Making a difference...together

Saanich Peninsula Stormwater Quality Program

2023 Annual Report

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

Including the jurisdictions of

District of Central Saanich
District of North Saanich
Town of Sidney
Pauquachin First Nation
Tsartlip First Nation
Tsawout First Nation
Tseycum First Nation

Prepared By
Stormwater Quality Program

Capital Regional District
625 Fisgard Street, Victoria, BC V8W 2S6
T: 250.360.3000 | F: 250.360.3079
www.crd.bc.ca

September 2024

SAANICH PENINSULA STORMWATER QUALITY PROGRAM
2023 ANNUAL REPORT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Terms & Abbreviations

CCME	Canadian Council of Ministers of the Environment
CFU	Colony-forming unit
CRD	Capital Regional District
D/S	Downstream
DIS	Dissolved state
DND	Department of National Defence
E. coli	Escherichia coli
ENT	Enterococci
ENV	BC Ministry of Environment and Climate Change Strategy
EPT	Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies)
FC	Fecal Coliform
HBI	Hilsenhoff Biotic Index
HMW	High molecular weight
HPAH	High molecular weight polycyclic aromatic hydrocarbon
IHA	Island Health Authority
ISQG	Interim Sediment Quality Guideline
LMW	Low molecular weight
LPAH	Low molecular weight polycyclic aromatic hydrocarbon
LWMP	Liquid Waste Management Program
MMAG	Marine Monitoring Advisory Group
MSQG	Marine Sediment Quality Guidelines
NTU	Nephelometric Turbidity Unit
PAH	Polycyclic aromatic hydrocarbon
PEL	Probable effects level
POD	Point of discharge
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
SPSO	Sewage Pump Station Overflow
SPTP	Saanich Peninsula Treatment Plant
SQG	Sediment quality guidelines
TEU	Toxic equivalent unit
TOC	Total organic carbon
TOT	Total state
TSS	Total Suspended Solids
U/S	Upstream
WQG	Water Quality Guidelines

SAANICH PENINSULA STORMWATER QUALITY PROGRAM
2023 ANNUAL REPORT

1.0 INTRODUCTION

The Capital Regional District (CRD) Stormwater Monitoring Program works to identify and reduce contamination from the land into stormwater, creeks and the ocean. CRD staff, in cooperation with municipalities and First Nations, accomplish this through environmental monitoring, assessment, collaboration, education and enforcement. This work meets commitments in the Saanich Peninsula Liquid Waste Management Plan (LWMP; CRD, 1996), described below.

CRD staff monitor approximately 300 stormwater discharges and creeks to identify contamination and impacts to stormwater due to land use practices. Data is used to assign priority ratings for mitigative action by the appropriate jurisdiction. When contamination is found, CRD staff conduct investigations and work with municipal staff and First Nations to identify the source(s).

CRD monitoring staff work to monitor and assess any existing stormwater contamination, while CRD source control staff work to prevent the release of contamination into the municipal drainage system. This is accomplished through education, guidance and enforcement. Source control staff conduct site visits with every facility on the Saanich Peninsula with a business waste discharge, parking lot or outdoor storage.

This report summarizes the results of the following work which was completed in 2023 (2024 data was considered when available):

- Stormwater Discharge Evaluations – Public Health
- Bacterial Source Investigations
- Stormwater Discharge and Watercourse Evaluations – Chemical Contaminants
- Saanich Peninsula Stormwater Source Control Service

Data, sampling locations and details about the CRD stormwater discharge rating methods for public health and environmental concern are available in appendices A through G.

Regulatory Background

Stormwater Quality Monitoring Service

The CRD created the stormwater quality monitoring service to meet commitments in the Saanich Peninsula LWMP. The CRD commitments regarding stormwater quality and management are to:

1. *plan, promote and co-ordinate a program for management of stormwater quality and surface water resources in cooperation with the participating municipalities, communities and local governments to:*

    a. *limit the impacts of stormwater runoff on the environment and public health and well-being;*
    b. *protect freshwater and near-shore marine ecosystems and resources; and*

2. *promote education about water quality issues and to develop educational material.*

Municipalities and First Nations own the stormwater infrastructure and have authority over stormwater under the *Community Charter*[*]. In the LWMP, participants make the following commitments:

1. *to act on priorities within their jurisdiction to protect stormwater quality, the physical environment and aquatic habitat, and to reduce the levels of contaminants in stormwater discharges to accepted government standards in watercourses and near-shore marine areas;*

[*] https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/03026_00

2. *to use resources available to municipal governments to achieve these reductions; and*

3. *to amend bylaws, as necessary, to ensure that new development takes place in accordance with appropriate best management practices.*

Saanich Peninsula Stormwater Source Control Service

The CRD created the Saanich Peninsula Stormwater Source Control Service with the goal to prevent the release of contamination into the municipal drainage system through education and guidance, maintenance of catch basins, appropriate business practices, and proper disposal of waste. Staff created Regulatory Bylaw No. 4168 and amending Bylaw No. 4229 that set out the requirements for discharges to the municipal drainage system. There are two Codes of Practice included in the bylaw, one for Parking Lot Operations and another for Outdoor Storage Operations.

2.0 STORMWATER DISCHARGE EVALUATIONS - PUBLIC HEALTH

Public Health Concern Rating Methods

Staff prioritize stormwater discharges annually to meet LWMP commitments and support local governments in directing funds where they will have the greatest benefit. Discharges are prioritized through public health concern ratings, based on the concentration of bacteria in the discharge and the potential for public contact.

Each year, CRD staff sample a selection of stormwater discharges in the wet and dry seasons and analyze them for *E. coli*, an indicator of sewage or animal waste. A summary of the CRD rating system is included in Appendix G. An *E. coli* count greater than 200 colony forming units (CFU)/100 mL indicates a source of sewage or animal waste with the potential to cause adverse effects to members of the public engaging in recreational activities in the vicinity. The CRD assigns discharges a high public health concern rating if:

- the average *E. coli* counts (geomean) are over 200 CFU/100 mL or a single count is over 400 CFU/100 mL on a shoreline used by the public for swimming or diving; or
- the *E.coli* count is greater than 5,000 CFU/100 mL on a shoreline used by the public for small boating (e.g., kayaking or paddle-boarding).

2023 Public Health Concern Ratings

In 2023, staff assessed 99 stormwater discharges, of which 26 discharges had one or more *E. coli* counts greater than 400 CFU/100 mL. However, many of these discharges have low flows or are located where there is little risk of public contact. Considering the likelihood for contact, CRD staff assigned the following public health concern ratings:

- 74 low ratings;
- 16 moderate ratings; and
- 6 high ratings (Table A, Figure A).

These ratings and the associated bacterial data are listed in appendices B and C. Quality assurance and control data are in Appendix D.

CRD source investigations indicate that malfunctioning on-site sewage treatment systems or agricultural practices are the sources of bacteria leading to high ratings in three North Saanich discharges and one in Tseycum Creek. Sources of bacteria in Sidney discharges are due to sewer cross-connections and aging infrastructure. The recent repair of a cross-connection reduced the number of high-rated discharges in Sidney in 2022. CRD staff are working with municipal staff and the Island Health Authority (IHA) to mitigate these sources.

Ratings over Time

Since 2012, the number of high-rated discharges has decreased on the Saanich Peninsula from 13 to 6 (see Table B). The number of high-rated discharges increased by one since 2022, with the addition of a discharge in Coles Bay (3118, at Hartfell Avenue) that exhibited elevated *E.coli* counts.

Discharge 3118 has had intermittently elevated fecal bacterial counts since CRD monitoring was initiated in 1998. Efforts by the CRD and IHA in recent years resulted in on-site sewage system repairs and a reduction in bacterial counts. However, recent data indicate that other sources have developed or intensified.

Five of the high-rated discharges have been of concern for several years. These discharges have recurring malfunctioning on-site systems, aging infrastructure or are the result of agricultural practices.

Table A 2023 Discharges Rated High for Public Health Concern

Jurisdiction	Discharges Rated High
Central Saanich	-
North Saanich	3077, 3078A, 3118
Sidney	447, 3016
Pauquachin First Nation	-
Tsartlip First Nation	-
Tsawout First Nation	-
Tseycum First Nation	3078

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

Jurisdiction	Number of Discharges Rated High											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Central Saanich	2	1	1	1	0	0	1	2	1	0	1	0
North Saanich	4	4	3	3	3	4	4	4	3	3	2	3
Sidney	4	5	6	3	2	1	2	2	2	2	1	2
Pauquachin First Nation	0	0	0	0	0	0	0	0	0	0	0	0
Tsartlip First Nation	1	1	0	0	0	0	0	0	0	0	0	0
Tsawout First Nation	1	0	0	0	0	0	0	0	0	0	0	0
Tseycum First Nation	1	1	1	1	1	1	1	1	1	1	1	1
Total	**13**	**12**	**11**	**8**	**6**	**6**	**8**	**9**	**7**	**6**	**5**	**6**

Bacterial Source Investigations

CRD, municipal, First Nation and IHA staff continue to work together to identify bacterial sources in stormwater discharges of concern so they can be addressed by the appropriate jurisdiction. CRD staff narrow down sources of bacteria using upstream sampling for parameters such as bacteria, caffeine and genetic analysis to determine if the origin of the bacteria is animal or human. The sources of contamination include:

- malfunctioning on-site sewage treatment systems
- agricultural practices
- aging stormwater and sewage infrastructure
- sewage to stormwater cross connections
- wild and domestic animals

In 2023, CRD staff investigated the catchment areas of seven stormwater discharges on the Saanich Peninsula. The status of these investigations are as follows (see Table C for specific discharges and locations):

- one source was narrowed down in Sidney and information was passed onto municipal staff for identification of sewer to stormwater cross-connection;
- investigations were finalized in two discharges that were narrowed down and mitigated;
- one investigation was suspended due to lack of flows and lower bacterial counts; and

- investigations are ongoing in three catchments where multiple sources exist.

In 2024, staff will continue investigations in many of these stormwater catchments and others of concern.

Coles Bay

CRD staff continue to work with Island Health, North Saanich and Pauquachin First Nation to monitor, find and eliminate sources of bacteria in stormwater going into the bay. In 2023, CRD staff completed side-by-side sampling of stormwater discharges with Pauquachin members and staff as well as UVIC researchers to share data and compare bacterial results from two methods. Results showed good precision between CRD collected and lab-analyzed bacterial data and Pauquachin SimPlate results.

Table C Status of 2023 Source Investigations

Stormwater Discharge #	Location/ Jurisdiction	Status	Next Steps
3005	Sidney	Ongoing; multiple sources exist.	CRD to continue investigation.
3007	Sidney	Cross-connection identified; source narrowed.	Sidney to investigate.
3095	North Saanich	Source narrowed to upstream of Tseycum First Nation; ongoing.	CRD to continue investigations.
3133	Central Saanich	Ongoing; one source narrowed; other sources exist.	CRD to continue investigations.
3138	Central Saanich	Bacterial concentrations are lower.	CRD to confirm lower bacterial counts.
412 Puckle Road	Central Saanich	Complete; source known; mitigation steps taken.	CRD to continue monitoring.
3100 Tapping Road	Central Saanich	Complete; source known; mitigation steps taken.	CRD to continue monitoring.

3.0 STORMWATER DISCHARGE AND WATERCOURSE EVALUATIONS – CHEMICAL CONTAMINANTS

The CRD assesses environmental concern in water and sediment from stormwater, pipes, ditches and streams, based on their potential to impact the marine receiving environment. Staff also assess watercourse health in seven freshwater streams through water quality and benthic invertebrate sampling. When contamination is found, the results are passed onto the appropriate jurisdiction and the CRD works in partnership to find and eliminate the source.

Chemical Contaminant Sampling

Stormwater Sediment

The program evaluates sediment from within stormwater discharges (pipes, ditches and streams) for potential environmental impact due to contaminant levels. Sediment data and ratings are in Appendix E.

CRD staff assign contaminant ratings to stormwater discharges from sediment samples taken at the point of discharge into the marine environment. Ratings are determined by comparing the concentration of each contaminant [eight metals and high and low molecular weight polycyclic aromatic hydrocarbons (PAH)] to the CRD marine sediment quality guidelines (MSQG) protective of marine life. Methods are described in Appendix G.

2023 Sediment Contaminant Ratings

Staff collected sediment samples from seven stormwater discharges on the Saanich Peninsula and assigned low contaminant ratings to all discharges except for Tod Creek which was assigned a moderate

rating. One discharge (Mermaid Creek) remains on the corrective action list due to contamination found in previous years.

A sample from the mouth of Tod Creek in 2022 had elevated mercury compared to the CRD MSQG. As elevated mercury had never been measured at that location (from 16 samples collected since 1999), staff collected three samples in 2023 to confirm the results. All three samples had low concentrations of mercury (<0.05, <0.05 and 0.06 mg/kg) with no exceedances of the MSQG for mercury or other metals. Therefore, there may have been concentrated mercury contamination in a small area of the creek, or the 2022 result was erroneous. CRD staff will continue to monitor metals in sediment from this location but have downgraded the rating to moderate.

Comparison of the Tod Creek 2023 sediment samples to the Canadian Council of Ministers of the Environment's guidelines show that arsenic, lead and zinc are elevated above the CCME Interim Sediment Quality Guidelines protective of freshwater aquatic life. However, 2023 concentrations remain within the range of data collected since 1999.

Other CRD-supported work in Tod Creek is being undertaken by Raincoast Conservation Foundation (see Watercourse section below).

Discharges Requiring Corrective Action

Remedial work resulted in decreased contamination in two of the three discharges that have been a concern for many years, allowing removal of these from the list of discharges requiring corrective action. The data indicates lower levels of contaminants in discharges 441 (Reay Creek) and 3138 (Tsartlip Boat Launch).

Only Mermaid Creek (discharge 3005) remains on the list of discharges requiring corrective action based on elevated metals and PAHs. Discharge 3005 has been of concern since 2005. CRD staff conducted numerous investigations, however, finding a source has been challenging due to lack of sediment and multiple sources within the catchment. Staff have been monitoring water quality (i.e., aqueous metals) in recent years.

Previous data has indicated that copper, iron and zinc can be elevated in stormwater within the catchment of discharge 3005, however, copper was the only contaminant elevated above water quality guidelines for protection of aquatic life in recent years. Copper is elevated above marine aquatic life guidelines in more than 58% of all stormwater discharges assessed in the Saanich Peninsula, however, some of the highest concentrations were measured upstream in the Mermaid Creek catchment.

The highest metals concentrations are measured in a manhole on Malaview Avenue between Fifth Street and Resthaven Drive. The area is residential and no evident sources of contamination have been found.

Sidney staff found and repaired a cross-connection in the catchment in early 2023. Staff will continue sampling the catchment and will remove this discharge from the action list if further samples have low contaminant concentrations.

Locations of these discharges are shown in Appendix A.

Watercourse Monitoring

Staff continued to monitor Hagan/Graham, ḰEL,SET (Reay), Tetayut, Tatlow (Chalet), ȾEN̲TEN, Tod and Tseycum creeks in 2023, to provide information about creek and watershed health.

Twice per year staff collect water quality measurements at the discharge of each creek, providing a snapshot of creek health in the wet and dry seasons. Approximately every second year, staff focus on one Saanich Peninsula watershed to conduct more comprehensive monitoring that includes additional locations, additional water quality parameters, higher sampling frequency and benthic invertebrate data collection.

CRD Watercourse Data

Based on the CRD monitoring data, the parameters of most concern in Saanich Peninsula creeks are *E. coli*, phosphorus and turbidity, with some creeks also experiencing low dissolved oxygen and elevated metals. Poor water quality is likely the result of development, business waste (historical and ongoing), agricultural practices and malfunctioning on-site sewage treatment systems.

Significant findings in Saanich Peninsula creeks are as follows:

- ȾEN̲TEN Creek which drains Victoria Airport Authority land and upstream farmland continues to display arsenic, cadmium, copper, iron and zinc concentrations which are elevated above BC Water Quality Guidelines for protection of freshwater aquatic life. This is likely due to historical contamination on airport lands.

- Tetayut Creek drains Tsawout First Nation reserve and upstream agricultural and residential areas. In early 2023, staff measured elevated bacterial counts in Tetayut Creek. Further sampling was conducted and staff were planning source investigations. It was later discovered that a sewage spill had been occurring in the creek. Tsawout First Nation identified the cause, removed the contamination and repaired the infrastructure. It is unknown how long the sewage spill had been occurring, but CRD 2021 data indicated that water quality had decreased in the creek and the presence of more pollution tolerant benthic invertebrate species indicated that there was an increase in organic pollution in the creek over time.

- ḴEL,SET (Reay) Creek Watershed originates in Sidney and drains into Bazan Bay. Reay Creek Pond was designated a Class 1 contaminated site by Transport Canada (TC) in 2016, due to elevated metals (cadmium, chromium, lead and zinc). TC remediated a section of the creek and pond in 2019 and 2020, including dredging of contaminated sediments. Sediment samples collected by CRD staff in Reay Creek in 2020 and 2021 had lower concentrations of metals, resulting in a lower contaminant rating (high to moderate) for the creek. 2023 water samples continue to indicate that aqueous metals concentrations are lower and remain below BC freshwater aquatic life guidelines.

- Tseycum Creek drains from North Saanich, through Tseycum First Nation and into Patricia Bay. CRD staff have been measuring elevated bacterial levels for over 15 years at the mouth of the creek. Past source investigations have pointed to agricultural land use in North Saanich. In 2024, CRD staff will conduct more source investigations including measurement of nutrients to get a better idea of sources and impact to the creek.

- Tod Creek Watershed originates in Saanich and flows through agricultural, forested and residential land uses before discharging into Saanich Inlet. In addition, the Hartland Landfill lies within the watershed. CRD staff planned focused sampling in Tod Creek watershed in 2023, however, the CRD Board approved a proposal from Raincoast Conservation Foundation (Raincoast) to assess the watershed as part of Raincoast's Healthy Waters Program. Therefore, the CRD is funding and offering in-kind coordination support for the project which will include measurement of an extensive variety of substances throughout the watershed. The project will identify the presence of substances of past, present and emerging concern at very low concentrations and compare results to other watersheds in British Columbia. Sampling was initiated in December 2023 and will continue over two years.

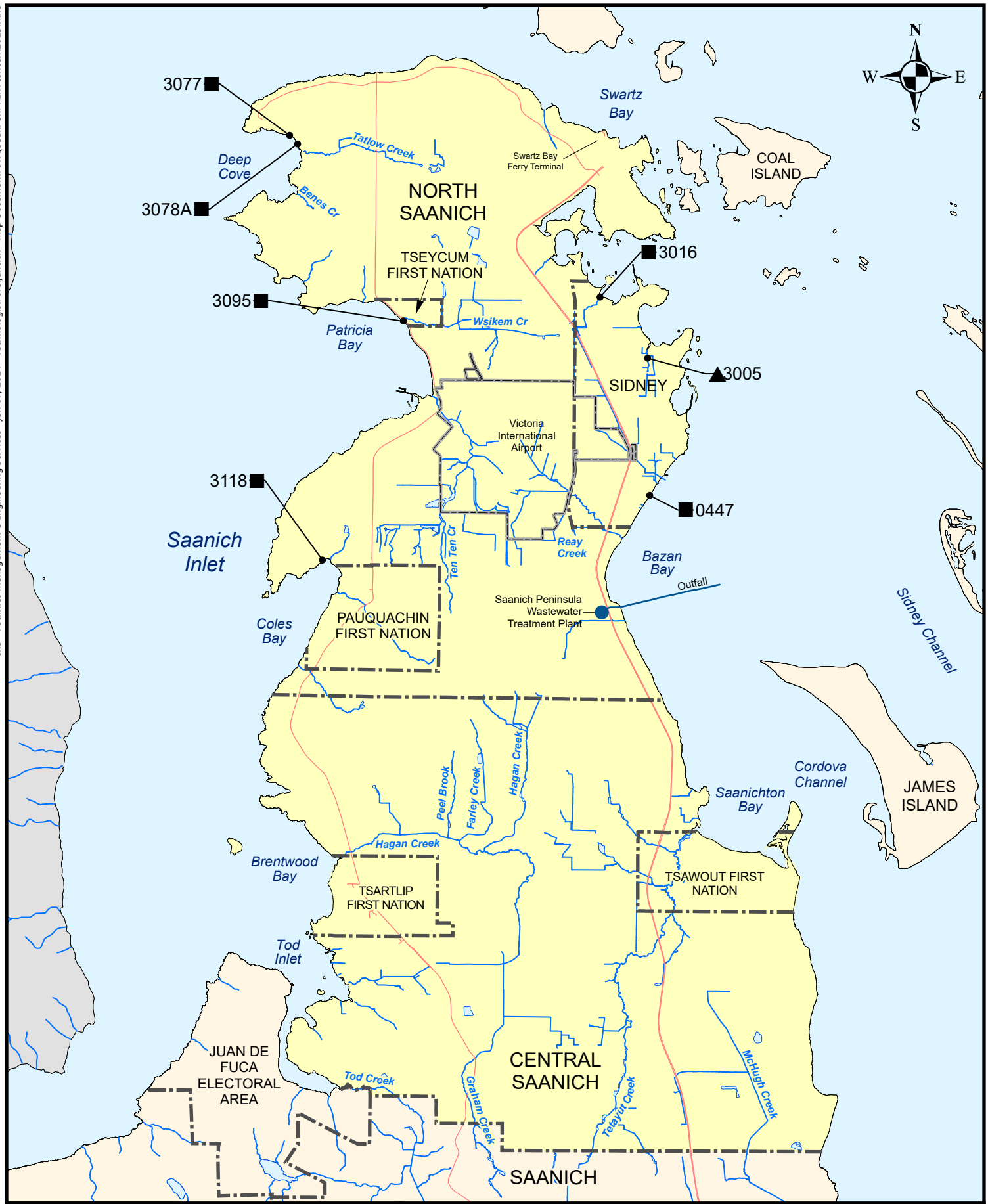
  The project is being carried out in partnership with W̱SÁNEĆ Leadership Council (WLC; comprised of Tsartlip (W̱JOŁEŁP') and Tseycum First Nations. The CRD has presented a letter of engagement to the WLC to provide financial support for training and collection of water samples from the Tod Creek watershed as well as for capacity for internal analysis and communications throughout the project.

In 2024, CRD staff will continue to monitor these creeks and work with First Nations and municipal staff to locate sources of bacterial, physical and chemical contamination.

Quality Assurance

The 2023 data met quality assurance/quality control requirements for the program. For bacterial analysis, quality assurance includes annual establishment of a precision criterion based on a range of Saanich Peninsula stormwater sample triplicates. Staff collect blanks and field-splits for 10% of the discharge and marine surface water samples collected.

Quality assurance for sediment analysis included field duplicates, laboratory triplicates and standard reference materials. Precision and accuracy of the laboratory analysis were estimated from the results of these replicate and standard reference materials samples. A detailed discussion on the quality assurance program is provided in Appendix D.



CRD - Facilities Management & Engineering Services - Jun 07, 2024 - Technologist: sruljancich - Map Document: SWQSaanPenPHEnvConcern2023.mxd

Making a difference...together

Kilometres

0 0.5 1 2

Projection: UTM ZONE 10N NAD 83

Figure A- Saanich Peninsula - Stormwater Discharges Rated High for Public Health or Environmental Concern

- High Public Health Concern Rating in 2022
- High Environmental Concern Rating in 2022 or previous years (and recommended for corrective action)
- Sewage Treatment and Outfall
- Significant Ditches, Streams, Rivers, and Storm Drains
- Municipal and First Nations Boundary
- Major Roads
- Stormwater Monitoring Area

4.0 SAANICH PENINSULA STORMWATER SOURCE CONTROL SERVICE

The CRD established the Saanich Peninsula Stormwater Source Control Service in 2014, with the goal to prevent the release of contamination into the municipal drainage system through education and guidance, maintenance of catch basins, appropriate business practices and proper disposal of waste. Staff created the regulatory Bylaw No. 4168 and amending Bylaw No. 4229 that set out the requirements for discharges to the municipal drainage system by December 2019.

CRD staff worked with municipalities, stakeholders and dischargers to implement the bylaw in 2019 and expanded implementation strategies in 2020. The implementation strategies included site visits with every facility on the Saanich Peninsula identified as having a business waste discharge or operating under one of the Codes of Practice (Parking Lot Operations and Outdoor Storage Operations). The site visit included education on the new Stormwater Bylaw and enforcement only when major infractions such as direct discharge to the stormwater system, lack of maintenance of stormwater rehabilitation units, or containment issues of hazardous materials were found.

The following sections summarize each of the stormwater source control services on the Saanich Peninsula.

Prohibited Discharges

The CRD identified twenty-two facilities actively discharging business waste to the stormwater system and successfully worked with fifteen of them to cease discharge to stormwater. Some businesses changed practices while others were directed to discharge to the sanitary sewer under regulation of the Sewer Use Bylaw 2922. At the end of 2023, two facilities were in the process of moving their discharge to sanitary sewer and five facilities were operating under a Temporary Approval Letter.

Temporary Approvals

CRD staff have identified seven facilities discharging business wastewater to the stormwater system through treatment works that were previously approved by the municipality. These facilities are operating under Temporary Approval Letters with conditions to prove efficacy of the treatment works through self-monitoring and reporting. At the end of 2023, one facility was at Step 1 of a three-step enforcement process for exceeding Prohibited Waste parameters, one facility was at Step 3 and Under Review for exceeding Prohibited Waste parameters and two facilities were in the process of moving the discharge to sanitary sewer after the Temporary Approval was revoked for exceeding Prohibited Waste parameters.

Bylaw No. 4168 - Inspections

In 2023, the CRD completed the implementation of Bylaw No. 4168 to complete inspections with all Saanich Peninsula facilities with a business waste discharge and those operating under a Code of Practice. In total, 385 in-person inspections were conducted to provide education on stormwater source control and solutions for managing business waste on-site to prevent contamination of the stormwater system and the downstream freshwater or marine receiving environment. Inspections took place at 348 parking lot operations, 24 outdoor storage operations and 13 were general inspections. Ninety-one of these facilities were determined to be regulated under the Stormwater Bylaw. The remaining were identified as not regulated under the Bylaw or the Codes of Practice.

Bylaw No. 4168 - Compliance

At the end of 2023 there were 245 facilities regulated under the Stormwater Bylaw. Of the ninety-one regulated facilities inspected in 2023, the initial compliance rate was 68%. Facilities under Bylaw No. 4168 such as vehicle wash operations had an initial compliance rate of 20% with prohibited waste discharge infractions. Parking lot operations had an initial compliance rate of 69% with infractions of excess sediments in catch basins requiring more frequent clean-outs. Outdoor storage operations had an initial compliance rate of 81% with hazardous materials containment infractions. All but six facilities brought their operations into compliance for an overall compliance rate of 93% for 2023.

Significant Incident Response

Staff responded to the following five significant incidents in 2023 and one incident in 2021 that received further investigation and follow-up:

- An oily/grease build-up in a pump station followed by an incident involving obstructive waste in the same pump station reported by municipal staff. A door-to-door education campaign was implemented, followed by a best practice educational mailout to the businesses in the catchment area.
- Construction waste discharge reported by the public. The business was engaged with education on best practices.
- A spill or illegal dumping of paint reported by municipal staff. While no point source was identified, a best practice educational mailout was sent to the residences in the catchment area.
- Two incidences involved deleterious substances reported by municipal staff. Following site visits, it was determined these facilities were operating under the Provincial Agricultural Land Reserve and not within the scope of the Stormwater Bylaw.

5.0 2024 PROGRAM

In 2024, CRD staff will continue to work with municipal partners, First Nations and the community to achieve LWMP goals to identify stormwater discharges of public health and environmental concern. CRD staff will continue to work with its partners to identify and reduce bacteria and contaminant concentrations in stormwater discharges, creeks and the marine receiving environment.

6.0 REFERENCES

CRD, 2011. Saanich Peninsula Liquid Waste Management Plan.

APPENDIX A

LOCATION OF STORMWATER DISCHARGES
2023

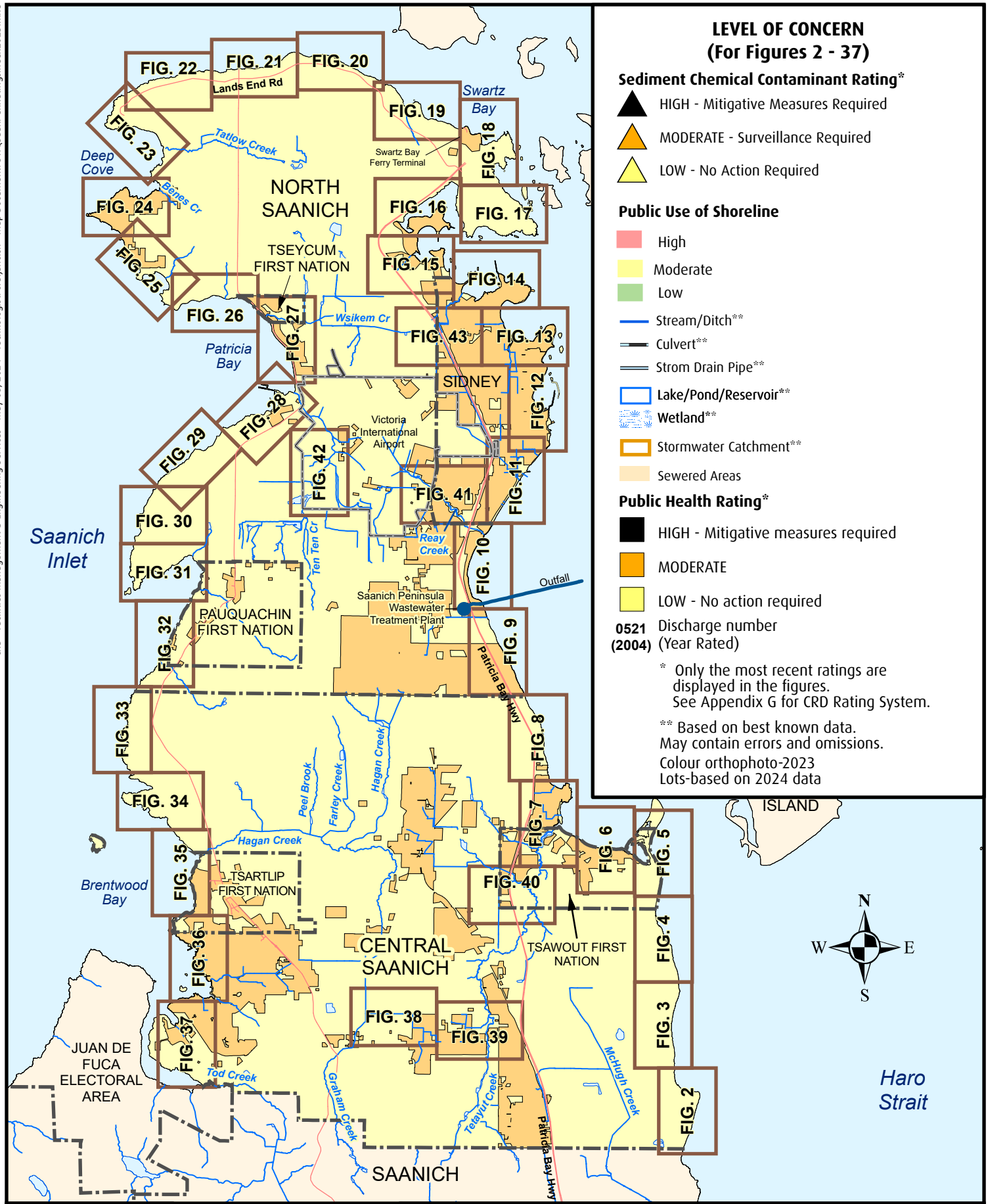


Figure 1
Key Index for Figures 2 - 37 and Legend

Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

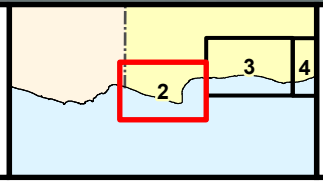


Figure 2
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

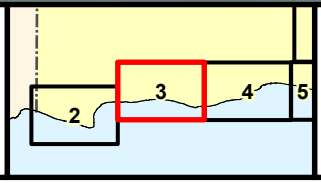
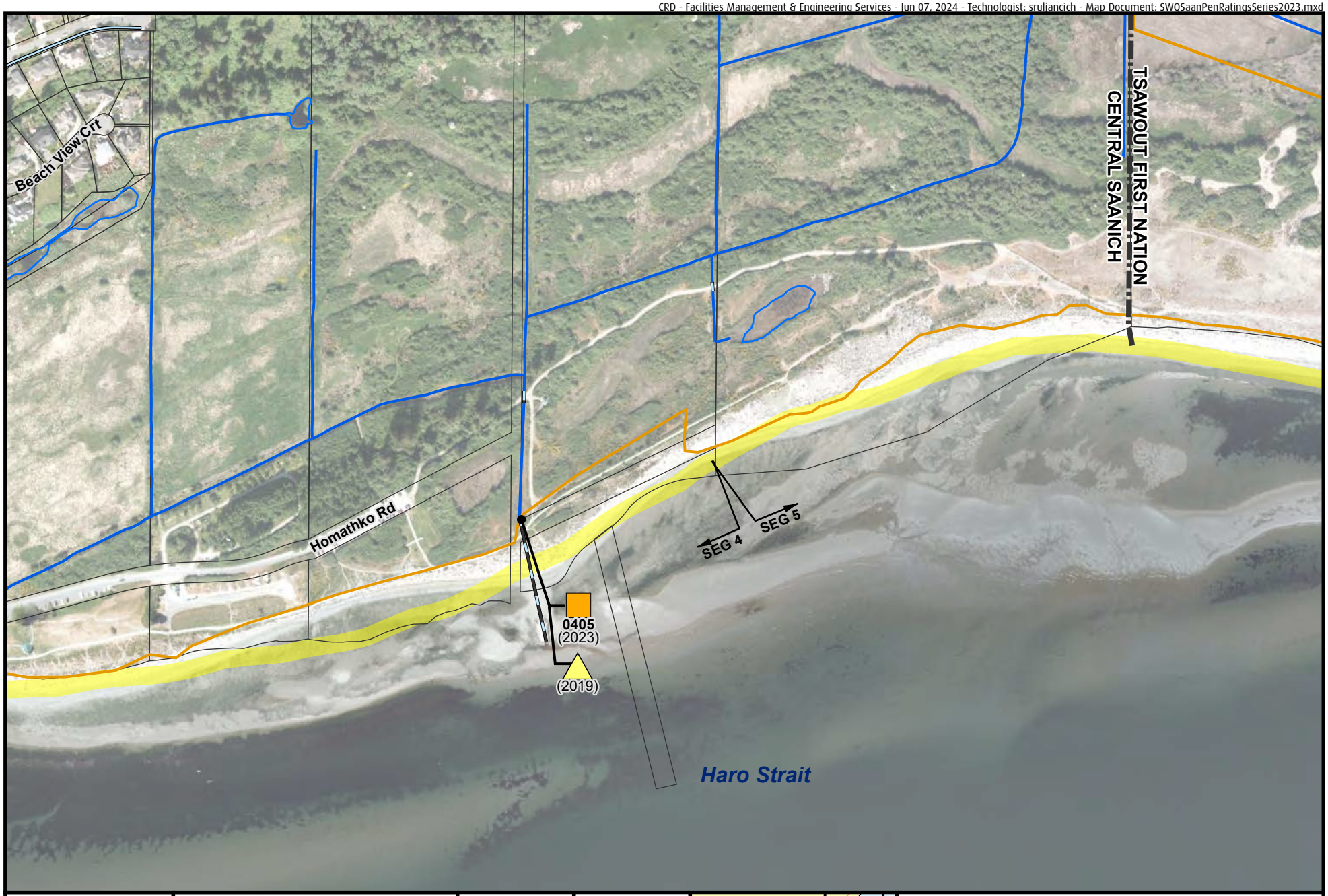


Figure 3
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

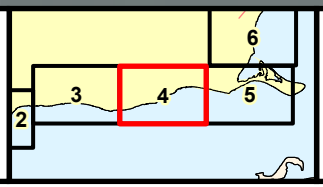


Figure 4

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

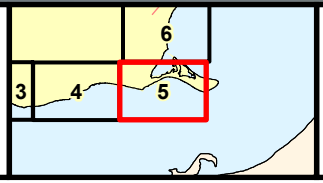
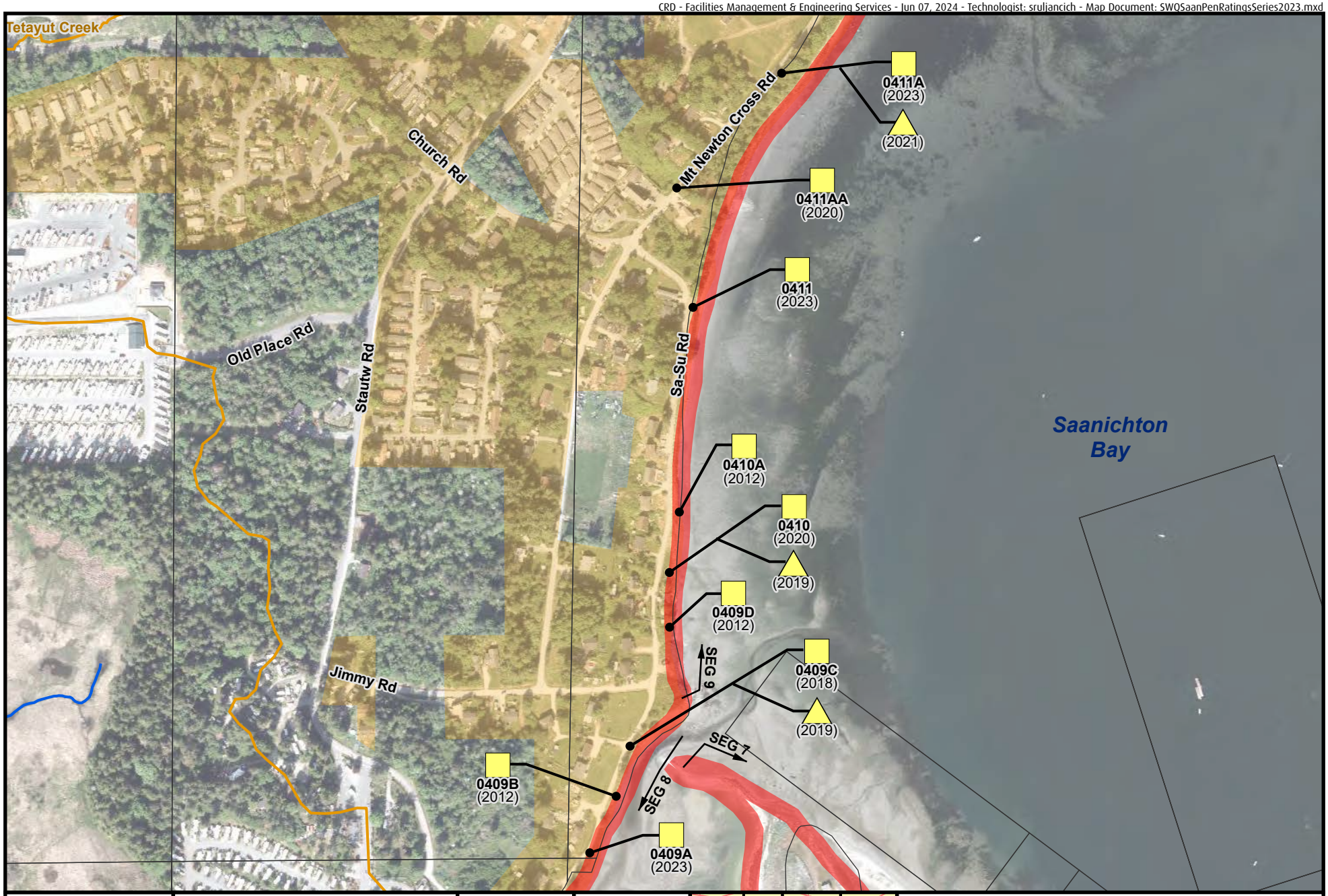


Figure 5

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



CRD Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

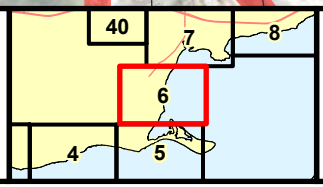
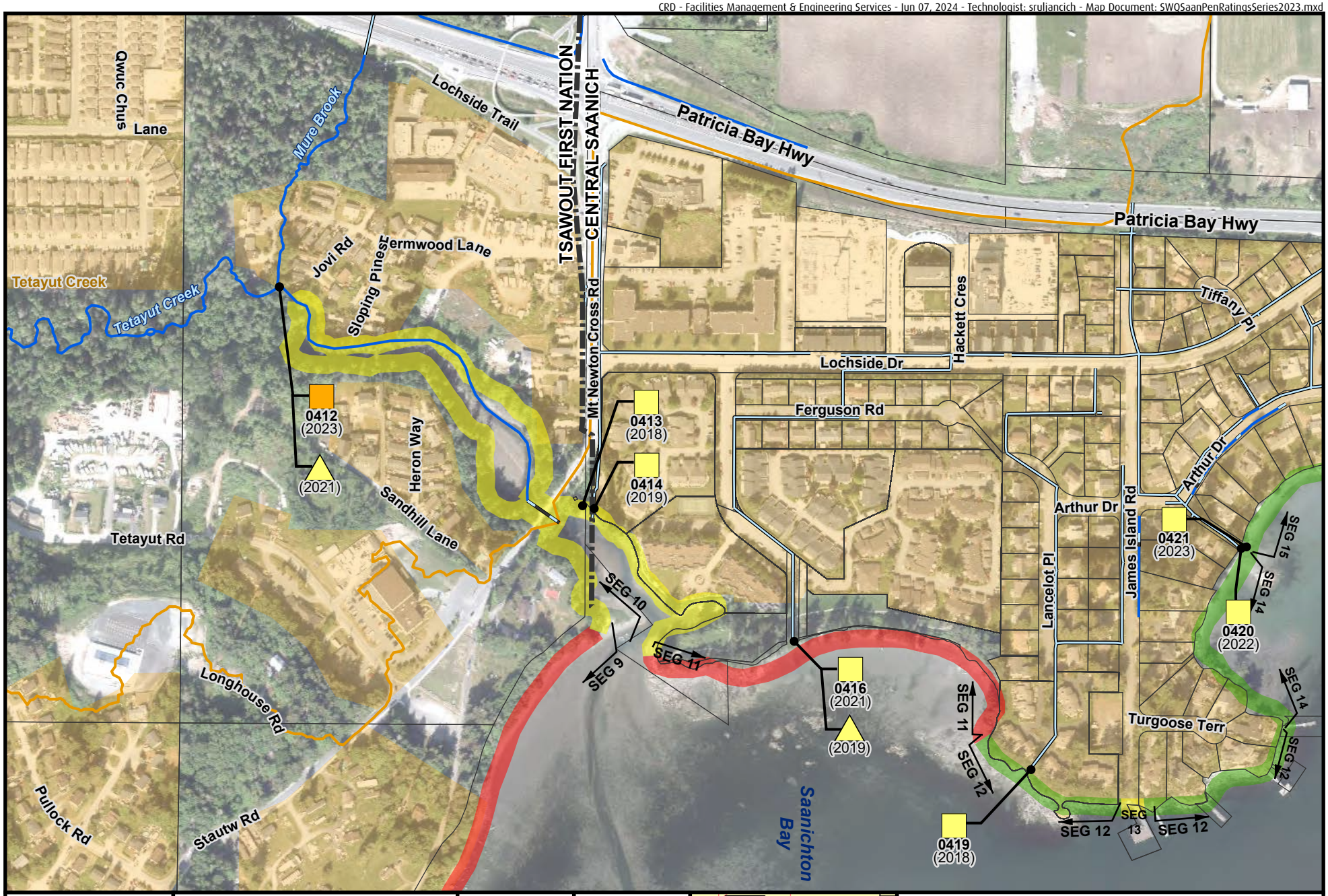


Figure 6

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



CRD Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

For Key Index and Legend See Figure 1

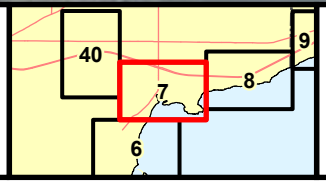


Figure 7
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

CRD - Facilities Management & Engineering Services - Jun 07, 2024 - Technologist: sruljancich - Map Document: SWQSaanPenRatingsSeries2023.mxd

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

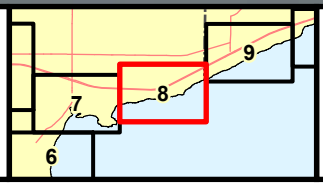


Figure 8

Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

CRD - Facilities Management & Engineering Services - Jun 07, 2024 - Technologist: sruljancich - Map Document: SWQSaanPenRatingsSeries2023.mxd

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

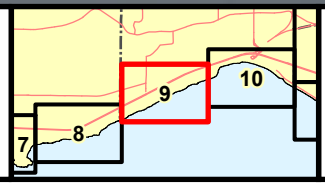
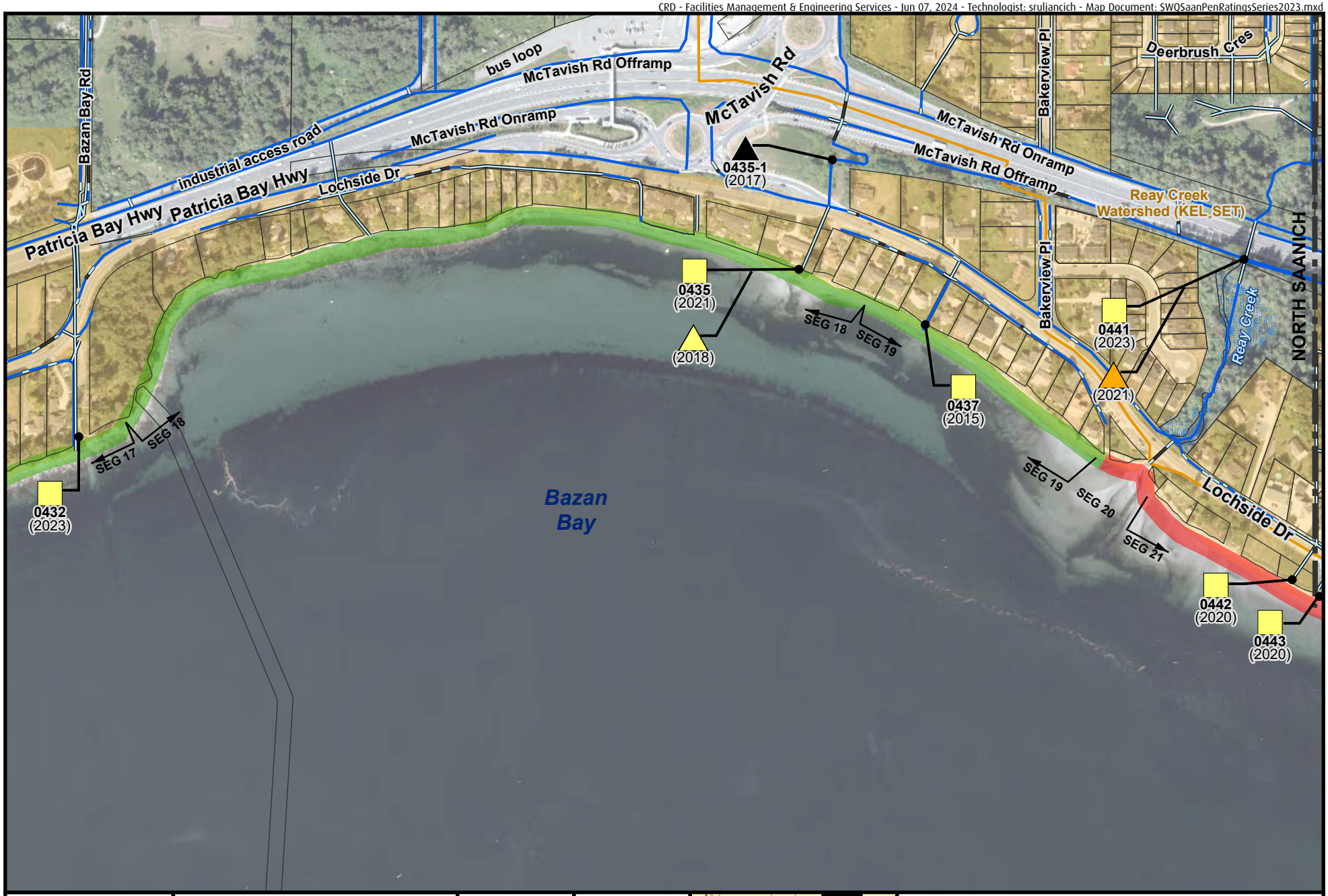


Figure 9

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern

CRD - Facilities Management & Engineering Services - Jun 07, 2024 - Technologist: sruljancich - Map Document: SWQSaanPenRatingsSeries2023.mxd



Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

For Key Index and Legend See Figure 1

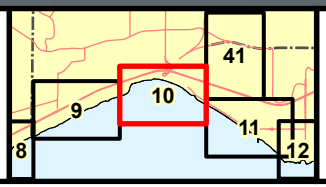


Figure 10
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

CRD Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

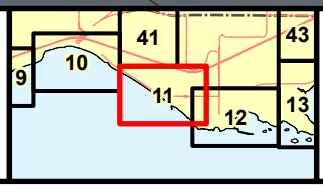
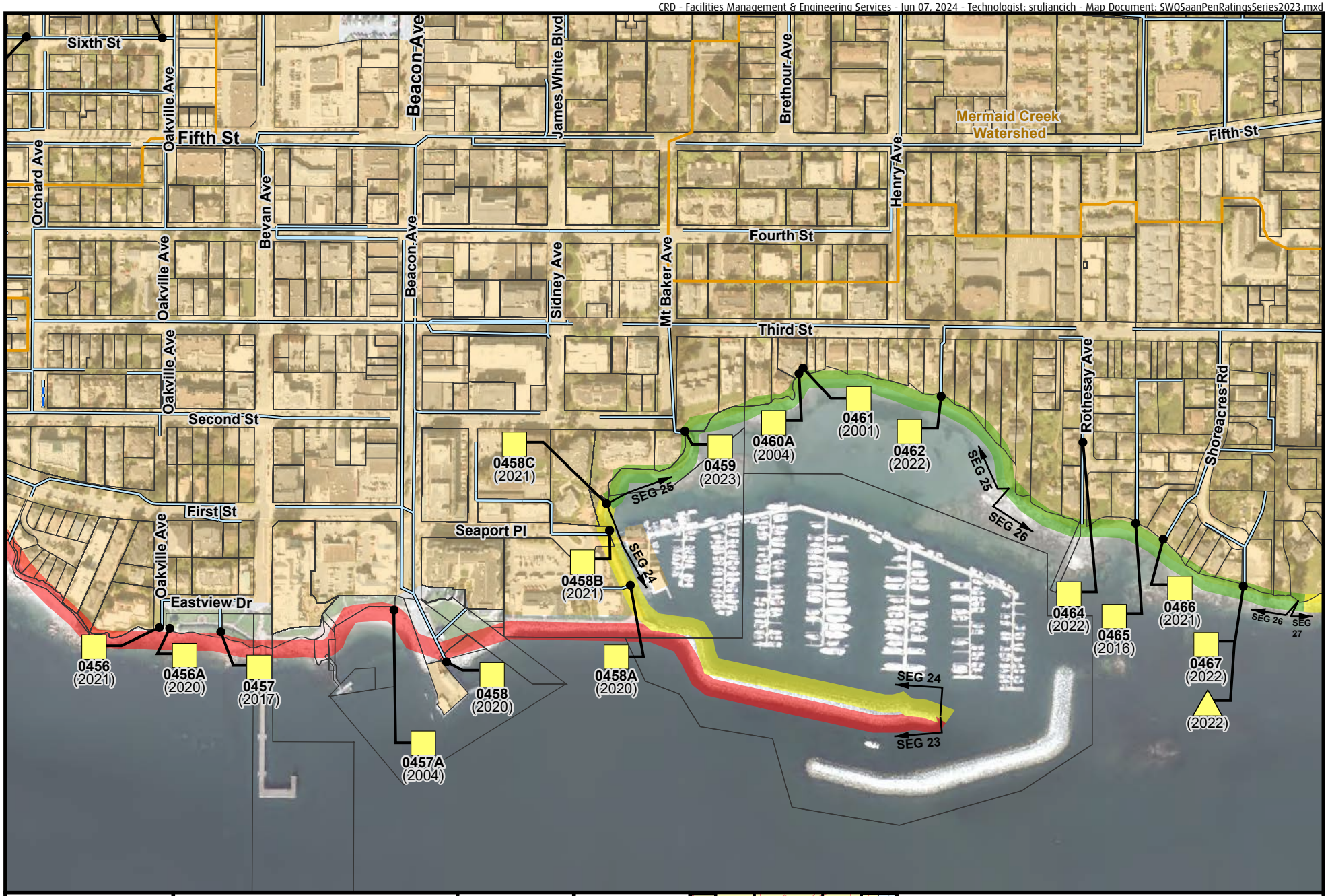


Figure 11

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

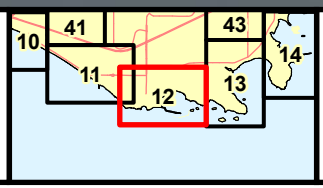
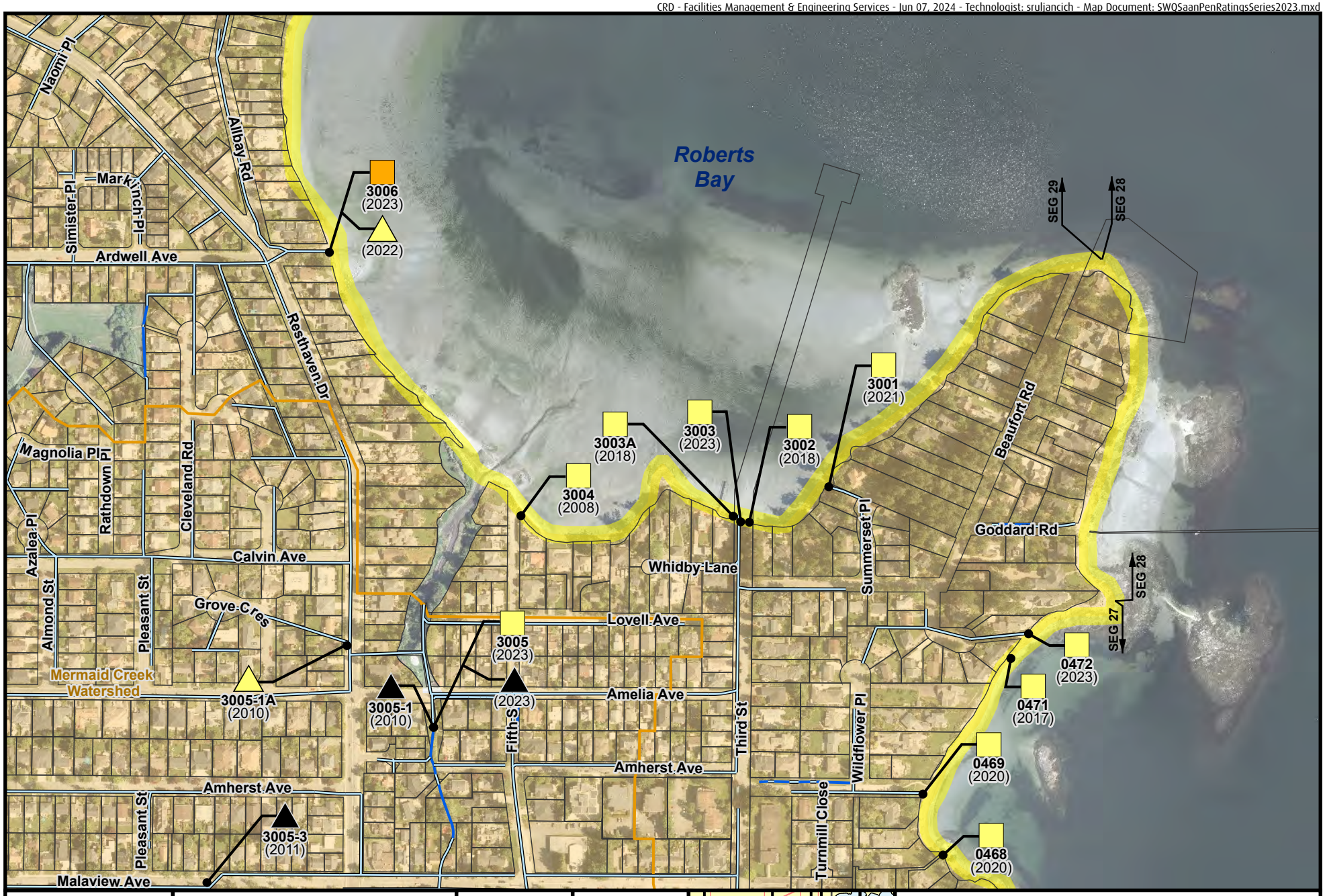


Figure 12
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



CRD Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

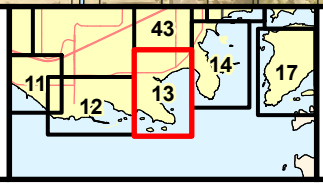


Figure 13

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern

CRD Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

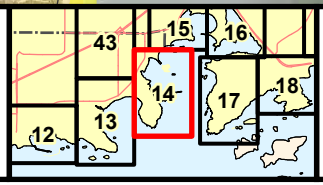


Figure 14
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

CRD Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

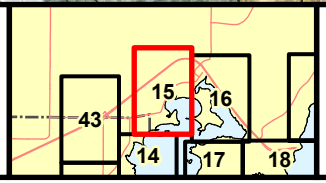
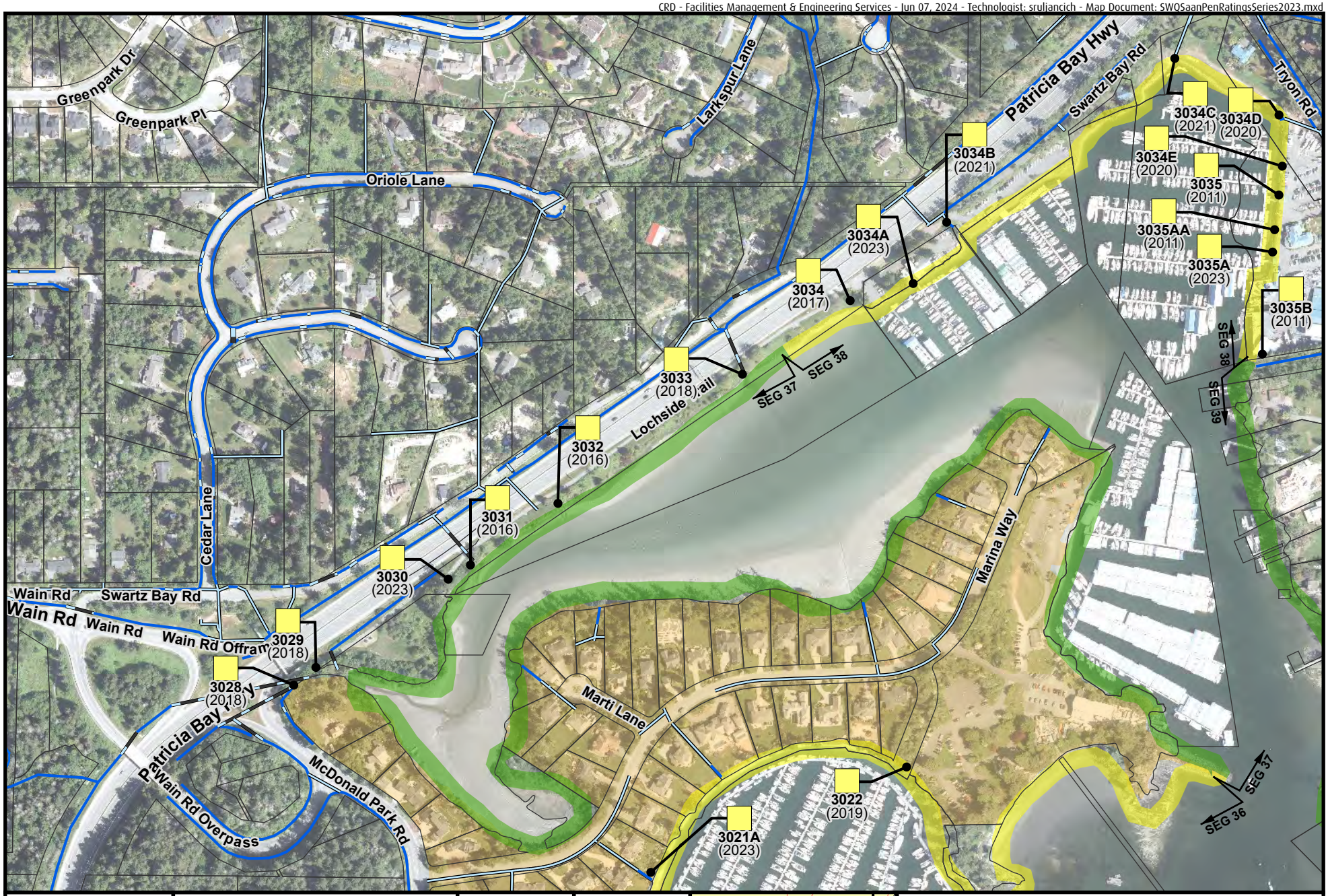


Figure 15
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



CRD Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

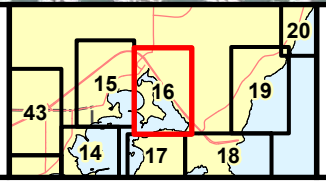
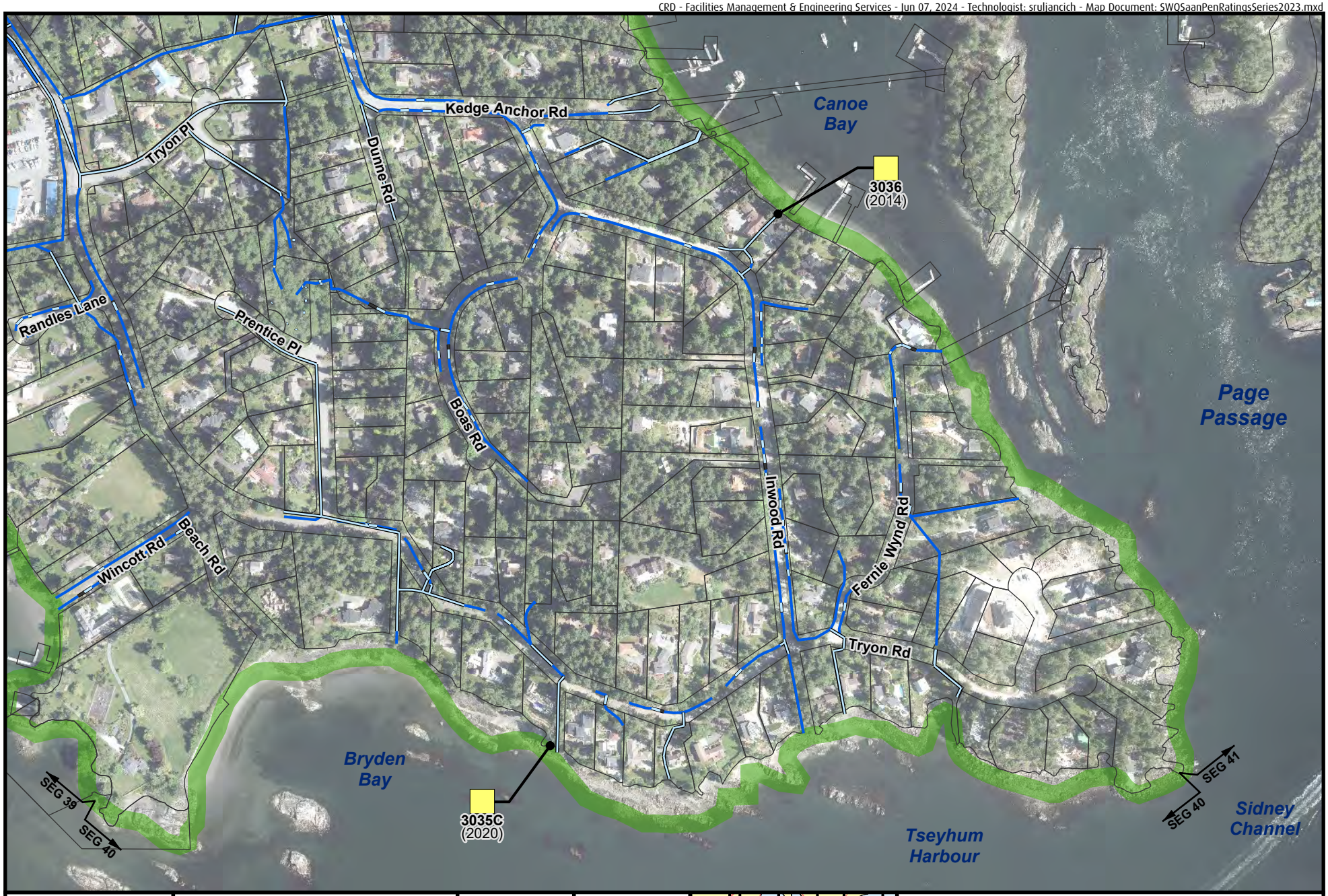


Figure 16
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

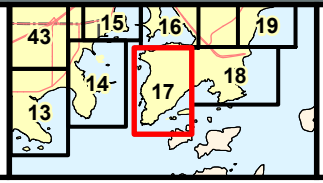
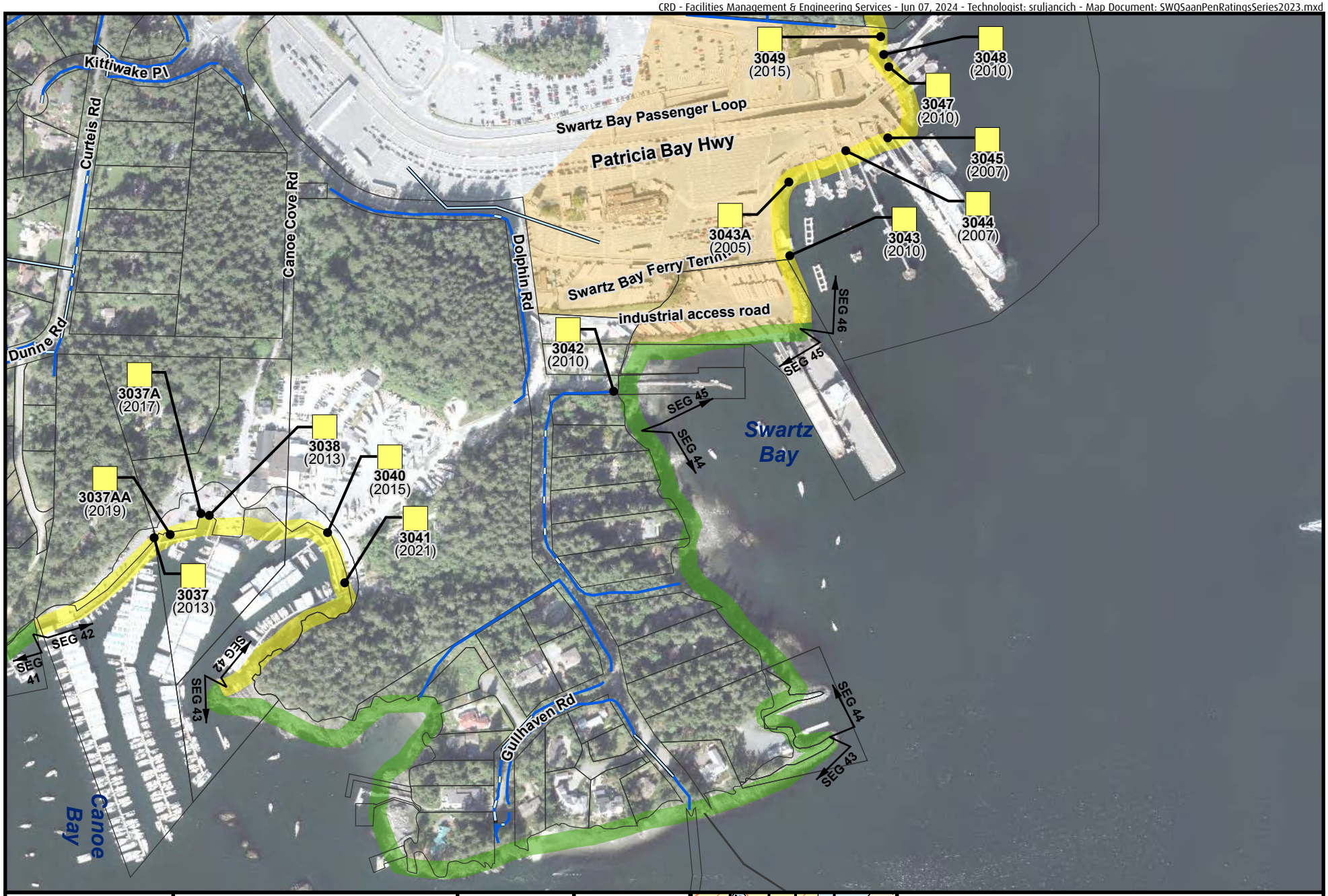


Figure 17

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

For Key Index and Legend See Figure 1

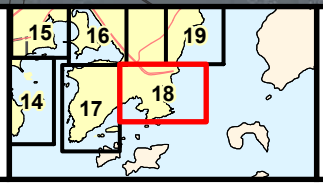


Figure 18
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

N
W E
S

For Key Index and Legend See Figure 1

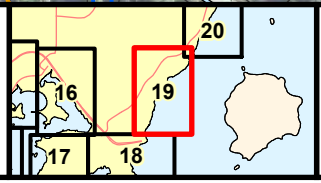


Figure 19

Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

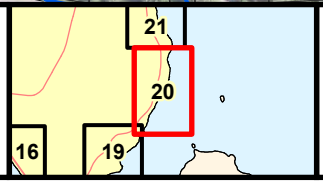
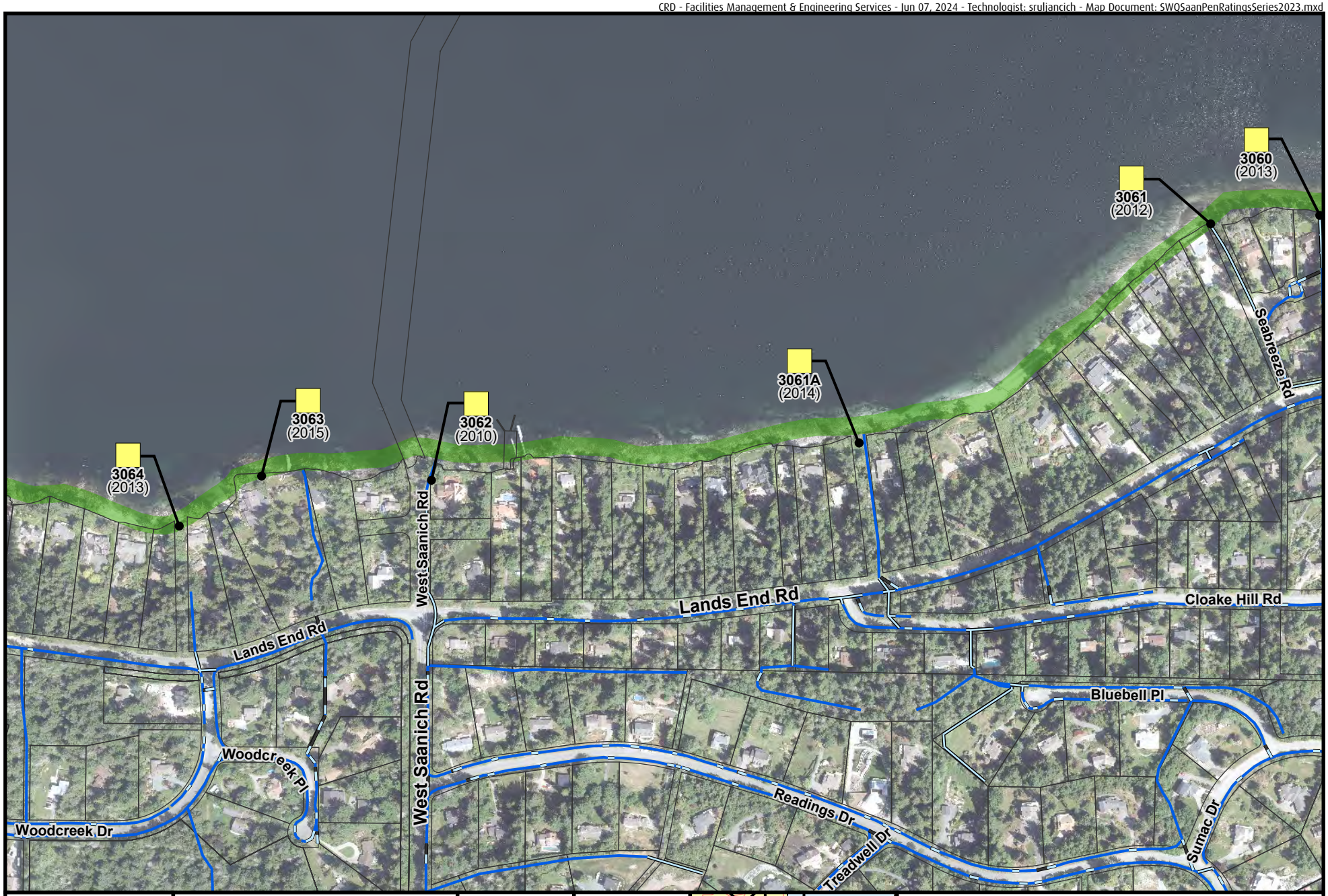


Figure 20

Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

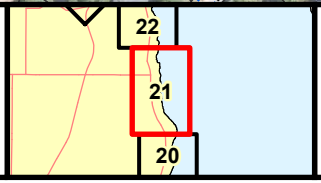
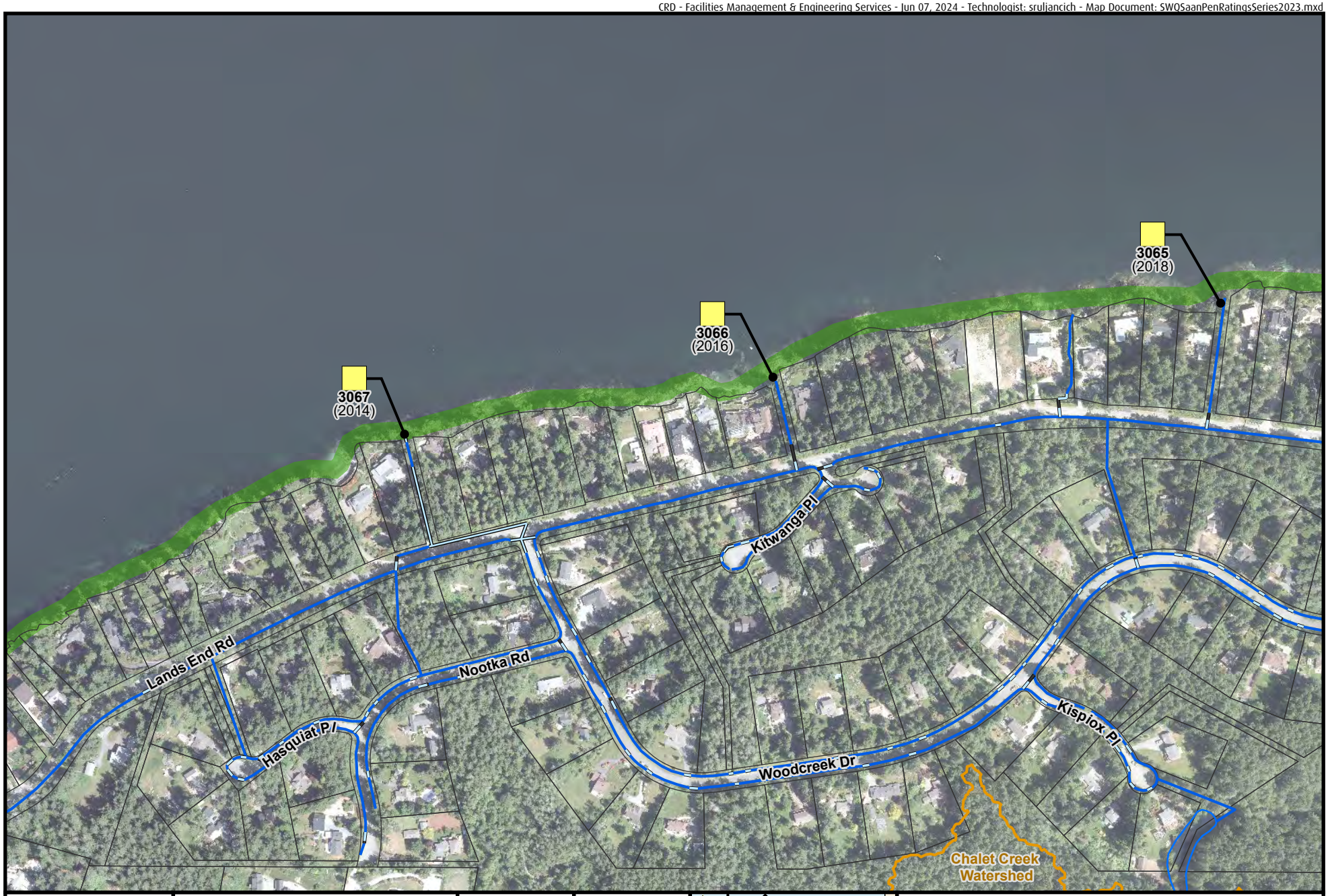


Figure 21

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

N

W E

S

For Key Index and Legend See Figure 1

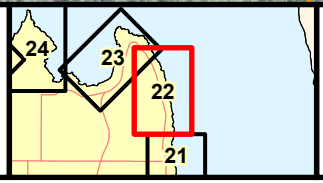


Figure 22

Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

For Key Index and Legend See Figure 1

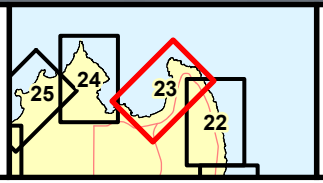


Figure 23

Saanich Peninsula 2023
Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

N
W E
S

For Key Index and Legend See Figure 1

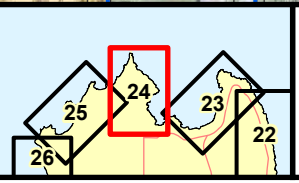


Figure 24
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

N E S W

For Key Index and Legend See Figure 1

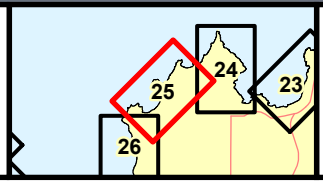


Figure 25

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern

CRD Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

N
W E
S

For Key Index and Legend See Figure 1

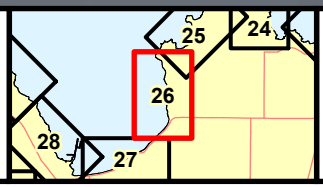
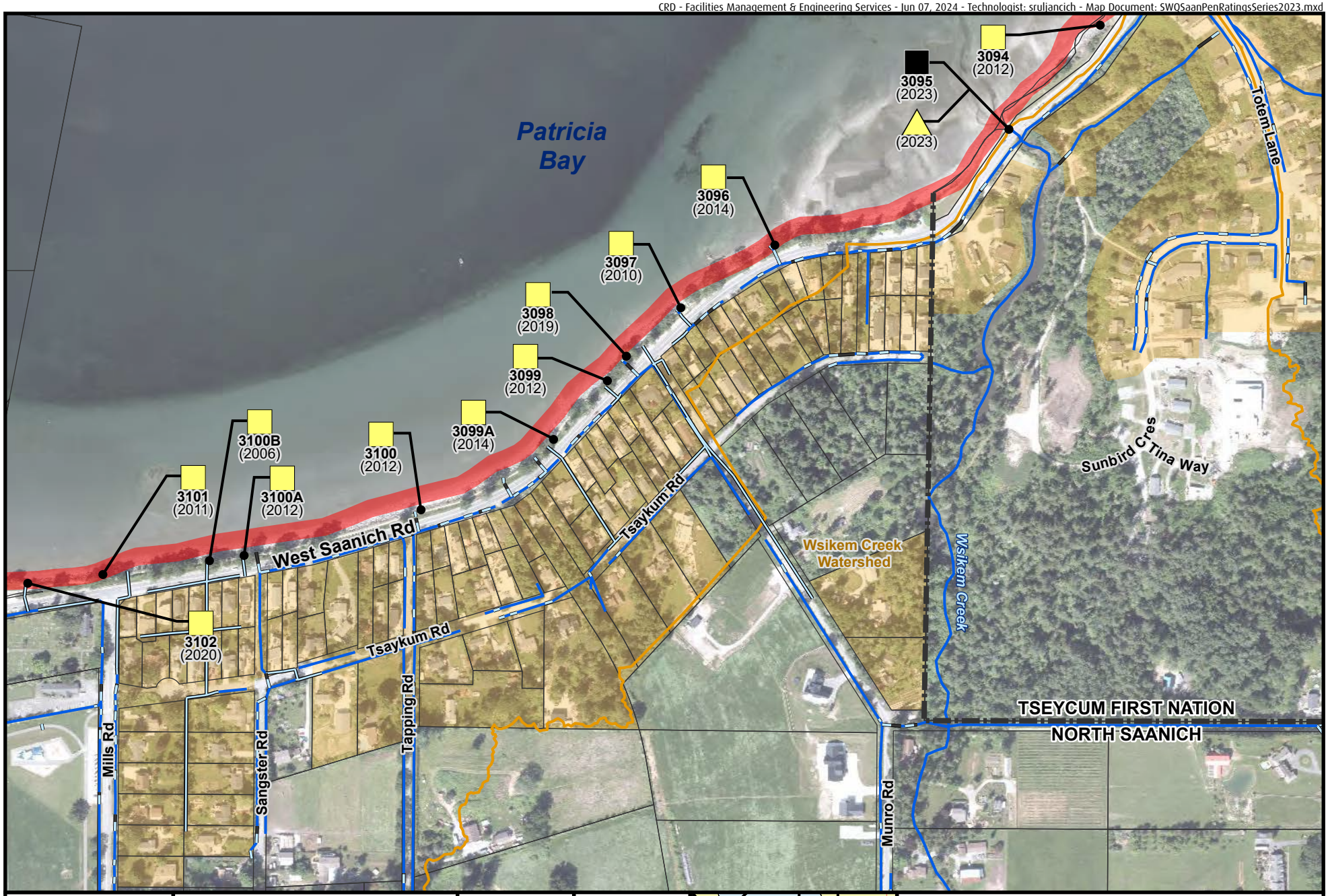


Figure 26
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

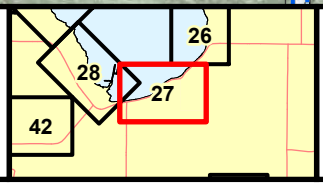
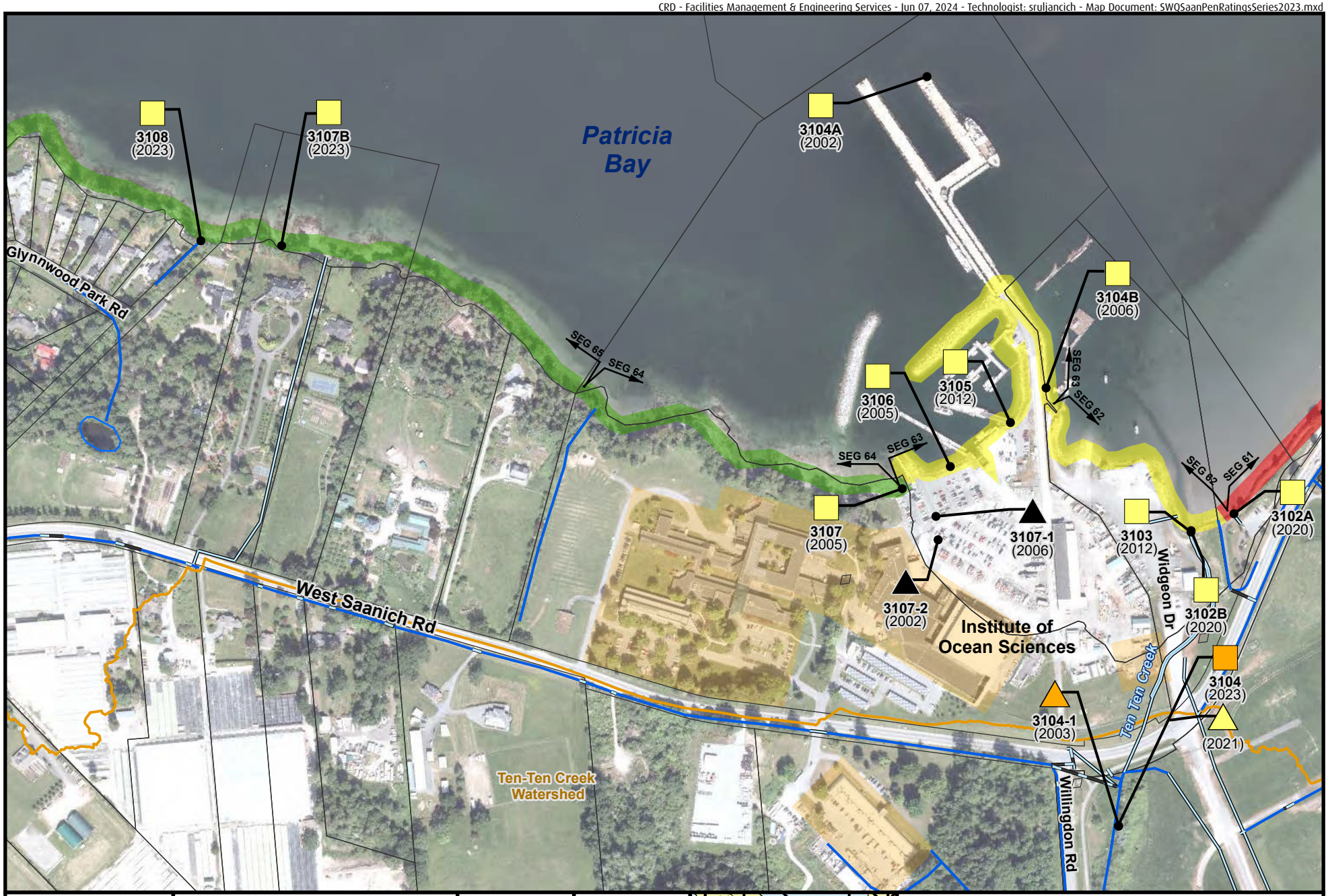


Figure 27

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

For Key Index and Legend See Figure 1

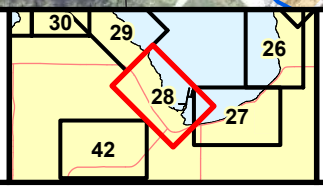
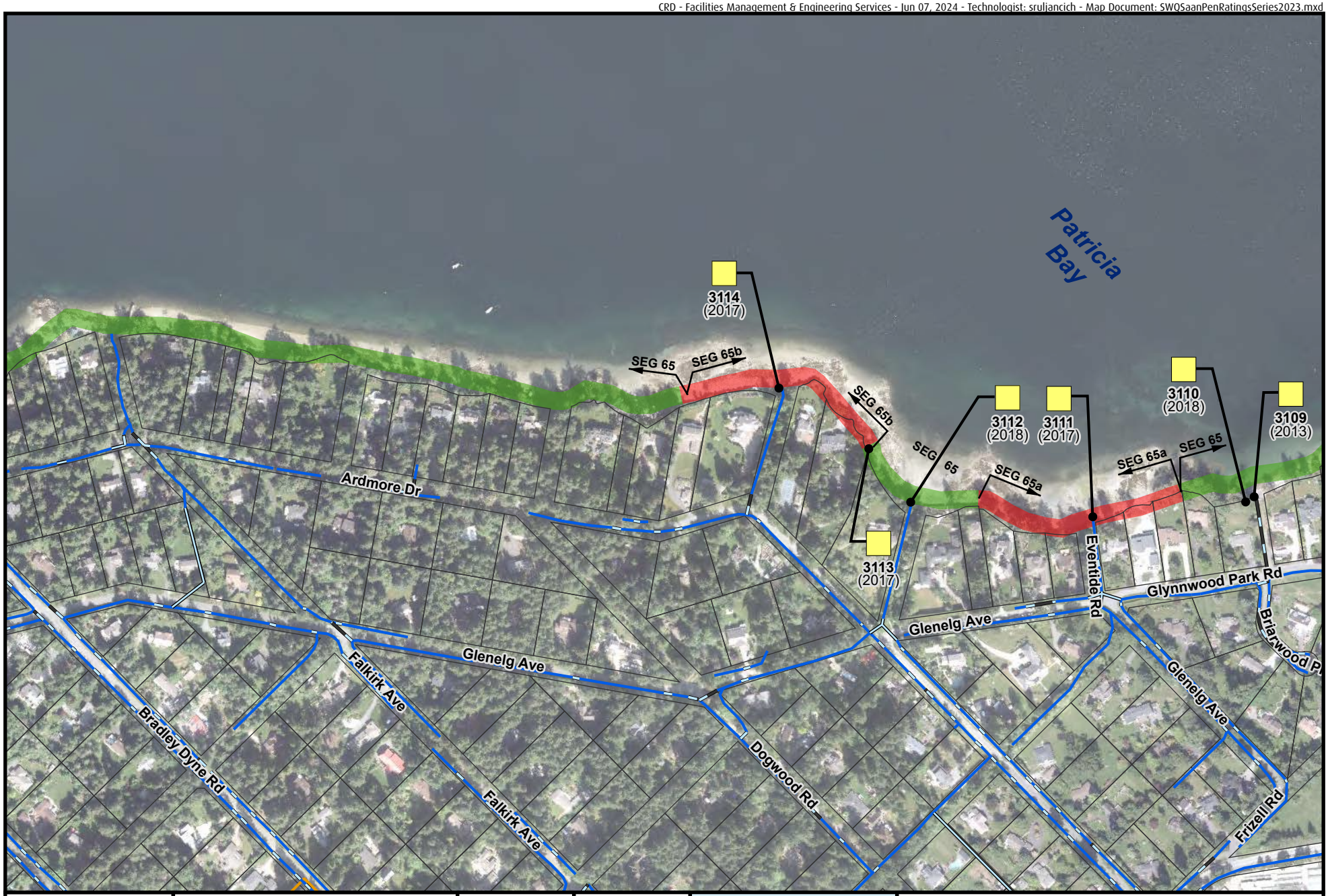


Figure 28

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

For Key Index and Legend See Figure 1

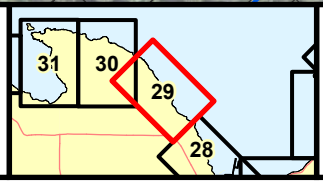
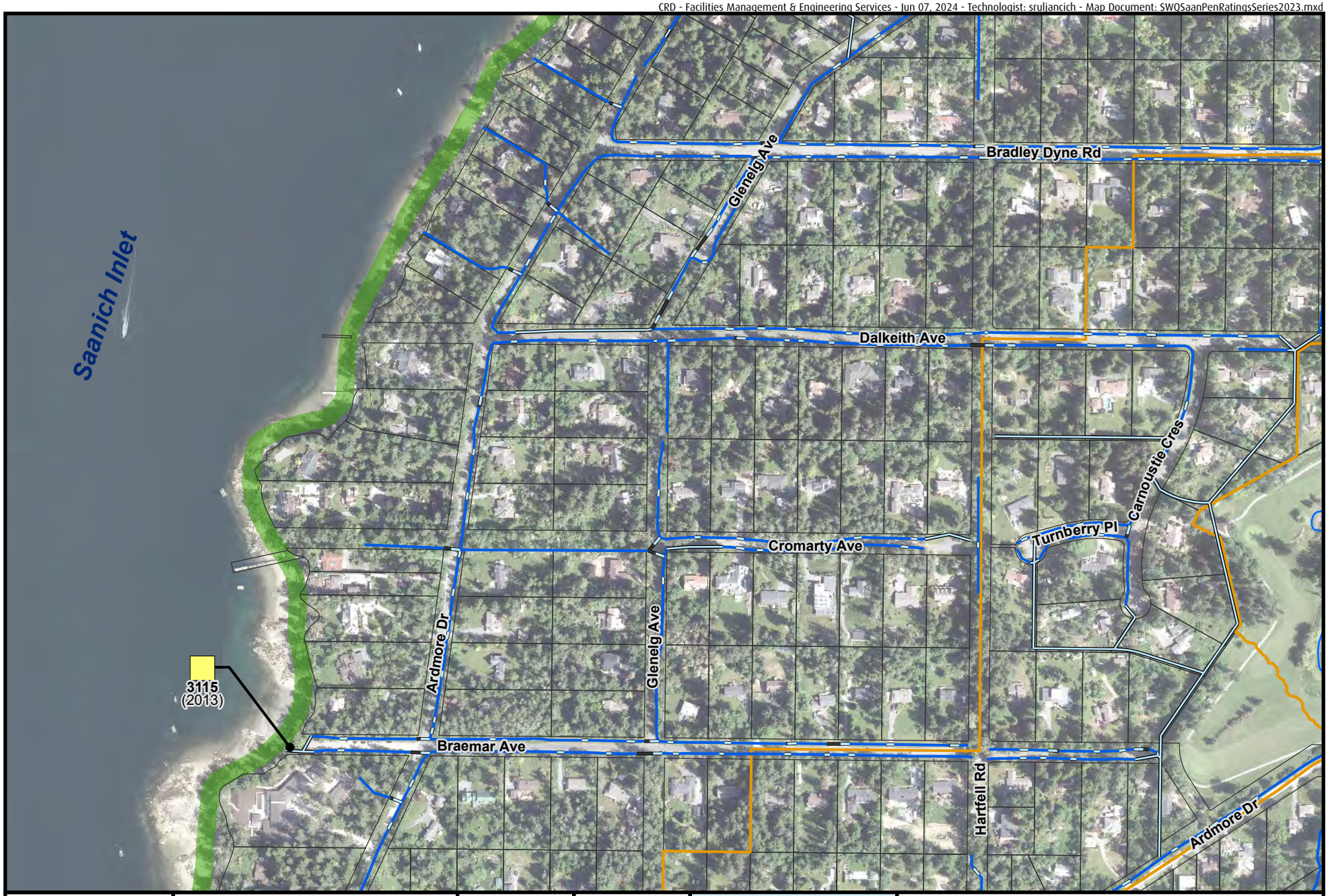


Figure 29

Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

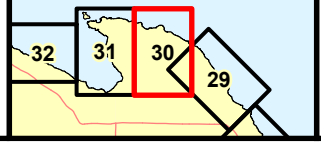
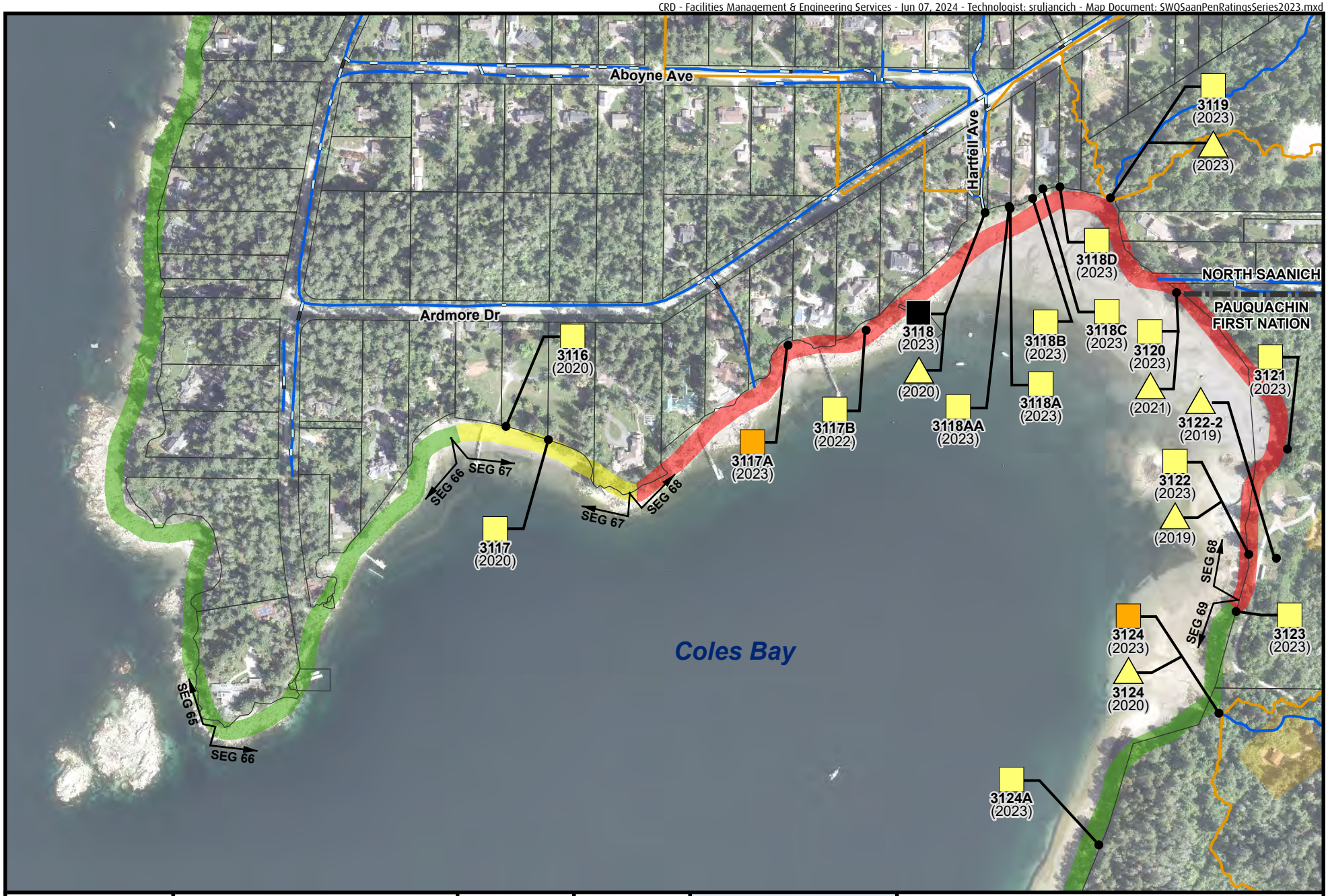


Figure 30

Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

CRD - Facilities Management & Engineering Services - Jun 07, 2024 - Technologist: sruljancich - Map Document: SWQSaanPenRatingsSeries2023.mxd



Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

N
W E
S

For Key Index and Legend See Figure 1

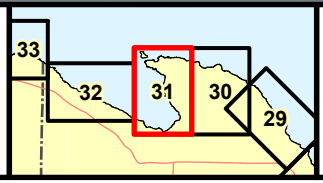
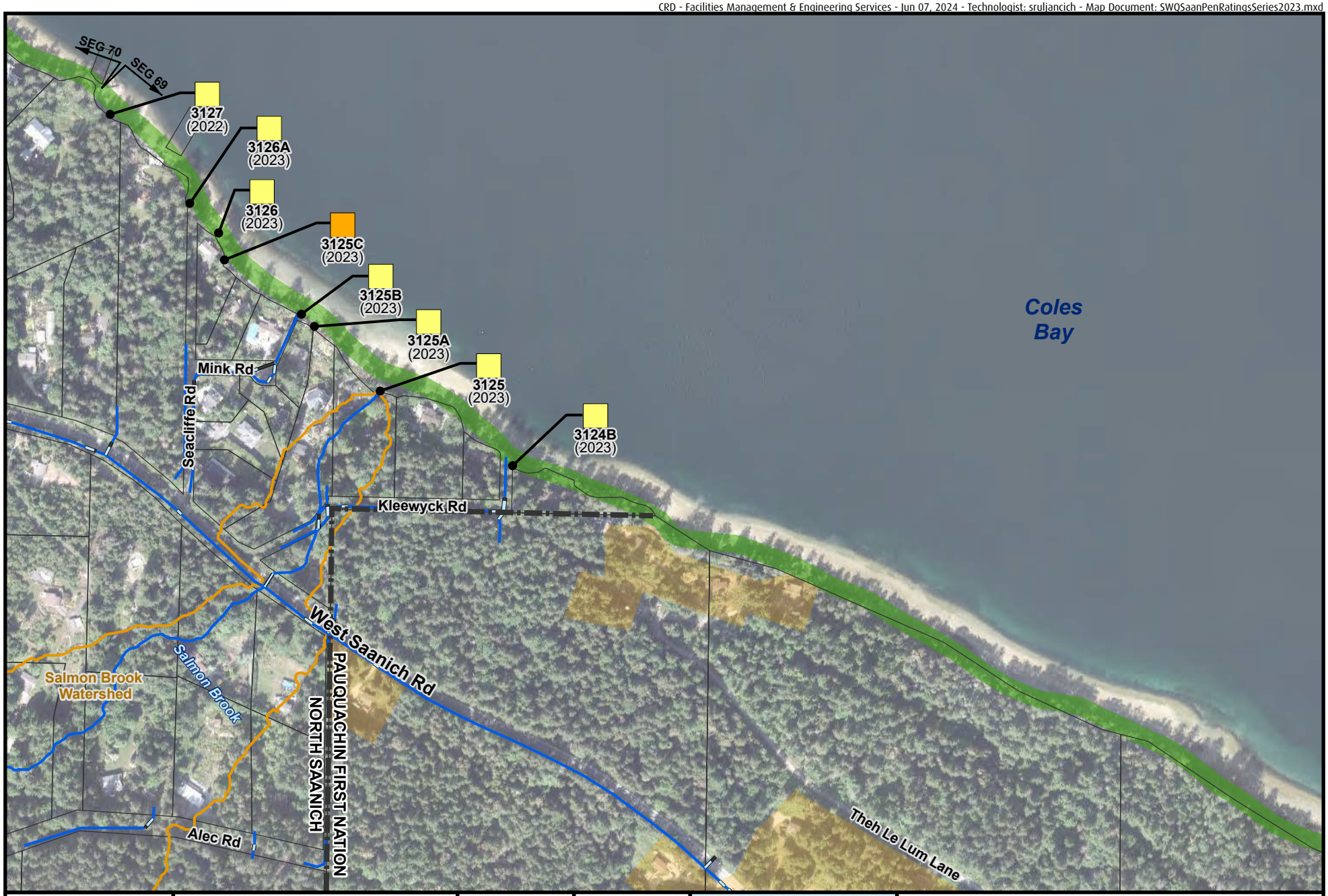


Figure 31
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

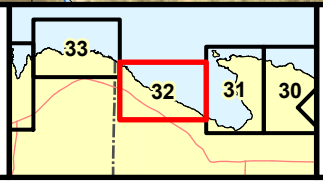
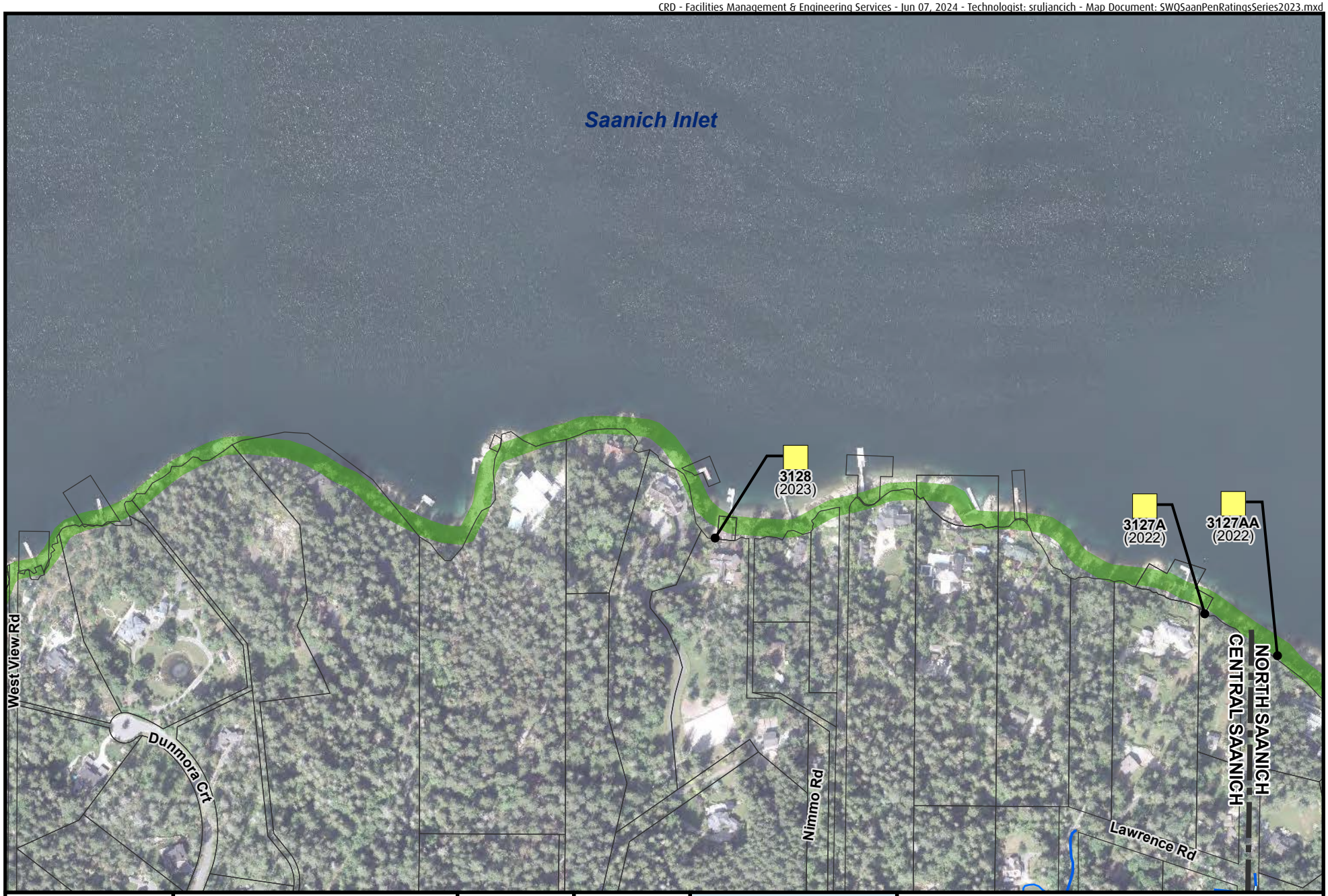


Figure 32

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

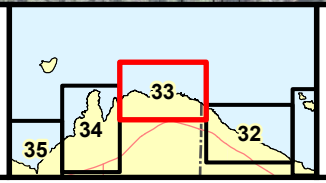


Figure 33
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

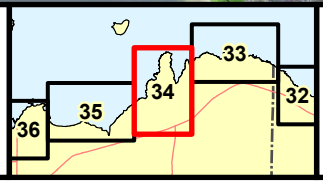


Figure 34

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern

Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

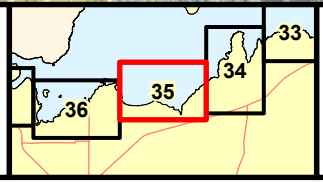


Figure 35
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

CRD Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

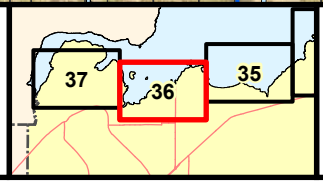
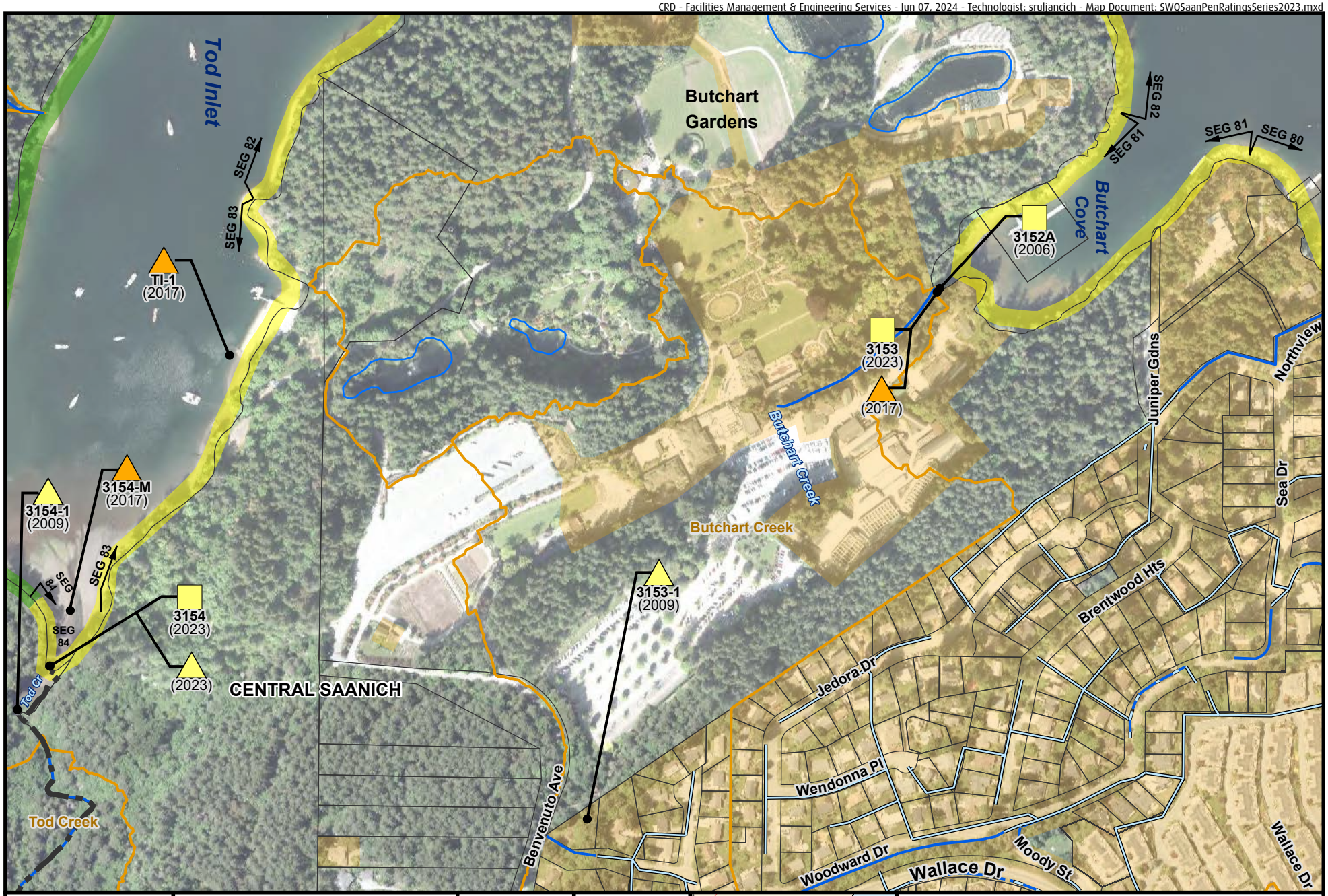


Figure 36
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

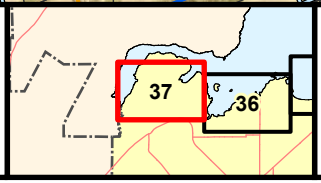
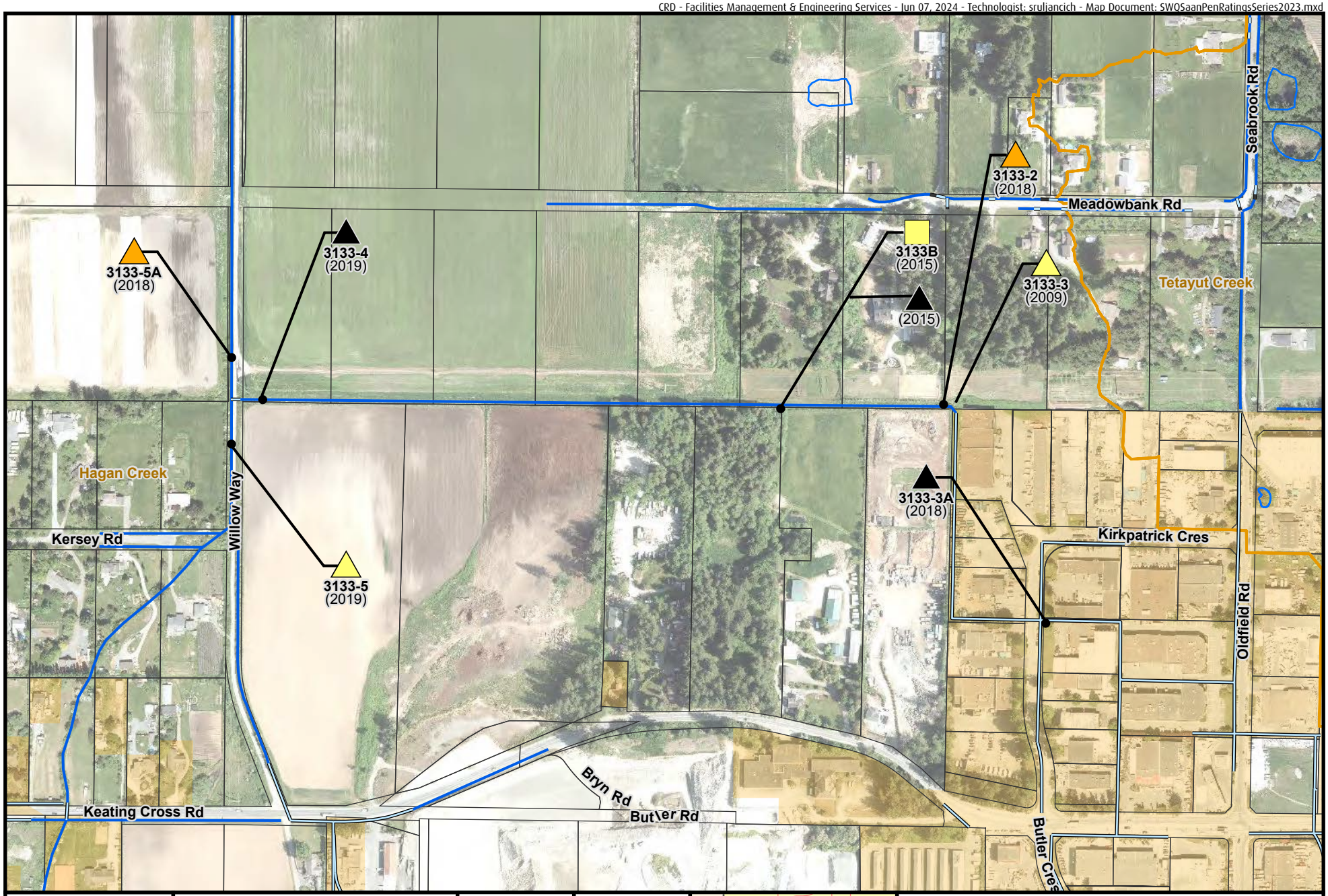


Figure 37
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

N
W E
S

For Key Index and Legend See Figure 1

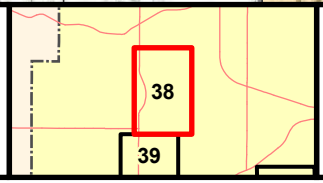
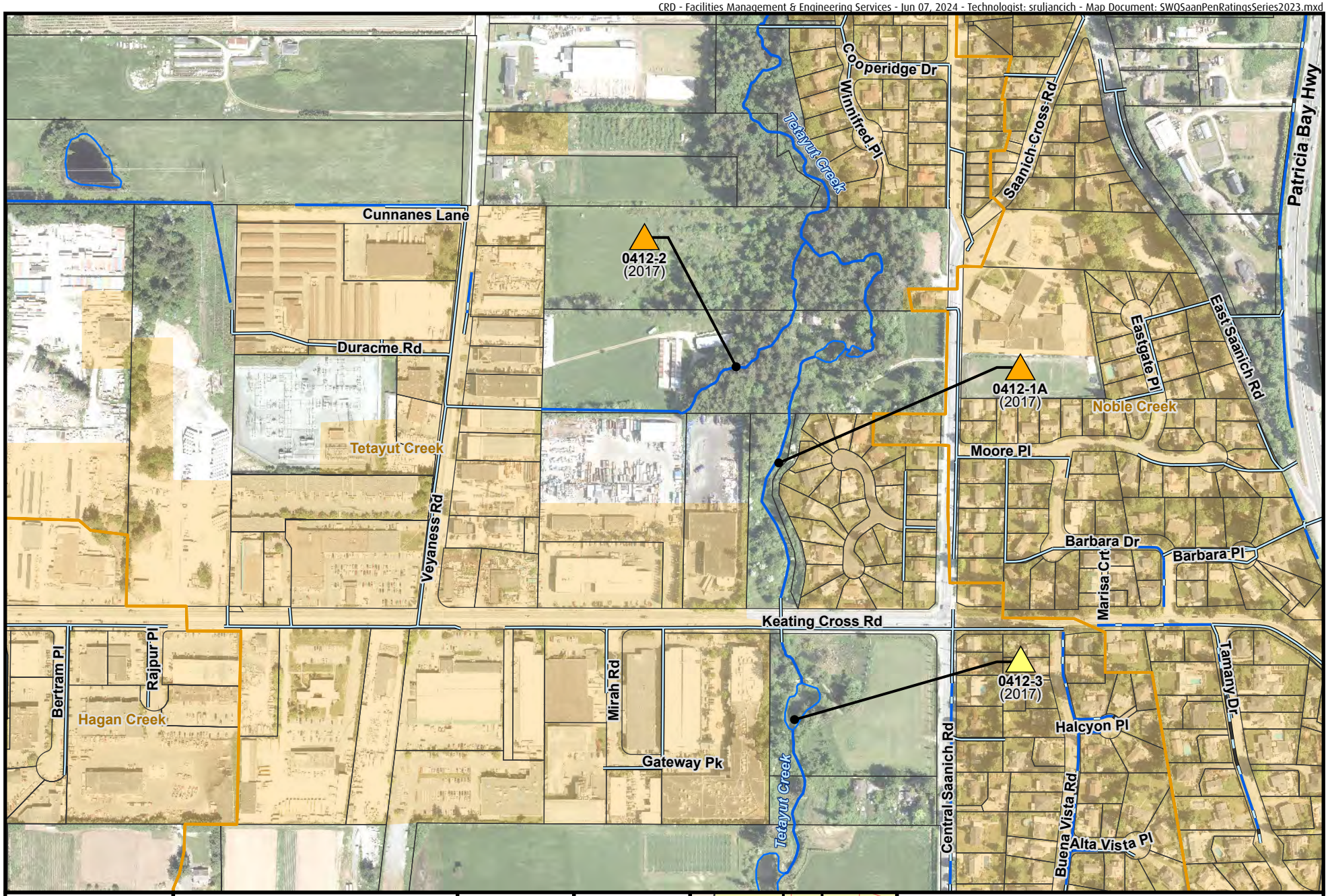


Figure 38

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



CRD Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

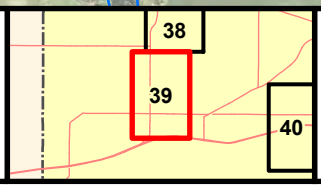


Figure 39
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

N
W E
S

For Key Index and Legend See Figure 1

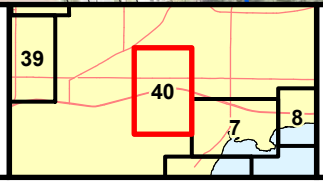
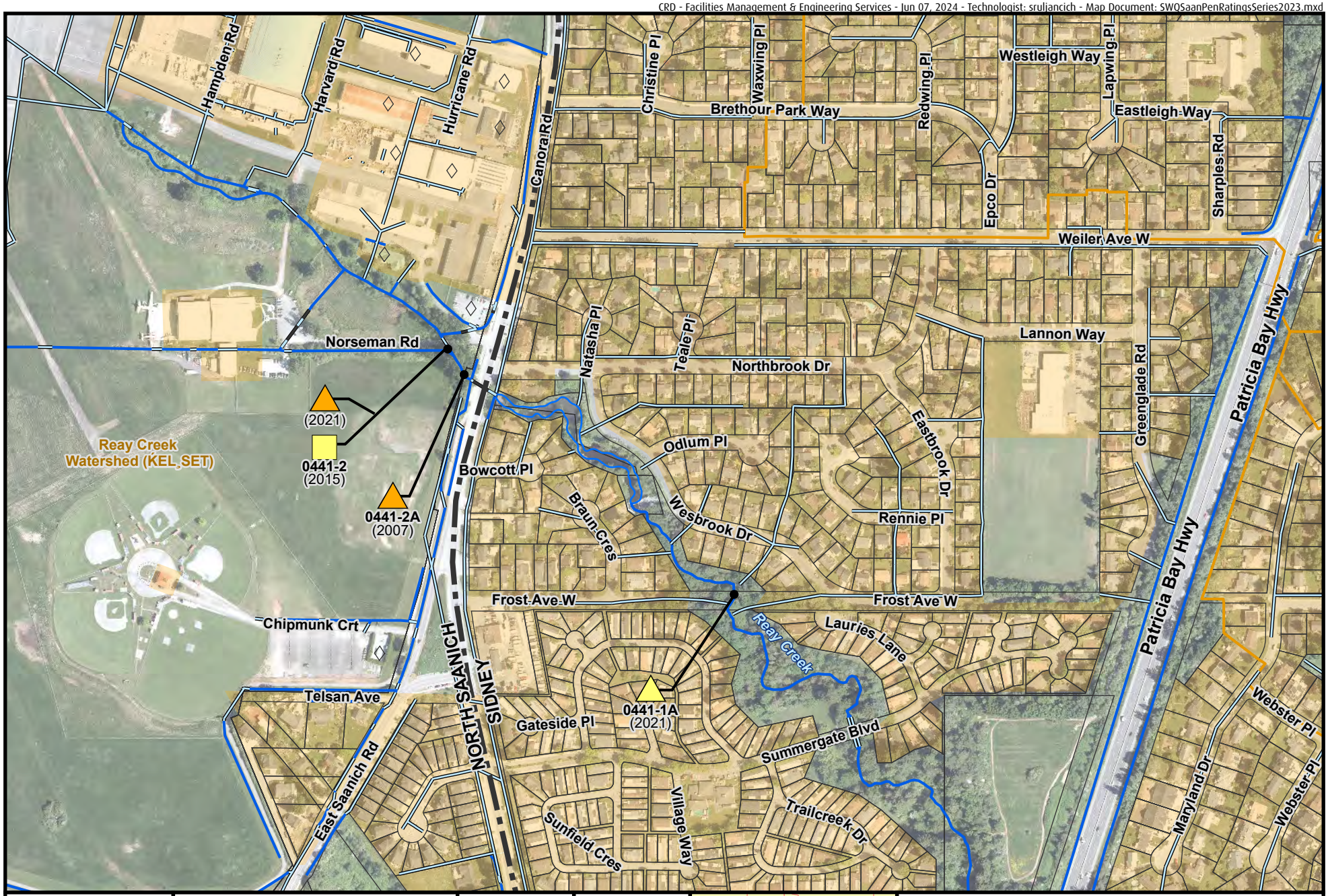


Figure 40
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

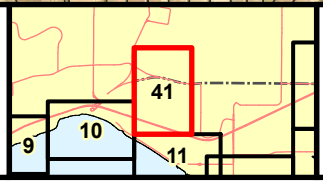
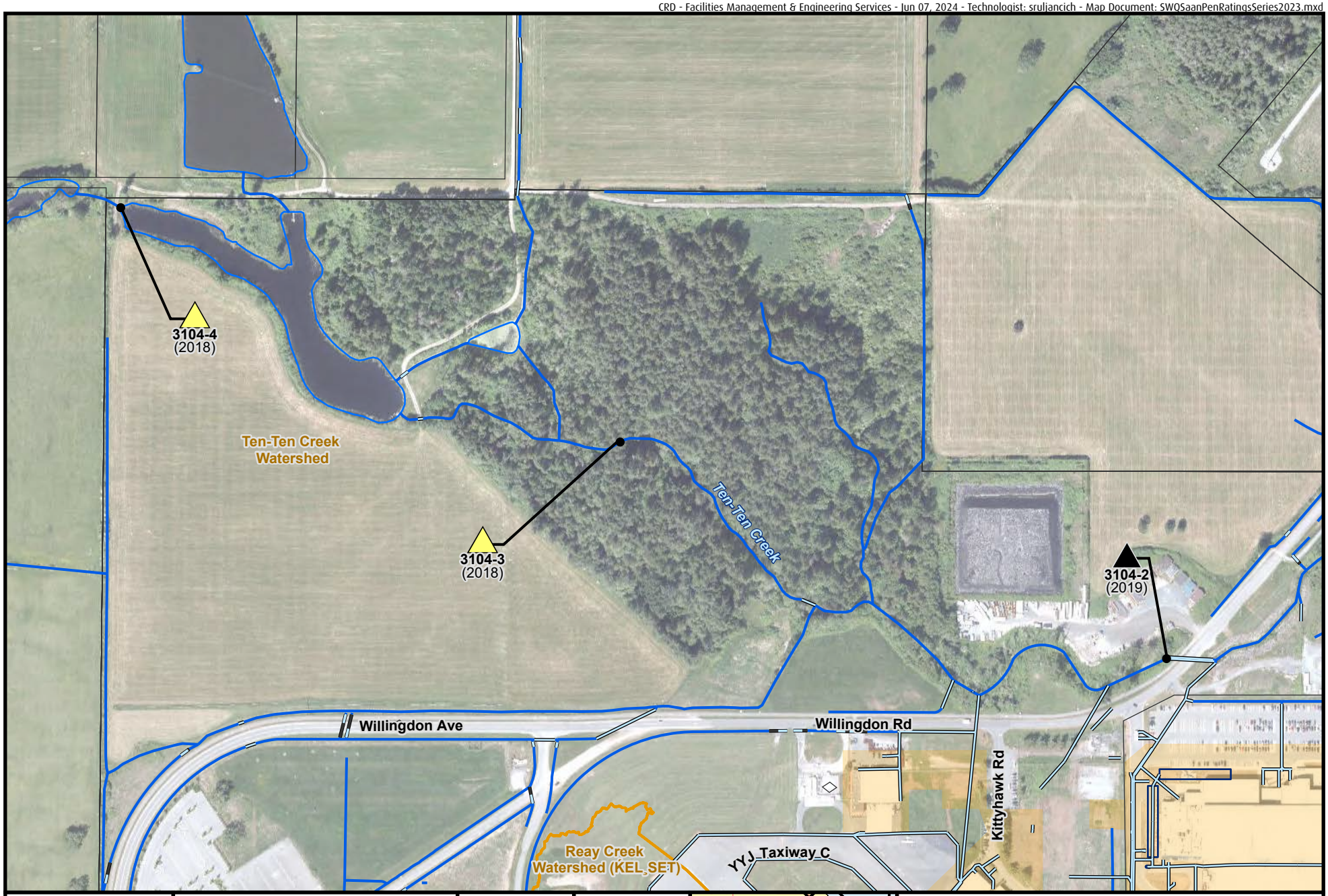


Figure 41

Saanich Peninsula 2023
Stormwater Discharge Location
and Level of Concern



Making a difference...together

Metres
0 25 50 100 150
Projection: UTM ZONE 10N NAD 83

W S E N

For Key Index and Legend See Figure 1

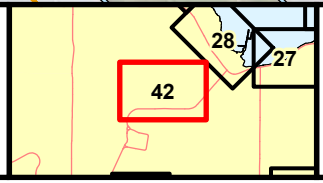
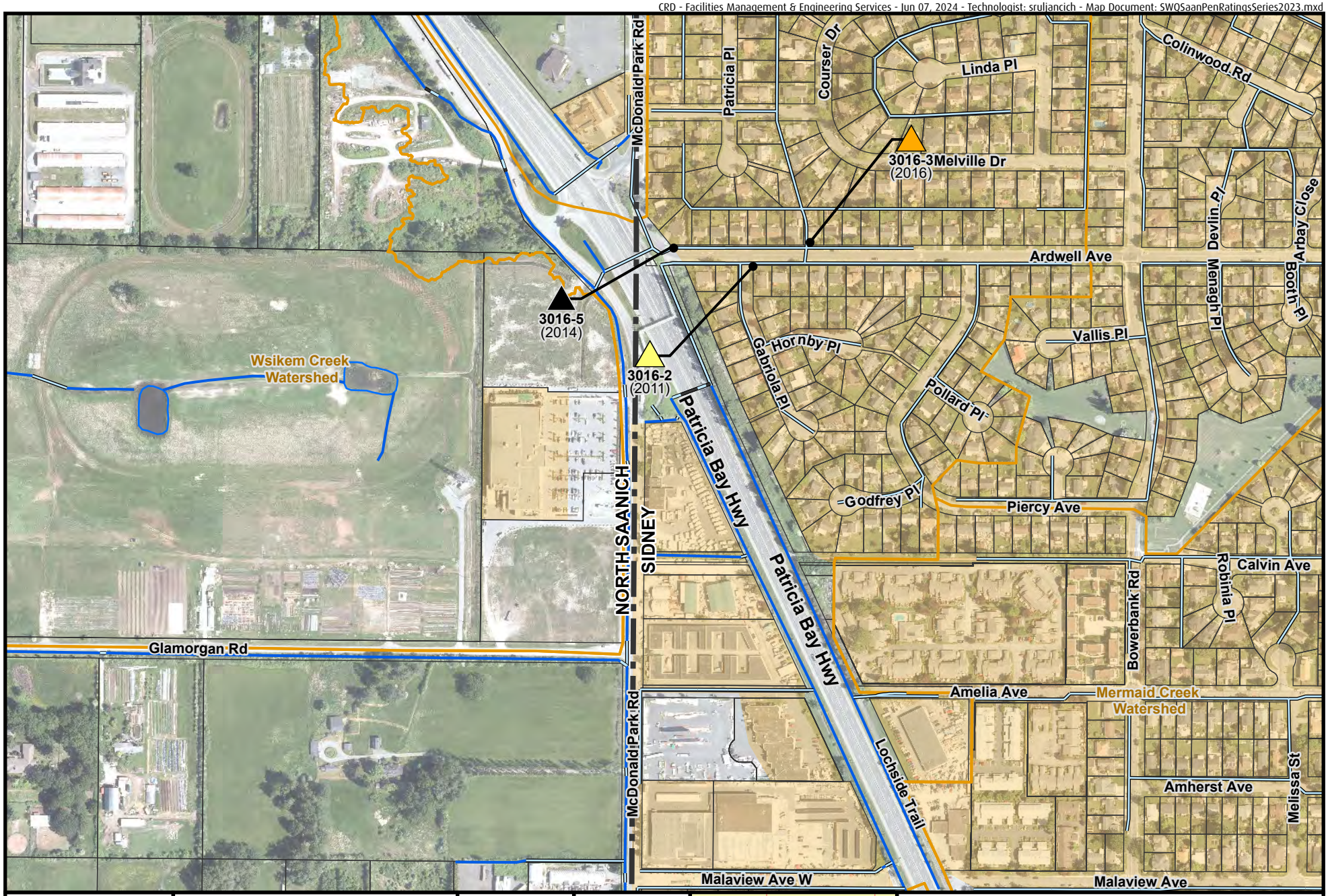


Figure 42
Saanich Peninsula 2023 Stormwater Discharge Location and Level of Concern



Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

N W E S

For Key Index and Legend See Figure 1

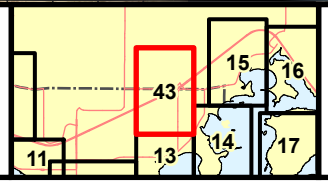


Figure 43

Saanich Peninsula 2023
Stormwater Discharge Location and Level of Concern

APPENDIX B

BACTERIAL AND FLOW DATA (2022-2023)

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW0405	N of Island View beach parking lot	2022-03-22	10	500	organic odour, tea colour, rain
		2022-07-07	270		iron oxide bacteria, pooled, no rain
		2023-04-11	92	50	earthy odour, amber, no rain
		2023-07-05	3000	400	swampy odour, amber, no rain
SW0408	Across from 2993 SA-SU Rd.	2023-09-25		0	dry, rain prior
SW0409	2991 SA-SU Rd. west of pump station	2023-01-31	79	< 1	murky brown, rain recent
		2023-09-25		0	dry, rain prior
SW0409A	Below 2801 SA-SU Rd. in bank	2023-01-31	< 1	< 1	clear, rain recent
		2023-09-25		0	dry, rain prior
SW0411	Near SA-SU Rd. and Mt. Newton X Rd.	2022-03-11	< 1	8	clear, no rain
		2022-07-27		0	dry, no rain
		2023-01-31	40	11	murky, rain recent
		2023-09-25		0	dry, rain prior
SW0411A	Across from 2721 Mt. Newton X Rd.	2022-03-11	< 1	11	clear, no rain
		2022-07-27	90	1	turbid brown, no rain
		2023-01-31	38	10	sewer odour, murky, rain recent
		2023-09-25		0	dry, rain prior
SW0412	Tetayut Creek, d/s of Mure Brook	2022-03-11	23	2000	clear, no rain
		2022-07-27	280	250	clear, no rain
		2023-03-29	160000	1200	
		2023-04-11	19000	1000	sewer odour, murky, no rain
		2023-09-25	650	500	clear, rain
SW0420	Arthur Rd. beach access, in rock wall	2022-03-11	< 1	20	clear, no rain
		2022-07-07	70	20	clear, no rain
SW0421	Concrete encasement below MH at Arthur Rd. beach access	2023-01-31		0	dry, rain recent
		2023-07-05		0	dry, no rain
SW0422A	Newman Rd., 3 m north of boat house	2022-03-11		0	dry, no rain
		2022-07-07		0	dry no sample, no rain
SW0424	Between 8475 and 8443 - Lochside Dr.	2022-01-17	3	75	clear, rain previous
SW0426	Wardle Rd. beach access	2022-03-11	23	12	clear, no rain
		2022-07-07	470	6	clear, no rain
		2023-01-31	50	24	clear, rain recent
		2023-07-05	37	8	clear, no rain
SW0430B	40 m N of public beach path from Cy Hampton Park, black PVC	2022-03-11	< 1	5	amber, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
		2022-07-07	350	3	amber, no rain
		2023-01-31	11	9	clear, rain prior
		2023-07-05	430	< 1	murky brown, no rain
SW0432	Foot of Bazan Bay Rd.	2022-03-11	2	45	clear, no rain
		2022-07-07	90	48	clear, no rain
		2023-01-31	260	80	earthy odour, murky, rain recent
		2023-07-05	32	32	clear, no rain
		2023-07-05	14	50	clear, no rain
SW0441	Reay Creek mouth	2022-05-18	86	500	amber, rain within 2 days
		2022-07-07	300	80	clear, no rain
		2022-08-12	5500	250	clear, no rain
		2022-08-18	800	200	clear, no rain
		2022-08-25	690	200	clear, no rain
		2022-09-01	240	200	clear, no rain
		2022-09-08	140	250	clear, no rain
		2022-10-25	380	300	clear, rain, potential first flush
		2022-10-25	470	300	clear, rain, potential first flush
		2022-11-03	96	800	clear, rain prior
		2022-11-08	130	800	clear, rain prior
		2022-11-17	78	600	clear, rain prior
		2022-11-24	330		clear, no rain
		2023-03-29	10	300	
		2023-07-05	64	250	clear, low tide, no rain
SW0444	Across from 9360 Lochside Dr.	2022-03-10	< 1	< 1	clear, no rain
		2022-07-07	79	5	clear, no rain
		2023-01-31	5	4	clear, rain prior
		2023-07-06		0	dry, no rain
SW0444A	12 m south of steps at 9388 Lochside Dr.	2022-03-10		< 0.01	flow too low to sample
		2022-07-07		0	dry no sample, no rain
		2023-01-31	9	< 1	clear, rain recent
		2023-07-06		0	dry, no rain
SW0445	20 m north of steps across from 9388 Lochside Dr.	2022-12-08	170	30	murky amber, rain (at times heavy)
SW0446	15 m S of beach access; 9462 Lochside	2022-03-10	< 1	1	clear, no rain
		2022-07-07	320	2	clear, no rain
		2023-01-20	< 1	5	clear, rain 2 days ago
		2023-07-06		0	dry, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW0447	Across from 9498 Lochside Dr.	2022-03-10	34	2	clear, no rain
		2022-06-16	14000	7	clear, rain 2 days ago
		2023-01-20	4400	9	sewer odour, rain 2 days ago
		2023-07-06		< 0.01	flow too low to sample, no rain
		2024-01-16	7000	4	amber, no rain
SW0448	Foot of Weiller Rd., Tulista Park	2022-03-10	1	3	amber, no rain
		2022-07-07	290	7	amber, no rain
		2023-01-20	10	6	clear, rain 2 days ago
		2023-07-06		< 0.01	flow too low to sample, no rain
SW0449	Ditch, SW side of Tulista Park	2022-03-10	1	350	murky brown, no rain
		2022-05-18	140	90	murky, rain within 2 days
		2022-07-11	140	20	amber, no rain
		2023-03-29	2	12	
		2023-07-06	250	8	clear, no rain
SW0449A	MH, corner of Oakville Eighth St.	2022-03-10	10	40	clear, no rain
		2022-05-18	600		clear, pooled, rain within 2 days
		2022-07-11	16		amber, pooled, no rain
		2023-03-29	8		
		2023-09-25	1500	10	clear, pooled flow, rain prior
SW0450	Below Ocean Ave. and Second St.	2022-03-10	860	35	murky, no rain
		2022-05-18	2000	40	sewer odour, clear, rain within 2 days
		2022-06-03	2700	70	murky, rain
		2022-07-21	2300	14	sewer odour, murky, no rain
		2022-08-25	1500	5	murky, no rain
		2023-03-29	17	10	
		2023-07-06	2400	7	amber, no rain
SW0459	Behind 9901-3rd St. parking lot, 20m S of beach access	2022-03-14	90	5	clear, no rain
		2022-07-11	590	1	amber, no rain
		2023-04-12	3	7	clear, no rain
		2023-07-06	50	2	amber, no rain
SW0462	Beach access at 10003 - 3rd St.	2022-03-14	1	2	clear, no rain
		2022-07-11		< 0.01	flow too low to sample, no rain
SW0464	Foot of Rothesay Rd. beach access	2022-03-14	< 1	3	clear, no rain
		2022-07-11		< 0.01	flow too low to sample, no rain
SW0467	Access at Shoreacres Rd. / Memory	2022-03-14	6	2	clear, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
		2022-03-22	5	5	amber, rain
		2022-07-11		0	dry, no rain
SW0472	Surfside Place beach access	2022-07-11		0	dry, no rain
		2023-07-06		0	dry, no rain
SW3003	Roberts Bay beach access at Third St.	2022-03-14	25	4	clear, no rain
		2022-07-11	52	1	clear, no rain
		2023-01-20	130	6	clear, rain 2 days ago
		2023-07-06	200	2	amber, no rain
SW3005	Foot of Fifth St., Mermaid Canal	2022-03-15	< 1	500	amber, rain
		2022-07-11	60	50	clear, no rain
		2022-12-12	50		clear, pooled, rain in past 2 days
		2023-04-12	14	65	clear, no rain
		2023-07-06	98	25	amber, no rain
SW3005-1A	MH in front of 1021 Resthaven Dr.	2022-03-15	280	60	amber, rain
		2023-04-12	4	20	clear, no rain
		2023-07-06	110	5	clear, no rain
SW3005-2A	MH at 2356/2362 Malaview Ave.	2023-04-12	16	15	clear, no rain
SW3005-4	MH, middle of Amelia Ave./Fifth St. intersection	2023-04-12	20	40	clear, no rain
		2023-07-06	400	20	amber, no rain
SW3006	Foot of Ardwell Ave.	2023-01-20	7	9	clear, rain 2 days ago
		2023-07-06	12000	2	amber, no rain
SW3007	Foot of Bowden, west of beach access	2022-03-15	130	7	clear, rain
		2022-07-11	7	1	clear, no rain
		2023-01-27	5	5	soap odour, suds, rain recent
		2023-07-06	420	1	laundry odour, blue flow, sudsy, no rain
SW3009	Foot of Allbay Rd., 5 m west of bedrock	2023-01-27	< 1	1	burnt odour, clear, rain recent
		2023-07-06		0	dry, no rain
SW3012	Foot of Griffith in riprap	2023-01-27	< 1	7	diesel odour, rain recent
		2023-07-06		0	dry, no rain
SW3013	Foot of Griffith near Blue Peter Pub	2023-01-27		< 0.01	flow too low to sample, rain recent
		2023-07-06		0	dry, no rain
SW3014	Eastern pipe, east side of wharf at DFO Small Craft Harbour Branch	2022-03-17	36	22	earthy odour, murky, heavy rain
		2022-07-11	15	1	clear, no rain
		2023-01-27	7	3	sewer odour, clear, rain recent
		2023-07-06	3	< 1	amber, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3015	Western pipe, east of wharf at DFO Small Craft Harbour Branch	2022-03-17	42	22	murky amber, heavy rain
		2022-07-11	16000	2	clear, no rain
		2023-01-27	2	4	sewer odour, clear, rain recent
		2023-07-06	2700	< 1	amber, no rain
SW3015A	White PVC pipe above larger aqua blue half pipe (SW3015), east of DFO wharf	2022-03-17	70	8	hydrocarbon odour, oil sheen, rain
		2022-07-11		0	dry, no rain
		2023-01-27		0	dry, rain recent
		2023-07-06		0	dry, no rain
SW3016	Behind 10462 Resthaven Rd.	2022-03-15	3400	120	clear, rain
		2022-07-11	1000	9	clear, no rain
		2023-01-27	4000	30	clear, rain recent
		2023-07-12	7700	2	flow too low to sample, no rain
SW3017A	Allbay Park, in front of first townhouse	2022-03-15	< 1	< 1	clear, rain
		2022-07-11		< 0.01	flow too low to sample, no rain
SW3017B	Allbay Park, between townhouses	2022-03-15	< 2	< 1	clear, rain
		2022-07-11		0	dry, no rain
SW3020	E of Capital City Yacht Club (Blue Heron Rd.), NE pipe	2022-03-17	510	60	earthy odour, dirty brown, heavy rain
		2022-07-21	15	4	clear, no rain
		2023-04-11	80	9	clear, no rain
		2023-07-12	290	4	clear, no rain
SW3020A	E of Capital City Yacht Club (Blue Heron Rd.), SW pipe	2022-03-17	40	18	clear, heavy rain
		2022-07-21	2	4	clear, no rain
		2023-04-11	2	4	clear, no rain
		2023-07-12	14	3	clear, no rain clear, no rain
SW3021	Corner of McDonald Park Bayfield Rd.	2022-12-08	8	40	murky brown, rain
		2023-01-20	1	14	clear, rain 2 days ago
		2023-04-13	1	11	clear, no rain
		2023-07-12		< 0.01	flow too low to sample, no rain
SW3021A	1835 Marina Dr, North Saanich Marina	2022-03-17	2700	80	sewer odour, amber, heavy rain
		2022-07-21	460	4	garlic odour, clear, no rain
		2023-04-13	2	5	clear, no rain
		2023-07-12	58	3	clear, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3030	200 m N of pedestrian overpass	2023-04-13		< 0.01	flow too low to sample, no rain
		2023-07-12		0	dry, no rain
SW3034A	Cedar Grove Marina, under office float	2023-04-13		< 0.01	flow too low to sample, no rain
		2023-07-12		0	dry, no rain
SW3035A	Under parking area, north Westport Marina	2023-04-13		0	dry, no rain
		2023-07-12		0	dry, no rain
SW3051A	55 m west of large dock at Shearwater Terrace beach access, Queen Mary Bay	2022-03-17	18	8	amber, heavy rain
		2022-07-21	5	1	clear, no rain
		2023-05-08	< 1	6	clear, rain in past 2 days
		2023-05-10	< 1	4	clear, no rain
		2023-07-12	91	1	clear, no rain
SW3077	50 m W of beach access at Tatlow Rd.	2022-03-17	94	6	brown, heavy rain
		2022-07-22	10000	3	amber, no rain
		2023-04-13	1300	6	murky brown, rain
		2023-07-07	3000	1	clear, no rain
SW3078A	Tatlow Beach access, between 11250 Tatlow and 11198 Chalet Rd.	2022-03-17	17000	12	sewer odour, brown, heavy rain
		2022-07-22	9800	1	sewer odour, turbid amber, no rain
		2022-12-08	1300	6	murky, rain (at times heavy)
		2023-04-13	3700	5	sewer odour, murky, rain
		2023-07-07		< 0.01	flow too low to sample, no rain
SW3078B	Foot of Tatlow, N of Tatlow Creek in rock	2023-04-13		0	dry, no recent rain
		2023-09-27		0	dry, recent rain
SW3079	Tatlow Creek, Tatlow beach access	2022-03-17	740	5000	murky, heavy rain
		2022-07-22	340	45	turbid, no rain
		2022-07-28	170	45	amber, no rain
		2023-02-03	21	200	clear, rain recent
		2023-04-13	23	400	clear, rain
		2023-07-07	400	34	clear, no rain
SW3080	Foot of Danton Rd.	2023-05-08	20	9	clear, rain in past 2 days
		2023-07-07		< 0.01	flow too low to sample, no rain
SW3080A	Bennes Creek, 10992 Kalitan Rd.	2022-03-22	200	100	murky, rain
		2022-07-22	36	8	amber, no rain
		2023-02-03	6	45	clear, rain recent
		2023-07-07	30	8	clear, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3085	Beach access at Cromar Rd., 2 m north	2023-05-08	9	4	clear, rain in past 2 days
SW3087	1 m S of Towner Rd. beach access	2022-03-22	34	70	amber, rain
		2022-07-22	8	5	clear, no rain
		2023-02-03	35	12	clear, rain recent
		2023-07-07	90	3	clear, no rain
SW3088	10608 Towner Rd., 4 m S of beach access	2022-03-22	9600	< 1	clear, rain
		2022-07-22		0	dry, no rain
		2023-02-03		< 0.01	flow too low to sample, rain recent
		2023-07-07		0	dry, no rain
SW3089A	North side of 945 Towner Park Rd.	2022-04-19	210	12	clear, rain yesterday
		2022-07-28		0	dry, no sample, no rain
		2023-04-25	6	9	clear, no rain
		2023-09-27		0	dry, rain prior
SW3089AA	East side of stairs below 693 Finlayson	2023-04-25		< 0.01	flow too low to sample, no rain
		2023-09-27		0	dry, rain prior
SW3089AAD	West of 693 Towner Park Rd.	2022-04-19	2	1	clear, rain yesterday
		2022-07-28		0	dry, no sample, no rain
		2023-04-25		0	dry, no recent rain
		2023-09-27		0	dry, no recent rain
SW3089AB	Between 785 and 771 Towner Park Rd.	2022-04-19	720	12	clear, rain yesterday
		2022-07-28	140	< 1	clear, no rain
		2023-04-25	25	14	clear, no rain
		2023-09-27		0	dry, rain prior
SW3089AC	West side of 825 Towner Park Rd.	2022-04-19	2	2	clear, rain yesterday
		2022-07-28		0	dry, no sample, no rain
		2023-04-25	1	3	clear, no rain
		2023-09-27		0	dry, rain prior
SW3089BB	West 701 Towner Park Rd., E of 3089AA	2022-04-19	12	1	clear, rain yesterday
		2022-07-28		0	dry, no sample, no rain
		2023-04-25	2	1	clear, no rain
		2023-09-27		0	dry, rain prior
SW3089CC	East side of 701 Towner Park Rd.	2022-04-19	< 1	3	clear, rain yesterday
		2022-07-28	1	1	clear, no rain
SW3089DD	White PVC under deck at 725 Towner Park Rd.	2023-04-25	< 1		clear, no rain
		2023-09-27	14	1	clear, no rain
SW3090	100 m N of 10429 West Saanich Rd.	2022-04-08	2	35	clear, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
		2022-07-22		0	dry, no rain
		2023-02-03	3	12	clear, rain recent
		2023-09-25		0	dry, rain prior
SW3091	25 m N of 10425 West Saanich Rd.	2022-04-08	130	10	clear, no rain
		2022-07-27		0	dry, no sample, no rain
		2023-02-03	20	11	clear, rain recent
		2023-09-25		0	dry, rain prior
SW3095	Tseycum Creek 10m N of 1036 W. Saanich Rd.	2022-04-08	53	70	murky amber, no rain
		2022-07-27	5100	12	amber, no rain
		2023-04-14	200	85	clear, no rain
		2023-09-25	4000	11	murky brown, pooled flow, rain
		2023-11-29	11000	200	amber, no recent rain
SW3104	TEN TEN Creek mouth	2022-04-19	7	180	amber, rain yesterday
		2022-08-18	400	65	amber, no rain
		2023-05-08	68	80	amber, rain in past 2 days
		2023-07-05	250	40	amber, low tide, EOP, no rain
SW3107B	22 m E of property line 9730 / 9750 W. Saanich Rd, access at Briarwood Pl.	2023-02-01	4	20	clear, rain recent
SW3108	Foot of Frizell Rd.	2023-05-08		< 0.01	flow too low, rain past 2 days
		2023-09-25		0	dry, rain prior
SW3109	Beach access at Briarwood Place	2023-02-01	6	9	clear, rain recent
		2023-09-25		0	dry, rain prior
SW3117A	SE corner of 673 Ardmore Dr., black pipe	2022-03-25	190	10	clear, rain 2 days ago
		2022-08-12		0	dry, no sample, no rain
		2023-05-11	450	< 1	clear, no rain
		2023-06-22		0	dry, no rain
SW3117B	703 Ardmore Dr., white pipe in rock	2022-03-25	< 1	2	clear, rain 2 days ago
		2022-08-12	32	2	clear, no rain
SW3118	Foot of Hartfell Ave.	2022-03-25	480	55	clear, rain 2 days ago
		2022-08-12		0	dry, no sample, no rain
		2023-05-11	1000	9	clear, no rain
		2023-06-22	320	10	clear, no rain
		2023-07-06		< 0.01	flow too low to sample, no rain
SW3118A	20 m east of Hartfell beach access	2023-06-01	7	1	clear, no rain
		2023-06-22	< 1	2	clear, no rain
SW3118AA	18 m east of Hartfell beach access	2023-06-01		< 0.01	flow too low to sample, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
		2023-06-22		0	dry, not sampled
SW3118B	30 m east Hartfell beach access	2022-03-25	< 1	< 1	clear, rain 2 days ago
		2022-08-12		< 0.01	flow too low to sample, no rain
		2023-05-11		0	dry, no rain
		2023-06-22		0	dry, no rain
SW3118C	45 m east of Hartfell beach access	2022-03-25	< 2	3	dirty, rain 2 days ago
		2022-08-12	< 1	1	clear, no rain
		2023-05-11	< 1	< 1	clear, no rain
		2023-06-22	3	2	clear, no rain
SW3118D	50 m east of Hartfell beach access	2022-03-25	< 1	2	clear, rain 2 days ago
		2022-08-12	11	< 1	clear, no rain
		2023-05-11	< 1	< 1	clear, no rain
		2023-06-22	< 1	1	clear, no rain
SW3119	E of Coles Bay Park beach access	2022-03-25	19	75	clear, rain 2 days ago
		2022-08-12		0	dry, no sample, no rain
		2023-04-14	7	28	clear, no rain
		2023-06-22	380	< 1	clear, no rain
		2023-07-06		< 0.01	flow too low to sample, no rain
SW3120	5 m S of wood steps at McTavish Rd.	2022-03-25	< 1	50	clear, rain 2 days ago
		2022-08-12		0	dry, no sample, no rain
		2022-11-08	530	6	clear, rain in the past 2 days
		2023-04-14	25	15	clear, no rain
		2023-06-22	96	1	clear, no rain
		2023-07-06		< 0.01	flow too low to sample, no rain
SW3121	East Coles Bay, from Pauquachin Lane (near pump station).	2022-03-25	1	10	clear, rain 2 days ago
		2022-08-12	230	2	clear, no rain
		2023-05-11	< 1	4	clear, no rain
		2023-06-22	140	2	clear, no rain
SW3122	40 m S of boat ramp; Pauquachin FN	2022-04-08	12	60	clear, no rain
		2022-08-12		0	dry, no sample, no rain
		2022-08-18		0	dry, no sample, no rain
		2022-11-08	3200	6	clear, rain in the past 2 days
		2023-05-11	2	5	clear, no rain
		2023-06-22		0	dry, no rain
		2023-07-06		0	dry, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3123	50 m S of boat ramp; Pauquachin FN	2022-04-08	12	45	clear, no rain
		2022-08-12		0	dry, no sample, no rain
		2022-08-18		0	dry, no sample, no rain
		2023-05-11		0	dry, no rain
		2023-06-22		0	dry, no rain
		2023-07-06		0	dry, no rain
SW3124	200 m S of boat ramp; Pauquachin FN	2022-04-08	< 1	500	clear, no rain
		2022-08-18	89	20	clear, no rain
		2022-08-25	140	14	clear, no rain
		2022-09-01	24	12	clear, no rain
		2022-09-08	30	10	clear, no rain
		2022-09-15	1500	8	clear, no rain
		2022-10-25	81	8	clear, rain , potential first flush
		2022-11-03	25	11	clear, rain prior
		2022-11-08	21	20	clear, rain prior
		2022-11-17	13	18	clear, rain prior
		2022-11-24	12		clear, no recent rain
		2023-05-11	< 1	25	clear, no rain
		2023-06-22	4	32	clear, no rain
		2023-07-06	420	18	clear, no rain
SW3124A	300 m S of 3124, by alder, Pauquachin FN	2022-04-08	1	50	clear, no rain
		2022-07-29		< 0.01	flow too low to sample, no rain
		2023-04-20	< 1	5	clear, rain
		2023-06-22		< 0.01	flow too low to sample, no rain
SW3124B	Between 8660 8640 Kleewyck Rd.	2022-04-19	10	11	clear, rain yesterday
		2022-07-29		< 0.01	flow too low to sample, no rain
		2023-04-20	< 1	12	clear, rain
		2023-06-22	37	6	clear, no rain
SW3125	Kleewyck Rd.	2022-04-19	3	110	clear, rain yesterday
		2022-07-29	29	3	clear, no rain
		2023-04-20	< 1	24	clear, rain
		2023-06-22	92	< 1	clear, no rain
SW3125A	1 m E of stairs, at 8580 Mink Rd.	2022-04-19	1800	4	clear, rain yesterday
		2022-07-29	12	< 1	clear, no rain
		2023-04-20	2	4	clear, rain
		2023-06-22		< 0.01	flow too low to sample, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3125B	Between 8560 and 8580 Mink Rd.	2022-04-19	< 1	9	clear, rain yesterday
		2022-07-29	70	5	clear, no rain
		2023-04-20	24	7	clear, rain
		2023-06-22	38	7	clear, otter activity, no rain
SW3125C	Below 570 Seacliff Rd.	2022-04-19	< 1	7	clear, rain yesterday
		2022-07-29	72	5	clear, no rain
		2023-04-20	6	8	clear, rain
		2023-06-22	1400	1	clear, no rain
SW3126	Under patio at 750 Seacliff Rd.	2022-04-19	2	3	clear, rain yesterday
		2022-07-29		0	dry, no sample, no rain
		2023-04-20	1	2	clear, rain
		2023-06-22		0	dry, no rain
SW3126A	Below 8530 W Saanich Rd.	2022-04-19	< 1	14	clear, rain yesterday
		2022-07-29		< 0.01	flow too low to sample, no rain
		2023-04-20	< 1	5	clear, rain
		2023-06-22		< 0.01	flow too low to sample, no rain
SW3127	Salmon Creek, 570 Lawrence Rd.	2022-04-19	< 1	4	clear, rain yesterday
		2022-07-29		< 0.01	flow too low to sample, no rain
SW3127A	30 m east of large grey boat house	2022-04-19	< 1	15	clear, rain yesterday
		2022-07-29		< 0.01	flow too low to sample, no rain
SW3127AA	Between 530 and 531 Salmon Rd.	2022-04-19	< 1	4	clear, rain yesterday
		2022-07-29		< 0.01	flow too low to sample, no rain
SW3128	Beach access at Nimmo Rd.	2023-04-20	13	8	clear, rain
		2023-06-22		< 0.01	flow too low to sample, no rain
SW3133	Hagan Creek mouth, u/s of waterfall	2022-04-08	27	2000	amber, no rain
		2022-08-18	20	500	clear, no rain
		2023-04-19	50	2000	clear, rain yesterday
		2023-06-22	62	1000	clear, no rain
SW3133-2	Ditch d/s of Kirkpatrick Cres	2022-08-29	150000	12	sewer/chemical odour, black, no rain
		2022-09-13	230000	12	sewer/chemical odour, black floculant, no rain, surge
		2022-09-13	160000	8	sewer/chemical odour, black floculant, no rain, used Peninsula Streams equipment
		2023-10-20	2100	12	chemical odour, clear, rain previous
SW3135	Above viewing platform on Tsartlip FN	2022-04-11	1	5	clear, rain prior
		2022-08-18		0	dry, no sample, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3136	Intersection of Ettiene and Tsartlip Rd.	2022-04-11	35	100	clear, rain prior
		2022-08-18		0	dry, no sample, no rain
SW3136A	Shoreline west of Tsartlip Drive	2022-04-11	52	12	clear, rain
		2022-08-18		0	dry, no sample, no rain
SW3137	NE of Tsartlip boat launch	2023-04-19	380	9	murky brown, rain yesterday
		2023-06-28		0	dry, no rain
SW3138	Tsartlip boat launch parking	2022-04-11	23	40	clear, rain prior
		2022-08-18	12000	1	clear, no rain
		2023-04-19	350	24	clear, rain yesterday
		2023-05-10	27	8	clear, no rain
		2023-06-28	100	6	clear, no rain
SW3138-1D	Ditch, west side of driveway 848 Stelly s X Rd.	2023-05-10	2	7	clear, no rain
SW3141	Under ferry wharf, foot of Verdier Ave.	2022-03-23	< 1	< 1	clear, rain previous 2 days
		2022-08-18		0	dry, no rain
		2023-01-26	< 1	11	clear, rain 2 days ago
		2023-06-28	1	< 1	clear, no rain
SW3142	North of ferry wharf at foot of Verdier	2022-03-23	11	80	clear, rain previous 2 days
		2022-06-13	12	8	clear, no rain
		2023-01-26	8	< 1	clear, rain 2 days ago
		2023-06-28	16	3	clear, no rain
SW3145	Foot of Clarke Rd.	2022-03-23	1	45	clear, rain previous 2 days
		2022-06-03	70	9	clear, rain
		2022-06-13	12	8	clear, no rain
		2023-01-26	2	10	clear, rain 2 days ago
		2023-06-28	600	< 1	clear, no rain
SW3145A	Devonshire beach access	2022-03-23	6	9	clear, rain previous 2 days
		2022-07-22	470	4	amber, no rain
		2023-01-26	< 1	7	clear, rain 2 days ago
		2023-06-28	6	5	clear, no rain
SW3146	Brentwood Drive near Marchant Rd.	2022-03-23	240	1000	clear, rain previous 2 days
		2022-07-22	840	50	clear, no rain
		2023-01-26	51	50	clear, rain 2 days ago
		2023-06-28	360		clear, no rain
SW3148	East of Port Royale, under bridge	2022-04-07	100	500	clear, no rain
		2022-07-22	42	28	clear, no rain
		2023-04-25	3	80	clear, no rain

Bacterial and Flow Data (2022-2023)

Station ID	Station Description	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
		2023-09-27	25	12	clear, rain
SW3150	Below Port Royale path, 40 m E of wharf	2022-04-07	57	50	clear, no rain
		2022-06-03	1400	5	clear, foam, rain
		2022-06-13	3200	7	sulphur odour, clear, no rain
		2022-07-22	6000	3	clear, no rain
		2023-04-25	3600	9	clear, otter observed in pipe, no rain
		2023-09-27		< 0.01	flow too low to sample, recent rain
SW3150A	Foot of Woodward Dr.	2023-04-25		< 0.01	flow too low to sample, no rain
		2023-09-27		0	dry, recent rain
SW3151	Foot of Deamere, west end Port Royale	2022-04-07		0	dry, no rain
		2022-07-28		0	dry, no sample, no rain
		2023-04-25		< 0.01	flow too low to sample, no rain
		2023-09-27		0	dry, recent rain
SW3153	Small bay at Butchart Gardens	2023-09-27		0	dry, recent rain
SW3154	Tod Creek, south of Butchart Gardens	2022-04-07	18	4000	clear, no rain
		2022-07-28	120	250	amber, no rain
		2023-02-22	6	5000	clear, rain yesterday
		2023-09-27	110	400	clear, recent rain

Notes:
Flow is visually estimated.
CFU/100 mL is colony forming units per 100 millilitres.
u/s is upstream.
d/s is downstream.
b/t is between

APPENDIX C

PUBLIC HEALTH CONCERN RATINGS 2023

Public Health Concern Ratings

CRD Discharge No.	Report Figure No.	Jurisdiction at Discharge	Rating			Level of Concern			Comments	Recommendations
			E.coli Rating	Public Shoreline Use	Overall Rating	2021	2022	2023		
405	4	Central Saanich	2	2	4	moderate	moderate	moderate	Amber colour; Island View Beach	Continue monitoring
421	7	Central Saanich	1	1	2	NR	NR	low		Confirm rating
422A	8	Central Saanich	1	1	2	NR	low	low	Dry	Resample in 2028
3128	33	Central Saanich	1	1	2	NR	NR	low	Dry in summer	Confirm rating
3133	35	Central Saanich	1	2	3	moderate	moderate	low	SPSO, Hagan Creek	Continue monitoring
3141	36	Central Saanich	1	2	3	moderate	low	low	Dry in summer	Continue monitoring
3142	36	Central Saanich	1	2	3	moderate	low	low	Elevated intermittently; suds observed	Continue monitoring
3145	36	Central Saanich	2	3	5	low	low	moderate	Human bacteria upstream in past	Confirm rating; continue investigations
3145A	36	Central Saanich	1	2	3	low	moderate	low	Elevated in summer	Confirm rating
3146	36	Central Saanich	2	2	4	low	moderate	moderate	SPSO	Continue monitoring
3148	36	Central Saanich	1	2	3	NR	low	low	Brentwood Bay	Confirm rating
3150	36	Central Saanich	2	2	4	low	**high**	moderate	Brentwood Bay	Continue monitoring and investigations
3150A	36	Central Saanich	1	2	3	NR	NR	low	Brentwood Bay; low flow	Confirm rating
3151	36	Central Saanich	1	2	3	NR	low	low	Dry	Resample in 2028
3153	37	Central Saanich	1	2	3	low	NR	low	Dry	Confirm rating
3154	37	Central Saanich	1	2	3	low	low	low	Tod Creek	Continue monitoring
426	9	North Saanich	2	1	3	low	low	low	Bazan Bay; no human bacteria measured	Continue monitoring
430B	9	North Saanich	2	1	3	low	low	low	Dog park	Continue monitoring
432	10	North Saanich	1	1	2	low	low	low	Bazan Bay	Continue monitoring
441	10	North Saanich	1	2	3	low	moderate	low	Reay Creek; birds upstream	Continue monitoring
3020	15	North Saanich	2	2	4	moderate	moderate	moderate		Continue monitoring
3020A	15	North Saanich	1	2	3	moderate	low	low	Dry in summer	Confirm rating
3021A	16	North Saanich	1	2	3	low	moderate	low	Dry in summer	Confirm rating
3030	16	North Saanich	1	1	2	NR	NR	low	Dry	Resample in 2028
3034A	16	North Saanich	1	2	3	NR	NR	low	Dry	Confirm rating
3035A	16	North Saanich	1	2	3	NR	NR	low	Dry	Confirm rating
3051A	19	North Saanich	1	2	3	low	low	low	Low counts	Resample in 2028
3077	23	North Saanich	2	3	5	moderate	**high**	**high**	Deep Cove; counts lower	Continue monitoring
3078A	23	North Saanich	3	3	6	**high**	**high**	**high**	Deep Cove; human bacteria present	Continue monitoring and source investigations

Public Health Concern Ratings

CRD Discharge No.	Report Figure No.	Jurisdiction at Discharge	Rating			Level of Concern			Comments	Recommendations
			E.coli Rating	Public Shoreline Use	Overall Rating	2021	2022	2023		
3078B	23	North Saanich	1	3	4	low	NR	low	Private discharge in rock wall	Resample in 2028
3079	23	North Saanich	2	3	5	moderate	moderate	moderate	Tatlow/Chalet Creek; human bacteria present	Continue monitoring and investigations
3080	24	North Saanich	1	1	2	NR	NR	low	Danton Road	Resample in 2028
3080A	24	North Saanich	1	1	2	low	low	low	Benes Creek	Resample in 2026
3087	25	North Saanich	1	3	4	low	low	low	Low counts	Resample in 2026
3088	25	North Saanich	1	3	4	low	moderate	low	High count; dry upon resampling	Confirm rating
3089A	26	North Saanich	1	3	4	low	low	low	Stream; one count slightly elevated; dry in summer	Continue monitoring
3089AA	26	North Saanich	1	3	4	NR	NR	low	Dry	Confirm rating
3089AAD	26	North Saanich	1	3	4	low	low	low	Slightly elevated count; dry in summer	Resample in 2026
3089AB	26	North Saanich	1	3	4	low	moderate	low	Stream; low flow and low counts in summer	Confirm rating
3089AC	26	North Saanich	1	3	4	low	low	low	Dry in summer	Resample in 2028
3089BB	26	North Saanich	1	3	4	**high**	moderate	low	Dry in summer	Confirm rating
3104	28	North Saanich	1	2	3	moderate	moderate	low	SPSO, Ten Ten Creek	Continue monitoring
3107B	28	North Saanich	1	1	2	NR	NR	low	Only one sample	Confirm rating
3108	28	North Saanich	1	1	2	NR	NR	low		Confirm rating
3117A	31	North Saanich	2	2	4	moderate	low	moderate	New; private; no human bacteria present	Confirm rating
3118	31	North Saanich	2	3	5	moderate	moderate	**high**	One source fixed; human bacteria present in 2021	Continue monitoring
3118A	31	North Saanich	1	3	4	low	NR	low	Only sampled in June	Confirm rating
3118AA	31	North Saanich	1	3	4	NR	NR	low	Dry; only sampled in June	Confirm rating
3118B	31	North Saanich	1	3	4	**high**	moderate	low	Counts lower; human bacteria present in 2021	Confirm rating
3118C	31	North Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
3118D	31	North Saanich	1	3	4	low	low	low	Elevated count in past	Continue monitoring
3119	31	North Saanich	1	3	4	moderate	low	low	Coles Bay; dry in summer; human bacteria not present	Continue monitoring
3120	31	North Saanich	1	3	4	moderate	moderate	low	Coles Bay; dry in summer; human bacteria not present	Continue monitoring
3124B	32	North Saanich	1	2	3	low	low	low	Coles Bay	Resample in 2026

Public Health Concern Ratings

CRD Discharge No.	Report Figure No.	Jurisdiction at Discharge	Rating			Level of Concern			Comments	Recommendations
			E.coli Rating	Public Shoreline Use	Overall Rating	2021	2022	2023		
3125	32	North Saanich	1	2	3	low	low	low	Coles Bay	Continue sampling
3125A	32	North Saanich	1	2	3	low	moderate	low	High count in 2022	Confirm rating
3125B	32	North Saanich	1	2	3	low	low	low	Dry in summer	Continue sampling
3125C	32	North Saanich	2	2	4	low	low	moderate	Dry in summer	Confirm rating
3126	32	North Saanich	1	2	3	low	low	low	Dry in summer	Resample in 2026
3126A	32	North Saanich	1	2	3	low	low	low	Dry in summer	Resample in 2026
444	11	Sidney	1	3	4	moderate	low	low	High count during heavy rain; dry in summer	Continue monitoring
444A	11	Sidney	1	3	4	moderate	low	low	High count during heavy rain; dry in summer	Continue monitoring
446	11	Sidney	1	3	4	low	moderate	low	Suds previously in discharge	Continue monitoring
447	11	Sidney	3	3	6	**high**	**high**	**high**	Counts fluctuate	Continue monitoring and source investigations
448	11	Sidney	1	3	4	low	moderate	low	Low flow in summer. SPSO	Confirm rating
449	11	Sidney	1	3	4	**high**	moderate	low	Counts fluctuate	Continue monitoring
449A	11	Sidney	2	3	5	moderate	moderate	moderate	Low flows; lower counts; extended outfall	Continue monitoring
450	11	Sidney	2	3	5	moderate	moderate	moderate	Cross-connection fixed; multiple sources upstream	Confirm investigations
459	12	Sidney	2	1	3	low	low	low	Elevated in summer	Confirm rating
472	13	Sidney	1	2	3	NR	low	low	Only one visit in summer; dry not sampled	Confirm rating
3003	13	Sidney	1	2	3	low	low	low	Low flow	Continue monitoring
3005	13	Sidney	1	2	3	moderate	low	low	SPSO	Confirm rating
3006	13	Sidney	3	2	5	NR	NR	moderate	Roberts Bay	
3007	14	Sidney	2	2	4	moderate	low	moderate	Foot of Bowden	Continue monitoring; start investigations
3009	14	Sidney	1	1	2	NR	NR	low		Resample in 2028
3012	14	Sidney	1	2	3	NR	NR	low		Confirm rating
3013	14	Sidney	1	2	3	NR	NR	low		Confirm rating
3014	14	Sidney	1	2	3	low	low	low	Low EC, low flows	Resample in 2028
3015	14	Sidney	2	1	3	low	moderate	moderate	High count in summer	Confirm rating
3015A	14	Sidney	1	1	2	NR	low	low	Low count; dry in summer	Resample in 2028

Public Health Concern Ratings

CRD Discharge No.	Report Figure No.	Jurisdiction at Discharge	Rating			Level of Concern			Comments	Recommendations
			E.coli Rating	Public Shoreline Use	Overall Rating	2021	2022	2023		
3016	14	Sidney	3	2	5	moderate	moderate	**high**	Elevated EC, SPSO, one source known but challenging to fix	Continue monitoring
3090	26	Tseycum/North Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
3091	26	Tseycum/North Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
3095	27	Tseycum/North Saanich	3	3	6	**high**	**high**	**high**	Tseycum Creek, SPSO	Continue monitoring
3121	31	Pauquachin/North Saanich	1	3	4	low	low	low	Low flow	Continue monitoring
3122	31	Pauquachin/North Saanich	2	3	5	low	moderate	low	Dry in summer	Confirm rating
3123	31	Pauquachin/North Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
3124	31	Pauquachin/North Saanich	2	3	5	moderate	low	moderate	Low upstream as well	Confirm rating
3124A	31	Pauquachin/North Saanich	1	1	2	low	low	low	Dry in summer	Confirm rating
3135	35	Tsartlip/Central Saanich	1	3	4	moderate	low	NR	Not sampled	Confirm rating
3136	35	Tsartlip/Central Saanich	1	3	4	moderate	low	NR	Not sampled	Confirm rating
3137	35	Tsartlip/Central Saanich	1	3	4	NR	NR	moderate	One elevated count in winter; dry in summer	Confirm rating
3138	36	Tsartlip/Central Saanich	1	3	4	moderate	moderate	low	Low flow in summer	Confirm rating
408	5	Tsawout/Central Saanich	1	3	4	NR	NR	NR	Only one visit in summer; dry not sampled	Confirm rating
409	5	Tsawout/Central Saanich	1	3	4	NR	NR	low	Tsawout	Confirm rating
409A	6	Tsawout/Central Saanich	2	3	5	NR	NR	low	Tsawout	Confirm rating
411	6	Tsawout/Central Saanich	1	3	4	moderate	low	low	Dry in summer	Continue monitoring
411A	6	Tsawout/Central Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
412	7	Tsawout/Central Saanich	2	3	5	moderate	moderate	moderate	Tetayut Creek	Continue monitoring

Notes
Level of Concern determined by sum of the *Escherichia coli* (*E.coli)* and shoreline ratings. Low sums of 2 and 3, moderate sum of 4 and high sums of 5 and 6.
Flow, season, previous *E.coli* measurements and recent changes in the catchment are also considered.
EC *E.coli* counts
NR Not rated because it was not one of the discharges assessed this year
SPSO This discharge acts as a sewage pump station overflow

APPENDIX D

E. COLI SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM 2023

APPENDIX D
***E. COLI* SAMPLING QUALITY ASSURANCE**
AND QUALITY CONTROL PROGRAM
2023

TABLE OF CONTENTS

LIST OF TABLES

APPENDIX D

E. COLI SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM FOR 2023

1.0 INTRODUCTION

Quality Assurance and Quality Control (QA/QC) programs are protocols adopted to ensure that results of any study are valid, internally consistent and comparable with similar projects. These protocols are set out in writing and based on current and relevant research on related topics.

Data collected for the quality assurance (QA) program are used to ensure consistency in field handling and analytical methods. If data exceed a specified precision criterion, then the laboratory is notified of a potential problem in the procedure and steps are taken to resolve the issue.

2.0 METHODS FOR BACTERIAL SAMPLING

All water samples were collected in 250 mL wide-mouth polypropylene bottles supplied by the analytical laboratory, Bureau Veritas. Labelled samples were stored in an insulated cooler with ice packs for protection from prolonged exposure to UV light and delivered the same day to the laboratory. *Escherichia coli* bacteria (*E. coli*) were analyzed following the procedures in Standard Methods (APHA, 1998) and reported as colony forming units per 100 mL (CFU/100 mL).

2.1 Stormwater Discharge Sampling

Where possible, stormwater samples were collected from the point of discharge. Where this was not possible, the stormwater system was followed back to the nearest point where samples could be taken.

2.2 Quality Assurance

2.2.1 Stormwater Sample Replicates (Field Splits)

Ten percent of the total number of samples collected were replicated in the field (field replicates) and are identified in this report as field splits. A single sample was collected in a laboratory-prepared one-litre sample bottle and inverted 30 times to ensure that the sample was homogeneous. The sample was split evenly into two sample bottles. The two bottles were labelled and sent to the laboratory for analysis as separate samples, but not identified as field splits.

2.2.2 Quality Control Assessment

To establish the precision criteria, 18 replicates (field splits) were analyzed for *E. coli* bacteria. Field splits were collected from six stormwater discharges on the Saanich Peninsula. Discharges were chosen based on previous results, specifically high, moderate or low levels of *E. coli* concentrations. The QA sampling for the assessment was for all *E. coli* samples analyzed by Bureau Veritas. The three levels of *E. coli* concentrations were selected to represent the variance in the samples analyzed during the sampling program. Three grab samples were taken at each of the six stations and split into two replicate sample bottles. Three blank samples of potable water were also collected as part of the assessment. Samples were supplied to the laboratory with individual numbers.

2.2.3 Calculation of Quality Assurance Results

Laboratory precision for *E. coli* analysis is determined by analyzing several pairs of field samples (field splits). The following procedure is the same as that used for fecal coliforms from Standard Methods, 20th edition (APHA, 1998).

Data are arranged in pairs (D1 and D2). The log of each field measurement is determined (L1, L2) and the difference (range) in the log value between each pair of field splits is calculated: R (L2 - L1). An average range (Mean-R) is then determined for all of the pairs.

The precision criterion is calculated by multiplying the Mean-R by 3.27 and is rounded to one decimal place.

The log range (R) is calculated for each of the field splits and compared to the precision criterion, to determine whether the sample is acceptable or not, according to the following criteria:

Acceptable (A) If the calculation is less than the precision criterion, then the field data are within normal variability.

Unacceptable (U) If the calculation is greater than the precision criterion, then the field data are outside of the normal variability. Data collected after the last acceptable set of data should be discarded and no further analysis should be done until the source of the problem is identified by the laboratory.

It is important not to put too severe an interpretation on the results, especially when they are close to the unacceptable guideline. Each result represents a value within a 95% confidence interval, which gets proportionately larger as the actual result gets smaller. Therefore, one can expect, through randomness, 5% of the samples to be outside of the precision criterion. Also, bacterial counts under 200 CFU/100 mL are considered too small to accurately calculate or compare to a precision criterion (APHA, 1998). It is also important to note that discharges with *E. coli* counts lower than 200 CFU/100 mL receive a low public health concern rating.

The results should be rounded to one decimal place and compared to the precision criterion (e.g., 0.3). If the calculated value from the duplicate results still exceeds the criterion, then an informal investigation of the laboratory should be initiated. If only a few duplicates are unacceptable (i.e., one out of every 20 pairs of duplicates), the laboratory is probably meeting the guideline.

The overall process is intended to act as an alarm, alerting the study group to potential problems with the sampling and analytical procedures.

3.0 RESULTS

CRD staff collected 18 pairs of stormwater samples from six discharges having high, moderate, or low levels of bacteria. Samples were analyzed for *E. coli* concentration used to calculate the precision criterion.

3.1 Blanks

Staff submitted three blank samples (tap water) to the laboratory for *E. coli* analysis. Blanks were reported as having <1 CFU/100 mL. Therefore, the results meet the QA requirements.

3.2 Precision Criteria

None of the field splits exceeded the precision criterion, therefore, the data are acceptable.

Table 1 shows laboratory results of the 18 pairs of samples used to determine the precision criterion. The calculated precision criterion was low this year at 0.3.

3.3 Field Splits

Table 2 presents results for the field splits collected during the dry period. Two of the field splits exceeded the precision criterion of 0.3 but one of them had low bacteria concentrations (E.coli counts lower than 200 CFU/100 mL are not expected to meet criterion). The other split sample had a precision criterion of 0.46.As one can expect through randomness that 5% of the split will not meet the criterion, this data is considered acceptable.

Table 3 presents results for the field splits collected during the wet period. The results met the criterion and are acceptable.

Table 1 2023 Precision Criterion Calculation

Date	Discharge No.	Pair No.	1st Duplicate D1	2nd Duplicate D2	Log of D1 L1	Log of D2 L2	Range of Logs (Rlog) (Log L1 Log L2)
17-Jan	245	1	140	110	2.1461	2.0414	0.1047
		2	94	83	1.9731	1.9191	0.0540
		3	120	110	2.0792	2.0414	0.0378
18-Jan	805	1	210	260	2.3222	2.4150	0.0928
		2	240	180	2.3802	2.2553	0.1249
		3	300	300	2.4771	2.4771	0.0000
09-Feb	503	1	350	320	2.5441	2.5051	0.0389
		2	320	380	2.5051	2.5798	0.0746
		3	310	320	2.4914	2.5051	0.0138
16-Feb	216	1	4700	6300	3.6721	3.7993	0.1272
		2	5600	6200	3.7482	3.7924	0.0442
		3	5900	6800	3.7709	3.8325	0.0617
20-Jan	447	1	4400	4900	3.6435	3.6902	0.0467
		2	3400	5400	3.5315	3.7324	0.2009
		3	4300	5700	3.6335	3.756	0.1224
19-Jan	777A	1	23000	27000	4.3617	4.4314	0.0696
		2	20000	23000	4.3010	4.3617	0.0607
		3	32000	31000	4.5051	4.4914	0.0138
	Mean - R_{log} (Sum R_{log}/18)						0.0867
	Precision Criterion (3.27 x Mean - R_{log})						0.2834

Table 2 Comparison of Field Splits to Precision Criterion – 2023 Dry Period

Date	Discharge	Field Split Fecal Coliform Counts	Log	Log Range	Acceptable (A), Unacceptable (U) or Conditionally Acceptable (A*)
9-Jun	578	130	2.1139	0.0726	A
		110	2.0414		
12-Jun	559	130	2.1139	0.0348	A
		120	2.0792		
12-Jun	567	3800	3.5798	0.3123	A
		7800	3.8921		
13-Jun	736A	420	2.6232	0.0928	A
		520	2.7160		
13-Jun	744B	14000	4.1461	0.4559	U
		4900	3.6902		
14-Jun	320	27	1.4314	0.0334	A
		25	1.3979		
14-Jun	322	250	2.3979	0.0362	A
		230	2.3617		
15-Jun	212	13	1.1139	0.0726	A
		11	1.0414		
15-Jun	237	1600	3.2041	0.3274	A
		3400	3.5315		
16-Jun	768	27	1.4314	0.0164	A
		26	1.4150		
16-Jun	777A	200000	5.3010	0.0414	A
		220000	5.3424		
19-Jun	854	100000	5.0000	0.0269	A
		94000	4.9731		
20-Jun	503	16	1.2041	1.4293	A*
		430	2.6335		
4-Jul	607	3300	3.5185	0.0835	A
		4000	3.6021		
4-Jul	620	22000	4.3424	0.0555	A
		25000	4.3979		
4-Jul	627	14000	4.1461	0.0300	A
		15000	4.1761		

Notes:
CFU: colony forming units.
A: calculated data is less than the precision criterion and, therefore, falls within normal variability.
U: calculated data is greater than the precision criterion and, therefore, falls outside normal variability.
A*: any *E. coli* count under 200 is considered too small an amount to calculate precision.

Table 3 Comparison of Field Splits to Precision Criterion – 2023 Wet Period

Date	Discharge	Field Split Fecal Coliform Counts	Log	Log Range	Acceptable (A), Unacceptable (U) or Conditionally Acceptable (A*)
7-Feb	227	1500	3.1761	0.0300	A
		1400	3.1461		
9-Feb	322	950	2.9777	0.1648	A
		650	2.8129		
10-Feb	216	91000	4.9590	0.0000	A
		91000	4.9590		
23-Feb	310	1400	3.1461	0.1761	A
		2100	3.3222		
2-Mar	805	2000	3.3010	0.0458	A
		1800	3.2553		
10-Mar	781	1400	3.1461	0.0300	A
		1500	3.1761		
14-Mar	574	47	1.6721	0.0000	A
		47	1.6721		
22-Mar	611	3200	3.5051	0.1076	A
		4100	3.6128		
24-Mar	768	1500	3.1761	0.2730	A
		800	2.9031		
24-Mar	854	1600	3.2041	0.0000	A
		1600	3.2041		
27-Mar	650	5800	3.7634	0.0147	A
		6000	3.7782		
3-Apr	737	25	1.3979	0.0334	A
		27	1.4314		
14-Apr	6003	2	0.3010	0.3010	A*
		1	0.0000		
24-Apr	306	24	1.3802	0.0792	A
		20	1.3010		
4-May	920	6	0.7782	0.0792	A
		5	0.6990		
5-May	812	5500	3.7404	0.1383	A
		4000	3.6021		

Notes:
CFU: colony forming units.
A: calculated data is less than the precision criterion and, therefore, falls within normal variability.
U: calculated data is greater than the precision criterion and, therefore, falls outside normal variability.
A*: any *E. coli* count under 200 is considered too small an amount to calculate precision.

4.0 CONCLUSIONS

All requirements for the stormwater monitoring QA/QC program were carried out in 2023. All QA/QC results were acceptable for rating stormwater discharges for public health concerns.

5.0 REFERENCES

APHA, 1998. American Public Health Association, American Water Works Association, Water Pollution Control Federation, 20th Edition. Standard Methods for the Examination of Water and Wastewater.

APPENDIX E

CONTAMINANT DATA AND RATINGS FOR ENVIRONMENTAL CONCERN

Table 1 2023 Stormwater Sediment Contaminant Concentrations

Station ID	Station Name	Sample Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH*	HPAH*	LPAH	Sample Comments
	Marine Sediment Quality Guidelines	CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	12	5.2	960	370	
		CCME ISQG	7.24	0.7	52.3	18.7	30	0.13	1	124	-	-	-	-	
		CCME PEL	42	4.2	160	108	112	0.7	2.2	271	-	-	-	-	
	Vancouver Island Background		4	0.95	65	100	40	0.15	1	150	-	-	-	-	
SW0407	SA-SU Rd. east corner of Saanichton Bay	2022-12-12	4.05	0.104	26.9	*27.3*	5.99	<0.05	<0.05	43.7	0.03	0.012	0.8	0.2	medium brown fines; marine influence
SW0467	Beach access at foot of Shoreacres Rd. and Memory	2022-12-12	3.83	0.093	26.2	*29.5*	8.36	<0.05	<0.05	44.8	0.04	0.009			dark brown fines; organic debris
SW3005-2A	MH in sidewalk at 2356/2362 Malaview Ave. property line	2023-04-12	1.67	0.083	14.1	15.8	3.5	0.118	<0.05	82.6	0.11	0.014	3.1	0.4	medium grey sand
SW3006	Foot of Ardwell Ave.	2022-12-12	3.79	0.091	25.8	*27.9*	6.35	<0.05	<0.05	44	0.29	0.065			grey sand, gravel; marine influence
SW3021	Near corner of McDonald Park Rd., Bayfield Rd.	2022-12-08	3.54	0.177	20.7	*22.5*	43.1	*0.161*	0.14	97.5	0.17	0.027	20.2	3.2	medium grey sand and fines
SW3021	Near corner of McDonald Park Rd., Bayfield Rd.	2023-04-13	2.9	0.117	17.2	17.4	16.8	0.146	0.101	69.4	0.14	0.032	8.2	1.9	medium brown sand, fines, organics
SW3079	Beach access at foot of Tatlow Rd., Tatlow Creek	2023-07-07	2.53	0.099	21.5	*22.5*	3.71	<0.05	<0.05	65.8	0.034	0.0035	2.0	0.2	medium grey sand and fines
SW3095	Tseycum Creek 10 m north of 1036 West Saanich Rd.	2023-04-14	8.6	0.078	42	*41.7*	8.49	0.094	0.053	88.6	0.012	0.0071	1.5	2.4	medium brown fines and gravel
SW3119	Immediately east of Coles Bay Regional Park beach access	2023-04-14	5.39	0.099	26.8	*22.5*	5.54	<0.05	0.057	62	0.016	0.026	2.3	0.5	brown fines, sand and gravel
SW3148	East of Port Royale development under wooden bridge	2023-04-25	4.4	0.116	25.4	*29.3*	7.73	0.133	0.071	87.4	0.026	0.0045	1.2	0.2	medium brown sand, fines and gravel
SW3154	South of Butchart Gardens in Tod inlet, Tod Creek	2022-12-08	8.12	0.233	24.6	*51.1*	92.5	1.15	0.065	169	0.0048	0.0013	0.1	0.0	medium grey sand and brown fines
SW3154	South of Butchart Gardens in Tod inlet, Tod Creek	2023-02-22	6.9	0.291	28.8	*35.3*	40.2	<0.05	0.063	170	0.056	0.026	4.7	2.2	sand, gravel, fine; 100 m from discharge
SW3154	South of Butchart Gardens in Tod inlet, Tod Creek	2023-02-22	8.51	0.287	28.5	*35.2*	*33.1*	0.08	0.059	181	-	-	-	-	coarse sand, gravel, at discharge
SW3154	South of Butchart Gardens in Tod inlet, Tod Creek	2023-02-22	7.85	0.196	26.7	*34.2*	*34*	<0.05	<0.05	*143*	-	-	-	-	sand, gravel; 10 m from discharge

Notes:
Concentrations are in mg/kg dry weight.
CRD MSQG Marine sediment quality guidelines adopted from Washington State s Department of Ecology for protection of aquatic life.
LPAH and HPAH are low and high molecular weight polycyclic aromatic hydrocarbons, respectively.
CCME Canadian Council of Ministers of the Environment.
ISQG interim sediment quality guideline; concentrations above this level but below the PEL will occasionally result in adverse effects on aquatic life.
PEL probable effects level; concentrations above this level will frequently result in adverse effects to aquatic life.
Vancouver Island Background Concentrations are regional estimates (95th percentiles) from BC MOE; https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/protocol_4.pdf

XX	Italicized values are those that exceed a guideline but are below the Vancouver Island background concentration
XX	Value is greater than or equal to the CCME ISQG.
XX	Value is greater than or equal to the CCME PEL.
XX	Value it greater than or equal to CRD MSQG and adverse effects to aquatic life are likely to occur.

For mercury only, the CRD MSQG is lower than the CCME PEL.
Some samples are not collected at discharge to marine, therefore marine guidelines are not applicable but used for screening purposes, see Table 4 for freshwater comparisons.
*Carbon normalized

Table 2 2023 Sediment Contaminant Ratings

Station ID	Sample Date	Ratios of Contaminant Concentration to CRD Sediment Quality Guideline										TEQ	Rating
		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH		
	CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	12	5.2		
SW0407	2022-12-12	0.07	0.02	0.10	0.07	0.01	0.12	0.01	0.11	0.00	0.00	0.52	Low
SW0467	2022-12-12	0.07	0.02	0.10	0.08	0.02	0.12	0.01	0.11	0.00	0.00	0.52	Low
SW3005-2A	2023-04-12	0.03	0.02	0.05	0.04	0.01	0.29	0.01	0.20	0.01	0.00	0.66	Low
SW3006	2022-12-12	0.07	0.02	0.10	0.07	0.01	0.12	0.01	0.11	0.02	0.01	0.54	Low
SW3021	2022-12-08	0.06	0.03	0.08	0.06	0.10	0.39	0.02	0.24	0.01	0.01	1.00	Low
SW3021	2023-04-13	0.05	0.02	0.07	0.04	0.04	0.36	0.02	0.17	0.01	0.01	0.78	Low
SW3079	2023-07-07	0.04	0.02	0.08	0.06	0.01	0.12	0.01	0.16	0.00	0.00	0.51	Low
SW3095	2023-04-14	0.15	0.02	0.16	0.11	0.02	0.23	0.01	0.22	0.00	0.00	0.91	Low
SW3119	2023-04-14	0.09	0.02	0.10	0.06	0.01	0.12	0.01	0.15	0.00	0.01	0.58	Low
SW3148	2023-04-25	0.08	0.02	0.10	0.08	0.02	0.32	0.01	0.21	0.00	0.00	0.84	Low
SW3154	2022-12-08	0.14	0.05	0.09	0.13	0.21	2.80	0.01	0.41	0.00	0.00	3.85	**High**
SW3154	2023-02-22	0.12	0.06	0.11	0.09	0.09	0.12	0.01	0.41	0.00	0.01	1.03	Moderate
SW3154	2023-02-22	0.15	0.06	0.11	0.09	0.07	0.20	0.01	0.44	0.00	0.00	1.13	Moderate
SW3154	2023-02-22	0.14	0.04	0.10	0.09	0.08	0.12	0.01	0.35	0.00	0.00	0.92	Low

Notes:
This table shows the ratio of contaminant concentration to CRD Marine Sediment Quality Guidelines.
CRD MSQG Marine sediment quality guidelines adopted from Washington State s Department of Ecology for protection of aquatic life.
LPAH and HPAH are low and high molecular weight polycyclic aromatic hydrocarbons, respectively.
XX Value is approaching (ratio 0.75) or greater than (ratio is 1) the CRD MSQG and adverse effects to aquatic life probable.
TEQ is toxicity equivalency quotient which is a sum of all the ratios as an indicator of overall probable adverse effect from all contaminants.
Ratings are calculated as follows: low if the ratio sum (TEQ) is < 1; moderate if it is 1 with no individual ratios greater than 0.75 and high if an individual ratio is 0.75.
Some samples are not collected at discharge to marine, therefore marine guidelines are not applicable but used for screening purposes, see Table 4 for freshwater comparisons.

Table 3 Summary of Contaminant Ratings for Environmental Concern

Discharge # (Location)	Figure #	Jurisdiction	Contaminant Ratings						Comments & Recommendations
			2018	2019	2020	2021	2022	2023	
405 (Island View Beach)	4	Central Saanich	Low	Low	-	-	-	-	Resample in 2024 to monitor for change.
407 (Saanichton Bay)	5	Tsawout First Nation	-	-	-	-	Low	-	Rated low in 2005, 2011 and 2017. Resample in 2027 to monitor for change.
409C (Saanichton Bay)	6	Tsawout First Nation	Low	Low	-	-	-	-	Resample in 2024 to monitor for change.
410 (Saanichton Bay)	6	Tsawout First Nation	-	Low	-	-	-	-	Elevated lead in 2012. Resample in 2025.
411A (Saanichton Bay)	6	Tsawout First Nation	-	-	-	Low	-	-	Rated low in 2011 and 2016. Rated moderate in 2008. Resample in 2026 to confirm rating.
412 (Tetayut Creek)	7	Tsawout First Nation	-	Low	-	Low	-	-	Low at discharge but elevated levels upstream. Resample discharge in 2024 to monitor for change.
416 (Foot of Ferguson Rd)	7	Central Saanich	Low	Low	-	-	-	-	Rated low in 1999, 2000 2011. Resample in 2024 to monitor for change.
435 (Bazan Bay)	10	North Saanich	Low	-	-	-	-	-	High upstream near highway but low at discharge and in marine. Resample in 2024 to monitor for change.
441 (Reay Creek)	10	North Saanich	-	-	Moderate	Moderate	-	-	Remedial action undertaken, continue monitoring.
445 (Foot of Frost Ave.)	11	Sidney	-	-	NR	-	-	-	Rated high yearly (2002 to 2007) due to zinc. U/S: 445-2 high in 2007 due to mercury PAHs. No sediment available since 2009. Elevated copper and zinc in water.
449 (Tulista Park)	11	Sidney	Low	Moderate	Low *	-	-	-	Tidally influenced at discharge. Sample 449-2D for rating. * n low in sediment, but copper and zinc elevated in one water sample. Resample in 2025.
450 (Foot of Ocean Ave.)	11	Sidney	-	-	-	-	-	-	Rated moderate in 2005 and 2007 due to cumulative contaminants. Rated low in 2011, 2012 and 2017. Resample in 2024 to monitor for change.

Table 3, continued

Discharge # (Location)	Figure #	Jurisdiction	Contaminant Ratings						Comments & Recommendations
			2018	2019	2020	2021	2022	2023	
467 (Foot of Shoreacres)	12	Sidney	-	-	-	-	Low	-	Resample in 2027 to monitor for change.
3005 (Mermaid Canal)	13	Sidney	-	-	NR	-	-	Low	Rated high due to n PAH in past. Low in 2023. Sediment is challenging to find. Elevated metals in water but multiple sources. **Action Required** (higher priority). Continue source investigations with water.
3006 (Roberts Bay)	13	Sidney	-	-	-	-	Low	-	Resample in 2027 to monitor for change.
3016 (All Bay)	14	Sidney	Moderate	-	-	Moderate	-	-	Rated moderate due to Cu and n CCME ISQG Upstream arsenic concentrations lower. Sidney flushed line in fall 2015. Resample in 2024.
3021 (Tsehum Harbour)	15	North Saanich	**High**	Moderate	**High**	Moderate	Low	Low	2020: elevated Hg and Pb in sediment; no exceedances in water. Confirm rating.
3077 (Deep Cove)	23	North Saanich	-	-	NR	High in water	-	High in water	In 2020, Cu and n 10X above BC ENV marine guidelines. Pipe buried; elevated aqueous Al, Cr, Cu, n in 2023. Start investigations.
3079 (Tatlow Creek)	23	North Saanich	Low	-	-	-	-	Low	Rated low in 2018 and 2079. Resample in 2028 to monitor for change.
3080A (Benes Creek)	24	North Saanich	Low	-	-	-	-	-	Rated high in 2015 due to mercury; possible lab error. Resample in 2024 to monitor for change.
3090 (Patricia Bay)	26	Tseycum First Nation	Low	Low	-	-	-	-	Rated low in 2001, 2005 2010. Resample in 2024 to monitor for change.
3095 (Tseycum Creek)	27	Tseycum First Nation	Low	-	-	-	-	Low	Rated low in previous years. Resample in 2028 to monitor for change.
3104 (T n T n Creek)	28	North Saanich	Moderate High u/s	Low High u/s	-	Low	-	-	n and Cu above the PEL at Willingdon Road but low at discharge. Transport Canada remediated gross contaminants. Confirm rating.
3118 (Coles Bay)	31	North Saanich	-	-	Low	-	-	-	Rated low in 2001, 2005 2011. Rated moderate in 2006 and 2008 2012. Resample in 2025.
3119 (Coles Bay)	31	North Saanich	Low	-	-	-	-	Low	Rated low in 1998, 2004 2011. Rated high in 2015 due to mercury; possible lab error. Resample in 2028 to monitor for change.

Table 3, continued

Discharge # (Location)	Figure #	Jurisdiction	Contaminant Ratings						Comments & Recommendations
			2018	2019	2020	2021	2022	2023	
3120 (Coles Bay)	31	North Saanich	-	-	-	Low	-	-	Rated low in 1999, 2006, 2011 and 2016. Resample in 2026 to monitor for change.
3122 (Coles Bay)	31	Pauquachin First Nation	Low	Low	-	-	-	-	Rated low in past. Rated high in 2015 due to Hg and in 2017 due to Ca. Resample in 2024.
3124 (Coles Bay)	31	Pauquachin First Nation	Low	-	-	-	-	-	Rated low in 2001 2005. Resample in 2023 to monitor for change.
3133 (Hagan Creek)	35	Tsartlip First Nation	Low to High U/S	Low but High U/S	Low	-	-	High in water u/s	Rated low at point of discharge. Elevated As, Ca, Cr, Cu, Pb and n upstream. Resample discharge in 2025. Continue investigations around Keating Industrial Park.
3135 (South of Hagan Bight)	35	Tsartlip First Nation	-	-	Moderate	Moderate	-	-	Copper and zinc elevated above CCME PEL. U/S: stations were rated low. Resample in 2026.
3136A (Stream, south of Hagan Bight)	35	Tsartlip First Nation	-	Low	Low	-	-	-	No exceedances of guidelines in 2015. Rated high in 2014 due to zinc. Resample in 2025.
3136B (North of Tsartlip boat launch)	35	Tsartlip First Nation	-	-	Low	-	-	-	Rated low in 2002 2008. Resample in 2025.
3138 (Brentwood Bay, north of boat ramp)	36	Tsartlip First Nation	**High**	Low	Low	-	-	-	Rated high between 2004-2013 due to zinc. Tsartlip replaced pipes. Resample in 2025.
3146 (Brentwood Drive)	36	Central Saanich	-	Low	-	-	-	-	Rated low in 2006, 2007. Resample in 2024.
3148 (Brentwood Bay)	36	Central Saanich	Low	-	-	-	-	Low	Rated low in 2005, 2010, 2011 and 2018. Resample in 2023 to monitor for change.
3153 (Brentwood Bay)	37	Central Saanich	-	-	-	-	-	-	Elevated levels of n but rated moderate because the sediment is pumped out. U/S: in 2008 2009, station 3153-1 rated low. Remedial action undertaken, confirm sediment is still being removed.
3154 (Tod Creek)	43	Central Saanich	-	-	Low	-	**High**	Moderate	Elevated mercury in 2022. Sampled three times in 2023 and mercury not elevated. As, Pb, n elevated above CCME ISQG at mouth. Confirm rating.

See Table Notes next page.

Table 3, continued

Notes:

POD Point of discharge; U/S upstream

CCME Canadian Council of Ministers of the Environment

ISQG Interim Sediment Quality Guidelines

Table 4 2023 – Freshwater Sediment Contaminant Concentrations

Station ID	Station Name	Sample Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH	Sample Comments
	Freshwater Sediment Quality Guidelines	CCME ISQG	5.9	0.6	37.3	35.7	35	0.17	0.5	123	0.1	0.1	
		CCME PEL	17	3.5	90	197	91	0.486	-	315			
		Vancouver Island Background	4	0.95	65	100	40	0.15	1	150	-	-	
SW0407	SA-SU Rd. east corner of Saanichton Bay	2022-12-12	4.05	0.104	26.9	27.3	5.99	<0.05	<0.05	43.7	0.03	0.012	medium brown fines, marine influence
SW3021	Near corner of McDonald Park Rd., Bayfield Rd.	2022-12-08	3.54	0.177	20.7	22.5	43.1	*0.161*	0.14	97.5	0.17	0.027	medium grey sand and fines
SW3079	Beach access at foot of Tatlow Road, Tatlow Creek	2023-07-07	2.53	0.099	21.5	22.5	3.71	<0.05	<0.05	65.8	0.034	0.0035	medium grey sand and fines
SW3095	Tseycum Creek 10 m north of 1036 West Saanich Rd.	2023-04-14	8.6	0.078	*42*	*41.7*	8.49	0.094	0.053	88.6	0.012	0.0071	medium brown fines and gravel
SW3154	Tod Creek, south of Butchart Gardens in Tod inlet	2022-12-08	8.12	0.233	24.6	*51.1*	92.5	1.15	0.065	169	0.0048	0.0013	medium grey sand and brown fines
SW3154	Tod Creek, south of Butchart Gardens in Tod inlet	2023-02-22	6.9	0.291	28.8	35.3	40.2	<0.05	0.063	170	0.056	0.026	sand, gravel, fine; 100 m from discharge
SW3154	Tod Creek, south of Butchart Gardens in Tod inlet	2023-02-22	8.51	0.287	28.5	35.2	33.1	0.08	0.059	181	-	-	coarse sand, gravel, at discharge
SW3154	Tod Creek, south of Butchart Gardens in Tod inlet	2023-02-22	7.85	0.196	26.7	34.2	34	<0.05	<0.05	*143*	-	-	sand, gravel; 10 m from discharge

Notes
Concentrations are in mg/kg dry weight.
LPAH and HPAH are low and high molecular weight polycyclic aromatic hydrocarbons, respectively.
CCME Canadian Council of Ministers of the Environment.
ISQG Interim sediment quality guideline; concentrations above this level but below the PEL will occasionally result in adverse effects to aquatic life.
PEL Probable effects level; concentrations above this level will frequently result in adverse effects to aquatic life.
Vancouver Island background concentrations in soil are regional estimates (95th percentiles) from BC MOE; https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/protocol_4.pdf

XX	Italicized values are those that exceed a guideline but are below the Vancouver Island background concentration
XX	Value is greater than or equal to the CCME ISQG.
XX	Value is greater than or equal to the CCME PEL.
XX	Value it greater than or equal to CRD MSQG and adverse effects to aquatic life are likely to occur.

APPENDIX F

2023 WATERCOURSE MONITORING DATA

Table 1. Saanich Peninsula Streams Data

Station ID	Station Name	Sample Date	Specific Conductivity	Oxygen	E. Coli	Flow Rate	Hardness (CaCO3)	Nitrite	Nitrate	Ortho-phosphorus	Phosphorus	pH	Temperature	Turbidity
			-	DIS	TOT	-	TOT	DIS	DIS	DIS	TOT	-	-	-
			µS/cm	mg/L	CFU/100 mL	L/min	mg/L	mg/L	mg/L	µg/L	µg/L	pH	°C	NTU
BC Water Quality Guideline for Freshwater Aquatic Life		maximum	-	5*	400	-	-	0.06	32.8	-	10	6.5 - 9	-	9
		average	-	8*	200	-	-	0.02	3	-	5		17	3
SW0412	Tetayut Creek, at Mure Brook	2021-01-26	165.7	11.6	100000	>1000			1	*156*		7.69	5	14.5
		2021-02-01	192.4	11.51	400	>2000			1	*104*		7.64	6.4	73.9
		2021-07-16	279.3	9.22	890	>500			0.7	*59*		7.81	14.8	8.77
		2021-08-10	345.8	8.54	96	>250	132	<0.005	1.02			7.77	16	6.75
		2021-08-17	428.6	*7.82*	210	>250	134	<0.005	0.954		50	7.68	15.1	7.91
		2021-08-24	341.9	9.09	230	>300	131	<0.005	1.28			7.71	13.5	6.23
		2021-08-31	340.8	8.33	550	>300	126	<0.005	1.27			7.74	13.4	6.28
		2021-09-07	330.1	*7.94*	64	>300	119	<0.005	1.3			7.7	13.3	6.63
		2021-10-12	340.5	9.69	170	>600	123	<0.005	1.28		65.4	7.43	7.9	6.56
		2021-10-20	346.4	10.14	270	>2000	126	0.005	1.41		97	7.68	10	14.6
		2021-10-26	685.3	8.68	380	>3200	213	0.0145	3.6		104	7.66	10.6	18.9
		2021-11-03	294.3	10.71	150	>3500	107	*0.0289*	5.88		127	7.49	10	23.5
		2021-11-09	812	10.64	900	>3600	134	*0.0221*	4.31		142	7.08	8.4	56.7
		2022-03-11	291.4	12.54	23	>2000			1	*65*		7.35	5.8	7.67
		2022-07-27	351.6	8.65	280	>250			2.2	*98*		7.21	*17*	8.56
		2023-03-29	299.5	11.52	160000	>1200	91.9		1.1	*225*		7.63	7.1	7.26
		2023-04-11	274.3	11.11	19000	>1000	89.3		1	*235*		7.63	8.9	8.31
		2023-09-25	320	9.7	650	>500			0.9	*85*		7.77	12.7	*4.39*
		2024-02-29	193.4	12.44	800	>5000	60.2		1.7	*33*		7.37	6.9	37.1
		2024-05-10	364.2	9.03	47	>500	126		0.8	*59*		7.7	12	*4.21*
SW0412-2B	Tetayut Creek, 2230 Cooperidge Dr.	2021-07-16			80	30								
		2021-10-12	273.1	9.73	33	40	60.9	0.005	0.391		79.2	7.36	7.7	*3.65*
		2021-10-20	134	9.46	1600	>250	48.2	0.0099	0.372		170	7.15	10.7	108
		2021-10-26	247.1	8.01	270	>300	67.4	0.005	0.857		123	7.12	10.8	17.2
		2021-11-03	169.7	10.16	150	>450	68.3	0.051	1.73		94.7	7.47	9.2	11.6
		2021-11-09	193.8	10.89	25	>450	63.3	0.0452	2.31		85.9	7.43	8.3	18.7
SW0412-2C	Tetayut Creek, d/s of E. Saanich Rd.	2021-08-17	326.5	9.54	72	200	128	0.005	2.87		11	7.51	12.4	1.88
		2021-08-24	333.6	10.09	40	200	132	0.005	2.87			7.59	12.4	1.86
		2021-08-31	335.2	9.07	130	250	128	0.005	2.92			7.54	11.7	1.81
		2021-09-07	328.7	8.83	22	220	118	0.005	2.27			7.56	12.7	1.73
		2021-10-12	317.3	9.33	20	>350	119	0.005	2.39		44.2	7.4	9.2	*3.93*
		2021-10-20	294.3	10.51	72	>1000	105	0.0131	1.38		138	7.32	10.3	41.5
		2021-10-26	260.9	9	320	>1200	88.3	0.0082	1.69		79.1	7.27	10.7	14.2
		2021-11-03	214.7	11.18	90	>1500	76.6	*0.0294*	2.33		83.8	7.44	9.8	13.1

Table 1, continued

Station ID	Station Name	Sample Date	Specific Conductivity	Oxygen	E. Coli	Flow Rate	Hardness (CaCO3)	Nitrite	Nitrate	Ortho-phosphorus	Phosphorus	pH	Temperature	Turbidity
			-	DIS	TOT	-	TOT	DIS	DIS	DIS	TOT	-	-	-
			µS/cm	mg/L	CFU/100 mL	L/min	mg/L	mg/L	mg/L	µg/L	µg/L	pH	°C	NTU
BC Water Quality Guideline for Freshwater Aquatic Life		maximum	-	5*	400	-	-	0.06	32.8	-	10	6.5 - 9	-	9
		average	-	8*	200	-	-	0.02	3	-	5		17	3
		2021-11-09	200.4	11.27	38	>2000	69.3	*0.0278*	2.34		86.3	7.29	8.6	21.7
SW0412-2D	Tetayut Creek (at Kennel Brook)	2024-05-10	326.7	9.62	34	>250	116		0.8	*42*		7.82	11.6	*3.82*
SW0412-3	Tetayut Creek, SW of Keating X Rd. & C. Saanich Rd.	2021-07-16			12	18								
SW0412-7	Kennel Brook	2024-05-10	488.7	*7.78*	54	35	181		0.9	*121*		7.77	12.8	*3.06*
SW0441	Reay Creek; 9265 Lochside	2021-02-02	186.8	11.25	450	>2000			0.8	*26*		7.54	6.8	53
		2021-07-19			600	85	343							
		2022-03-11	706.1	11.56	6	>800	163		0.9	*39*		7.48	7.3	*4.69*
		2022-05-18	557.3	10.05	86	>500			0.8	*42*		7.25	12.5	11.1
		2022-07-07	552.7	8.46	300	80			0.7	*42*		7.23	16.4	*6.68*
		2022-08-12	184.7	9.9	5500	>250	955	0.0096	0.632			7.4	15.9	*5.51*
		2022-08-18	2995	8.06	800	>200	375	0.0109	0.755			7	*17.8*	*6.15*
		2022-08-25	4631	8.61	690	>200	564	0.0138	0.609			7.1	*17.3*	13.2
		2022-09-01	2022	*7.97*	240	>200	332	0.0109	0.761		109	7.1	*18.7*	*5.63*
		2022-09-08	278.4	9.02	140	>250	465	0.0107	0.719			7.2	16.6	*4.74*
		2022-10-25	3532	10.31	380	>300	405	0.011	0.993			7.2	10.5	*6.95*
		2022-10-25	3532	10.31	470	>300	405	0.0112	1			7.2	10.5	*6.95*
		2022-11-03	309.7	9.15	96	800	104	0.005	0.969		63.6	7.2	8.8	*4.12*
		2022-11-08	1994	8.31	130	>800	344	0.0066	0.82		62.3	7.2	7.5	*4.69*
		2022-11-17	2238	11.4	78	>600	359	0.0082	0.978		70.7	7.3	5.2	8.11
		2022-11-24			330		69.9	0.002	0.8		55.2			
		2023-03-29	3221	11.4	10	>300	390		0.8	*20*		7.68	9.8	*5.74*
		2023-07-05	6900	3.24	64	>250	828		0.9	*111*		7.81	*20.5*	*5.46*
		2024-04-30	751.6	9.88	23	>500	259		0.8	*39*		7.61	10.1	7.26
SW3095	Tseycum Creek 10 m north of 1036 W. Saanich Rd	2022-04-08	459.4	10.91	53	70				*124*		7.23	9.7	15.2
		2022-07-27	716	2.2	5100	12			0.3	*>815*		7.2	*18.5*	19.1
		2023-04-14	310.3	11.1	200	85	215		0.9	*98*		7.65	9.6	9.2
		2023-09-25	746.3	4.3	4000	11			0.8	*329*		7.37	13.1	59.4
		2023-11-29			11000	200								
SW3104	TENTEN Creek, north end of seaplane base	2022-04-19	262.5	10.39	7	>180	93.5		1	*72*		7.19	8.2	9.83

Table 1, continued

Station ID	Station Name	Sample Date	Specific Conductivity	Oxygen	E. Coli	Flow Rate	Hardness (CaCO3)	Nitrite	Nitrate	Ortho-phosphorus	Phosphorus	pH	Temperature	Turbidity
			-	DIS	TOT	-	TOT	DIS	DIS	DIS	TOT	-	-	-
			µS/cm	mg/L	CFU/100 mL	L/min	mg/L	mg/L	mg/L	µg/L	µg/L	pH	°C	NTU
BC Water Quality Guideline for Freshwater Aquatic Life		maximum	-	5*	400	-	-	0.06	32.8	-	10	6.5 - 9	-	9
		average	-	8*	200	-	-	0.02	3	-	5		17	3
		2022-08-18	307.5	*6.12*	400	65	219		3.8	*818*		7.2	15.9	*6.56*
		2023-05-08	425.5	10.25	68	>80	164		2.2	*215*		7.76	12.8	*4.09*
		2023-07-05	2195	9.01	250	40	377		3.9	*>815*		7.8	15.4	11.6
SW3133	Hagan Creek, south side of Woodwyn Farm	2022-04-08	209.6	11.34	27	>2000	78.1		0.8	*36*		7.25	11.1	11.5
		2022-08-18	293.3	*6.02*	20	>500	117		1.3	*59*		6.7	16.9	2.44
		2023-04-19	215.4	11.57	50	>2000	94.6		0.9	*33*		7.64	8.6	6.33
		2023-06-22	264.7	8.26	62	>1000			1.2	*46*		7.54	15	*3.56*
SW3133-2	Hagan Creek, ditch from Kirkpatrick Cres.	2022-08-29			150000	12								
		2022-09-13			160000	8								
		2022-09-13			230000	12								
		2023-10-20			2100	12	92.6							
SW3154	Tod Creek	2022-04-07	154.4	11.52	18	>4000	61.8		0.8	*42*		7.15	9.4	*6.66*
		2022-07-28			120	>250								
		2023-02-22	168.5	12.01	6	>5000	67.2		0.7	*29*		7.87	4	2.64
		2023-09-27	345.6	10.35	110	400			1.1	*82*		7.91	12.5	*3.24*

Notes:
DIS dissolved state; TOT total state.
BC water quality average guidelines are based on the average of 5 weekly samples in 30 days, except for temperature, which is weekly average based on daily measurements at minimum.

* Guidelines are minimum values.
XX Value exceeds a water quality guideline.
XX Value may exceed a water quality guideline; further investigation needed.
Max: 9 NTU (8 NTU above ambient levels in the upper Sooke River watershed) at any time during clear flow periods, and average 3 NTU (2 NTU above ambient levels during clear flow periods).

APPENDIX G

CRD PUBLIC HEALTH AND ENVIRONMENTAL CONCERN RATING SYSTEM

1.0 STORMWATER DISCHARGE RATING SYSTEM

The Capital Regional District (CRD) evaluates stormwater discharges for public health and environmental concerns using a rating system for stormwater discharges developed by the CRD titled *Stormwater Discharge Rating System for the Capital Regional District* (Drinnan, 1997). As part of the rating system, the following study was used to determine levels of public use, coastline habitat sensitivity and flushing characteristics of the marine receiving waters:

- *An Evaluation of the Coastline Sensitivity Associated with Stormwater Discharges on the Saanich Peninsula (Drinnan, 1997)*

Public shoreline use ratings indicate the potential for public contact with stormwater. These ratings were officially updated in 2010, however, shoreline use is updated for individual discharges as they are assessed each year.

The rating of discharges allows the jurisdictions involved to better manage limited funds and undertake remedial measures where necessary. A copy of the rating system and the coastline sensitivity evaluations are available upon request from the CRD. A brief explanation of the stormwater discharge rating system follows.

1.1 Public Health Concern

CRD staff rate each discharge as a high, moderate or low level of concern for public health based on the level of bacterial contamination in the stormwater and the potential for human contact. The parameters used to assess the level of concern for public health are:

- Escherichia coli (*E. coli*) concentrations in the stormwater discharge
- discharge flow rate
- location of the discharge (e.g., below high-water line)
- public use of the shoreline (uses such as swimming, fishing, or kayaking)

The level of contamination is used to assign a bacterial rating. Public shoreline use ratings are used to indicate the potential for public contact with stormwater and depends on the type of activities carried out on the shoreline. Table 1 shows criteria for the bacterial and public shoreline use ratings.

Table 1 Fecal Coliform and Public Shoreline Use Rating Criteria

Rating	Bacterial Rating Criteria	Rating	Public Shoreline Use Rating Criteria
1	No flow measured or *E. coli* count consistently under 200 CFU/100 mL	1	Low contact (e.g., inaccessible, beach walking)
2	*E. coli* count between 200 and 5,000 CFU/100 mL	2	Secondary contact (e.g., kayaking)
3	*E. coli* count greater than 5,000 CFU/100 mL	3	Primary contact (e.g., swimming, scuba diving)

Note: *E. coli* counts above 200 CFU/100 mL (on average) indicate the potential to cause adverse public health effects from primary recreational activities such as swimming or diving.

1.2 Environmental Concern

Environmental concerns are based on a contaminant rating of discharge sediments. The contaminant rating is determined by comparing the sediment concentration of each of eight metals and two groups of organic contaminants (Cn) with the CRD Marine Sediment Quality Guidelines (MSQG) to obtain a ratio (Cn/MSQG). To account for potential additive effects, these ratios are summed to calculate the toxic equivalent unit (TEU). Table 2 provides the criteria for determining the contaminant rating.

Table 2 Criteria for Determining the Contaminant Rating

Contaminant Rating	Criteria for Determining the Contaminant Rating
Low	Sum of the individual ratios of Cn/MSQG (TEU) is less than 1.0
Moderate	Sum of the individual ratios of Cn/MSQG (TEU) is greater than or equal to 1.0, but no individual parameter exceeds, or is equal to, a value of 0.75
High	The ratio Cn/MSQG is greater than, or equal to, 0.75 for any single parameter

Discharges evaluated are located near environmentally sensitive areas, in creeks or near heavily settled areas where there is an increased probability of pollution. All discharges sampled for environmental concern are sampled for at least two years to confirm the contaminant concentrations and contaminant(s) of concern. Only a small number of discharges can be sampled each year due to budgetary constraints; therefore, each discharge selected for sampling can only be sampled once per year.

Discharges with a confirmed high contaminant rating are investigated to determine the source(s) of contamination. The priority in which high-rated discharges are investigated and problems mitigated is determined by calculating a habitat rating (high, moderate or low). The habitat rating is based on the habitat sensitivity, discharge flow and marine flushing characteristics. The following briefly describes the rating criteria for the habitat rating.

Table 3 Criteria for Determining Ratings for Habitat Sensitivity, Discharge Flow and Marine Flushing

Habitat Sensitivity Rating		Discharge Flow Rating		Marine Flushing Ratings	
Rating	Criteria	Rating	Criteria	Rating	Criteria
1	Low productivity; less diverse habitats	0.5	Less than 50 L/minute	0.5	Open shoreline; high flushing
2	Moderate productivity; diverse habitats	1	Between 50 to 500 L/minute	1	Partially enclosed area; moderate flushing
3	High productivity or endangered or protected habitats	1.5	Greater than 500 L/minute	1.5	Enclosed area; poor flushing

These three ratings (habitat sensitivity, discharge flow and marine flushing) are summed to determine a habitat rating as shown in Table 4. The habitat rating assigned to each discharge will allow limited resources to be spent in a prioritized manner.

Table 4 Criteria for Establishing the Habitat Rating

Habitat Rating and Mitigative Priority	Sum of Criteria (Habitat + Flow + Flushing)
Low	2.0-3.0
Moderate	3.5-4.5
High	5.0-6.0

OTHER CONCERNS

There are a number of other concerns that have been jointly reviewed and discussed by staff from the CRD and the other jurisdictions involved. This review and discussion assists in setting priorities for remediation of discharges with a high level of concern for public health and the environment. These include:

- the cost of remediation
- the likelihood that remediation will be successful
- compatibility with the priorities of the jurisdictions
- public interest