with what is prescribed in the codes of practice. Further, a “Compliant” or “Step 1” enforcement status assumes that the treatment works are being properly maintained. All treatment systems are rendered ineffective if they are not maintained, thus as a compliance indicator, this is much more accurate in representing how well waste is being managed.

“Priority Contaminants” is based on the “yearly trend” in loads at both Macaulay Point and Clover Point outfalls for 36 priority contaminants, as documented in trend assessment reports. Long-term analysis of effluent trends for the core area outfalls is only undertaken every three to five years.

“Biosolids and Sludge” has shown some variability in the early years, largely due to the mixed liquor metals results from the Ganges WWTP exceeding Class A criteria for biosolids. However, in 2023, for the 15th consecutive year, the plant mixed liquor results met the Class A criteria for all metals, including mercury. Saanich Peninsula WWTP dewatered sludge monitoring commenced in March 2013. All of these results also met the Class A criteria for metals. The combined results from the two plants provided an overall 100% rating for this performance measure in 2023.

4.0 CONCLUSION

This report meets the CRD's commitments in the Core Area and Saanich Peninsula Liquid Waste Management Plans to prepare an annual report on the program for submission to the provincial government. The information in this report is used by CRD staff to evaluate the performance and future direction of RSCP activities and by municipal staff to understand trends in discharge of contaminants from residential and business sources.

The CRD continued to work toward its goals to protect sewage collection and treatment facilities, public health and safety, and the marine receiving environment, by reducing the amount of contaminants that industries, businesses, institutions and households discharge into the CRD's sanitary sewer systems. The program regulated approximately 2,236 businesses through industrial wastewater discharge permits, authorizations and sector-specific codes of practice.

Increasing trends in trucked liquid waste quantities deposited at regional facilities are used as a key performance indicator of the program's success. Catch basin quantities received at regional facilities increased in 2023. This trend will continue to be evaluated in 2024 to ensure the continued protection of stormwater and the nearshore marine environment.

A total of 1,529 code of practice inspections were conducted over the year. Semi-annual inspections of the 37 active permits and annual inspections of most of the 99 active industrial, commercial and institutional authorizations were completed. Five new permits and nine new authorizations for a variety of business types and terms were issued. Five significant incidents reported in regional and municipal sewers were investigated or continued to be investigated in 2023, and two tickets were issued to non-compliant food services operations. The overall compliance rate, including facilities operating under code of practice, authorization and permit was 90% in 2023.

Ganges WWTP mixed liquor results met the Class A biosolids criteria for all metals, including mercury. Saanich Peninsula WWTP dewatered sludge results also met the Class A criteria for metals.

Most monitoring targets set for 2023 were achieved. In addition, new businesses and commercial sites were introduced to RSCP sampling for compliance monitoring.

The CRD also reduces inputs of contaminants into the sewer system with numerous non-regulatory tools, which leads to the reduction of contaminants to the environment. Significant activities throughout the year included:

- Continued promoting of new engagement and behaviour change tools with the "What You Put Down the Drain Matters!" campaign with messaging to discourage the disposal of FOG into the sewer.
- "Live Green in the Bathroom" and other campaigns to inform residents about cleaning and personal care products that are not suitable for flushing down the toilet.
- Continuation of a standardized direct mailout program to residents in service areas with high obstructive waste maintenance requirements.
- Refreshed Medication Return Program messaging to remind residents to return unwanted medications to pharmacies for proper disposal.

In 2024, the program will be working on several initiatives, including:

- Evaluating emerging business sectors in order to set appropriate regulations and discharge limits for their unique flow and waste strength characteristics.
- Continuing to update web and print resources for the education of businesses and residents.
- Delivering educational campaigns to promote source control actions in order to protect wastewater quality and operation of existing sewage infrastructure and the new McLoughlin Point WWTP.

5.0 REFERENCES

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APPENDIX 1

RSCP Priority Contaminant List (2023)

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

APPENDIX 2

Calculation Methods for RSCP Performance Measures

The following methods are used to calculate the three CRD performance measures referred to in Section 3.7.

Performance Measure #1:

Overall Compliance

This performance measure, replacing “number of facilities with proper waste treatment” includes facilities regulated through permits, authorizations or codes of practice receiving either a “compliance” or “Step 1” inspection status. A “Step 1” compliance status is indicative of a “first infraction” (e.g., a late permit report, or failure to keep records, as required). A single infraction does not have a significant impact on the program. Any facility without proper treatment works or not maintaining treatment works would be given a “Step 2” (“first major infraction” or higher level of enforcement depending on the situation).

Performance Measure Calculation

The first step in estimating overall compliance is establishing the individual code of practice sector sizes. All facilities recorded in the RSCP database are reviewed to assess if they are still actively discharging to the CRD sewer system. For example, businesses that have transitioned to off-site waste disposal are no longer regulatable under the Sewer Use Bylaw. It should be noted that the screened facilities are not assumed to permanently exist in that state and are revisited for updates through “newly sewer facility”, mapping updates and/or site contact to determine if practices have changed. Sector sizes for permitted and authorized facilities are simply based on the number of active permits/authorizations at that time.

Summary of Code of Practice/Permit/Authorization Sector Sizes in 2023

Code of Practice	Sector Size (2023)
Automotive Repair	181
Carpet Cleaning	39
Dental	134
Dry Cleaning	8
Fermentation	27
Food Services	1,529
Laboratory	83
Photographic Imaging	27
Printing	28
Vehicle Wash	44
Total CoP Operations	2,100
Total Active Permits	37
Total Active Authorizations	99
Total Regulated Facilities	2,236

With the established code of practice sector sizes and number of permitted/authorized facilities, number of “overall compliant” facilities within each data set are established using the last compliance status of 2023. Facilities with “compliant” or “Step 1” status are considered “overall compliant” Overall compliance since full implementation of code of practice are presented in the table at the end of this appendix.

Performance Measure #2:

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

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

The CRD has collected samples of wastewater from the Macaulay Point 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 assessment (Golder Associates Ltd., 2018), utilizing data from the period 1990-2015, updates the previous assessment (Golder Associates Ltd., 2013).

In 2008, the CRD prepared a list of core area priority contaminants, based on information provided by the CRD's Environmental Monitoring Program and other sources. The table in Appendix 1 shows the current list of 36 RSCP priority contaminants. Most of these contaminants have been targeted for reduction by the program, either through regulation or outreach, or a combination of initiatives.

Performance measure #2 is based on the "yearly trend" in loads at both Macaulay Point and Clover Point outfalls for the 36 priority contaminants, as documented in the most recent trend analysis report. All program priority contaminants showing either a decrease or "no significant trend" in loads at either Macaulay Point or Clover Point outfalls are identified and reported as a percentage of the 36 listed priority contaminants. Note that trends for "total" metals, not "dissolved", are used in the calculation. For polycyclic aromatic hydrocarbon, trends for individual polycyclic aromatic hydrocarbon, low molecular weight polycyclic aromatic hydrocarbon, high molecular weight polycyclic aromatic hydrocarbon and total polycyclic aromatic hydrocarbon are used in the calculation.

Performance Measure Calculation

The following table shows how performance measure #2 was calculated for 2005, 2008, 2011, 2016, Cycle 1 (2011-2015) and Cycle 2 (2016-2019), based on information provided in the Golder Associates Ltd, 2017 and Hatfield 2021 reports. Starting in 2011, the Environmental Monitoring Program began to analyze contaminant trends over shorter cycles than previous analyses that considered trends over data sets back to 1990. Therefore, the timeframes for this performance measure have changed and include the two cycles reported to date.

Note: Only the contaminants for which a significant increasing trend was reported are shown - all other contaminants showed either a "significant decrease", no "significant trend" or "could not be calculated".

RSCP Priority Contaminant	Yearly Trend Core Area Loads					
	(1990-2005)	(1990-2008)	(1990-2011)	(1990-2016)	Cycle 1 (2011-2015)	Cycle 2 (2016-2019)
TOTAL METALS						
arsenic (As)		Increase				
cadmium (Cd)						
cobalt (Co)			Increase (MAC)			
chromium (Cr)						
copper (Cu)						
lead (Pb)						
molybdenum (Mo)	Increase (CLO)	Increase (MAC)				
manganese (Mn)						
mercury (Hg)						
nickel (Ni)						
selenium (Se)		Increase				
silver (Ag)						
zinc (Zn)						
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)						
Low molecular weight PAH						
naphthalene						
acenaphthylene						
acenaphthene		Increase		Increase (MAC)		Increase (MAC)
fluorene				Increase (MAC)		
phenanthrene						
anthracene						
fluoranthene		Increase				
High molecular weight PAH	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 PAH		Increase (MAC)				
Phthalates						
bis(2 ethylhexyl)phthalate	Increase	Increase (MAC)				
di-n-butyl phthalate						
Miscellaneous						

RSCP Priority Contaminant	Yearly Trend Core Area Loads					
	(1990-2005)	(1990-2008)	(1990-2011)	(1990-2016)	Cycle 1 (2011-2015)	Cycle 2 (2016-2019)
1,4-dichlorobenzene						
phenol						
total oil and grease						
cyanide - WAD			Increase (CLO)	Increase (CLO + MAC)		
cyanide - SAD						
Total # Increase	3	8	2	3	0	1
% of 36 Priority Contaminants	92%	78%	94%	92%	100%	97%

Notes:

CLO – Clover Point Outfall

MAC – Macaulay Point Outfall

SAD – strong acid dissociable cyanide

WAD – weak acid dissociable cyanide

Performance Measure #3

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

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

Composite samples of biosolids produced at the Saanich Peninsula WWTP were analyzed on a regular basis during periods of production from May 2000 to April 2011. Samples were analyzed for metals, moisture, pH, nutrients and microorganisms. Analytical results for metals were assessed using Class A biosolids standards, as specified in the Canadian Food Inspection Agency Trade Memorandum T-4-93 Table II (see below).

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

Class A Biosolids Standards, Maximum Acceptable Metal Concentrations*

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

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

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

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

Performance Measure Calculation – 2023

The following table illustrates how performance measure #3 is calculated for 2023.

Treatment Plant	# Samples (2023)¹	# Compliant (2023)²
Ganges Plant (Mixed Liquor)	12	12
Saanich Peninsula Plant (Dewatered Sludge)	12	12
Totals	24	24
Percentage Compliant		100%

Notes:

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

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

The overall percentage of biosolids and sludge samples that met Class A standards for metals in 2023 was 100%.

Overall Compliance for 2023

Codes	Sector Size	# Insp 2023	% Insp	Total Comp	% Comp	In Prog	% In Prog	Step 1	# Overall Compliant (Compliant or Step 1)	% Overall Compliant	DUR	% DUR
Automotive	181	52	28.7%	173	95.6%	5	2.8%	4	177	97.8%	0	0.0%
Carpet	39	0	0.0%	31	79.5%	4	10.3%	4	35	89.7%	0	0.0%
Dental	134	8	6.0%	115	85.8%	26	19.4%	18	133	99.3%	0	0.0%
Dry Cleaning	8	3	37.5%	6	75.0%	1	12.5%	1	7	87.5%	0	0.0%
Fermentation	27	13	48.1%	22	81.5%	1	3.7%	1	23	85.2%	0	0.0%
Food	1,529	1,376	90.0%	1,306	85.4%	141	9.2%	58	1,364	89.2%	0	0.0%
Labs	83	39	47.0%	78	94.0%	3	3.6%	0	78	94.0%	0	0.0%
Photo	27	3	11.1%	20	74.1%	1	3.7%	1	21	77.8%	0	0.0%
Printing	28	1	3.6%	25	89.3%	2	7.1%	1	26	92.9%	0	0.0%
Recreation*	-	-	-	-	-	-	-	-	-	-	-	-
Vehicle Wash	44	36	81.8%	35	79.5%	8	18.2%	5	40	90.9%	0	0.0%
Total	2,100	1,531	72.9%	1,811	86.2%	192	9.1%	93	1,904	90.7%	0	0.0%
Authorizations	99	64	64.6%	81	81.8%	16	16.2%	6	87	87.9%	1	1.0%
Permits	37	54	73.0%	23	62.2%	13	35.1%	4	27	73.0%	1	2.7%
All Totals	2,236	1,649	73.7%	1,915	85.6%	221	9.9%	103	2,018	90.3%	2	0.09%

Note: *Recreation facilities previously regulated under the CoP have all been transferred over to individual authorizations.

APPENDIX 3
CRD Regulated Industrial Categories
(Currently Operating Under RSCP Permits or Authorizations)

BUSINESS TYPE	TYPICAL CONTAMINANTS OF CONCERN	TYPICAL PRE-TREATMENT INSTALLED
Breweries	solids, organics, pH	solids diversion, filtration, pH adjustment
Chemical Manufacturing	pH, toxic metals, solvents	process control, waste neutralization, off-site waste management
Food Processing	fats, oils and grease, solids, organics	solids separation, grease interceptor, neutralization, dissolved air flotation
Groundwater Remediation	mineral oil and grease, toxic metals, toxic organics, solids, sulphides	settling, filtration, sulphide reduction, adsorption
Hazardous Waste Treatment	mineral oil and grease, toxic organics, sulphides, solids, solvents	filtration, oil/water separation, chemical oxidation, aeration, precipitation, flocculation, adsorption, sulphide reduction
Hospitals	fats, oils and grease, solids, organics, solvents, pH	solids separation, grease interceptor, off-site waste management, adsorption
Industrial Laundries	fats (and mineral) oils and grease, solids, organics	grease interceptor, filtration, oil skimmers
Metal Platers	toxic metals, cyanide, solvents, pH	process control, metals adsorption, off-site waste management
Organic Waste Treatment	fats, oils and grease, metals, solids, pH, sulphides	dewatering, grease interceptor, bio-reactors, sulphide reduction, dissolved air flotation
Recreation Facilities	pH, chloride, high volume	pH and chloride adjustment, attenuation
Ship Repair	mineral oil and grease, solvents, toxic metals, toxic organics, solids	settling, flocculation, filtration, electrocoagulation
Street Waste Treatment	fuel, toxic metals, mineral oil and grease, organics, solids	filtration, settling, oil/water separation
Transportation	mineral oil and grease, fuel, solids, de-icing fluid	neutralization, oil/water separation, dissolved air flotation
Wet-Cutting	suspended solids	solids separation, settling