Making a difference...together

SAANICH PENINSULA WASTEWATER COMMISSION
Notice of Meeting on **Thursday, July 18, 2024 at 9:30 am**
Meeting Room 2, Sidney Community Safety Building, 2245 Oakville Ave., Sidney, BC

For members of the **public who wish to listen to the meeting** via telephone please call **1-833-353-8610** and enter the **Participant Code 1911461 followed by #.** You will not be heard in the meeting room but will be able to listen to the proceedings.

D. Kelbert (Chair)
M. Doehnel (Vice Chair)
S. Duncan
D. Halldorson
P. Jones
Z. King
C. McNeil-Smith
C. Pinches
S. Shrivastava
R. Windsor

AGENDA

1. **TERRITORIAL ACKNOWLEDGEMENT**

2. **APPROVAL OF AGENDA**

3. **ADOPTION OF MINUTES** 3

   ***Recommendation**: That the minutes of the May 16, 2024 meeting be adopted.*

4. **CHAIR'S REMARKS**

5. **PRESENTATIONS/DELEGATIONS**

   Delegations will have the option to participate electronically. Please complete the online application for "Addressing the Board" on our website and staff will respond with details.

   Alternatively, you may email your comments on an agenda item to the Saanich Peninsula Wastewater Commission at iwsadministration@crd.bc.ca. Requests must be received no later than 4:30 p.m. two calendar days prior to the meeting.

6. **GENERAL MANAGER'S REPORT**

7. **COMMISSION BUSINESS**

   7.1. Septage Reception at Saanich Peninsula Wastewater Treatment Plant.....6

   ***Recommendation:** The Saanich Peninsula Wastewater Commission recommends to the Capital Regional District Board:*
   That the Saanich Peninsula Wastewater Commission continues to support the existing private model for delivery of septage treatment services.

To ensure quorum, advise IWSAdministration@crd.bc.ca if you cannot attend.

7.2. Saanich Peninsula Liquid Waste Management Plan – Programs Summary and Update .....

There is no recommendation. This report is for information only.

7.3. Saanich Peninsula Inflow & Infiltration Update 22

There is no recommendation. This report is for information only.

7.4. Saanich Peninsula Wastewater Service 2024 Mid-Year Capital Projects and Operations Update 87

There is no recommendation. This report is for information only.

8. NOTICE(S) OF MOTION

9. NEW BUSINESS

10. CORRESPONDENCE

10.1. Correspondence [Sent]: To District of North Saanich: CRD Bylaw 4596 (Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024) 91

There is no recommendation. The correspondence is for information only.

11. ADJOURNMENT

Next Meeting: Thursday, September 26, 2024

MINUTES OF A MEETING OF THE Saanich Peninsula Wastewater Commission, held Thursday, May 16, 2024 at 9:30 am, Meeting Room, Sidney Community Safety Building (Fire Hall), 2245 Oakville Ave, Sidney BC

PRESENT: **Commissioners:** D. Kelbert (Chair); M. Doehnel (Vice Chair); S. Duncan; D. Halldorson; C. McNeil-Smith; S. Shrivastava (EP); R. Windsor (EP)
Staff: A. Fraser, General Manager, Integrated Water Services; J. Marr, Senior Manager, Infrastructure Engineering; J. Dales, Senior Manager, Wastewater Infrastructure Operations; P. Kickham; M. Cowley; D. Dionne, Administrative Coordinator, Integrated Water Services (Recorder); M. Risvold, Administrative and Committee Clerk, Integrated Water Services
REGRETS: P. Jones; Z. King; C. Pinches

EP = Electronic Participation

The meeting was called to order at 9:32 am.

1. TERRITORIAL ACKNOWLEDGEMENT

The Chair provided the Territorial Acknowledgement.

2. APPROVAL OF AGENDA

MOVED by Commissioner McNeil-Smith, **SECONDED** by Commissioner Halldorson,
That the agenda be approved.

CARRIED

3. ADOPTION OF MINUTES

MOVED by Commissioner Halldorson, **SECONDED** by Commissioner McNeil-Smith,
That the minutes of the March 21, 2024 Saanich Peninsula Wastewater Commission meeting be adopted.

CARRIED

4. CHAIR'S REMARKS

The Chair thanked everyone for their participation and dedication and reminded everyone to be mindful of the amount of work done in the background.

5. PRESENTATIONS/DELEGATIONS

There were no presentations or delegations.

6. GENERAL MANAGER'S REPORT

A. Fraser introduced staff in the room.

- Peter Kickham who will be attending regularly on Glenn Harris' behalf and will be providing an update on the Biosolids plan today.
- Malcolm Cowley who works directly with the wastewater system and is here in support of the Treatment Plant Capacity report on the agenda.

She advised that the response to the Commission's request to review moving Saanich Peninsula septage to the treatment plant will be coming to the next commission meeting.

7. COMMISSION BUSINESS

7.1. Saanich Peninsula Wastewater Treatment Plant Capacity Update

J. Marr introduced the staff report.

Discussion ensued and staff responded to questions from the Commission regarding:

- Airport Authority peak flow and whether there are plans to reduce on their end.
- Inflow and Infiltration (I&I) versus sewage flow - can we determine what that factor would be.
- Individual municipalities I&I.

Staff advised that these questions can be addressed in the I&I staff report scheduled to be presented to the Commission in July.

This item was received for information.

7.2. Saanich Peninsula Wastewater Asset Management Update

J. Marr introduced the staff report.

Discussion ensued and staff responded to questions from the Commission and the following further details were noted:

- The next update of the Asset Management Plan would be 2027, updated every five years with the last one completed in 2022.
- Turgoose Pump Station upgrades completion were prior to 2021.

This item was received for information.

7.3. Biosolids Plan Update [Verbal]

P. Kickham provided a verbal update noting the following:

- Short-term beneficial use was incineration at Lafarge in Richmond, BC with a contingency plan of using as engineered cover systems at Hartland Landfill.
- Due to longer than expected periods when Lafarge was not able to receive biosolids in 2022 and 2023, the majority were landfilled at Hartland.
- The province requires the long-term biosolids management plan to be submitted by June 18, 2024 and implemented by January 1, 2025.
- Public and First Nation engagement on all biosolids management options is required.
- A technical consultant was hired to prepare an options analysis and propose a draft long-term beneficial use strategy.
- A three-tiered long-term strategy was presented to the Capital Regional District (CRD) Board on May 8, 2024:
    - Tier 1 – sets the preferred option as advanced thermal (gasification of pyrolysis) treatment of biosolids. The CRD is currently procuring a 15-month

on-site pilot project to prove the technology prior to making a final decision on a long term advanced thermal facility.
    - Tier 2 – Out of region compliance options – Land application options out of region to ensure regulatory compliance while the Tier 1 option is being investigated and implemented.
    - Tier 3 – In region contingency options The CRD would implement Tier 3 options on a contingency basis, only when options within the Tier 2 portfolio are unavailable.
- Staff continue to explore biosolids beneficial use opportunities with any Frist Nation that express interest.
- Next steps are public comment period on the long-term strategy and to refer back to the Technical and Community Advisory Committee for review and comment.
- Staff will compile final comments for the CRD Board's June 12 meeting, for submission to the Province by June 18.

Discussion ensued and staff responded to questions from the Commission regarding:

- Potential risks related to public not having a full understanding of the actual risks involved and how to balance any misguided feedback.
- Clarification about the out of region options. The only out of region is mine-application. The Board's preference is industrial, forestry, composting, staff not to pursue agriculture.
- The biosolids are being mixed with sand and stockpiled the Cassidy site.
- The updates to the plan are posted on the website and are available for comment, this Commission, as an interested party, could provide comment.
- Staff are hoping that the Residuals Treatment Facility (RTF) can receive other municipal solid waste within the next couple of months.

8. NOTICE(S) OF MOTION

There were none.

9. NEW BUSINESS

There was no new business.

10. ADJOURNMENT

MOVED by Commissioner McNeil-Smith, **SECONDED** by Commissioner Halldorson,
That the May 16, 2024 meeting be adjourned at 10:13.

CARRIED

_____
CHAIR

_____
SECRETARY

Making a difference...together

EEP 24-42

REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION
MEETING OF THURSDAY, JULY 18, 2024

SUBJECT **Septage Diversion to the Saanich Peninsula Wastewater Treatment Plant**

ISSUE SUMMARY

To report back to the Commission on the implications of redirecting local Saanich Peninsula septic tank effluent to the Saanich Peninsula Wastewater Treatment Plant (SPWWTP) and to review the Commission's authority to mandate this.

BACKGROUND

Currently, all septic tank waste in the capital region is transported by private haulers as septage to a private treatment facility (Septage Processing Ltd. [SPL] in Langford, owned by GFL Environmental Inc. [GFL]). GFL is under contract (Septage Services Agreement - EPRO2021-002) with the Capital Regional District (CRD) to receive the region's septage from the private haulers, then treat materials to allow the liquid stream to be discharged to the CRD Core Area sewer system. Septage (also called trucked liquid waste) includes septic tank waste and other wastes that do not meet the sewer discharge requirements of CRD Bylaw No. 2922 (Sewer Use Bylaw), such as catch basin material, portable toilets, oil and grease interceptors, and high-strength business waste.

Residual solids generated in SPL's treatment process are transported to locations designed and authorized to manage wastewater residuals in accordance with provincial regulation, including GFL's composting facility in Chemainus. Currently, that facility is undergoing capital improvements and SPL residuals are deposited at Hartland Landfill under a Controlled Waste permit.

The Saanich Peninsula Wastewater Commission has received two previous staff reports discussing options for accepting septage at the Saanich Peninsula Wastewater Treatment Plant (SPWWTP). The reports of April 17, 2014 (Appendix A) and March 16, 2023 (Appendix B) were both received for information by the Commission. This report summarizes aspects of the previous reports, as well as covering the mandate and options for changes to the septage handling process on the Saanich Peninsula.

ALTERNATIVES

Alternative 1
The Saanich Peninsula Wastewater Commission recommends to the Capital Regional District Board:
That the Saanich Peninsula Wastewater Commission continue to support the existing private model for delivery of septage treatment services.

Alternative 2
The Saanich Peninsula Wastewater Commission recommends to the Capital Regional District Board:
That staff be directed to procure a consulting firm to undertake a Feasibility Review and Business Case Analysis to be funded from the Saanich Peninsula Liquid Waste Management Planning Operating Reserve.

Alternative 3
That this report be referred back to staff for additional information.

IMPLICATIONS

Operational Implications

The CRD has no authority to regulate what homeowners put into their private septic system. As such, they are not subject to our source control approach to liquid waste management. The CRD does have educational programming on best practices for protecting septic systems that mirrors source control best practices.

Septic tank pump out material is much more concentrated than municipal sewage (which is 98% water), as much of the water in on-site systems is dispersed through a drain field, leaving behind a high concentration of sludge and non-biodegradable materials in a septic tank for up to five years. Therefore, the pump out material is generally aged and anaerobic, with much higher levels of ammonia, total suspended solids and biochemical oxygen demand, which would require special handling if it were received at the SPWWTP.

Financial Implications

The costs of accepting residential septage at the SPWWTP would be determined through a Feasibility Review and Business Case Analysis. However, as indicated in Appendix A, significant capital investment would be required to support receiving septage at the SPWWTP, including at minimum:

- a receiving station inclusive of a concrete pad, screening, grit removal equipment and metering
- an equalization tank and mixers
- a new or upgraded odour control system
- various upgrades to the existing solids stream including larger tanks and dewatering equipment; and
- upgrades to the SPWWTP access road to accommodate two-way truck traffic

In addition to the capital investment, there would also be additional operation and maintenance costs that will need to be considered. Some of the additional costs include:

- increased polymer usage
- new staff positions
- additional tipping fees; and
- additional odor control media

The review and analysis would include consideration of offsetting a portion of these increased capital and operational costs by tipping fees charged to haulers. Tipping fee rate(s) would be determined during the review and analysis, and would consider market rates, as well as cost recovery of delivering this service.

Staff estimate the current cost for a consultant to undertake the analysis at $100,000-150,000, but the CRD would need to proceed with a procurement process to get a more accurate costing. Funding for the analysis would be drawn from the Saanich Peninsula Liquid Waste Management Planning Operating Reserve.

Legal Implications

CRD Bylaw No. 3427, Saanich Peninsula Liquid Waste Management Local Service Committee, Bylaw No. 1, 1997, states *…the Commission shall establish policies governing the provision and operation of the service....* CRD Bylaw No. 2827 (Septage Disposal Bylaw) sets out the requirement for the disposal of septage at a septage disposal facility (e.g., SPL or other facilities designated by bylaw amendment) and a prohibition for the discharge of septage waste via direct or indirect connection to a sewer or drain, except at a septage disposal facility. In addition, the quality criteria for discharge in Bylaw No. 2827 assumes septage is treated prior to discharge to the sewage system.

Staff procured a legal review of the current Septage Services Agreement, and diversion of Saanich Peninsula septage from SPL would not result in a breach of the agreement. Irrespective of the agreement terms, diversion of Saanich Peninsula septage away from SPL would represent a change in the longstanding delivery model for the trucked liquid waste service, and a significant loss of business for SPL. There is a risk of creating business uncertainty for the CRD's septage services contractor by removing waste streams from the historically projected volumes and signalling the CRD's willingness to change the business model further in the future.

Service Delivery Implications

More than 20 years ago, the CRD opted to pursue a private model for delivery of septage treatment and trucked liquid waste services. Since the inception of the service, the SPL facility has been accepting the required septage and trucked liquid waste from the entire capital region.

In recent years, GFL has invested significant resources into its facility and has worked closely with the CRD to modify and upgrade its treatment system to ensure compliance with the Sewer Use Bylaw. At the same time, GFL continues to deliver an essential component of the liquid waste service as a centralized service, benefiting the entire region. The CRD currently does not have authority to compel or mandate homeowners or septage haulers to transport septage to a certain location for processing. Similarly, the CRD has no regulatory authority to direct private haulers to use specific receiving stations based on the geographic location of their waste pickup.

Regulatory Implications

In the Septage Collection Plan approved in Amendment 2 of the Saanich Peninsula Liquid Waste Management Plan (SPLWMP), septage generated on the Saanich Peninsula will be processed at the private regional facility (SPL). Any changes to septage collection and treatment would require amendment of the SPLWMP.

Similarly, any changes to the treatment process at SPWWTP, including the addition of a septage receiving facility, would require an amendment to the Operating Certificate issued by the Ministry of Environment and Climate Change Strategy, and a corresponding amendment of the SPLWMP.

Climate Action Implications

The review and analysis outlined in Appendix A did not explicitly consider the impacts to greenhouse gas emissions and other climate impacts.

CONCLUSION

The Saanich Peninsula Wastewater Commission has asked staff to report on the implications of redirecting local Saanich Peninsula septic tank effluent to the Saanich Peninsula Wastewater Treatment Plant and to review the Commission's authority to mandate this. This would result in significant operational and financial impact to the Saanich Peninsula Wastewater service and cause potential issues for the existing regional private septage treatment business model in the capital region. Evaluation of capital upgrades and consideration of triple bottom line (with an emphasis on operational impacts, climate impacts and benefits) would require a modified Feasibility Review and Business Case Analysis based on the 2014 proposed scope, at an estimated cost of $100,000-$150,000. While the Commission can establish policies governing the provision and operation of a service, the CRD currently does not have authority to compel or mandate homeowners or septage haulers to transport septage to a certain location for processing.

RECOMMENDATION

The Saanich Peninsula Wastewater Commission recommends to the Capital Regional District Board:
That the Saanich Peninsula Wastewater Commission continues to support the existing private model for delivery of septage treatment services.

Submitted by:	Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection
Concurrence:	Luisa Jones, MBA, General Manager, Parks, Recreation & Environmental Services
Concurrence:	Alicia Fraser, P. Eng., General Manager, Integrated Water Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

ATTACHMENTS

Appendix A: Staff Report: Saanich Peninsula Wastewater Treatment Plant – Scope for Feasibility Review and Business Case Analysis of Receiving Septage (April 17, 2014)
Appendix B: Staff Report: Review of Septic Tank Disposal Options for Saanich Peninsula Residents (March 16, 2023)

Making a difference...together

Agenda Item #5
REPORT #SPWWC 2014 - 02

REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION
MEETING OF THURSDAY, APRIL 17, 2014

SUBJECT **SAANICH PENINSULA WASTEWATER TREATMENT PLANT – SCOPE FOR FEASIBILITY REVIEW AND BUSINESS CASE ANALYSIS OF RECEIVING SEPTAGE**

ISSUE

The Commission has requested a draft, high level Terms of Reference for a consultant to conduct a feasibility review and business case analysis for receiving septage at the Saanich Peninsula Wastewater Treatment Plant (SPWWTP).

BACKGROUND

Supplementary Letters Patent provide authority to the Capital Regional District (CRD) for disposal of septage. Currently, a private company, Septage Processing Limited (SPL) provides septage receiving, treatment and disposal services for the region under contract with the CRD at their facility in Langford. At SPL, the liquid waste receives primary treatment before the effluent is returned to the District of Langford sewer system, which then flows into the CRD Core Area sewer system. The residuals from SPL's treatment process are managed by SPL. The manner in which liquid waste is managed outside sewerage areas on the Saanich Peninsula is outlined in Section 4.4.4 of the Saanich Peninsula Liquid Waste Management Plan.

The total annual volumes of residential, commercial, institutional and industrial septage taken to SPL from Central Saanich, Sidney, North Saanich, and Salt Spring Island are shown in Table 1. It is assumed that any septage from the Tseycum and Pauqauchin First Nations would be included in the totals for North Saanich and Central Saanich, respectively.

Table 1: 2011 to 2013 Annual Septage Received at SPL

Stakeholder	2011 Septage (m3)	2012 Septage (m3)	2013 Septage (m3)
Central Saanich	705	780	731
Sidney	36	51	64
North Saanich	1,512	1,519	1,490
Salt Spring Island	3,845	3,465	4,447
Total	6,098	5,815	6,732

Note: Salt Spring Island is currently receiving on-island septage at an on-island transfer station. The septage is then being hauled to SPL for treatment and disposal.

When considering whether or not to receive septage at the SPWWTP, instead of sending it to SPL in Langford, the following are some of the issues that would need to be considered:

Wastewater Treatment Plant Capacity

The SPWWTP is currently operating at 50% capacity, with an actual 2012 flow of 9,323 m^3/day compared with a design capacity of 18,596 m^3/day. If the 2013 septage volume of 6,732 m^3 (18.4 m^3/day) is added to the SPWWTP, the remaining capacity is reduced by 0.2%. Therefore, plant capacity could accommodate additional septage volumes.

Governing Bylaws and Contracts

CRD Bylaw 2439, *Liquid Waste Management Saanich Peninsula Local Service Establishment Bylaw No. 1, 1996* - Currently, the service does not include the provision of septage receiving and treatment, and the participants' purchased capacity allocations only considered municipal collection system inputs. As well, an amendment to the CRD bylaw governing the Salt Spring Island liquid waste service would be required to allow septage to be trucked off-island if this was to be considered. SPL does not have exclusive rights to the region's septage; other facilities can enter into septage receiving, treatment and disposal service agreements with the CRD.

Infrastructure and Space Requirements for Receiving Septage

Currently, neither the configuration nor the infrastructure at the SPWWTP allows for septage receiving or pre-treatment. Construction of a septage receiving station would be required, and typically consists of a concrete pad, a screen, grit separation/removal, odour control, and equalization tanks. A location close to the headworks is preferred. The available space on the existing property is earmarked for future twinning of the plant to serve future population growth. The upgrades required for receiving septage are significant and may require the purchase of additional property.

SPWWTP Treatment Process

The SPWWTP is a conventional secondary aeration and clarification treatment plant and is designed to handle a suspended solids level of 200 mg/l, which corresponds to typical wastewater from domestic, commercial, institutional and light industry uses. The constituents of septage can be similar to domestic sewage, but are often stronger and more concentrated. For example, the level of suspended solids in septage is typically much higher than domestic sewage at 2,000-3,000 mg/l. Addition of septage could therefore, have a significant impact on the treatment process unless it is pre-treated or blended with wastewater through the use of equalization tanks. It may also be necessary to consider continuing to send higher strength commercial, institutional and industrial liquid wastes to SPL, which have a greater potential to upset the treatment process.

Odour Control

Odour issues are of concern with residential neighbours nearby. The existing treatment plant carbon filtration system would likely not be large enough for the increased loading that would be present if septage was added. A larger carbon filter would be required or, alternatively, a separate filter at another location.

Truck Traffic

The expected increase in truck traffic is between 2 to 6 septage truck trips per day if the SPWWTP is to accept septage. The existing narrow access road to the SPWWTP was not designed to handle this level of large truck traffic and does not readily accommodate two-way truck traffic safely. The plant access road would likely require upgrading to accommodate two-way truck traffic. In addition, the District of North Saanich may have concerns about increased truck traffic in the surrounding neighbourhood.

Tipping Fees

The current septage tipping fee at SPL is $0.27/ imperial gallon. To be a viable option economically to private septage haulers, the tipping fee at the SPWWTP would have to be in-line with the SPL tipping fee.

Carbon Footprint

Receiving and treating septage from the Saanich Peninsula at the SPWWTP allows for centralized treatment of 'locally' generated liquid wastes. Rather than hauling to Langford, the hauling distance would be greatly reduced, reducing the amount of diesel fuel consumed, resulting in lower emissions and CO2 releases.

Feasibility Review and Business Case Analysis

Before moving forward with the concept of receiving septage at the SPWWTP, the Commission directed staff to prepare a draft, high level terms of reference and cost estimate for a consultant to prepare a feasibility review and business case analysis. The draft terms of reference follow:

1. Considering the issues noted above as a guide, conduct a high level feasibility review of receiving septage at the SPWWTP.
2. Evaluation of the impacts of septage on the current treatment process, including changes to the treatment process, impacts on odour control, increased operating costs, and accelerated replacement of equipment.
3. Methods for re-allocating the purchased capacity at the SPWWTP with septage included.
4. Provide Class "D" cost estimates for design and construction of providing a septage receiving facility at the SPWWTP including the space to accommodate the works, changes to treatment process, and road improvements required.
5. Provide Class "D" cost estimates for administration, operation and maintenance costs for providing a septage receiving facility at the SPWWTP.
6. Based on the cost estimates above, estimate the life cycle cost of the upgrade and operation.
7. Evaluate method of cost recovery through tipping fees, and estimated return on investment. Provide a financial framework for funding capital and operating costs considering the context of the current service funding model.
8. Propose amendments to the existing CRD bylaws and agreements to capture and satisfy all requirements.
9. Prepare a triple bottom line evaluation to understand the economic, environmental and social implications of the concept.
10. Prepare recommendations for the Commission's consideration.

The cost for a consultant to undertake a comprehensive analysis based on the above-noted scope is estimated at $60,000.

ALTERNATIVES

1. That the Saanich Peninsula Wastewater Commission (SPWWC) direct staff to amend the 2014 capital plan to include a SPWWTP Septage Receiving and Treatment – Feasibility Review and Business Case Analysis project, with a budget of $60,000 funded from the capital reserve fund, and prepare a Request for Proposals to retain a consultant to undertake this work.

2. That the Saanich Peninsula Wastewater Commission receive the staff report for information.

IMPLICATIONS

Alternative 1 – In order to receive septage at the SPWWTP, there are many issues to be addressed including those identified above. Some of the issues have significant financial and social implications, which may affect the business case for moving the concept forward. A feasibility review and business case analysis will allow the Commission to determine if there is merit in proceeding further with the concept.

Alternative 2 – Should this alternative be chosen, no further action will be taken at this time.

CONCLUSION

In order to receive septage at the SPWWTP, the technical, economic, social and environmental impact of doing so must be evaluated. Prior to proceeding further with this concept, the Commission would need to consider the feasibility and business case for receiving septage at the SPWWTP rather than utilizing the current regional service provider.

RECOMMENDATION

That the Saanich Peninsula Wastewater Commission receive the staff report for information.

Craig Gottfred, P.Eng.
Manager, Regional Wastewater
Integrated Water Services

Tim Tanton, MPA, P.Eng.
Senior Manager, Infrastructure Engineering
Integrated Water Services
Concurrence

Ted Robbins, BSc, CTech
General Manager, Integrated Water Services
Concurrence

CG:rw:mm

REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION
MEETING OF THURSDAY, MARCH 16, 2023

SUBJECT **Review of Septic Tank Disposal Options for Saanich Peninsula Residents**

ISSUE SUMMARY

The Saanich Peninsula Wastewater Commission (SPWWC) directed staff to investigate the feasibility of delivering septic tank waste from Saanich Peninsula residents directly to the Saanich Peninsula Wastewater Treatment Plant (SPWWTP).

BACKGROUND

Septic tank waste is the liquid and solid material pumped from a septic tank. The waste consists of the liquid within the tank, surface scum, floatable material and sludge from the bottom that has accumulated since the last pump-out. All septic tank waste in the capital region is transported by private haulers as septage to a private treatment facility (Septage Processing Ltd. [SPL] in Langford) that is under contract with the Capital Regional District (CRD) to receive the region's septage for treatment before discharge to the CRD sewer system. Septage (also called trucked liquid waste) includes septic tank waste, as well as other wastes that do not meet the sewer discharge requirements of CRD Bylaw No. 2922 (Sewer Use Bylaw), such as material from catch basins, portable toilets, oil and grease interceptors, and high-strength brewery and dairy waste.

CRD Bylaw No. 2827 (Septage Disposal Bylaw) sets out the requirement for the disposal of septage at a septage disposal facility (e.g., SPL) and a prohibition for the discharge of septage waste via direct or indirect connection to a sewer or drain except at a septage disposal facility. In addition, the quality criteria for discharge in Bylaw No. 2827 assumes septage is treated prior to discharge to the sewage system.

Discharges into septic systems are not regulated by the requirements of the Sewer Use Bylaw because these systems are not connected to the CRD or municipal sewage infrastructure. CRD Bylaw No. 3479 (Onsite Sewage System Maintenance Bylaw) regulates the maintenance of septic systems in Colwood, Langford, Saanich and View Royal but not the substances discharged into septic systems. Septic system users in the other nine municipalities and three electoral areas of the capital region are served by educational programs on best practices for onsite sewage system maintenance and operation.

There are jurisdictions that accept septic tank waste at their sewage treatment plants or nearby at a transfer station. For example, Metro Vancouver and City of Calgary accept these wastes and either do pre-treatment solids removal or accept waste as a "no tip" discharge to retain solids in the truck for disposal elsewhere. In the capital region, the septage waste facility model was chosen to provide pre-treatment of these high-strength, unregulated, variable wastes before acceptance to municipal and CRD infrastructure. As with regular sewage, the waste may contain obstructive material such as fat, oil and grease, wipes, paper towels, dental floss, and other non-flushable products. The SPWWTP currently has no infrastructure or procedures in place for accepting septic tank waste.

CONCLUSION

In the capital region, septic tank waste is collected by private haulers who deliver the waste to a facility in Langford for pre-treatment before discharge to the CRD core area wastewater system. Septic tank waste composition is unregulated, variable in composition and due to the nature of septic tank function, may contain higher-strength waste or higher solids than residential sewage discharge to sanitary sewers. The Saanich Peninsula Wastewater Treatment Plant has no infrastructure in place to accept these wastes from septic waste haulers.

RECOMMENDATION

There is no recommendation. This report is for information only.

Submitted by:	Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection
Concurrence:	Larisa Hutcheson, P. Eng., General Manager, Parks & Environmental Services
Concurrence:	Ian Jesney, P.Eng., Acting General Manager, Integrated Water Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

CONCLUSION

In the capital region, septic tank waste is collected by private haulers who deliver the waste to a facility in Langford for pre-treatment before discharge to the CRD core area wastewater system. Septic tank waste composition is unregulated, variable in composition and due to the nature of septic tank function, may contain higher-strength waste or higher solids than residential sewage discharge to sanitary sewers. The Saanich Peninsula Wastewater Treatment Plant has no infrastructure in place to accept these wastes from septic waste haulers.

RECOMMENDATION

There is no recommendation. This report is for information only.

Submitted by:	Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection
Concurrence:	Larisa Hutcheson, P. Eng., General Manager, Parks & Environmental Services
Concurrence:	Ian Jesney, P.Eng., Acting General Manager, Integrated Water Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION
MEETING OF THURSDAY, JULY 18, 2024

SUBJECT **Saanich Peninsula Liquid Waste Management Plan – Programs Summary and Update**

ISSUE SUMMARY

To provide a summary and update on the Saanich Peninsula Liquid Waste Management Plan and related programs.

BACKGROUND

The Capital Regional District (CRD), on behalf of the Saanich Peninsula participants – Central Saanich, North Saanich, Sidney, Tseycum First Nation, Pauquachin First Nation, Tsawout First Nation and Tsartlip First Nation – manages wastewater and stormwater according to strategies and activities outlined in the Saanich Peninsula Liquid Waste Management Plan (Plan). Other significant parties of interest in the Plan include the Victoria Airport Authority (VAA) and the Institute of Ocean Sciences (IOS).

The 25-year Plan was originally approved by the BC Ministry of Environment under the Environmental Management Act in October 1996, and has had four amendments, most recently consolidated in October 2009 (with minor corrections in 2011). A copy of the Plan can be found online at:
https://www.crd.bc.ca/docs/default-source/septic-pdf/saanichpen-lwmpconsolidated102009.pdf.

CRD liquid waste management involves planning, operation and maintenance, as well as various other activities that have regulatory reporting requirements and commitments to support, inform and educate parties of interest about liquid waste and environmental protection. There are five general objectives of the Plan:

- to ensure efficient, and optimal, operation and maintenance of liquid waste infrastructure
- to reduce contaminants in the liquid waste infrastructure and the environment
- to monitor and assess risks associated with the liquid waste infrastructure on human health and the environment
- to report out on provincial and federal regulatory requirements and inform parties of interest and the public
- to plan and implement liquid waste infrastructure upgrades

There are eight programs that work to achieve the Plan objectives:

- operations, maintenance and planning
- inflow and infiltration management
- corrosion and odour control
- wastewater and marine environment monitoring
- sanitary and stormwater source control
- stormwater quality
- trucked liquid waste management
- onsite wastewater management

The various reports generated by these programs can be found online at: https://www.crd.bc.ca/about/document-library/documents/plans-reports/wastewater-stormwater.

Planning

From a longer-term planning perspective, there are two initiatives currently underway: biosolids management planning and an overall review of the Plan commitments. There are no provincial directives to update the Plan, but it is generally out of date and would benefit from a review and update. The Plan is also audited on a five-year basis, the most recent audit being in 2019. A number of plan commitments were found to be non-compliant during the audit.

In 2019, following the audit, the Commission approved formation of a Technical Advisory Committee (TAC), consisting of staff and municipal engineers, to review the Plan and any outstanding commitments, and bring recommendations to the commission. First Nations and other parties of interest (i.e., VAA and IOS) were also invited to participate in the TAC. First Nations have also been given an option to participate independently in a forum of their choice.

The inaugural meeting of the TAC was held on June 12, 2024, with attendees from all three municipalities, VAA, IOS, and two Peninsula First Nations (SȾÁUTW [Tsawout] and BOḰEĆEN [Pauquachin]). At this meeting, staff presented a summary of the current plan, outstanding commitments, and the implications of any significant changes to Plan commitments. A summary of recent Inflow and Infiltration (I&I) investigations was also provided; a similar presentation on I&I will be presented at this Commission meeting (July 18). The next TAC meeting is anticipated for Q3 2024.

Operations and Maintenance

The Integrated Water Services Department is responsible for the operation and maintenance of the wastewater system, including sewage collection from municipal systems, conveyance through CRD trunk systems, secondary treatment at the Saanich Peninsula Treatment Plant and ultimate disposal of treated effluent through the ocean outfall in Bazan Bay. Treatment plant screenings and sludge are currently both being disposed of at the Hartland Landfill.

The facility has been operating reliably and has maintained compliance with all provincial and federal regulatory requirements since commissioning, with the exception of only a few minor compliance issues in the 20+ years of operation.

Biosolids Management

Wastewater residual solids produced at the treatment plant are dewatered and then disposed of at the Hartland Landfill as controlled waste, a practice that does not meet the beneficial use requirements and expectations of the provincial and federal governments. Residuals generated at the Saanich Peninsula Wastewater Treatment Plant had a temporary exemption from beneficial reuse from the Province during development of the Core Area Wastewater Treatment Project. The Core Area Residuals Treatment Facility (RTF) was constructed with the ability to receive and process sludges from non-Core Area facilities; however, the receiving equipment required retrofitting, and has not yet been commissioned. Staff are currently negotiating the expedited completion of this work with Hartland Resources General Partnership (HRMG), the company that is under contract to operate the facility until 2040.

A long-term biosolids management strategy for the core area was approved by the Board on June 12, 2024, and submitted to the Province on June 18, 2024. Once repairs to the Other Municipal Solids receiving station are complete, wastewater residuals from the Saanich Peninsula will be beneficially reused under the core area strategy.

As per the strategy, Saanich Peninsula Wastewater Treatment Plant residual solids will be processed with Core Area residuals into a Class A biosolids and beneficially used in a tiered approach with the following priority:

1) as feedstock in an advanced thermal pilot facility, which is expected to be in operation in 1.5. to 2 years
2) for continued use as an alternative fuel at a Lower Mainland cement kiln
3) for out-of-region industrial land reclamation, forest fertilization or blended soil products
4) for use as engineered cover at the Hartland Landfill
5) for other in-region land application uses, but only if options one to four are not available and any proposed in-region options receive direct Board approval, have had sufficient First Nations consultation and do not involve direct agricultural land application
6) for emergency disposal in the landfill if options one to five are not available

Inflow and Infiltration Management

Inflow and infiltration (I&I) management is an important component of the Plan to ensure proper operation and longevity of the sewage conveyance system. I&I management on the Saanich Peninsula is currently facilitated primarily by the municipalities, with CRD support. The CRD has recently undertaken comprehensive I&I assessments as due diligence with respect to the overall age of the system. An update on these assessments will be provided in a staff report on this Commission agenda (July 18).

Corrosion and Odour Control

The Corrosion and Odour Program undertakes routine monitoring from approximately May through September each year. The objective of the program is to identify locations where sewer corrosion is a concern and where odours may cause a public nuisance. The CRD also provides guidance to municipalities in the operation of their odour and corrosion control systems. Finally, staff also respond to, and investigate, odour nuisance complaints submitted by the public.

Wastewater and Marine Environment Monitoring

The Wastewater and Marine Environment Program monitors and assesses wastewater quality and quantity, and the potential effects of the Bazan Bay outfall to the marine environment. Effluent quality monitoring for compliance with the treatment plant's Operational Certificate is also required. Monitoring is undertaken over a four-year cycle, and data and other information are routinely submitted in various forms (e.g., annual reports, compliance reports, etc.) to satisfy provincial and federal regulatory reporting requirements.

Source Control

The Regional Source Control Program protects Saanich Peninsula sewage collection and treatment facilities, public health and safety, and the marine receiving environment by reducing the amount of contaminants that industries, businesses, institutions and households discharge into the district's sanitary sewer systems. The program was expanded in 2017 to also regulate and reduce contaminants that are discharged into municipal stormwater systems. The program generates annual reports summarizing their activities.

Stormwater Quality

The Stormwater Quality Program plans, promotes and coordinates the management of stormwater quality in consultation with the municipalities and First Nations. The program helps assess the operation of municipal stormwater infrastructure and impacts to the environment, both freshwater and marine. Staff in this program work closely with those coordinating the stormwater source control activities noted above. This program also generates annual reports.

Stormwater staff have also been working with the Pauquachin First Nation as it investigates opportunities to restore shellfish harvesting in Coles Bay. It is anticipated that other First Nations will be interested in starting similar efforts elsewhere on the Peninsula.

Finally, the CRD provides Island Health with summer recreational beach sampling support. This support is ultimately provided on behalf of municipalities and other beach owners (e.g., CRD Regional Parks) through the stormwater service.

Trucked Liquid Waste Management

The Trucked Liquid Waste Program objectives are to ensure domestic and non-domestic trucked liquid waste (e.g., residential and commercial septage, portable toilet waste, road and parking lot catch basin waste, restaurant oil and grease, high-strength business wastes, etc.) is handled and disposed of in an appropriate and responsible manner, and to prevent adverse impacts to human health and the environment. To achieve these objectives, education and outreach to trucked liquid waste haulers is regularly provided as part of the program.

Currently, trucked liquid waste is treated at a private facility contracted by the CRD. The potential for some trucked liquid waste, specifically local Peninsula septic tank effluent, to be redirected to the Saanich Peninsula Treatment Plant for treatment (instead of going to the private contracted facility) is currently under consideration by the Commission under separate cover.

Onsite Wastewater Management

The Onsite Wastewater Management Program is a pollution prevention program for septic systems that aims to protect public health and safety, local surface and groundwater resources, and the environment. The program strives to reduce the number of malfunctioning onsite wastewater systems by promoting proper care and maintenance through outreach programs, such as Septic Savvy, and with some regulatory requirements for system maintenance, but currently only applicable in some CRD municipalities.

On the Saanich Peninsula, there are currently no regulatory requirements for system owners. However, the District of North Saanich is joining the regulatory component of the program in 2025, in part to help address potential contamination concerns in Coles Bay. The regulations will ensure that North Saanich systems are pumped out, and potentially inspected, on a regular basis.

CONCLUSION

The Capital Regional District, on behalf of municipal, First Nations and other parties of interest, ensures Saanich Peninsula liquid waste systems are managed to minimize potential impacts to human health and the environment and ensure compliance with provincial and federal regulatory requirements. These services are guided by commitments made in the Saanich Peninsula Liquid Waste Management Plan, which are due for a review by Plan participants.

RECOMMENDATION

There is no recommendation. This report is for information only.

Submitted by:	Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection
Concurrence:	Luisa Jones, MBA, General Manager, Parks, Recreation & Environmental Services
Concurrence:	Alicia Fraser, P.Eng., General Manager, Integrated Water Services and Acting Chief Administrative Officer

SPWWC 24-06

REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION
MEETING OF THURSDAY, JULY 18, 2024

SUBJECT **Saanich Peninsula Wastewater Inflow and Infiltration Management Plan**

ISSUE SUMMARY

To present the Saanich Peninsula Inflow & Infiltration (I&I) Management Plan and recommendations.

BACKGROUND

The Saanich Peninsula Liquid Waste Management Plan (Plan) sets goals and commitments for the Capital Regional District (CRD) and Saanich Peninsula municipalities to manage Inflow & Infiltration (I&I). The plan was audited in 2019 and it was found that some of the I&I commitments were incomplete and required further action. In response, the Saanich Peninsula Wastewater Commission approved $136,000 in funding spread over three years from 2020 to 2023, to initiate an inflow & infiltration (I&I) management plan for the member municipalities which was completed by the CRD with assistance from Kerr Wood Leidal (KWL) consultants.

I&I Management Plans are long-term endeavors. They require periodic updates (i.e. five-year intervals) and build on previous versions of the plan. The plans are broken into four phases:

- Phase 1: Divide municipality into appropriately sized sewer catchments, periodically collect flow data and analyze for I&I.
- Phase 2: Investigate catchments found to have elevated I&I (i.e., smoke testing, closed circuit television [CCTV]).
- Phase 3: Prepare rehabilitation plans (when needed), schedule work and obtain budgets.
- Phase 4: Conduct post-rehabilitation monitoring to verify the effectiveness of rehabilitation effort.

The focus of this initial I&I Management Plan was to start Phase 1 and begin long-term sewer flow monitoring on the Saanich Peninsula, which will support all four phases noted above. The work leveraged the resources and expertise of the Core Area I&I program. With improvements, the flow data will also be valuable to municipal engineers for calibrating sewer models, capacity studies, and development related decisions.

The Saanich Peninsula I&I Management Plan is included in Appendix A. The entire report including appendices can be found on the public website. The report includes sewer data collection and I&I analyses from 50-meter sites; 39 of which were setup specifically for this report. It was found that approximately half of the catchments had elevated I&I at levels indicating the need for continued monitoring / periodic assessments into the future. However, it's worth noting that each of the Saanich Peninsula jurisdictions are currently meeting their regional sewer flow allocations and the only known I&I related overflows occurred during a 100-year atmospheric rain event in 2021.

The Saanich Peninsula municipalities have a history of carrying out significant I&I related work, even in the absence of flow data. Much of this work focuses on camera inspection work to identify and address structural issues (i.e. cracks), which are the pathways for infiltration. Smoke testing and dye testing programs help identify and address direct pipe connections, which are the pathways for inflow. In addition, major sewer replacement projects have the potential to dramatically lower I&I rates. Below are a few highlights:

Central Saanich initiated a major sewer renewal project in the Brentwood Bay area in 2024 that included replacing 0.7 kilometers (km) of sewer main and three km of forcemain, replacing two pump stations with one larger pump station, installing inspection chambers at the connections to the new sewer pipe, and rerouting sections of gravity pipe to better optimize the system. In 2025, Central Saanich will be updating its sewer master plan and sewer model. The municipality annually carries out around15 km of sewer camera inspections and up to 300 manhole inspections. From 2006 and 2015, smoke testing was conducted in older areas of the sewer system including the Keating industrial area. Central Saanich monitors and maintains two Tsartlip First Nation Lift Stations, which has known I&I issues and takes efforts to assist with identifying defects.

North Saanich's sewer master plan and sewer model were completed in 2017. These will be updated in 2025/26 following completion of North Saanich's official community plan. The main recommendations in the current sewer master plan are to begin a CCTV program (planned for 2025), commence an "asbestos cement gravity main" rehabilitation program (2025), and to assess and upgrade pump stations as conditions require. The sewer master plan indicated that a focused I&I reduction was not yet needed.

Sidney's past I&I related projects include a manhole grouting program, smoke testing programs, pipe relining and replacement projects. Efforts continue with pipe replacement and relining projects identified through Sidney's Asset Management plans. Sidney continues to work with private properties, including the installation of inspection chambers, to resolve I&I issues identified through smoke testing programs. Sidney has an annual sewer CCTV program, inspecting approximately one fifth of the municipality's sewer mains and manholes each year in efforts to identify sources of I&I. In 2024, Sidney updated its sewer model and will be updating its underground infrastructure replacement plans.

NEXT STEPS

The key recommendations from the report included:

- Municipalities to collect better quality data from their pump stations (i.e. SCADA upgrades) to enable the generation of high-quality flow data. (The Saanich Peninsula municipal SCADA system is currently outdated with components no longer supported by the manufacturers. In addition, due to technical reasons, the flow data generated from this SCADA data is suitable for some I&I analyses but isn't suitable for calibrating sewer models, capacity studies, etc.).
- CRD to implement minor improvements to how flow data is collected from the CRD's nine billing meters.
- Municipalities to review the I&I analysis results to determine if follow-up efforts are needed (i.e. sewer investigation work). Documenting this process will ensure that the findings are available for future use.

- CRD to update the plan at five-year intervals, including follow-up I&I analyses, with the next update in 2029. CRD to include budget for this update in the CRD's five year capital plan.
- CRD to provide I&I related support to the municipalities as appropriate (funding dependent).

IMPLICATIONS

Environmental & Climate Action

The work documented in the report supports Saanich Peninsula Liquid Waste Management Plan (SPLWMP) commitments related to reducing overflows, which will have a positive impact on local creeks, beaches and ecosystems.

Reducing I&I would have minimal impact on annual operational cost for the sewer system and treatment plant as the infrastructure is already in place and most of the operating costs are fixed (i.e. labor costs, ongoing operational costs). However, keeping I&I low will preserve sewer capacity for future development and prevent the need for costly upsizing of sewers and the treatment plant.

Financial Implications

The Core Area I&I Program received one time funding of $136,000 from 2020 to 2023 to complete this report. There was no funding prior to, or since, that time.

Municipal infrastructure repair initiatives to reduce I&I are funded by the respective municipality. Municipalities carry out this work to prevent costly sewer pipe failures and to ensure that capacity is available for new development and densification.

In addition, member Municipalities are charged based on the annual average flow of sewage from their municipality versus the total annual average flow of sewage from all participating municipalities so any reduction in I&I would reduce the total annual cost to the municipality.

The CRD will need to budget for the five-year update of the I&I Management Plan in 2029 in the CRD's five-year capital plan.

Intergovernmental Implications

The SPLWMP contains several commitments related to managing I&I. Originally established in 1996, the plan underwent an audit in 2019. As a result, the commission provided approval for the formation of a Technical Advisory Committee (TAC), consisting of CRD staff, municipal engineers, First Nations, the Victoria Airport Authority (VAA), and the Institute of Ocean Sciences (IOS). The inaugural TAC meeting, held in June 2024, involved representatives from three municipalities and two Peninsula First Nations (SȾÁUTW [Tsawout] and BOḰEĆEN [Pauquachin]). During this meeting, staff presented a summary of the current plan, outstanding commitments, the implications of potential changes and recent I&I investigations. Looking ahead, any revisions to the SPLWMP could impact future I&I commitments. The next TAC meeting is anticipated for the third quarter (Q3) 2024.

Social Implications

Keeping I&I low and preventing overflows will reduce the potential for future beach closures and impacts on the natural environment.

CONCLUSION

The initial Saanich Peninsula Inflow & Infiltration Management Plan was finalized in 2024 and included flow data collection and I&I analyses from 50 sewer catchments. The key finding was that approximately half of the catchments had elevated I&I which should be monitored/managed into the future to ensure that sewer system capacity and treatment plant capacity are maintained for future development and to prevent overflows. Currently the Saanich Peninsula municipalities are meeting their regional sewer flow allocations and there are no I&I related sewer overflows on the Saanich Peninsula for sub five-year storms. This initial Saanich Peninsula Inflow & Infiltration Management Plan will be updated at five-year intervals to assess the effectiveness of municipal I&I reduction efforts and to assist in identifying any new areas of concern. The next update will be in 2029.

RECOMMENDATION

There is no recommendation. This report is for information only.

Submitted by:	Joseph Marr, P.Eng., Senior Manager, Infrastructure Engineering
Concurrence:	Jason Dales, B.SC., WD IV, Senior Manager, Wastewater Infrastructure Operations
Concurrence:	Alicia Fraser, P. Eng., General Manager, Integrated Water Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

ATTACHMENT(S)

Appendix A: Saanich Peninsula I&I Management Plan

Saanich Peninsula Inflow & Infiltration Management Plan

Saanich Peninsuala Wastewater

Capital Regional District | July 2024

Capital Regional District Integrated Water Services
479 Island Highway, Victoria BC V9B 1H7
T: 250.474.9600 www.crd.bc.ca

Making a difference...together

Contents

List of Appendices

Executive Summary

From 2020 to 2023, the Saanich Peninsula Wastewater Commission approved three years' worth of funding to initiate inflow & infiltration (I&I) management plans for the Peninsula municipalities ($136,000 total). The project scope was limited to generating sewer flow data from municipal pump station SCADA data, mapping pump station catchments, assessing flow data quality, I&I analyses, and recommendations. The work leveraged the resources and expertise of the Core Area I&I program. The work was carried out to address some "in progress" I&I commitments in the Saanich Peninsula Liquid Waste Management Plan.

I&I refers to rainwater and groundwater that enters the sanitary sewer system. Inflow refers to clean water entering sewers through improper plumbing connections (i.e. roof drains). Infiltration refers to groundwater that seeps into sewers through cracks. A certain amount of I&I is unavoidable and is accounted for in routine sewer design. However, too much I&I can cause overflows and increase conveyance / treatment costs.

I&I Management Plans are long term endeavors. They require periodic updates (i.e. 5-year intervals) and build on the previous versions of the plan. The plans are setup around four phases:

- Phase 1: Divide municipality into appropriately sized sewer catchments, collect flow data, analyze for I&I, determine if any catchments merit follow up action.
- Phase 2: Investigate catchments found to have elevated I&I (i.e., smoke testing, CCTV).
- Phase 3: Rehabilitate sewers, when appropriate, based on priority, with defined schedules and budgets.
- Phase 4: Conduct post-rehabilitation monitoring to verify the effectiveness of rehabilitation effort.

This is the initial I&I management plan for the Saanich Peninsula, so the work focused on the actions from Phase 1. This was problematic because prior to 2020 the Saanich Peninsula municipalities had virtually no sewer flow data. The only available flow data came from nine CRD billing meters and two CRD pump stations. The lack of sewer data was an issue because:

- It is expensive to collect. New permanent flow meter sites cost >$100K. Temporary flow meters costs ~$10K/year per meter if done by a contractor.
- Each peninsula municipality needs ~10 metering sites for adequate I&I coverage.
- It can take multiple years to acquire sufficient storm event data to carry out I&I analyses.

To address this issue, sewer flow data was generated using SCADA data (i.e. pump starts/stops and levels) from 38 Saanich Peninsula municipal pump stations and from 11 existing CRD meters. Catchment maps were prepared for each site. (Catchments are like "puzzle pieces" the divide a map.) Overall, these

catchments provide sufficient I&I monitoring coverage for each municipality, except Sidney, which would need additional metering in the future (i.e. 2 portable meters) to fill a gap in meter coverage.

Before using flow data, it's important to understand the source of the data and its level of accuracy because poor flow data, which is common, can result in poor decisions (i.e. inaccurate sewer models, development decisions.) For this project, a consultant assessed the flow data generated for each site. The consultant concluded that the pattern of the data was reliable, but the magnitude of the data was not. This was due to limitations in the SCADA data quality. As a result, the I&I analyses was confined to metrics comparing measured flows to average dry weather flows (ADWF). The consultant made recommendations for improving future flow data for each site to make it universally useful (i.e. calibrating sewer models, capacity studies and advanced I&I analyses.)

For this report, 50 flow metering sites were analyzed for I&I including 16 sites in Central Saanich, 14 in North Saanich, 12 in Sidney along with Tseycum First Nation, Pauquachin First Nation, IOS, BC Ferries, and the Victoria Airport Authority. Table ES1 shows an example of the I&I metrics analyzed for each catchment and Figure ES1 summarizes the results for the key metric on a map.

Table ES1: Example of I&I Statistics Analyzed for Each Catchment

Catchment Name	Size (ha)	I&I Analyses			
		Peak 24hr Flow vs ADWF	Peak 1hr Flow vs ADWF	Typical Winter Dry Day Flow vs Summer ADWF	Summer Groundwater Expressed as a % of ADWF
Example Catchment: Saanich Peninsula Total	1,688	5.0 x ADWF	7.4 x ADWF	1.5 x ADWF	24% ADWF

ADWF = Average Dry Weather Flow

Based on the I&I analyses results, approximately half of the catchments exceed 4x average dry weather flow, which indicates that there is significant I&I, which should be monitored/managed into the future. Note, however, that each jurisdiction's flows are currently meeting their regional sewer flow allocations. Also note that there currently are no I&I related sewer overflows on the Saanich Peninsula for sub 5-year storms. The only known I&I related overflows occurred during a 100-year storm in 2021.

The Peninsula municipalities have a history of carrying out significant I&I related work despite having minimal sewer flow data. Below are a few highlights:

Central Saanich initiated a major sewer renewal project in the Brentwood Bay area in 2024 that includes replacing 0.7 km of sewer main and 3 km of forcemain, replacing two pump stations with one larger pump station, installing inspection chambers at the connections to the new sewer pipe, and rerouting sections of gravity pipe to better optimize the system. In 2025, Central Saanich will be updating its sewer master plan and sewer model. The municipality annually carries out ~15 km of sewer camera inspections and ~300 manhole inspections. From 2006 and 2015, smoke testing was conducted in older areas of the sewer system including the Keating industrial area. Central Saanich monitors and maintains two Tsartlip FN Lift Stations, which has known I&I issue, and takes efforts to assist with identifying defects.

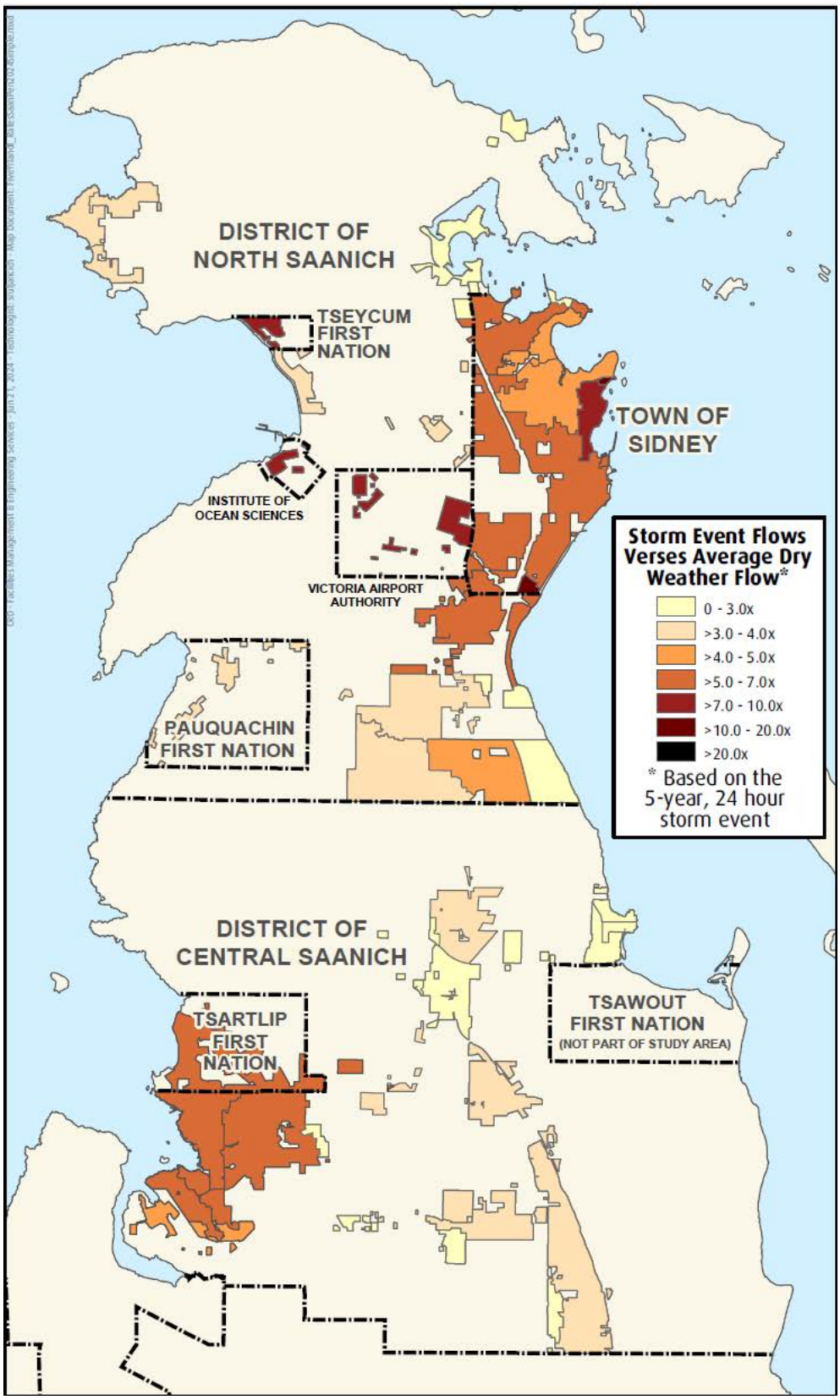
North Saanich's sewer master plan and sewer model were completed in 2017. These will be updated in 2025/26 following completion of North Saanich's official community plan. The main recommendations in the current sewer master plan are to begin a CCTV program (will start in 2025), commence an "asbestos cement gravity main" rehabilitation program (2025), and to assess and upgrade pump stations as conditions require. The sewer master plan indicated that a focused I&I reduction was not yet needed.

Sidney's past I&I related projects include a manhole grouting program, smoke testing programs, pipe relining and replacement projects. Efforts continue with pipe replacement and relining projects identified through Sidney's Asset Management plans. Sidney continues to work with private properties, including the installation of inspection chambers, to resolve I&I identified through smoke testing programs. Sidney has an annual sewer CCTV program, inspecting approximately one fifth of the municipality's sewer mains and manholes each year in efforts to identify sources of I&I. In 2024, Sidney updated its sewer model and will be updating its underground infrastructure replacement plans.

The key recommended from the report included:

- Peninsula municipalities to improve the quality of their flow data by addressing "SCADA timestamp" issues at 33 pump stations and "wetwell volume" issues at 8 pump stations. This would make the data universally useful for things like calibrating sewer models, capacity studies and advanced I&I analyses.
- CRD to do minor SCADA programming to improve the flow data at 9 billing meter sites and two CRD pump stations.
- Peninsula municipalities to review catchments with elevated I&I to determine if follow-up efforts are needed (i.e. sewer investigation work). The process should be documented to ensure that the findings are available for future use.
- CRD to conduct follow-up I&I analyses for inclusion in the 5-year update of this plan (2029).
- CRD to provide I&I related support to the municipalities as appropriate (funding dependent).
- Update the plan at 5-year intervals.

Figure ES1: Summary of I&I Rates for the Saanich Peninsula



1 Introduction

1.1 Background

The Saanich Peninsula Liquid Waste Management Plan (SPLWMP), last consolidated in 2009, contains several commitments related to inflow and infiltration (I&I) (see Section 1.3). Prior to 2020, some of the commitments were "in progress" due to an absence of sewer flow data, which is needed to measure I&I.

From 2020 to 2023, the Saanich Peninsula Wastewater Commission approved three years' worth of funding to initiate I&I management plans for the Peninsula municipalities: $30,000 in 2020, $41,000 in 2021, and $65,000 in 2022. The goal was to leverage the resources and expertise of the Core Area I&I program to help initiate I&I actions on the Peninsula. Based on need, the focus was on sewer flow data, which is the foundation of I&I management plans. The purpose of this report is to document the work completed and to chart a path forward.

1.2 Local Context

The Saanich Peninsula wastewater system serves the municipalities of Central Saanich (including Tsartlip First Nation), North Saanich, and the Town of Sidney, as well as the Swartz Bay Ferry Terminal, Victoria International Airport, the Institute of Ocean Sciences and the Tseycum and Pauquachin First Nations. (The Tsawout First Nation has its own wastewater system and treatment plant and is not connected to the Saanich Peninsula wastewater system.)

Sewer flows in the system are conveyed to the Saanich Peninsula Wastewater Treatment plant. The plant provides secondary treatment prior to discharging the treated effluent to Bazen Bay. The plant commenced operation in 2000. It replaced three individual CRD sewage treatment plants that were constructed in the early 1970's that generally served each of the individual municipalities.

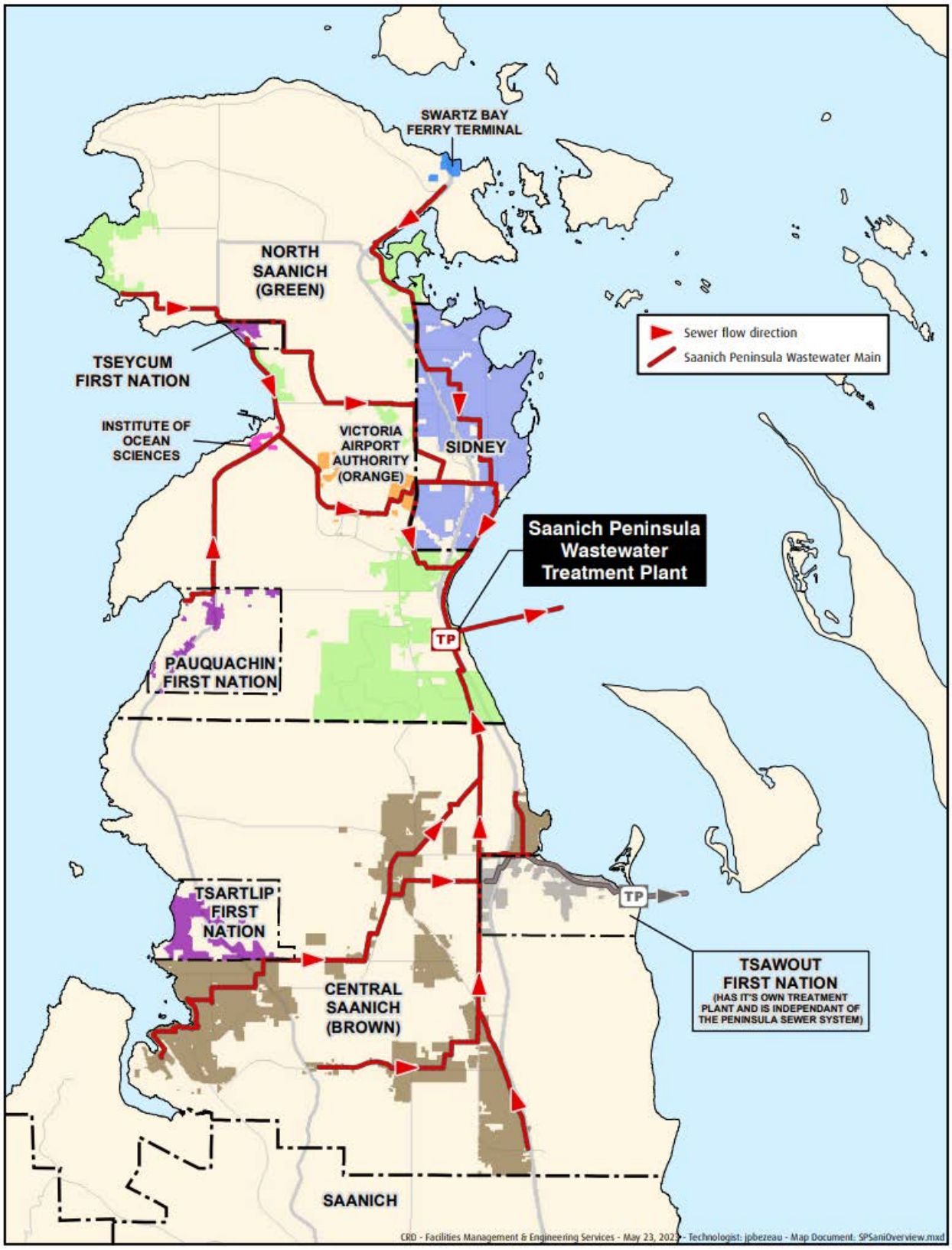
A map of the Saanich Peninsula wastewater system is in Figure 1.1. A summary of sewer infrastructure is in Table 1.1.

Table 1.1: Sewer Infrastructure in the CRD Saanich Peninsula

Jurisdiction [1]	Gravity Sewers (km)	Force Mains (km)	Manholes (#)	Pump Stations (#)	Laterals (#)	Average Pipe Age (years)	% Developed Properties Connected to Sewer
Central Saanich	88,320	6,866	961	14	3516	n/a	80.7%
North Saanich	62,488	14,948	784	12	2267	26	48.6%
Sidney	48,025	2,900	555	12	2766	52	99.6%
CRD	12,002	5,374	70	3	NA	29	NA

[1] Data was not available for the Swartz Bay Ferry Terminal, Victoria International Airport, the Institute of Ocean Sciences or the Tseycum and Pauquachin First Nations.

Figure 1.1 Map of the Saanich Peninsula Wastewater System



1.3 Saanich Peninsula Liquid Waste Management Plan Commitments

The SPLWMP contains seven commitments related to I&I. A number of these commitments were part of the original plan from 1996. The commitments are as follows:

- To develop and carry out a detailed program for identification and sources and quantity of inflow and infiltration (I&I) by the end of 1999.
- To develop guidelines for use by the member municipalities and federal jurisdictions to prioritize areas within which rehabilitation works are warranted and cost effective.
- To provide additional funds for I&I reduction that are either economically or environmentally justified by avoidance of future costs to convey, treat and dispose of I&I, or by protecting effluent quality.
- Where rehabilitation works for I&I reduction are undertaken, to measure flows before and after carrying out such works, to document I&I expenditures and achievements, and to use this information to refine cost benefit curves developed to optimize expenditures.
- To standardize and pass appropriate bylaws, or amendments to bylaws, in each municipality or jurisdiction to reduce or eliminate the incidence of storm water connections to the sanitary sewer system.
- That in areas of high infiltration, to address concerns of exfiltration from the systems to groundwater.
- That the CRD, as an aspect of operating the wastewater treatment plant, shall monitor flows from the participants and shall advise of the need for investigation of I&I problems.

In 2024, the CRD will be reconvening the Saanich Peninsula LWMP Technical Advisory Committee to determine if the current LWMP is sufficient or if updates are warranted. Potentially, this process could eventually lead to future changes to the I&I commitments in the plan.

1.4 Regulatory Context

The following table summarizes some of the main drivers for I&I reduction in the CRD.

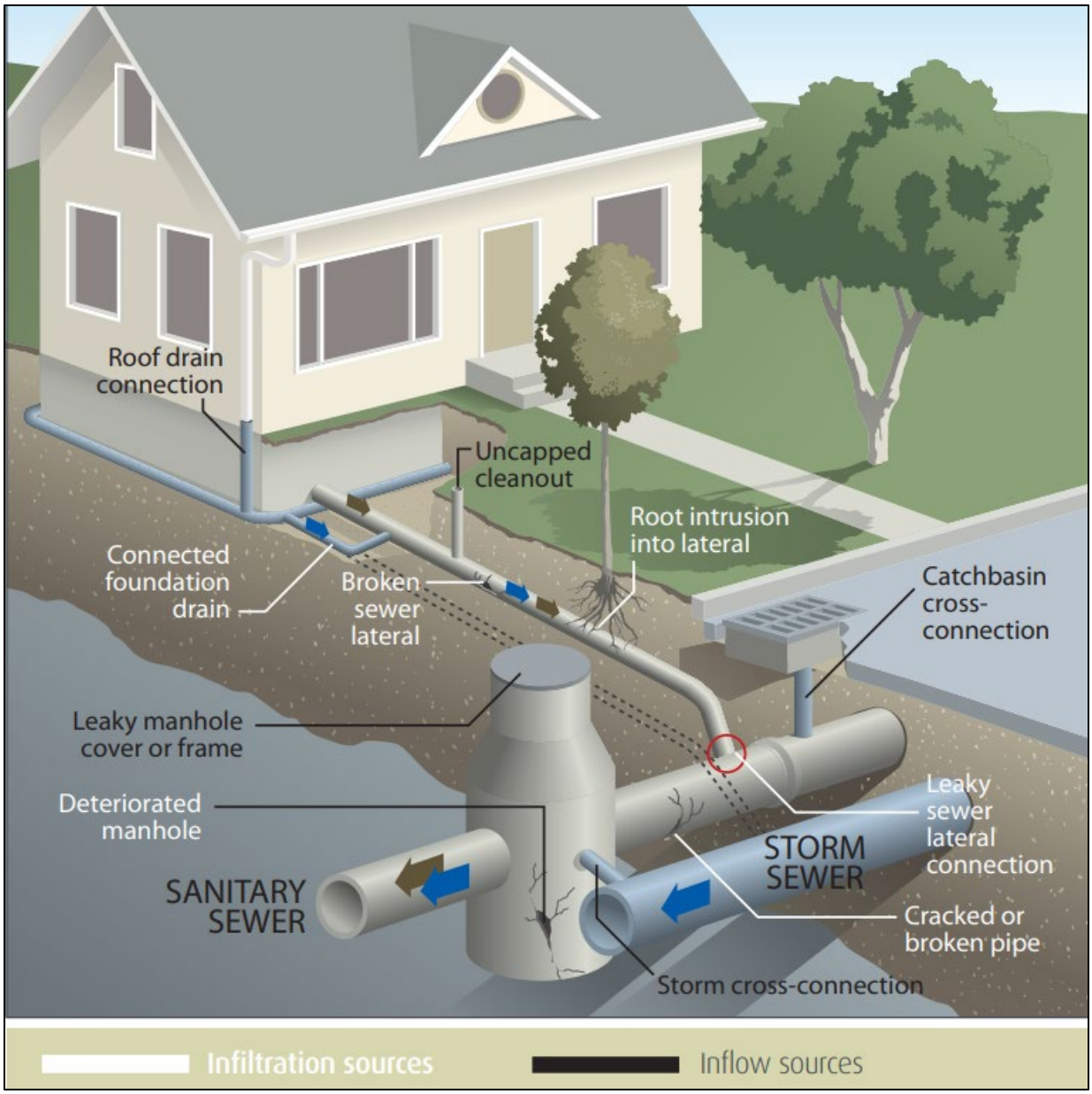
Table 1.2: Regulatory Documents Related to I&I

Level of Government	Regulatory Documents
Federal	CCME: Canada Wide Strategy for the Management of Municipal Wastewater Effluent
	National Guide to Sustainable Municipal Infrastructure: Innovations and Best Practices (InfraGuide)
Provincial	Municipal Wastewater Regulation
	BC Building Code
Regional	Saanich Peninsula Liquid Waste Management Plan
	CRD Sewer Use Bylaw

1.5 Inflow & Infiltration

I&I refers to rainwater and groundwater that enters the sanitary sewer through a variety of defects as shown in the Figure 1.2. Inflow sources allow rainwater to enter the sanitary sewer through improper connections (i.e. roof drain connections, catch basin cross connections) and holes in manhole covers. Infiltration sources allow groundwater to seep into the sanitary sewer through cracks or bad joints in sewer pipes and manholes. A certain amount of I&I is unavoidable and is accounted for in routine sewer design. However, when I&I exceeds design allowances, sewer capacity is consumed and may result in overflows, risks to health, damage to the environment and increased conveyance treatment and disposal costs.

Figure 1.2: Common Sources of I&I



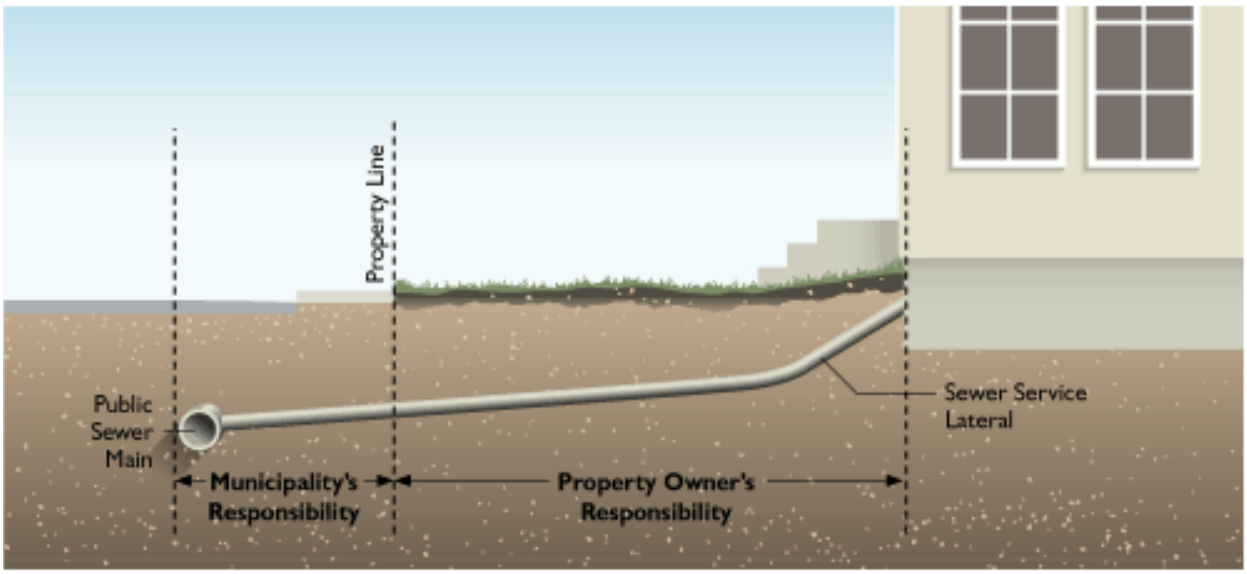
1.6 Private Property I&I (PPI&I)

Property owners own and are responsible for maintaining the portion of the laterals located between their home/building and the property line (Figure 1.3). Municipalities own and are responsible for maintaining the portion of the pipe located between the property line and the municipal sewer main. Property owners generally don't inspect or repair their laterals unless a

pipe failure or blockage has occurred. It's rare for property owners to proactively inspect and repair their pipes.

Studies show that approximately 50% of I&I comes from private property. Sources of this I&I can include roof and foundation drains that are connected to the sanitary sewer, leaky pipes or improper plumbing connections between your house and the sewer system. Section 7 provides additional details related to private property I&I and issues related to addressing it.

Figure 1.3: Sewer Lateral Ownership and Responsibility



1.7 Drivers for I&I Reduction

Municipalities have finite resources and budgets. These must be allocated based on their council's priorities and direction. For an I&I related capital project to be approved, it generally needs to strongly support one or more of the following interrelated "drivers".

a) Regulatory Compliance
   - Preventing overflows and excessive I&I

b) Asset management
   - Maintaining sanitary sewer systems and replacing components at the end of their service life

c) Future Growth

- Maintaining or creating sewer capacity for future development / densification.

d) Climate Change
   - Climate models predict more extreme rainfall events in the future. As such, sewer capacity needs to be maintained to prevent overflows.

e) Synergistic Upgrades
   - Finding cost savings by combining related work when doing upgrades. For example, if a road is already dug up to replace sewer pipes, there may be an opportunity to cost effectively replace other underground infrastructure at the same time.

1.8 I&I Management Plans

In general, I&I Management Plans are long term plans that are updated at set intervals (i.e., five years). The actions in the plans fall into the following sequential phases:

Phase 1: Divide municipality into appropriately sized catchments, collect sewer flow data and analyze for I&I. The resulting data is used to rank catchments based on I&I from best to worst and to track changes in I&I rates over time.

Phase 2: Investigate catchments found to have elevated I&I (i.e., smoke testing, CCTV);

Phase 3: Rehabilitate sewers based on priority with defined schedules and budgets; and

Phase 4: Conduct post-rehabilitation monitoring to verify the effectiveness of rehabilitation effort.

The approach noted above aligns with the best practice guide "Infiltration/Inflow Control/Reduction for Wastewater Collections Systems", which was prepared through a collaboration of the Federation of Canadian Municipalities (FCM) and the National Research Council (NRC), in 2003, as part of the National Guide to Sustainable Municipal Infrastructure: Innovations and Best Practices. Appendix A contains a chart illustrating the approach.

1.9 Overflows

Sanitary sewer overflows are releases of raw sewage into storm drains and/or local waterways. They can occur as a result of excessive I&I overwhelming the sewer system, pipe blockages (pipe failure and pump station failures. Sewer overflows can expose people, pets, and the environment

to harmful chemicals, infectious bacteria, viruses, parasites, etc. The impact of overflows is influenced by the characteristics of the receiving environment, such as:

- public use (e.g., shoreline access, kayaking, swimming, shellfish harvesting);
- habitat sensitivity (e.g., productive or endangered habitats such as shellfish areas, kelp beds and herring spawning sites); and
- flushing characteristics (e.g., exposed coastline or in-land waters).

I&I is predicted to increase overtime due to aging sewers and larger storms due to climate change. For these reasons, I&I reduction efforts are essential for preventing overflows now and into the future.

In British Columbia, the Municipal Sewage Regulation requires that all unauthorized bypasses, emergency overflows and spills be reported in accordance the Spill Reporting Regulation. In the CRD, when sewer overflows occur, they are investigated, documented, and reported to Emergency Management BC.

The CRD monitors its Saanich Peninsula regional trunk sewers for overflows using level sensors at CRD's Keating, Sidney and Turgoose pump stations. The data is collected using the CRD SCADA system, which stores the data and allows it to be viewed in real-time. The SCADA system also has alarms that are designed to proactively help operators avoid overflows." From 2018 to May 2023, there was only one I&I related sanitary sewer overflow in the CRD's Saanich Peninsula regional trunk sewer system, which occurred on November 15, 2021, a 100-year storm event.

Information on municipal overflows in the Saanich Peninsula is included in the municipal sections of this report (Sections 3-5.)

1.10 Asset Management

Long-term municipal sewer asset management programs are a key pathway for addressing I&I. These programs focus on the planned replacement of infrastructure based on "remaining service life". Preferably, the timing of the actual replacements is determined through condition assessments. However, asset age is often used as a proxy in the absence of condition assessment data.

In general, I&I rates correlate to sewer infrastructure age. This is due to sewer infrastructure decaying over time (like all infrastructure) and to changes in sewer design/materials/installation practices over time. New sewers tend to have lower I&I. Old sewers often have higher I&I.

I&I rates provide insights into the condition of municipal sewer assets. If a catchment with young sewers has atypically high I&I rates, it may indicate the presence of a major defect that is worth finding and fixing.

With Public Standard 3150 having been in place for several years, most municipalities have a reasonably good inventory of assets with book value and asset age. I&I related data can provide valuable insight into the condition of those assets and their remaining service life.

1.11 Climate Change

A changing climate brings much uncertainty. At a global scale, a changing climate has already resulted in a warmer atmosphere, warmer and more acidic oceans, reduced amounts of snow and ice, and higher sea levels. At the local level, scientists project that the Capital Region will continue to experience hotter, drier summers; warmer, wetter winters; more intense and frequent rain and windstorms; and sea level rise. These changes will directly impact infrastructure, (e.g. water supply, sewer and storm water systems), social and economic systems (e.g. heat waves, disruptions to work, competitiveness), and natural systems (e.g. biodiversity and habitat loss, invasive species).

Most climate change projections indicate that future rainfall events will be more extreme in size and intensity resulting in the potential for greater I&I. This will stress the capacity of existing sewer infrastructure potentially leading to more overflows. To account for this, municipalities should implement I&I reduction programs and size new sewers with additional capacity to account for climate change.

2 Key Actions Completed (2020 to 2023)

2.1 Establishing Long-Term Sewer Catchments

There are two key considerations when establishing long-term flow monitoring catchments. The first is the desire for manageable sized catchments (i.e. ~30-100 hectares). The second is the need for high-quality low-cost long-term flow data. For reference, below are the three broad categories of sewer flow meters along with their pros and cons:

- Pump station SCADA data can be used to generate consistent, reliable, long-term, low-cost flow data. The setup time is only a few hours per pump station. Of benefit, SCADA systems already collect and store multiple years' worth of the required data (pump starts/stops and levels).

- Permanent meters with telemetry (weirs, flumes, surface RADAR, magnetic flow meters) provide high quality, consistent long-term data. Aside from mag meters, they need periodic staff time for calibration and cleaning. They are expensive to install, typically well over $100K when factoring in electrical and kiosk.

- Temporary open channel flow meters (of which there are various types) provide data of varying quality depending on site conditions and contractor skill. Typically, they are installed, and data is provided as a turn-key service from specialized contractors. Rough monthly cost per site is $2,000, meaning a typical winter monitoring season per site is around $10K. Alternatively, municipalities can also buy their own meters (~$10,000 each) and use their municipal staff for the installations (installer, traffic control, CSE, etc.) The quality of data collected by temporary meters varies widely often making analyses challenging.

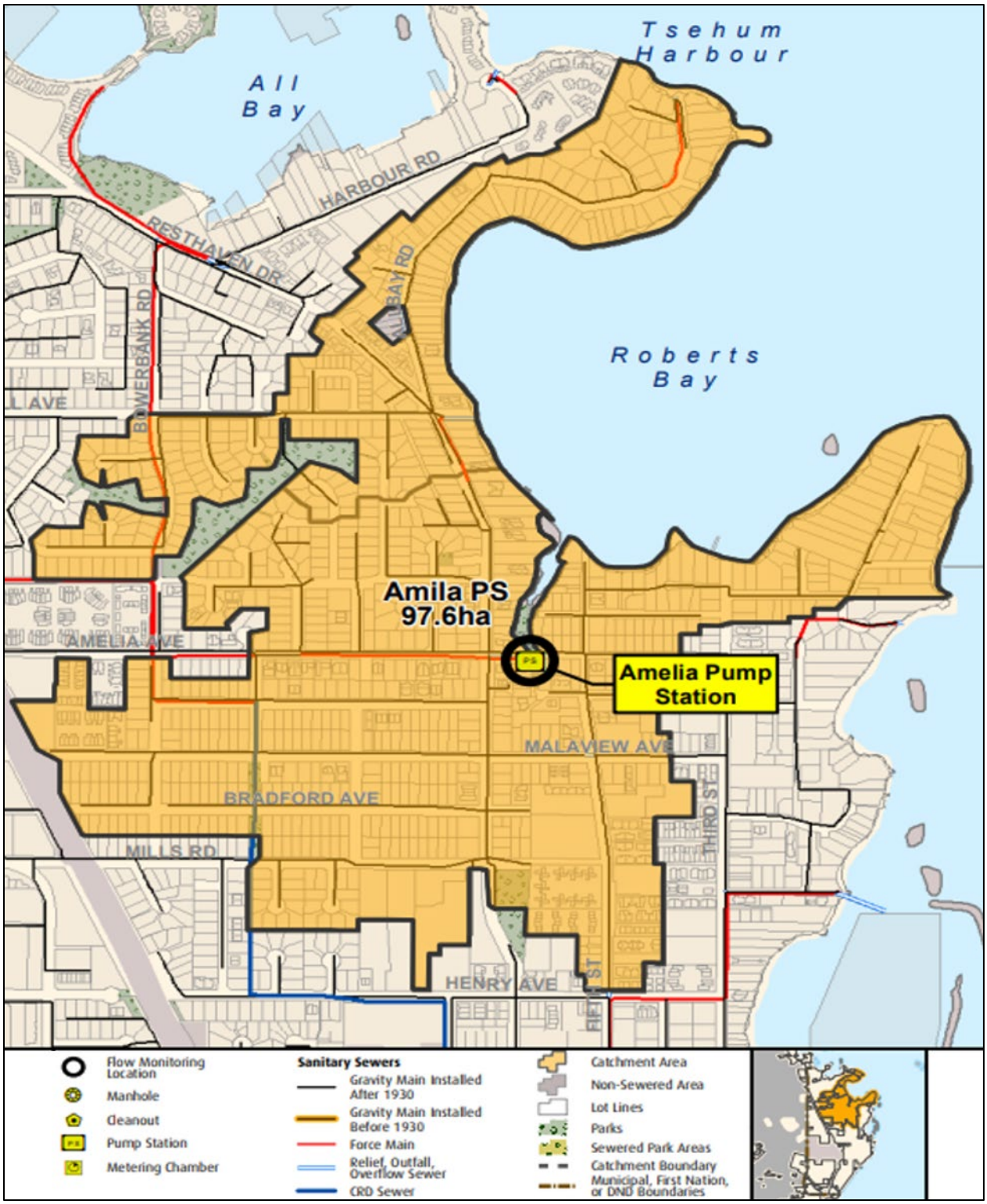
For the Saanich Peninsula municipalities, new sewer catchments were built around municipal pump station catchments. These pump stations are already on the Saanich Peninsula SCADA system which has data stored back to 2012, allowing for years of flow data to be generated at low relatively low cost. Catchments were also built for the 11 existing CRD permanent flow meters on the Saanich Peninsula.

For each catchment, CRD GIS staff prepared catchment maps (Figure 2.1) and summarized key catchment statistics (Table 2.1).

Table 2.1: Example Key Catchment Statistics Table

Pump Station	Site Code	Size	Ave Age	Gravity Sewers	Force Mains	Pump Stations	Man holes	Sewered Properties	Gravity Sewer Pipe Type					Catchment Makeup				
									PVC	Concrete	Clay	Rehabbed	Other/Unk	Single Family	Multi Family	Commercial	Industrial	Institutional
		Ha	yrs	m	m	#	#	#										
Allbay	SID3	2.8	1970	216	0	1	4	18	38.4	61.6	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0

Figure 2.1: Example of a Catchment Map



2.2 Turning Municipal Pump Stations SCADA Data into Sewer Flow Data

In its simplest form, pump station inflow calculations are no more complicated than timing how long it takes to fill a bucket with a stopwatch. The "bucket" in this case is the volume of storage in a pump station wet well between the lead pump start elevation and the stop elevation. The "stopwatch" is the SCADA system, that records the start and stop times. Every "fill" cycle of the wet well is timed, and a series of these cycles produces the time-stamped data of flow entering pump station. Utilizing the draw down time combined with an estimate of the previous inflow can also be used to estimate the pumping rate of each pump during each cycle.

There are 38 municipal pump stations on the Saanich Peninsula including 14 in Central Saanich, 12 in North Saanich, and 12 in Sidney. These do not have purpose-built flow meters. As part of this project, flow data was derived using on the following:

- Wet well level and pump start/stop data spanning multiple years downloaded from the Saanich Peninsula SCADA system;
- Metadata provided by each municipality including wet well shape, wetwell cross-sectional area, storage tanks, inlet sewer elevation; and
- Purpose-built flow data analyses tools on www.Flowworks.com to convert the SCADA data to flow data. (Flowworks is a subscription service utilized by the CRD that provides flow data analysis tools including graphing, reporting, rainfall event analysis, I&I analysis, and the pump station inflow calculator.)

2.3 Assessing the Quality of the Flow Data

The accuracy and reliability of sewer flow data can vary dramatically based on flow meter technologies and site-specific conditions. For example, mag meters generally produce data that is more accurate than flumes. However, if a mag meter is installed in sub-optimal conditions (i.e., turbulence with air entrapment), its accuracy could be much lower than expected. Overall, it's important to understand the quality of the flow data before using it.

Not all end users need high quality flow data. For example, some I&I analyses can be done with somewhat lower quality flow data. Conversely, some end users require accurate data (i.e. calibrating sewer models, sewer capacity related decisions).

For this project, the accuracy of the pump station flow data was assessed and following key issues were noted:

1. SCADA Time Stamp Issues (36 of 38 sites)

   The Peninsula SCADA system polls each pump station approximately every 45 seconds to 5 minutes and can only record the data that it sees at the time of polling. This is substantially less accurate than "event based" SCADA systems, where the events (i.e. pump starts/stops) are accurately timestamped when they happen. This issue affects all of the Saanich Peninsula municipal pump stations except for two pump stations in North Saanich, which were uniquely were setup with DNP2 data collection which produces accurate time stamped data. This issue can be addressed by either:

   - Installing dataloggers (~$5000 each plus installation), which use simple connections to the wet well level, pump start/stop signals and flow meter channels as available/appropriate. With a modem (~$500) with monthly cellular bills and a monthly fee (~$35/site), the data can be sent hourly to FlowWorks.com. These dataloggers are fast and relatively easy to install. However, they may require periodic maintenance (i.e. restarts, modem upgrades over time).

   - Upgrading the Peninsula SCADA system to bring its capabilities inline with what's been used in the Core Area since ~2008. This would be a significant project with costs of approximately $8000 per pump station (i.e., new SCADA packs, antennas, and programming) and related system upgrade costs. Of note, the current pump station SCADA packs are no longer supported by the manufacturer and should be replaced anyway. Also, SCADA upgrades were previously recommended to the Saanich Peninsula Commission but were rejected due to budget constraints.

2. Unknown wet well fill cycle volumes (8 of 38 sites)

An accurate wet well fill cycle volume is important when calculating sewer flow data. However, some sites are complicated by storage tanks connected to the wetwell or inlet pipes that backwater during pump station fill cycles. This issue affected 5 pump stations in Central Saanich, 2 in North Saanich, and 1 in Sidney making their data less reliable. Despite this, the pattern of the data still allowed for some I&I analysis.

This issue can be addressed by having a consultant carry out an analysis to calculate the wetwell level to volume relationship. For example, with clear record drawings of the station and incoming sewer, aided by GIS records of the upstream pipes if available, an engineer or technologist could typically do the analysis and calculate the required curve in four to eight hours. Then the level to volume relationships can be used to update the FlowWorks.com calculations, resolving the issue.

3. Complex sites (1 of 38 sites)

Some pump stations are too complex to generate reliable SCADA derived sewer flow data. This may be due to: multiple pumps routinely running at once, long running pump cycles, variable rate pumps, and complex configurations. The only complex site in the Peninsula is the Hagan pump station in Central Saanich.

Complex sites are generally best addressed by installing permanent flow meters (either a full-pipe magmeter or clamp-on ultrasonic or Doppler) on the pump station forcemains but it's recommended that an experienced engineer assess the options. Potentially, there could be simple inexpensive options that are viable. If not, expensive options are only worthwhile if there is a strong need for the flow data (i.e., cost allocations, key monitoring locations).

Appendix B contains a consultant memo that summarized the work completed to generate the sewer flow data and a summary of the flow data grades for each pump station. Enclosure A documents how the flow data was generated. Enclosure B includes individual grading sheets for each pump station, an example of which is located in Figure 2.2.

Appendix C contains a consultant memo with specific recommendations for improving the flow data from each of the municipal pump stations. These recommendations are also summarized in the municipal sections of this report (Section 3-5).

Figure 2.2: Example of Pump Station SCADA Flow Assessment Worksheet

Figure 2.2: Example of Pump Station SCADA Flow Assessment Worksheet

Station Name	Surfside PS
Owner	Sidney
Address	
Date	2021/12/02

FLOW METHOD GRADE: C+[1]

Source of Flow Data Used for Assessment

Calculated Flow Method: (1) 2 3

Magmeter ☐ Clamp-on Ultrasonic/Doppler ☐

Wet Well Shape

☒ Circular ☐ Rectangular ☐ Irregular

⌀ 1.2 m _____ m X _____ m _____ m

Controller

☐ Local Control ☐ Central Control

☐ Ultrasonic ☐ Pressure ☐ Floats

Controller Model _____

Sensor Model _____

Starters

☐ Soft Starters

____ secs

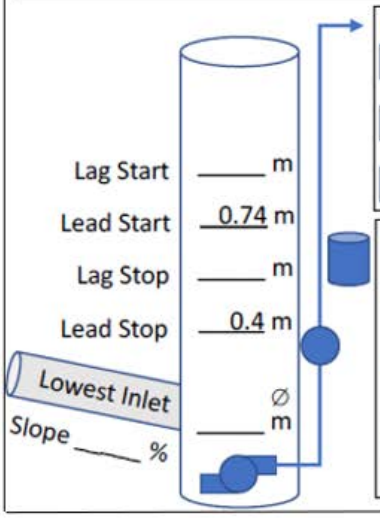
☐ VFD

SCADA Recording

Pump Start/Stop	Wet Well Level	Flow Meter
☐ Event Recorded	☐ Event Recorded	☐ Event Recorded
☒ Polling Interval _____secs	☒ Polling Interval _____secs	☐ Polling Interval _____secs
	☐ Deadband _____m	

Timestamps Generated At

☐ Controller ☐ PLC ☐ SCADA Server



Pumps to:

☐ Gravity Sewer

☐ Pressure Sewer

☐ Common Forcemain

Storage Tank Y / (N)

Impacting Calcs Y / (N)

Existing Flowmeter

None / Mag / Clamp-on

# of Pumps 1 (2) 3 4

Pump Capacity _____

Flow Method Grade (typical, results vary)

Grade	Description	
A	Flow Meters with Reliable Flow Data	
B	Calculated using SCADA Data with "Event" Based Timestamps. Suitable for General Uses including I&I Analysis	
C	Calculated using SCADA Data with "Polling Interval" Timestamps. Niche Use Only (i.e. I&I) as Data Accuracy is Impacted by SCADA Polling Frequency	
	C+[1]	Excellent flow pattern
	C+[2]	Less intuitive flow pattern
	C+[3]	Infrequent pumping results in multiple hours with zero flow
	C	True peak storm flow often underestimated due to pump capacity. Could be addressed with Method 3 and a site visit
D	Flow Data cannot be Calculated Accurately due to Storage Tanks, Inlet Levels, etc. and would Require Substantial Effort to Address.	
	D[1]	SCADA Data has "Event" Based Time Stamps
	D[2]	SCADA Data has "Polling Interval" Based Time Stamps
F	Data unusable	

Calculated Flow Methods

(Using SCADA Level and Pump On/Off data)

Method	Description
1	Standard PS inflow calculations
2	Custom approach for PS's that pump infrequently
3	Custom approach for PS's that pump for extended periods of time during storm events

2.4 I&I Analyses

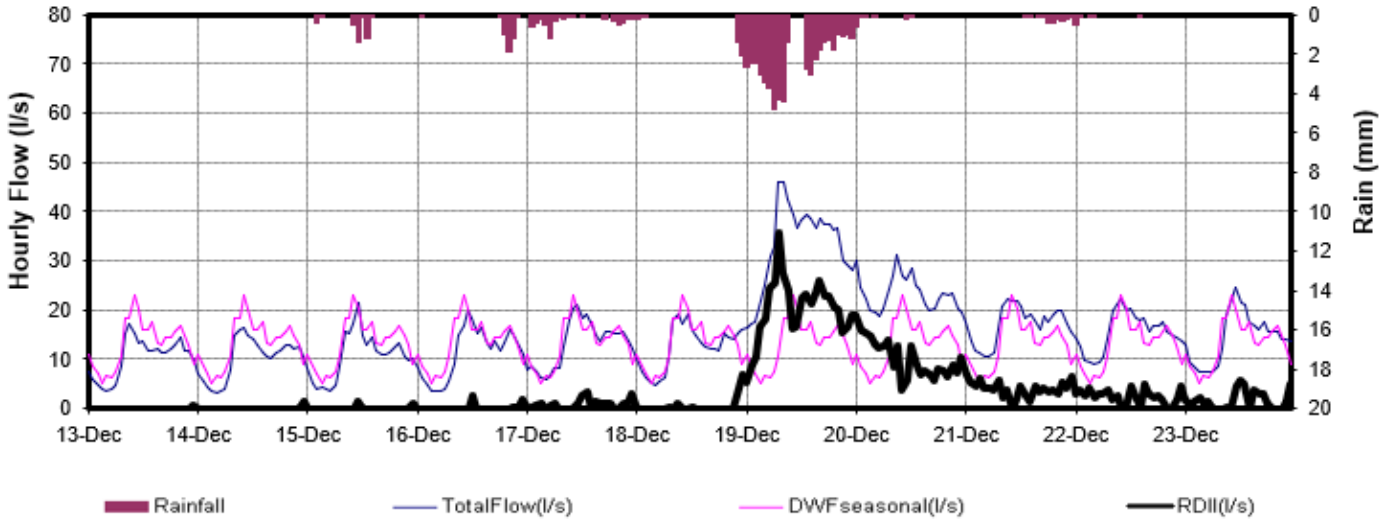
The flow data generated from municipal pump station SCADA data was not accurate enough for general use (i.e. sewer modeling, capacity studies). However, the pattern of the flow data is reliable allowing for relative comparisons of wet weather flows to average dry weather flow (ADWF). This is highly valuable for understanding I&I in catchments and between the catchments. The I&I analyses included the following three end items:

Hydrographs

Preparing storm event hydrographs (4 to 8) for each catchment (example in Figure 2.3). These graphs contain 10 days' worth of data and show:

- Hourly rainfall on the top (red)
- Measured total flow (blue)
- Typical winter flows when it isn't raining; aka dry weather seasonal flow (pink)
- Rainfall dependant I&I, which is the difference between the measured total flow and the dry weather seasonal flow (black).

Figure 2.3: Example of a Hydrograph

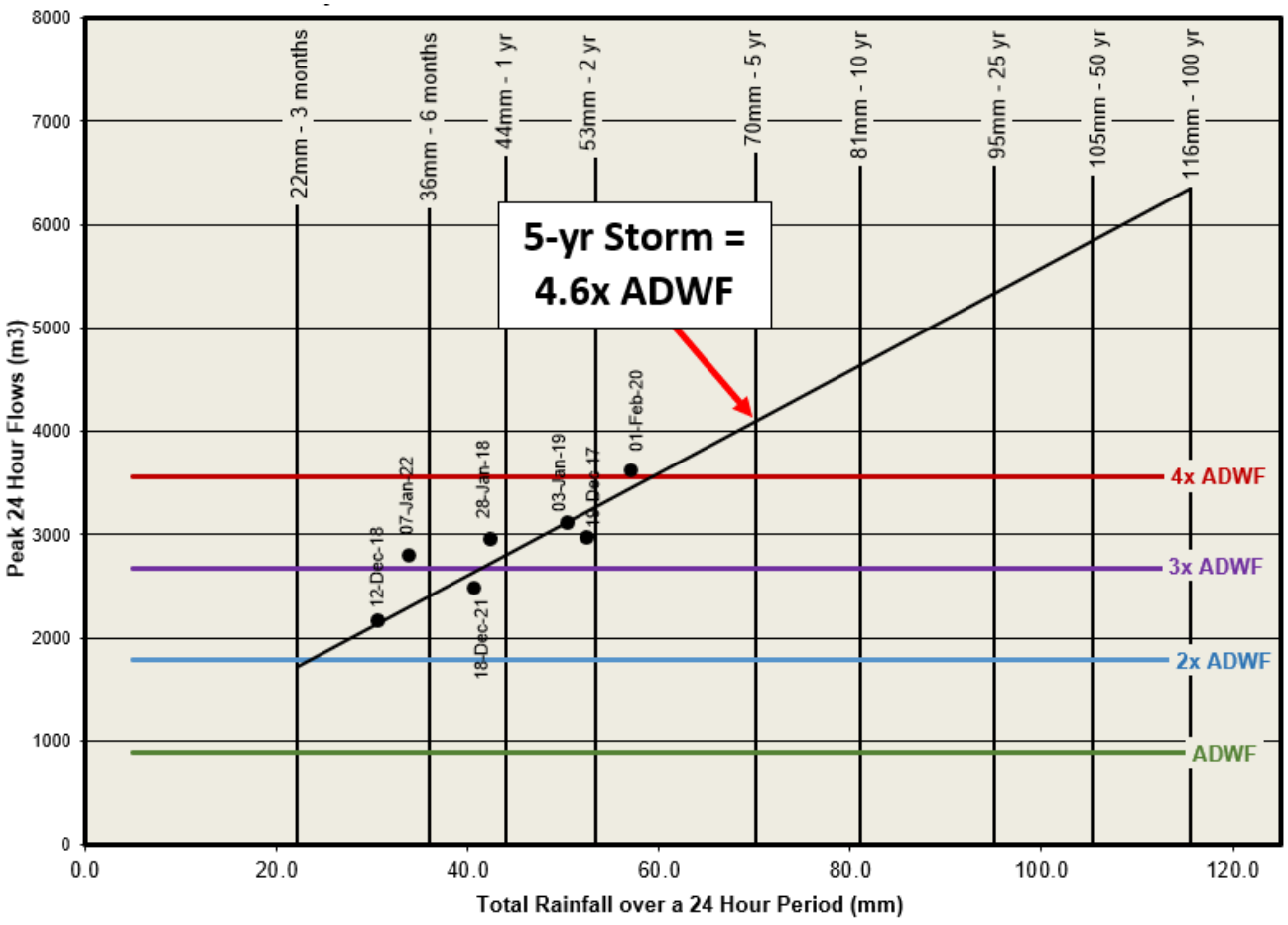


Specialized Charts Showing Peak 24-hr Storm Event Flows vs Rainfall

These charts (example in Figure 2.4) are used to determine the expected 24-hour sewer flow for a 5-year storm. This metric allows I&I to be compared between sites, regardless of the storm events used. The charts contain the following attributes:

- The y-axis is peak 24-hour flow.
- The x-axis is peak 24-hour rainfall.
- The vertical lines show the 24-hour rainfall return periods based on the Environment Canada rain gauge at the Victoria International Airport.
- The dots represent individual storms based on peak 24-hour flow and rainfall.
- The colored horizontal lines show the ADWF, 2x ADWF, 3x ADWF and 4x ADWF.
- The diagonal line is a "best fit" line for dots. The point at which the horizontal line intersects with the 5-year rainfall return period line is the flow for a 5-year storm.

Figure 2.4: Example of Specialized Chart Showing Peak 24-hr Storm Event Flows vs Rainfall



Summary Table Comparing I&I Metrics Between Catchments

The summary table (example in Table 2.2) contains the following:

- Peak 24 hr flows for the statistical 5-year storm vs average dry weather flow. This metric allows comparisons to the following:
    - The Municipal Sewer Regulation, which requires municipalities to have a Liquid Waste Management Plan if their flows over 2x ADWF.
    - The Core Area I&I Management Plan, which contains a commitment for the municipalities to be below 4x ADWF by 2030.
- Peak 1 hr flow vs average dry weather flow. This metric shows how quickly I&I enters the sewer system during rain events. If this value is high, it could indicate significant cross connections in the catchment.
- Typical winter dry days vs ADWF. This metric shows how much more groundwater drains into the sewer in winter vs summer. It provides key insights to the "peak 24 hr flows vs ADWF" metric.
- Summer groundwater infiltration vs average dry weather flow. This metric is typically 85% of the minimum hourly flows in the summer.

Table 2.2: Summery of Key I&I Metrics

Catchment Name	Size (ha)	I&I For A 5-yr Storm		Typical Winter Dry Day Flow vs ADWF (summer)	Summer GWI as a % of ADWF
		Peak 24hr Flow vs ADWF	Peak 1hr Flow vs ADWF		
Catchment 1	85	4.4 x ADWF	6.9 x ADWF	1.6 x ADWF	17% of ADWF
Catchment 2	15	2.7 x ADWF	3.8 x ADWF	1.0 x ADWF	21% of ADWF
Catchment 3	38	3.5 x ADWF	5.6 x ADWF	1.3 x ADWF	16% of ADWF

3 Central Saanich

3.1 Overview

I&I management plans require sewer flow data to assess and rank catchments for I&I and to quantify the effectiveness of I&I reduction work. Prior to 2020, Central Saanich had minimal sewer flow data. The focus of this initial I&I Management Plan was to establish long-term flow monitoring catchments for the municipality, generate sewer flow data for these catchments, and analyze the data for I&I. This report is considered a foundational first step towards I&I management that can be built upon in future years.

For context, the following table summarizes some of the key I&I benchmarks for the municipality.

Table 3.1: Key I&I Benchmarks

Key I&I Benchmarks *(for 5-year storms)*	Status
Municipality has I&I related overflows?	No
Municipal I&I contributes to downstream CRD overflows?	No
Municipality exceeds its flow allocations into the CRD trunk sewer system?	No
Existing flow metering sites (PS's, CRD billing meters, etc.) are sufficient to cover the municipality with suitably sized I&I management plan catchments?	Yes, but flow data needs improvement
Number of catchments exceeding 4x average dry weather flow (ADWF) [1]	6 of 16

[1] *Catchments >4x ADWF warrant further examination as they exceed the key I&I commitment in the Core Area LWMP.*

3.2 Establishing Long Term Sewer Monitoring Catchments

Central Saanich's long-term I&I catchments were established based on its municipal pump stations and existing permanent CRD flow meters (i.e. billing meters). These catchments provide adequate I&I monitoring coverage for Central Saanich's sewer system. Three of the catchments exceed the recommended 100 ha maximum catchment size but this isn't a problem for the following reasons:

- The Brentwood catchment is only slightly greater than 100 ha., which is close enough to 100 ha to be considered reasonable. In addition, the Brentwood catchment has nested catchments, which can be subtracted to get below the 100-ha threshold. For example:

"Brentwood Remainder" (81 ha) = Brentwood (114 ha) - Delamere (9 ha) - Butchart (24 ha)

- The "Hagan Remainder" catchment is 114 ha, which is close enough to 100 ha to be considered reasonable.
- The "Keating Remainder" catchment is large at 250 ha. However, it has very low I&I and won't be worth sub-dividing unless warranted by higher I&I rates in the future.

Appendix D includes a map of the municipality showing all the municipal catchments along with individual catchment maps for each catchment.

3.3 I&I Analyses

The flow generated from the municipal pump stations is suitable for I&I analyses only. For reasons documented in Section 2.3, the pattern of the flow data is reliable, but the magnitude of the data is not. As such, I&I analyses was limited to comparisons of wet weather flow to average dry weather flow (ADWF), which is useful for understanding I&I in a municipality. Table 3.2 summarizes the results of the I&I analyses. The key metric from this table, the "peak 24- hour flow vs ADWF" metric. This metric is summarized on a map of the Saanich Peninsula in Figure 8.1.

Table 3.2: Summary of I&I Analyses Results

Pump Station	Size (ha)	I&I Analyses			
		Peak 24hr Flow vs ADWF	Peak 1hr Flow vs ADWF	Typical Winter Dry Day Flow vs Summer ADWF	Summer Groundwater Expressed as a % of ADWF
Arthur PS	7.8	5.0 x ADWF	7.4 x ADWF	1.2 x ADWF	35% of ADWF
Brentwood PS	113.6	5.5 x ADWF	14.2 x ADWF	1.3 x ADWF	16% of ADWF
Butchart PS	23.6	4.9 x ADWF	7.3 x ADWF	2.1 x ADWF	23% of ADWF
Butler PS	10.6	Minimal I&I		0.6 x ADWF	28% of ADWF
Central PS	11.5	2.6 x ADWF	4.0 x ADWF	0.9 x ADWF	28% of ADWF
Cultra PS	2.3	No measurable I&I		0.6 x ADWF	30% of ADWF
Delemere PS	8.8	5.2 x ADWF	7.4 x ADWF	1.2 x ADWF	16% of ADWF
Hagan PS	234.0	5.3 x ADWF	10.4 x ADWF	2.1 x ADWF	16% of ADWF
Holm PS	8.0	6.2 x ADWF	10.5 x ADWF	1.7 x ADWF	41% of ADWF
Keating PS	4.8	1.8 x ADWF	3.5 x ADWF	1.1 x ADWF	18% of ADWF
Kirkpatrick PS	13.7	3.3 x ADWF	5.6 x ADWF	1.3 x ADWF	35% of ADWF
Lancelot PS	6.1	No measurable I&I		0.9 x ADWF	20% of ADWF
Newton PS	3.8	n/a	n/a	n/a	n/a
Silverdale PS	6.2	2.8 x ADWF	5.9 x ADWF	1.9 x ADWF	23% of ADWF
CRD Keating PS	328.7	3.3 x ADWF	4.4 x ADWF	1.4 x ADWF	14% of ADWF
CRD Turgoose PS	34.1	2.3 x ADWF	4.0 x ADWF	1.2 x ADWF	19% of ADWF
SPWWTP Mag Meter #1	919.3	4.0 x ADWF	5.2 x ADWF	1.4 x ADWF	25% of ADWF

Supporting data for Central Saanich's I&I analyses can be found in Appendix D, which includes:

- A map of the municipality showing all the municipal catchments
- A summary table documenting key catchment stats for each catchment (i.e., pipe length, number of manholes, pipe type, and land use)
- A section for each individual catchment that includes:
    - catchment map

- 10-day hydrographs charting sewer flows and rainfall for large storms
- specialized chart used to quantify the peak 24-hour flow for a 5-year storm
- specialized chart used to quantify the peak 1 hour I&I for a 5-year storm.

Key takeaways from the I&I analyses include:

- The municipality has low to moderate I&I.
- Large areas of the municipality have low I&I including the SPWWTP Mag Meter #1 (919 ha) and the CRD Keating PS (328.7 ha).
- Moderate I&I is found in the greater Hagan PS catchment. However, this I&I is typical given the age of the sewers pipes which were installed as early as the 1960's.
- During some large storms the Brentwood PS has high peak 1hr flows.
- Due to data quality issues, the I&I analyses was limited to comparisons to average dry weather flow (ADWF). However, the results of this analyses are useful and appear reliable.
- If the quality of the flow data is improved in the future (Section 3.4), additional I&I analyses could be completed including quantitative metrics (l/ha/day, m3/day, etc.).

3.4 Assessment of the Flow Data / Recommendations for Improvement

Before using sewer flow data, it's important to understand the source of the data and its level of accuracy as even the most accurate of meters can produce poor data if installed incorrectly.

Most of the flow data used for this report was generated from municipal pump station SCADA data. The method used is summarized in Section 2.2. Appendixes B and C contain consultant memos detailing how the flow data from each site was generated and assessed. It also contains recommendations for improving the data in the future.

Of note, the flow data from all sites is impacted by the Peninsula SCADA system polling frequency, which polls pump stations approximately every 45 seconds to 5 minutes and can only record the data that it sees at the time of polling. This is substantially less accurate than "event based" SCADA systems, where the events (i.e. pump starts/stops) are timestamped at the exact time that they happen. This issue can be addressed through one of the following options:

- Installing dataloggers with modems in the pump station kiosk to accurately log the data (~$5000 each, plus installation costs and a monthly cellular fee for each modem); or

- Upgrading the Peninsula SCADA system to enable the logging of "event based" data (~$8000/pump station plus system upgrade costs.) Of note, the Peninsula SCADA system is out of date and its SCADA packs are no longer sold or supported by the manufacturer. Upgrading the SCADA system, which the CRD has recommended in the past, would also bring the Peninsula SCADA system it in line with what's been used in the Core Area since 2008.

For either approach, it's recommended that the data be sent wirelessly to FlowWorks.com (~$35/site/month), to convert the SCADA data to flow data. The calculations are already setup and were used to generate the flow data for this report. (FlowWorks.com has easy to program, purpose-built tools designed for viewing and analyzing municipal sewer flow data in real-time.)

In addition, some pump stations require an engineering exercise to accurately calculate the fill cycle volume. This relates to pump stations whose inlet pipes backup during pump station fill cycles. It also applies to pump stations with storage tanks.

Table 3.3 summarizes the results of the flow data assessments and recommendations. By addressing these issues, the flow data would be dramatically improved making the data sufficient for sewer capacity related decisions, sewer models, and quantified I&I analyses (l/s, l/ha/day, etc.).

Table 3.3: Assessment of Flow Data Summary

Group No.	Flow Data Issue	Meter Grouping	Notes/Discussion/Solution
1	SCADA Polling Frequency Issue	Butler *(10.6 ha)*	Time stamp issue: Can be addressed by installing dataloggers or upgrading the SCADA system.
		Central *(11.5 ha)*	
		Holm *(8.0 ha)*	
		Keating *(4.8 ha)*	
		Kirkpatrick *(13.7 ha)*	
		Lancelot *(6.1ha)*	
2	SCADA Polling Frequency Issue + Unknown fill volume due to inlet pipes that back up during the wetwell fill cycle	Arthur *(7.8 ha)*	Time stamp issue: Can be addressed by installing dataloggers or upgrading the SCADA system. The fill volume issue could be addressed by building a lookup table of "wetwell levels to wetwell volumes" that incorporates backup in the inlet pipe during the wetwell fill cycle. Potentially, this is a straightforward desktop exercise based on as-built drawings. The information could also be collected through a site visit.
		Delamere *(8.8 ha)*	
		Silverdale *(6.2 ha)*	
3	Issues from Group 2 + Could be more complex because these PS's also have storage tanks	Brentwood *(113.6)*	Time stamp issue: Can be addressed by installing dataloggers or upgrading the SCADA system. A small desktop exercise (i.e. as-built review) or site visit should be carried out to determine if a simple method for determining the fill cycle volume is possible. If not, options other options
		Butchart *(23.6 ha)*	

Group No.	Flow Data Issue	Meter Grouping	Notes/Discussion/Solution
			should be considered (custom solutions, permanent flow meters, etc.)
4	Issues from Group 2 + Multiple pumps running at same time during storm events	Hagan *(234.0 ha)*	This is a complex site that would likely require a sewer flow meter to address.
5	N/A, Catchment Too Small	Cultra *(2.3 ha)* Newton *(3.8 ha)*	These catchments are very small and less useful for I&I studies, sewer modelling, capacity studies, etc.

3.5 Overflows

The Central Saanich sanitary system has not experienced I&I attributed overflows. All stations are fitted with SCADA for water level reporting through automated alarm dispatch to Duty On-Call staff. High sewage level response procedures are in place, trucked bypass pumping is routinely actioned where necessary. Of note, the three Lift Stations on the Tsartlip First Nation system are not fitted with SCADA. Two of the stations are maintained by CS, emergency or after-hour calls are received by phone call or dispatch.

3.6 Municipal I&I Related Work

General I&I program components for the municipality are summarized in Table 3.4.

Table 3.4: Snapshot of Current I&I Related Actions

I&I Program Component	Description
Flow Metering	• 10 pump stations with SCADA derived data (flow data only suitable for I&I analyses) • 3 permanent CRD flow meters.
Sewer Master Plan	• Created in 2015 (will be updated in 2025)
Sewer Model	• Created in 2015 (will be updated in 2025)
Camera Inspections	• New sewers upon installation • Approximately every 7 years thereafter
Private Property I&I Program	• All new sewer lateral connections since 2007 have inspection chambers. • The municipality doesn't have a specific program for private property I&I because I&I is relatively low throughout the municipality.
Asset Management	• Preliminary asset management plans have been created and continue to expand

In 2024, Central Saanich initiated a major capital project for the renewal and optimization of the original sanitary system in Brentwood Bay. The work will greatly reduce the potential for accidental overflows to the environment should system failure occur. The project includes:

- replacement of ~700m of existing sanitary mains, which were installed as part of the original system;
- adding inspection chambers to the connections of the replaced sewer mains;
- installation of 3000m of new sanitary forcemain allowing for abandonment of the original forcemain;
- construction of a single large sanitary pump station to replace two ageing pump stations (Hagan and Brentwood);
- upgrading the Silverdale pump station with increased capacity; and
- replacement and rerouting of sections of gravity mains for optimization.

Central Saanich I&I Reduction program includes:

- 300 manhole condition inspections conducted annually, defects noted and corrected.
- 15 km of CCTV inspection conducted annually with defects corrected. (The last cycle was completed in 2021 and the next cycle is planned to start in 2025.)
- From 2006 and 2015, smoke testing was conducted on older areas of the sewer system including the Keating industrial area. (Annual smoke testing is not conducted on a recurring basis.)

3.7 Next Steps

The key recommended next steps for Central Saanich include:

- Carry out the recommendations to improve the flow data quality from their pump stations (i.e. timestamp issue at 11 sites and wetwell volume issues at five sites).
- Map the municipality's potential sewer overflow locations (which may or may not actually overflow) and consider installing level sensors when appropriate. Document the results of the process.
- Review catchments with elevated I&I. Confirm whether investigation data (i.e. camera inspection data, smoke testing) is available to help identify the sources of the I&I. If not, decide if it is worth collecting this investigation data and scheduling the work. Document the results of the process.
- Support the update of this report at 5-year intervals.
- Central Saanich monitors and maintains two Tsartlip FN Lift Stations. It is known that the Tsartlip sanitary system does experience very high I&I. Efforts are ongoing to assist with identifying defects.
- Carrying out the actions noted in the Sewer Master Plan.

4 North Saanich

4.1 Overview

I&I management plans require sewer flow data to assess and rank catchments for I&I and to quantify the effectiveness of I&I reduction work. Prior to 2020, North Saanich had minimal sewer flow data. The focus of this initial I&I Management Plan was to establish long-term flow monitoring catchments for the municipality, generate sewer flow data for these catchments, and analyse the data for I&I. This report is considered a foundational first step towards I&I management that can be built upon in future years.

For context, the following table summarizes some of the key I&I benchmarks for the municipality.

Table 4.1: Key I&I Benchmarks

Key I&I Benchmarks *(for 5-year storms)*	Status
Municipality has I&I related overflows?	No
Municipal I&I contributes to downstream CRD overflows?	No
Municipality exceeds its flow allocations into the CRD trunk sewer system?	No
Existing flow metering sites (PS's, CRD billing meters, etc.) are sufficient to cover the municipality with suitably sized I&I management plan catchments?	Yes, but flow data improvement needs improvement
Number of catchments exceeding 4x average dry weather flow (ADWF) [1]	4 of 14

[1] *Catchments >4x ADWF warrant further examination as they exceed the key I&I commitment in the Core Area LWMP.*

4.2 Establishing Long Term Sewer Monitoring Catchments

North Saanich's long-term I&I catchments were established based on its municipal pump stations and existing permanent CRD flow meters (i.e. billing meters). These catchments provide adequate I&I monitoring coverage for North Saanich's sewer system. Two of the catchments exceed the recommended 100 ha maximum catchment size but this isn't a problem for the following reasons:

- The Reay Creek catchment has nested catchments, which can be subtracted to get below the 100-ha threshold.

  "Reay Creek Remainder" (76 ha) = Reay Creek (162 ha) – Munro (74 ha) – Bazen Bay (12 ha)

- The Ebor catchment has nested catchments as well, which can be subtracted to get below the 100-ha threshold.

Appendix E includes A map of the municipality showing all the municipal catchments along with individual catchment maps for each catchment.

4.3 I&I Analyses

The flow generated from the municipal pump stations is suitable for I&I analyses only. For reasons documented in Section 2.3, the pattern of the flow data is reliable, but the magnitude of the data is not. As such, I&I analyses was limited to comparisons of wet weather flow to average dry weather flow (ADWF), which is useful for understanding I&I in a municipality. Table 4.2 summarizes the results of the I&I analyses. The key metric from this table, the "peak 24-hour flow vs ADWF" metric. This metric is summarized on a map of the Saanich Peninsula in Figure 8.1.

Table 4.2: Summary of I&I Analyses Results

Pump Station	Size (ha)	I&I Analyses			
		Peak 24hr Flow vs ADWF	Peak 1hr Flow vs ADWF	Typical Winter Dry Day Flow vs Summer ADWF	Summer Groundwater Expressed as a % of ADWF
SPWWTP Mag Meter #2	82.8	5.8 x ADWF	9.5 x ADWF	1.1 x ADWF	28% of ADWF
Amity	40.3	2.8 x ADWF	4.3 x ADWF	1.1 x ADWF	21% of ADWF
Bazen Bay	11.9	1.8 x ADWF	n/a	1.3 x ADWF	47% of ADWF
Cromar	43.6	3.7 x ADWF	4.8 x ADWF	1.2 x ADWF	17% of ADWF
Ebor	170.0	4.2 x ADWF	5.7 x ADWF	1.5 x ADWF	16% of ADWF
Marina	20.0	3.7 x ADWF	6.2 x ADWF	1.2 x ADWF	17% of ADWF
McDonald	48.5	Minimal I&I		1.2 x ADWF	19% of ADWF
Mills	84.5	4.4 x ADWF	6.9 x ADWF	1.0 x ADWF	17% of ADWF
Munro	74.2	3.9 x ADWF	6.7 x ADWF	1.2 x ADWF	17% of ADWF
Reay Creek	161.5	6.0 x ADWF	8.3 x ADWF	1.5 x ADWF	13% of ADWF
Towner	57.2	3.9 x ADWF	7.5 x ADWF	1.0 x ADWF	15% of ADWF
Trincomali	99.2	3.5 x ADWF	4.8 x ADWF	1.5 x ADWF	20% of ADWF
West Saanich	15.8	3.2 x ADWF	6.2 x ADWF	1.2 x ADWF	20% of ADWF
Parkland	1.6	Too small to analyze			

Supporting data for North Saanich's I&I analyses can be found in Appendix E, which includes:

- A map of the municipality showing all the municipal catchments
- A summary table documenting key catchment stats for each catchment (i.e., pipe length, number of manholes, pipe type, and land use)
- A section for each individual catchment that includes:
    - catchment map
    - 10-day hydrographs charting sewer flows and rainfall for large storms
    - specialized chart used to quantify the peak 24-hour flow for a 5-year storm
    - specialized chart used to quantify the peak 1 hour I&I for a 5-year storm.

Key takeaways from the I&I analyses include:

- The municipality has low to moderate I&I.
- Most of the municipality has low to moderate I&I.

- Two North Saanich catchments have elevated I&I which merit closer scrutiny in future:
    - The Reay Creek PS catchment has elevated peak 24-hour flows but comparatively moderate peak 1-hour flows. This indicates that the I&I is based more on infiltration than inflow. The source of the I&I appears to be Reay Creek Remainder, which is calculated as Reay Creek minus (Munro plus Bazen). Both Munro and Bazen have relatively low I&I so the I&I must come from Reay Creek Remainder.
    - The SPWWTP Mag Meter #2 (82 hectares) has elevated I&I and is worth looking into. *(Note that the flow data from this catchment is highly accurate and it's I&I results are reliable.)*
- Due to flow data quality issues, the I&I analyses was limited to comparisons to average dry weather flow (ADWF). However, the results of this analyses are useful and appear reliable.
- If the quality of the flow data is improved in the future (Section 4.4), additional I&I analyses could be completed including quantitative metrics (l/ha/day, m3/day, etc.).

4.4 Assessment of the Flow Data / Recommendations for Improvement

Before using sewer flow data, it's important to understand the source of the data and its level of accuracy as even the most accurate of meters can produce poor data if installed incorrectly.

Most of the flow data used for this report was generated from municipal pump station SCADA data. The method used is summarized in Section 2.2. Appendixes B and C contain consultant memos detailing how the flow data from each site was generated and assessed. It also contains recommendations for improving the data in the future.

Of note, the flow data from all sites is impacted by the Peninsula SCADA system polling frequency, which polls pump stations approximately every 45 seconds to 5 minutes and can only record the data that it sees at the time of polling. This is substantially less accurate than "event based" SCADA systems, where the events (i.e. pump starts/stops) are timestamped at the exact time that they happen. This issue can be addressed through one of the following options:

- Installing dataloggers with modems in the pump station kiosk to accurately log the data (~$5000 each, plus installation costs and a monthly cellular fee for each modem); or

- Upgrading the Peninsula SCADA system to enable the logging of "event based" data (~$8000/pump station plus system upgrade costs.) Of note, the Peninsula SCADA system is out of date and its SCADA packs are no longer sold or supported by the manufacturer. Upgrading the SCADA system, which the CRD has recommended in the past, would also bring the Peninsula SCADA system it in line with what's been used in the Core Area since 2008.

For either approach, it's recommended that the data be sent wirelessly to FlowWorks.com (~$35/site/month), to convert the SCADA data to flow data. The calculations are already setup and were used to generate the flow data for this report. (FlowWorks.com has easy to program, purpose-built tools designed for viewing and analyzing municipal sewer flow data in real-time.)

In addition, some pump stations require an engineering exercise to accurately calculate the fill cycle volume. This relates to pump stations whose inlet pipes backup during pump station fill cycles. It also applies to pump stations with storage tanks.

Table 4.3 summarizes the results of the flow data assessments and recommendations. By addressing these issues, the flow data would be dramatically improved making the data sufficient for sewer capacity related decisions, sewer models, and quantified I&I analyses (l/s, l/ha/day, etc.).

Table 4.3: Assessment of Flow Data Summary

Group No.	Flow Data Issue	Meter Grouping	Notes/Discussion/Solution
1	Excellent Flow Data, No Issues	Cromar *(43.6 ha)* Towner *(57.2 ha)* SPWWTP Mag Meter #2	These sites use DNP2 data collection and produce very good quality data
2	Locations with CRD Sewer Billing Meters whose Data Is Impacted by the SCADA Polling Frequency Issue	Amity Mag *(40.3 ha)* Ebor Flume *(169.5 ha)* McDonald Mag *(48.58 ha)* Reay Creek Mag *(161.5 ha)*	The CRD will address the issues at these billing meter sites by programming the kiosk to log hourly flows. This "simple fix" is only possible because these locations have existing flow meters (i.e., mag meters).
3	SCADA Polling Frequency Issue	Bazen Bay *(11.9 ha)* Deep Cove Marina *(20 ha)* Munro *(74.2 ha)* West Saanich *(15.8 ha)*	Time stamp issue: Can be addressed by installing dataloggers or upgrading the SCADA system.
4	SCADA Polling Frequency Issue + Unknown fill volume due to storage tanks	Mills *(84.5 ha)* Trincomali *(99.2 ha)*	Time stamp issue: Can be addressed by installing dataloggers or upgrading the SCADA system. The unknown fill volume may be more complex. A small desktop assessment should be completed to determine if the issue can be addressed by customizing the calculations to account for the storage tanks. If not, flow meters could be an option (mag meters, clamp-on meters, etc.)
5	N/A, Catchment Too Small	Parkland *(1.8 ha)*	These catchments are very small and less useful for I&I studies, sewer modelling, capacity studies, etc.

4.5 Overflows

North Saanich's sewer system doesn't overflow at its pump stations due to rain events and North Saanich isn't aware of any other locations that overflow. Overflows due to line failures are documented and reported.

4.6 Municipal I&I Related Work

General I&I program components for the municipality are summarized in the following table.

Table 4.4: Snapshot of Current I&I Related Actions

I&I Program Component	Description
Flow Metering	• 10 pump stations with SCADA derived data (flow data only suitable for I&I analyses) • 3 permanent CRD flow meters.
Sewer Master Plan	• Yes (completed in 2017) • An update is planned for 2025/26 following completion of North Saanich's official community plan.
Sewer Model	• Yes (completed in 2017) • An update is planned for 2025/26 following completion of North Saanich's official community plan.
Camera Inspections	• Planned to commence in 2025
Private Property I&I Program	• Nothing formal
Asset Management	• N/A

North Saanich's Sewer Master Plan indicated that an I&I reduction program was not warranted at the time of plan (2017). The main recommendations in the plan were to begin a CCTV program, commence an AC Gravity Main rehabilitation program in 2025, and assess and upgrade pump stations as conditions require.

4.7 Next Steps

The key recommended next steps for North Saanich include:

- Carry out the recommendations to improve the flow data quality from their pump stations (i.e. timestamp issue at 6 sites and wetwell volume issues at two sites).

- Map the municipality's potential sewer overflow locations (which may or may not actually overflow) and consider installing level sensors when appropriate. Document the results of the process.
- Review catchments with elevated I&I. Confirm whether investigation data (i.e. camera inspection data, smoke testing) is available to help identify the sources of the I&I. If not, decide if it is worth collecting this investigation data and scheduling the work. Document the results of the process.
- Support the update of this report at 5-year intervals.
- Continue with the actions documented in the Sewer Master Plan.

5 Sidney

5.1 Overview

I&I management plans require sewer flow data to assess and rank catchments for I&I and to quantify the effectiveness of I&I reduction work. Prior to 2020, Sidney had minimal sewer flow data. The focus of this initial I&I Management Plan was to establish long-term flow monitoring catchments for the municipality, generate sewer flow data for these catchments, and analyse the data for I&I. This report is considered a foundational first step towards I&I management that can be built upon in future years.

For context, the following table summarizes some of the key I&I benchmarks for the municipality.

Table 5.1: Key I&I Benchmarks

Key I&I Benchmarks *(for 5-year storms)*	Status
Municipality has I&I related overflows?	No
Municipal I&I contributes to downstream CRD overflows?	No
Municipality exceeds its flow allocations into the CRD trunk sewer system?	No
Existing flow metering sites (PS's, CRD billing meters, etc.) are sufficient to cover the municipality with suitably sized I&I management plan catchments?	No. Unfortunately, there is an 203 hectare area in Sidney that isn't covered by existing Sidney or CRD pump stations. To derive flow data for this area would require a few portable flow meters as ideally, I&I catchments would be under 100 hectares in size.
Number of catchments exceeding 4x average dry weather flow (ADWF) [1]	9 of 14

[1] *Catchments >4x ADWF warrant further examination as they exceed the key I&I commitment in the Core Area LWMP.*

5.2 Establishing Long Term Sewer Monitoring Catchments

Sidney's long-term I&I catchments were established based on its municipal pump stations and existing permanent CRD flow meters (i.e. billing meters). These catchments provide adequate I&I monitoring

coverage for much of Sidney. The exception to this is a 203-hectare area called "Sidney PS Remainder", which would require ~2 temporary sewer flow meters address in the future.

Appendix F includes a map of the municipality showing all the municipal catchments along with individual catchment maps for each catchment.

5.3 I&I Analyses

The flow generated from the municipal pump stations is suitable for I&I analyses only. For reasons documented in Section 2.3, the pattern of the flow data is reliable, but the magnitude of the data is not. As such, I&I analyses was limited to comparisons of wet weather flow to average dry weather flow (ADWF), which is useful for understanding I&I in a municipality. Table 5.2 summarizes the results of the I&I analyses. The key metric from this table, the "peak 24- hour flow vs ADWF" metric. This metric is summarized on a map of the Saanich Peninsula in Figure 8.1.

Table 5.2: Summary of I&I Analyses Results

Pump Station	Size (ha)	I&I Analyses			
		Peak 24hr Flow vs ADWF	Peak 1hr Flow vs ADWF	Typical Winter Dry Day Flow vs Summer ADWF	Summer Groundwater Expressed as a % of ADWF
Allbay	2.8	6.0 x ADWF	9.7 x ADWF	0.3 x ADWF	21% of ADWF
Amelia	97.6	4.6 x ADWF	6.2 x ADWF	1.3 x ADWF	21% of ADWF
Ardwell	26.6	5.1 x ADWF	7.4 x ADWF	1.3 x ADWF	16% of ADWF
Beacon	0.1	Catchment too small for I&I Analyses			
Frost	3.4	6.2 x ADWF	10.1 x ADWF	2.5 x ADWF	31% of ADWF
Harbour	59.8	5.1 x ADWF	7.8 x ADWF	1.2 x ADWF	17% of ADWF
Latch	2.6	No measurable I&I		0.9 x ADWF	26% of ADWF
Lochside	4.5	13.1 x ADWF	20.4 x ADWF	1.4 x ADWF	26% of ADWF
Rothesay	23.8	9.3 x ADWF	12.2 x ADWF	1.8 x ADWF	24% of ADWF
Seaport	1.2	No measurable I&I		1.1 x ADWF	23% of ADWF
Summergate	11.3	5.2 x ADWF	8.2 x ADWF	2.2 x ADWF	19% of ADWF
Surfside	1.3	19.5 x ADWF	27.5 x ADWF	2.2 x ADWF	38% of ADWF
SPWWTP Mag Meter #3	685.9	5.2 x ADWF	8.2 x ADWF	1.5 x ADWF	26% of ADWF

Supporting data for Sidney's I&I analyses can be found in Appendix F, which includes:

- A map of the municipality showing all the municipal catchments
- A summary table documenting key catchment stats for each catchment (i.e., pipe length, number of manholes, pipe type, and land use)
- A section for each individual catchment that includes:
    - catchment map
    - 10-day hydrographs charting sewer flows and rainfall for large storms
    - specialized chart used to quantify the peak 24-hour flow for a 5-year storm
    - specialized chart used to quantify the peak 1 hour I&I for a 5-year storm.

Key takeaways from the I&I analyses include:

- The municipality has moderate I&I, which is inline with the age of the municipal sewers.
- The Lochside and Surfside catchments are very small but have substantial I&I. These should be investigated.
- The Rothesay catchment has high Peak 24 hour I&I. Some of this is due to the higher overall winter flows compared to summer flows, which could indicate that the catchment drains substantial groundwater during the winter.
- The All Bay Catchment has elevated flows, but the catchment is small, and the quality of the data is low. It should be reviewed further to determine if its worth investigating.
- The Summergate catchment's flows are typically much higher in the winter than in the summer. This should be looked into to determine why. Note that Summergate catchment sewers and pump station are private and not owned or maintained by Sidney.
- Due to issues flow data quality, the I&I analyses was limited to comparisons to average dry weather flow (ADWF). However, the results of this analyses are useful and appear reliable.
- If the quality of the flow data is improved in the future (Section 5.4), additional I&I analyses could be completed including quantitative metrics (l/ha/day, m3/day, etc.). The data would then also be useful for capacity related needs (capacity studies, sewer models, etc.).

5.4 Assessment of the Flow Data / Recommendations for Improvement

Before using sewer flow data, it's important to understand the source of the data and its level of accuracy as even the most accurate of meters can produce poor data if installed incorrectly.

Most of the flow data used for this report was generated from municipal pump station SCADA data. The method used is summarized in Section 2.3. Appendixes B and C contain consultant memos detailing how

the flow data from each site was generated and assessed. It also contains recommendations for improving the data in the future.

Of note, the flow data from all sites is impacted by the Peninsula SCADA system polling frequency, which polls pump stations approximately every 45 seconds to 5 minutes and can only record the data that it sees at the time of polling. This is substantially less accurate than "event based" SCADA systems, where the events (i.e. pump starts/stops) are timestamped at the exact time that they happen. This issue can be addressed through one of the following options:

- Installing dataloggers with modems in the pump station kiosk to accurately log the data (~$5000 each, plus installation costs and a monthly cellular fee for each modem); or

- Upgrading the Peninsula SCADA system to enable the logging of "event based" data (~$8000/pump station plus system upgrade costs.) Of note, the Peninsula SCADA system is out of date and its SCADA packs are no longer sold or supported by the manufacturer. Upgrading the SCADA system, which the CRD has recommended in the past, would also bring the Peninsula SCADA system it in line with what's been used in the Core Area since 2008.

For either approach, it's recommended that the data be sent wirelessly to FlowWorks.com (~$35/site/month), to convert the SCADA data to flow data. The calculations are already setup and were used to generate the flow data for this report. (FlowWorks.com has easy to program, purpose-built tools designed for viewing and analyzing municipal sewer flow data in real-time.)

In addition, some pump stations require an engineering exercise to accurately calculate the fill cycle volume. This relates to pump stations whose inlet pipes backup during pump station fill cycles. It also applies to pump stations with storage tanks.

Table 5.3 summarizes the results of the flow data assessments and recommendations. By addressing these issues, the flow data would be dramatically improved making the data sufficient for sewer capacity related decisions, sewer models, and quantified I&I analyses (l/s, l/ha/day, etc.).

Table 5.3: Assessment of Flow Data Summary

Group No.	Flow Data Issue	Meter Grouping	Notes/Discussion/Solution
1	SCADA Polling Frequency Issue	Amelia *(97.6 ha)* Ardwell *(26.6 ha)* Harbour *(59.8 ha)* Rothesay *(23.8 ha)* Summergate *(11.3 ha)*	Time stamp issue: Can be addressed by installing dataloggers or upgrading the SCADA system.
2	SCADA Polling Frequency Issue (small catchments)	Allbay *(2.8 ha)* Latch *(2.6 ha)* Lochside *(4.5 ha)* Seaport *(1.2 ha)* Surfside *(1.3 ha)*	Time stamp issue: Can be addressed by installing dataloggers or upgrading the SCADA system. Normally, catchments of this size are too small to be useful. However, the flow data from these catchments looks surprisingly reasonable.
3	SCADA Polling Frequency Issue + Small Catchments + Unknown Fill Volume due to Storage Tank	Frost *(3.4 ha)*	Time stamp issue: Can be addressed by installing dataloggers or upgrading the SCADA system. If there is a need for flow data from this location, a small desktop assessment could be completed to determine the simplest way to address the issue, which could be as simple as building a fill cycle volume lookup table whose calculations incorporate the storage tank.
4	N/A Catchment Too Small	Beacon *(0.1 ha)*	Due to its small size, it's not worth generating flow data for this site.
5	Excellent Flow Data	SPWWTP Mag Meter #3	No issues

5.5 Overflows

Sidney does not have known I&I related overflows. The only I&I related overflows on the Saanich Peninsula occurred during a 100 year rainfall event on November 15, 2021.

5.6 Municipal I&I Related Work

General I&I program components for the municipality are summarized in the following table.

Table 5.4: Snapshot of Current I&I Related Actions

I&I Program Component	Description
Flow Metering	• 10 pump stations with SCADA derived data (flow data only suitable for I&I analyses) • 3 permanent CRD flow meters.
Sewer Replacement Plan	• Yes (updated in 2024)
Sewer Model	• Yes (updated in 2024)
Camera Inspections	• New sewers • New sewers at 1 year (for third party installations) • All sewers every 5 years
Private Property I&I Program	• Inspection chambers installed on new sewer laterals, for redevelopment and at anytime a lateral requires repairs. • Inspection chambers installed on sewer laterals where smoke testing identifies I&I. • The municipality doesn't have a specific program for private property I&I
Asset Management	• Extensive, well established asset management program and infrastructure replacement plan. • Continue to update the Asset Management Plan as new data is collected.

Sidney's past I&I related projects include a manhole grouting program, smoke testing programs, pipe relining and replacement projects. Efforts continue with pipe replacement and relining projects identified through Sidney's Asset Management plans. Sidney continues to work with private properties, including the installation of inspection chambers, to resolve I&I identified through smoke testing programs. Sidney has an annual sewer CCTV program, inspecting approximately one fifth of the municipality's sewer mains and

manholes each year in efforts to identify sources of I&I. In 2024, Sidney updated its sewer model and will be updating its underground infrastructure replacement plans.

5.7 Next Steps

The key recommended next steps for Sidney include:

- Carry out the recommendations to improve the flow data quality from their pump stations (i.e. timestamp issue at 12 sites and wetwell volume issues at one site).
- Map the municipality's potential sewer overflow locations (which may or may not actually overflow) and consider installing level sensors when appropriate. Document the results of the process.
- Review catchments with elevated I&I. Confirm whether investigation data (i.e. camera inspection data, smoke testing) is available to help identify the sources of the I&I. If not, decide if it is worth collecting this investigation data and scheduling the work. Document the results of the process.
- Support the update of this report at 5-year intervals.
- Use portable flow meters to obtain flow data from the unmetered portion of Sidney.
- Continue with the actions noted in the Sewer Replacement Plan.

Table 6.1: Additional Flow Sites Assessed for I&I

Pump Station	Size	I&I Analyses			
	Ha	Peak 24hr Flow vs ADWF [1]	Peak 1hr Flow vs ADWF [1]	Typical Winter Dry Day Flow vs Summer ADWF	Summer Groundwater Expressed as a % of ADWF
SPWWTP Combined Inflow	1688.0	5 x ADWF	7.4 x ADWF	1.5 x ADWF	24% ADWF
Greater Victoria Airport Authority (PS#3)	71.0	8.4 x ADWF	13.4 x ADWF	1.6 x ADWF	22% of ADWF
Tseycum First Nation	10.1	7.2 x ADWF	9.8 x ADWF	1.5 x ADWF	20% of ADWF
BC Ferries	9.3	This catchment has no visible I&I.			

Institute of Ocean Sciences (IOS)	7.1	Peak 24 hours flows for a 5-year storm are around 10-15x ADWF, but this is largely due to the catchment's very low flows in summer, which is the basis of ADWF. In addition, the flow pattern in this catchment doesn't follow a consistent pattern and as such it doesn't lends itself well to I&I analyses.
Pauquachin First Nation	24.2	There's a moderate response to rainfall at this site of around 3.5x ADWF. However, the summer flow data varies between years and is not reliable enough to compare storm flows to ADWF.

Supporting information for the I&I analyses in included in Appendix G, which includes the following for each of the catchments in noted in the table above:

- catchment map
- 10-day hydrographs charting sewer flows and rainfall for large storms
- specialized chart used to quantify the peak 24-hour flow for a 5-year storm
- specialized chart used to quantify the peak 1 hour I&I for a 5-year storm.

6 First Nations, Airport, BC Ferries and IOS I&I

The focus of this report is I&I from the Saanich Peninsula municipalities. However, since flow data from some other existing flow meters was already available, it was also analyzed for I&I (Figure 6.1). The key metric from this table, the "peak 24- hour flow vs ADWF" metric whose results are summarized on a map of the Saanich Peninsula in Figure 8.1. Note that the flow data from these meters is impacted by the "SCADA timestamp" issue noted in Section 2.3. Being that each of these sites have existing magnetic flow meters, the issue can be resolved through a few hours of programming at each pump station kiosk. The CRD has implemented a project to address this issue in 2024.

Table 6.1: Additional Flow Sites Assessed for I&I

Pump Station	Size	I&I Analyses			
	Ha	Peak 24hr Flow vs ADWF [1]	Peak 1hr Flow vs ADWF [1]	Typical Winter Dry Day Flow vs Summer ADWF	Summer Groundwater Expressed as a % of ADWF
SPWWTP Combined Inflow	1688.0	5 x ADWF	7.4 x ADWF	1.5 x ADWF	24% ADWF
Greater Victoria Airport Authority (PS#3)	71.0	8.4 x ADWF	13.4 x ADWF	1.6 x ADWF	22% of ADWF
Tseycum First Nation	10.1	7.2 x ADWF	9.8 x ADWF	1.5 x ADWF	20% of ADWF
BC Ferries	9.3	This catchment has no visible I&I.			
Institute of Ocean Sciences (IOS)	7.1	Peak 24 hours flows for a 5-year storm are around 10-15x ADWF, but this is largely due to the catchment's very low flows in summer, which is the basis of ADWF. In addition, the flow pattern in this			

		catchment doesn't follow a consistent pattern and as such it doesn't lends itself well to I&I analyses.
Pauquachin First Nation	24.2	There's a moderate response to rainfall at this site of around 3.5x ADWF. However, the summer flow data varies between years and is not reliable enough to compare storm flows to ADWF.

Supporting information for the I&I analyses in included in Appendix G, which includes the following for each of the catchments in noted in the table above:

- catchment map
- 10-day hydrographs charting sewer flows and rainfall for large storms
- specialized chart used to quantify the peak 24-hour flow for a 5-year storm
- specialized chart used to quantify the peak 1 hour I&I for a 5-year storm.

7 Private Property I&I

7.1 Overview

By length, approximately 40% of the total length of the sewer system is composed of private property laterals. Property owners own and are responsible for the maintenance of their private property laterals. However, proactive inspection, maintenance and repair is rare. Property owners generally don't inspect or repair their laterals unless there has been a pipe failure or blockage has occurred. This is significant because studies show that approximately half of all I&I originates on private property.

Private property I&I (PPI&I) is not always a problem. PPI&I is generally an issue in catchments with old sewers and correspondingly high overall I&I. PPI&I may not be an issue in young sewers with correspondingly low I&I. Note, however, that cross-connections (i.e. roof drains connected to sewer) can contribute massive I&I, no matter what the age or overall condition of the sewer system.

7.2 Public's Understanding of the Issue

Property owners are generally aware of their responsibility to maintain their laterals and perimeter drains, however, they rarely think about their underground pipes, until they have a problem. They are aware that plumbers can inspect their laterals but are put off by the cost (i.e. $250) and potentially large repair cost (i.e. $1,200 to $20,000). Generally, property owners only get their pipes inspected if dealing with a plumbing problem (i.e. poor drainage rates, damp basement, basement flooding).

7.3 Education Approaches

Most municipalities do not have education initiatives focused on private property I&I. The small number that do encourage homeowners to inspect and repair their pipes to help reduce I&I and prevent overflows. Homeowners generally aren't interested in this type of education and recognize that it will costs them money to inspect and maintain their pipes but the benefits (i.e. lower I&I & overflows) go to the municipalities.

To address this, the Core Area I&I Program prepared education materials with the same end goal, to encourage pipe inspection and repair, but with a focus on "preventing basement flooding",

which is more in the self interest of homeowners. The approach was developed in collaboration with professional groups that homeowners trust (i.e. Realtor Association, plumbers, home inspectors, insurance industry). These materials, along with traditional private property education materials, can be found at www.crd.bc.ca/pipes.

"Focused voluntary education approaches" can also be developed to address specific issues. Sometimes this is done in combination with municipal rebates/grant programs. For example, in areas where municipal sewers routinely surcharge causing basement flooding (i.e. areas with combined sewers), some municipalities have specific programs encouraging homeowners to install backflow preventers on their sewer laterals to prevent flooding. The education may also include municipal rebates/grants to help pay for the work.

Despite the best intentions, the effectiveness of all voluntary I&I education approaches is hindered by the high costs of pipe inspection and repair.

7.4 Effective Municipal Private Property I&I Programs are Rare

In North America, it's difficult to implement programs that significantly reduce private property I&I (i.e. measured reductions in I&I) for the following reasons:

1) These programs are rare. There are currently no such programs in Canada. The ~40 such programs that exist in the USA were mandated by the Environmental Protection Agency. (The exception to this are programs in municipalities with combined sewers.)
2) The work is expensive. Pipe inspections cost ~$250 and fixes typically cost in the thousands of dollars.
3) Municipalities face potential liability / risks related to private property I&I initiatives.
4) Municipalities face tough decisions for how they prioritize their finite municipalities resources (i.e. staff time, tax dollars).
5) The issue is complicated. For example:
   - I&I rates vary substantially within municipalities and across the region. In some areas, I&I may not even be a problem. Generally speaking, I&I tends to be low in catchments with young sewers and high in catchments with old sewers.
   - Fixing cross-connections is the most efficient way to address private property I&I but finding them is complex and time consuming.
   - Voluntary approaches generally have very little uptake.

- Effective approaches (i.e. requiring lateral inspection and fixes at time of sales) have the unintended downside of impacting all properties, not just the ones contributing to the problem.

7.5 Private Property I&I Programs from Around North America

In 2012, the Core Area I&I program commissions a report to document the various private property I&I programs from around North America. The report was subsequently updated in 2014 and again in 2022. Of note, significant efforts were made to find Canadian examples for municipalities with separated sewers. In general, the Canadian examples were limited to a small number of municipalities that require lateral inspections/maintenance as part of building permit applications over a certain dollar amount (i.e. $150,000). A copy of the most recent version of the report is located in Appendix H.

7.6 "Strong" Private Property I&I Programs are Difficult to Implement

In the early to mid 2010's, King County (Washington State) and Metro Vancouver tried to require their member municipalities to voluntarily implement bylaws requiring sewer lateral fixes during real estate transactions. Up to that point, highly effective programs of this nature had only been implemented when mandated by the US Environmental Protection Agency. After 5 years of planning, the King County approach was shelved weeks prior to implementation due to pressure from interest groups. Metro Vancouver's requirement for its municipalities to adopt this type of program was ignored. The lesson learned was that "strong" private property I&I programs don't survive politically unless mandated by regulators.

7.7 Efforts in the Core Area

For the reasons noted earlier in Section 7, it's very difficult to implement programs to address private property I&I. Since the early 2000's, the Core Area I&I Program held countless meetings on the topic, reviewed all potential options, commissioned reports to see what's used around North America, presented to realtors and home inspectors and held workshops for experts / politicians. The work was loosely coordinated with Metro Vancouver and in was in alignment with consultant recommendations. Despite the considerable efforts, minimal progress was made.

Metro Vancouver has recently made some progress on the topic by offering its member municipalities the two types of bylaw options for addressing private property I&I (each must adopt one):

- Requiring sewer laterals be inspected and fixed as part of building permits over a certain dollar amount.
- Adjusting sewer tax rates based on the age of the home; with reduced rates if the lateral has been replaced or proven through a camera inspection of being in good condition.

The Metro Vancouver municipalities appear to be okay with these options and some have already adopted the options into their bylaws. The Core Area I&I Program expects to follow the same path.

8 Closing

This initial I&I Management Plan for the Saanich Peninsula focused on setting up sewer catchments and high level I&I analyses. The plan is considered a first step that can be built upon in the future with updates recommended at 5-year intervals.

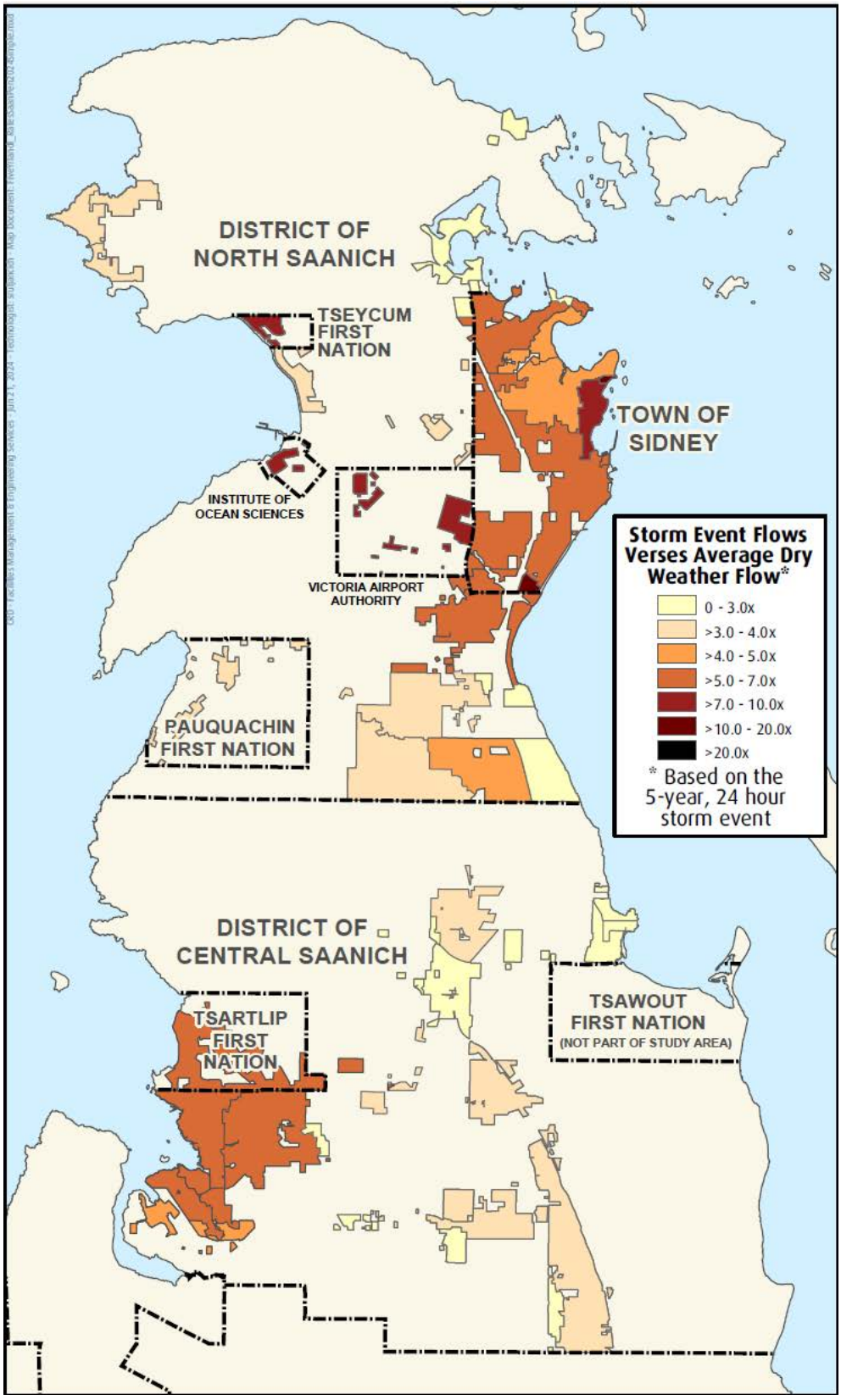
For this report, data from 44 sites was generated and analyzed. The key metric for the analyses was the "peak 24hr flow vs average dry weather flow (ADWF) metric; the results of which are summarized on a map in Figure 8.1. For reference, this is also the key the I&I commitment in the Core Area LWMP; to be below 4x ADWF by 2030.

The key recommended actions moving forward include:

- Municipalities to carry out the recommendations to improve the flow data quality from their pump stations (i.e. timestamp issue at 33 sites and wetwell volume issues at 8 sites). This would result in future data being useful for both I&I analyses and for municipal engineers (i.e. capacity studies, sewer modeling). The timestamp issues can be addressed by either:
  - Installing dataloggers with modems in the pump station kiosk to accurately log the data (~$5000 each, plus installation costs and a monthly cellular fee for each modem); or
  - Upgrading the Peninsula SCADA system to enable the logging of "event based" data (~$8000/pump station plus system upgrade costs.) Of note, the Peninsula SCADA system is out of date and its SCADA packs are no longer sold or supported by the manufacturer. Upgrading the SCADA system, which the CRD staff have recommended in the past, would also bring the Peninsula SCADA system it in line with what's been used in the Core Area since 2008.
- CRD are to carry out the recommendations to improve the flow data quality from 9 billing meter sites and two additional CRD pump stations. This option is relatively inexpensive (~$1000 per site) as each site already has a purpose-built flow meter (i.e., magnetic flow meter).
- Municipalities to map their potential sewer overflow locations (which may or may not actually overflow) and consider installing level sensors when appropriate. Document the results of the process.

- Municipalities to review catchments with elevated I&I. Confirm whether investigation data (i.e. camera inspection data, smoke testing) is available to help identify the sources of the I&I. If not, decide if it is worth collecting this investigation data and scheduling the work. Document the results of the process.
- The CRD to conduct follow-up I&I analyses prior to the 5-year update of this plan and to provide I&I related support to the municipalities as appropriate (funding dependant).
- Update this report at 5-year intervals.

Figure 8.1: Summary of I&I Rates for the Saanich Peninsula



Making a difference...together

SPWWC 24-05

REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION
MEETING OF THURSDAY, JULY 18, 2024

SUBJECT **Saanich Peninsula Wastewater Service 2024 Mid-Year Capital Projects and Operations Update**

ISSUE SUMMARY

To provide a mid-year update on the Saanich Peninsula Wastewater capital program and operations updates.

BACKGROUND

Capital Program

The Saanich Peninsula Wastewater (SPWW) capital program reflects the planned capital spending for the next five years and forms part of the annual service budget that is approved in March each year by the Capital Regional District (CRD) Board. In 2024, there are 14 capital projects identified with an expenditure estimated at $2.8 million. Of the 14 projects, more than 60% of the 2024 budget is attributed to four significant projects. The status of these projects are detailed in Appendix A and their locations shown in Appendix B. Project 23-03, the Odour Control Construction project has been deferred to 2025 awaiting approval of Loan Authorization Bylaw or alternative funding source and no spending will occur in 2024. Additional smaller projects will also progress based on criticality and resourcing.

Operations Update

The Saanich Peninsula and Gulf Islands Operations team operates and maintains the Saanich Peninsula Wastewater Treatment Plant, Collection System and District Energy (Wastewater Heat Recovery) System which includes a routine operational and preventative maintenance program. The 2024 annual operating budget is $4 million and is on target for a surplus at year end primarily due to an underspent biosolids disposal budget.

Wastewater Treatment Plant
The wastewater system typically treats and discharges approximately 3,600 megaliters (ML) of wastewater annually. At mid-year 1,770 ML have been treated and discharged. There have been no exceedances of the facilities operating permit to date.

Wastewater Collection System
The wastewater collection system includes the operations of the Sidney, Keating, and Turgoose Pumping Stations (primary sites) and the collection system piping. Repairs to the Keating Pump Station backup generator electrical alternator were completed February 2024.

Sludge Management
Dewatered untreated sludge is hauled and disposed of at the Hartland Landfill site, this will be resolved once the Residual Treatment Facility is ready to accept other municipal solids. On average the treatment facility produces approximately 4,000 metric tons of biosolids per year. To date, 1,930 metric tons of biosolids have been disposed of at the landfill site.

District Energy System

The District Energy System (DES) provides heat energy for the Panorama Recreation Center (PRC). The annual operating budget for the DES is approximately $126,000 and is expected to be on budget at year end. Revenue generated through energy sales to the PRC mid-year is approximately $70,000 which is significantly higher than budgeted due to a rate increase after the budget was prepared.

Operational Annual Provisional Items

The annual provisional account is in the services five-year capital plan and was established to provide funding for unplanned repairs/replacements that are outside of the operating budget contingencies. Unplanned repairs and replacements at mid-year are identified in the following table.

Project Title	Project Budget	Status
Equipment Replacement – Annual Provisional	$150,000	Project 1: Keating Pump Station standby power alternator replacement ($80,000) Project 2: Saanich Peninsula WWTP 600-volt distribution breaker replacement ($25,000) Project 3: San Pen WWTP Sidney Pumpstation (PS) capacitor replacement ($22,000) Project 4: Sidney PS pump no. 1 refurbishment ($12,000)

CONCLUSION

This report provides the Saanich Peninsula Wastewater Commission with operational and capital program updates for the Saanich Peninsula Wastewater Service.

RECOMMENDATION

There is no recommendation, this report is for information only.

Submitted by:	Joseph Marr, P.Eng., Senior Manager, Infrastructure Engineering
Submitted by:	Jason Dales, B.SC., WD IV, Senior Manager, Wastewater Infrastructure Operations
Concurrence:	Alicia Fraser, P. Eng., General Manager, Integrated Water Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

ATTACHMENT(S)

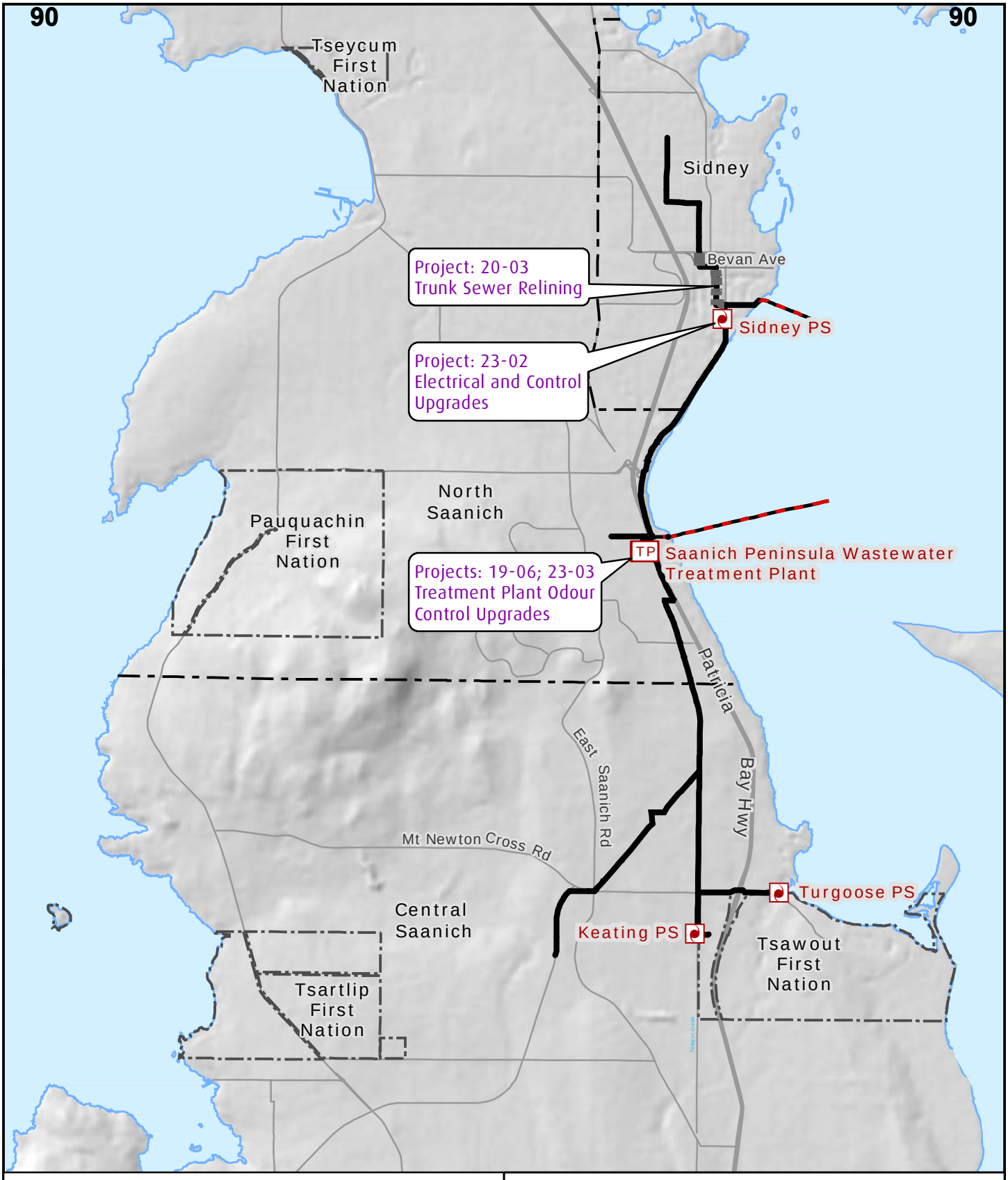
Appendix A: Saanich Peninsula Water Service Capital Program – Current Status of Active Projects
Appendix B: Saanich Peninsula Water Service Capital Program – Significant Project Locations

Appendix A

Saanich Peninsula Wastewater Capital Program – Current Status of Active Projects

Project Number	Project Title	Total Budget	Status
19-06	Odour Control Upgrades	$575,000	Odour Control upgrades are required to prevent ongoing corrosion and improve health and safety of frequently accessed treatment areas. This project is advancing design of the conceptual design and recommendations from KWL's Odour Control Program Study completed in 2018 for the Saanich Peninsula Wastewater Treatment Plant (WWTP). A consultant (HDR) has been engaged to complete design, tendering, and construction services for the upgrades. Detailed design is underway with options and associated costs being assessed.
23-03	Odour Control Upgrade Construction	$1,500,000	This project will commence following completion of design and tender of Capital Project No.19-06.
23-02	Electrical and Control Upgrades	$120,000	Replacement of Sidney Pumpstation Programmable Logic Controller (PLC) and Remote Terminal Unit's (RTU) that are no longer supported. Design work is underway. A Process Control Narrative was completed in 2023 and programming and Human Machine Interface (HMI) display are complete and ready for installation.
20-03	Trunk Sewer Relining	$1,100,000	Cured-in-Place-Pipe lining was completed in 2023 and the project is now into the warranty period.

- Project Numbers refer to project numbers from the 2024 Capital Plan.
- The projects listed above are not inclusive of all capital projects currently underway. Smaller scale projects have been omitted from this list for clarity.



DISCLAIMER

This map is for general information only and may contain inaccuracies.

Saanich Peninsula Wastewater
Significant Project Locations

Figure 1

Making a difference...together

Making a difference...together

Corporate Services
625 Fisgard Street
Victoria, BC V8W 2S6

T: 250.360.3129
F: 250.360.3130
www.crd.bc.ca

July 12, 2024

File: 3900-30

Mayor and Council, District of North Saanich
Attention: Rachel Dumas, Corporate Officer
1620 Mills Road
North Saanich, BC V8L 5S9
Via email: rdumas@northsaanich.ca

Dear Rachel Dumas:

RE: FOLLOW-UP ON MUNICIPAL CONSENT FOR BYLAW NO. 4596 – SAANICH PENINSULA WASTEWATER SERVICES LOAN AUTHORIZATION BYLAW NO. 1, 2024

On March 26, 2024, the Capital Regional District sent a letter requesting that North Saanich Council consider providing consent to the CRD adopting Bylaw No. 4596, "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024".

At the Regular Council meeting held April 29, 2024, the District of North Saanich Council defeated the motion "*That Council consent to the CRD adopting Bylaw No. 4596 "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024."*

We regret to inform you that there was an error in the letter on the requirement for obtaining consent on the above loan authorization bylaw. Section 407(3)(c) of the *Local Government Act* allows for participating area approval to be obtained through municipal consent but requires consent from **all participating areas**. Unfortunately, the letter stated that it only required two-thirds of participants which was incorrect.

Based on this new information on the requirement for 100% participant approval, we are requesting that the District of North Saanich reconsider its consent to Bylaw No. 4596.

If the District of North Saanich chooses to maintain its current position, infrastructure will further degrade, increasing the scope of the required repairs and the associated costs. The 8 projects identified to be funded by this debt include infrastructure improvements identified through the 2022 Saanich Peninsula Wastewater System Asset Management Plan. The following provides details of the more significant near-term projects to be funded by debt and the implications of not proceeding:

- By delaying the proposed odour control system upgrade project there is a risk of increased odour complaints by the surrounding community, ability to meet health and safety

requirements and by not capturing the gases there will be increased corrosion within the facility, thereby negatively impacting the condition and life of the overall facility infrastructure.

- A structural assessment to determine needed repairs to primary clarifier No. 2 and sludge tanks is required. This assessment and resulting recommendations will address and prevent further corrosion and structural damage.
- Original standby genset from 2000 is nearing end of life and a new genset is required to continue to provide standby power to the whole treatment plant. Failure of the genset without replacement would leave the plant with no back-up power which could result in exceedances of regulatory limits during subsequent power outages.
- PLC and CPUs at SPWWTP are at the end of life and must be replaced, failure to replace this equipment may result in communications issues and malfunctioning of equipment within the SPWWTP ultimately risking regulatory compliance.
- Based on inspections several high priority repairs and relining of existing manholes have been identified to avoid further degradation and possible failures. Without these repairs a failure could occur resulting in possible sewer backups and full manhole replacement at additional cost.

To mitigate further infrastructure degradation and the risks noted above, the service needs to fund the $7.72 million in capital project costs through either capital contributions directly from annual requisition or by leveraging debt. Funding these costs through capital contributions directly from annual requisition over the next five years will lead to significant fluctuations in one-time annual requisition amounts for the service from year to year. For example, the 2025 requisition would need to increase by approximately 85% to be enough to cover the planned 2025 capital work. Alternatively, by leveraging debt the requisition will be spread out over 15 years to service the debt and is expected to be in the range of 3.5% to 6.7% over the next five years, though this will be reviewed annually to look for opportunities for other efficiencies to offset increases. In addition, by funding these projects with debt, the costs will be spread over 15 years, therefore more equitably distributing the cost to those that are benefitting from these improvements that have long service lives.

Given the above we hope that North Saanich with reconsider and approve “Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024”.

We would appreciate a response no later than **August 16, 2024** on whether the District will reconsider consent on Bylaw No. 4596.

If you have questions about the proposed bylaw, please contact Joseph Marr, Senior Manager at jmarr@crd.bc.ca or by telephone at 250.474.9656.

If you have questions about the approval process, please contact Deputy Corporate Officer Marlene Lagoa at mlagoa@crd.bc.ca or by telephone 250.360.3127.

Sincerely,

Kristen Morley, JD
Corporate Officer
General Manager, Corporate Services

Attachments: CRD Letter dated March 26, 2024 (with attachments)
North Saanich non-consent letter dated April 30, 2024

cc: Stephanie Munro, Chief Administrative Officer, District of North Saanich
Emilie Gorman, Corporate Officer, District of Central Saanich
Christine Culham, Chief Administrative Officer, District of Central Saanich
Sandi Nelson, Corporate Officer, Town of Sidney
Andrew Hicik, Acting Chief Administrative Officer, Town of Sidney

Making a difference...together

Corporate Services
625 Fisgard Street
Victoria, BC V8W 2S6

T: 250.360.3129
F: 250.360.3130
www.crd.bc.ca

March 26, 2024

File: 3900-30

Mayor and Council, District of North Saanich
Attention: Rachel Dumas, Corporate Officer
1620 Mills Road
North Saanich, BC V8L 5S9
Via email: rdumas@northsaanich.ca

Dear Rachel Dumas:

RE: MUNICIPAL CONSENT FOR BYLAW NO. 4596 – SAANICH PENINSULA WASTEWATER SERVICES LOAN AUTHORIZATION BYLAW NO. 1, 2024

On January 10, 2024, the Capital Regional District (CRD) Board gave three readings to Bylaw No. 4596, "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024".

The Capital Regional District is seeking municipal consent for Bylaw No. 4596. The purpose of the bylaw is to authorize the borrowing of $7,720,000 for the purpose of replacing and improving aging wastewater infrastructure, upgrading odour control, relining trunk sewers, repairing and replacing manholes, enhancing control and communications systems and other improvements. As further background information, please find attached the proposed bylaw and staff report.

Formal consent to the loan authorization bylaw is required from two-thirds of participants which include the District of North Saanich, District of Central Saanich, and Town of Sidney. In addition to municipal Council consent, the bylaws will be forwarded to the Inspector of Municipalities for approval before returning to the CRD Board for adoption.

Please have your Council consider the bylaw at an upcoming meeting and return a response to us no later than May 17, 2024. Your Council resolution may be worded as follows:

> **That Council [consent/not consent] to the CRD adopting Bylaw No. 4596 "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024".**

If you have questions about the proposed bylaw, please contact Joseph Marr, Senior Manager at jmarr@crd.bc.ca or by telephone at 250.474.9656.

If you have questions about the approval process, please contact Deputy Corporate Officer Marlene Lagoa at mlagoa@crd.bc.ca or by telephone 250.360.3127.

Sincerely,

Kristen Morley, JD
Corporate Officer
General Manager, Corporate Services

Attachments: Bylaw No. 4596
Staff Report

cc: Stephanie Munro, Chief Administrative Officer, District of North Saanich

CAPITAL REGIONAL DISTRICT

BYLAW NO. 4596

****

A BYLAW TO AUTHORIZE THE BORROWING OF SEVEN MILLION SEVEN HUNDRED TWENTY THOUSAND DOLLARS ($7,720,000) FOR THE PURPOSE OF PLANNING, DESIGNING, AND CONSTRUCTING TRUNK SEWERS AND SEWAGE DISPOSAL FACILITIES OF SAANICH PENINSULA WASTEWATER TREATMENT PLANT

****

WHEREAS:

A. Under Bylaw No. 2388, "Liquid Waste Management Saanich Peninsula Local Service Establishment Bylaw No. 1, 1996", the Board of the Regional District established a local service for the operation of a service for the collection, conveyance, treatment and disposal of sewage;

B. It is deemed desirable to provide sewerage system facilities described hereunder described in accordance with the local service of Saanich Peninsula Wastewater;

C. The works shall include the capital renewal and upgrade of the Saanich Peninsula wastewater system which will involve the planning, study, project administration, project communications, and staff time required for design and construction of facilities, design and construction of facilities for the collection, conveyance, treatment and disposal of wastewater, as well as other related works, facilities and equipment purchases;

D. The estimated cost of the works, including expenses incidental thereto to be funded from debt servicing, is the sum of Seven Million Seven Hundred and Twenty Thousand ($7,720,000) dollars, which is the amount of debt intended to be authorized by this bylaw;

E. Pursuant to sections 407(3)(c) of the *Local Government Act*, participating area approval is required for this borrowing and shall be obtained by municipal council consent under s. 346 of the *Local Government Act*; and

F. Financing is proposed to be undertaken by the Municipal Finance Authority of British Columbia pursuant to agreements between it and the Capital Regional District;

NOW THEREFORE the Capital Regional District Board in open meeting assembled hereby enacts as follows:

1. The Board is hereby empowered and authorized to undertake and carry out or cause to be carried out the planning, study, public consultation, site selection, design, land and material acquisition, construction, supply and installation of all material, equipment and components and all construction necessary for the collection, conveyance, treatment and disposal of wastewater, as well as other related works, facilities and equipment therein before described and to do all things necessary in connection therewith and without limiting the generality of the foregoing:

    a) to borrow upon the credit of the Capital Regional District a sum not exceeding seven million seven hundred twenty thousand dollars ($7,720,000); and

b) to acquire all such real property, easements, rights-of-way, licenses, rights or authorities as may be requisite or desirable for or in connection with the design and construction of a system for the collection, conveyance, treatment and disposal of sewage and all related ancillary works, studies and equipment deemed necessary by the Board.

2. The maximum term for which debentures may be issued to secure the debt intended to be created by this bylaw is fifteen (15) years.

3. This Bylaw may be cited as "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024".

READ A FIRST TIME THIS	10th	day of	January,	2024
READ A SECOND TIME THIS	10th	day of	January,	2024
READ A THIRD TIME THIS	10th	day of	January,	2024
APPROVED BY MUNICIPAL COUNCIL CONSENT PROCESS PER S.346 OF THE *LOCAL GOVERNMENT ACT* THIS		day of		202__
APPROVED BY THE INSPECTOR OF MUNICIPALITIES THIS		day of		202__
ADOPTED THIS		day of		202__

CHAIR

CORPORATE OFFICER

FILED WITH THE INSPECTOR OF MUNICIPALITIES THIS day of

I hereby certify the foregoing to be a true and correct copy of a Resolution of the Capital Regional District Board on the 10 day of January, 2024.

Dated this 25 day of March, 2024.

Deputy Corporate Officer

Making a difference...together

REPORT TO FINANCE COMMITTEE
MEETING OF WEDNESDAY, JANUARY 03, 2024

SUBJECT **Bylaw No. 4596: Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024**

ISSUE SUMMARY

Pursuant to the Capital Regional District (CRD) provisionally approved 2024 to 2028 Financial Plan, this report brings forward the loan authorization Bylaw No. 4596 for the purpose of financing approved capital plan projects.

BACKGROUND

On October 25, 2023, the Board gave provisional approval for the CRD 2024 Financial Plan, inclusive of the Saanich Peninsula Wastewater Service five-year (2024 to 2028) capital plan. As is the case each year following plan approval, staff prepare the necessary loan authorization bylaws and security issuing bylaws. The Saanich Peninsula Wastewater Service capital plan includes planned infrastructure and improvements totaling $12.3 million, which requires the borrowing of $7.72 million from the Municipal Finance Authority of British Columbia (MFABC) starting in 2025.

The Saanich Peninsula Wastewater capital plan (the 'Capital Plan') includes replacing and improving aging wastewater infrastructure, upgrading odour control, relining trunk sewers, repairing and replacing manholes, enhancing control and communications systems and other improvements.

Loan authorization bylaws expire after five years, so bylaws are drafted to cover the five-year financial plan for services requiring borrowing to fund capital. The loan authorization bylaw will specify the maximum amount, the restricted use and the debt repayment amortization period. Requests to draw funds against the loan authorization bylaw will only be authorized with Board approval of a subsequent security issuing bylaw. The security issuing bylaws, prepared biannually, include only those borrowings that are necessary based on the cash flow needs as determined by the approved financial plan.

The following bylaw is proposed:

Service Area	Action	Purpose	Bylaw
3.718	Loan Authorization Bylaw	To create a loan authorization bylaw to permit long-term borrowing related to the Capital Plan for this service.	4596

ALTERNATIVES

Alternative 1
The Finance Committee recommends to the Capital Regional District Board:
1. That Bylaw No. 4596, "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024", be introduced and read a first, second and third time; and
2. That participating area approval for Bylaw No. 4596 be obtained by way of the municipal consent process for North Saanich, Central Saanich and Sidney, and if successful, be referred to the Inspector of Municipalities for approval.

Alternative 2
That Bylaw No. 4596 be referred to staff for additional information.

IMPLICATIONS

Legislative & Financial Implications

Section 24 of the *Municipal Finance Authority Act*, RSBC 1996 c 325 states that a regional district security issuing bylaw may only be enacted and financed if the long-term borrowing is arranged through the MFABC. The loan authorization required is up to $7.72 million and will support the planned five-year capital plan expenditures commencing in January 2025. The estimated debt servicing costs for the borrowing are included in the 2024 CRD provisional financial plan.

With the MFABC's indicative interest rate at 4.58% as of December 11, 2023, borrowing the full authorized amount over a 15-year amortization period would result in an estimated annual debt service cost of approximately $0.75 million. The total financing cost over this period is projected to be $11.3 million. These debt servicing expenses are planned to be funded through requisition and the actual amount borrowed each year will be based on the specific cash flow requirements for the year.

Long-term borrowing (i.e., loans with a term of more than five years) cannot be undertaken without the loan authorization bylaw being approved and, subsequently and separately, a security issuing bylaw being approved, in accordance with the *Local Government Act*.

As part of the loan authorization bylaw approval process, the bylaw requires participant approval. Participant approval can be obtained through consent on behalf of municipal participants or by sub-regional alternative approval process (AAP). Consent on behalf of the municipal participants of North Saanich, Central Saanich and Sidney will be initiated once the loan authorization bylaw has received third reading by the Board and is the preferred method administratively in this instance.

To ensure optimization of interest and timing of long-term debt, issuance of a temporary borrowing will be proposed if Ministerial approval is obtained, and the municipal consent process proves successful. The timing of the debt issuance will be based on the timing of expenditures and will be dependent on prevailing interest rates at the time. Before long-term debt issuance can be exercised, a security issuing bylaw will be brought forward for approval. The term of debt issuance under the loan authorization will be 15 years.

CONCLUSION

The CRD 2024 provisional financial plan sets out the capital expenditure for each service, including planned borrowing. Borrowing for the Saanich Peninsula Wastewater Service was identified as $7.72 million for planned infrastructure and improvements. Bylaw No. 4596, "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024", is presented now in preparation for the future borrowing to enable the identified projects within the Service's five-year (2024-2028) capital plan.

RECOMMENDATION

The Finance Committee recommends to the Capital Regional District Board:

1. That Bylaw No. 4596, "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024", be introduced and read a first, second and third time; and
2. That participating area approval for Bylaw No. 4596 be obtained by way of the municipal consent process for North Saanich, Central Saanich and Sidney, and if successful, be referred to the Inspector of Municipalities for approval.

Submitted by:	Rianna Lachance, BCom, CPA, CA, Senior Manager, Financial Services
Concurrence:	Nelson Chan, MBA, FCPA, FCMA, Chief Financial Officer
Concurrence:	Jan van Niekerk, P.Eng. Acting General Manager, Integrated Water Services
Concurrence:	Kristen Morley, J.D., General Manager, Corporate Services & Corporate Officer
Concurrence:	Larisa Hutcheson, P. Eng., Acting Chief Administrative Officer

ATTACHMENT

Appendix A: Bylaw No. 4596, "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024"

CAPITAL REGIONAL DISTRICT

BYLAW NO. 4596

****

A BYLAW TO AUTHORIZE THE BORROWING OF SEVEN MILLION SEVEN HUNDRED TWENTY THOUSAND DOLLARS ($7,720,000) FOR THE PURPOSE OF PLANNING, DESIGNING, AND CONSTRUCTING TRUNK SEWERS AND SEWAGE DISPOSAL FACILITIES OF SAANICH PENINSULA WASTEWATER TREATMENT PLANT

****

WHEREAS:

A. Under Bylaw No. 2388, "Liquid Waste Management Saanich Peninsula Local Service Establishment Bylaw No. 1, 1996", the Board of the Regional District established a local service for the operation of a service for the collection, conveyance, treatment and disposal of sewage;

B. It is deemed desirable to provide sewerage system facilities described hereunder described in accordance with the local service of Saanich Peninsula Wastewater;

C. The works shall include the capital renewal and upgrade of the Saanich Peninsula wastewater system which will involve the planning, study, project administration, project communications, and staff time required for design and construction of facilities, design and construction of facilities for the collection, conveyance, treatment and disposal of wastewater, as well as other related works, facilities and equipment purchases;

D. The estimated cost of the works, including expenses incidental thereto to be funded from debt servicing, is the sum of Seven Million Seven Hundred and Twenty Thousand ($7,720,000) dollars, which is the amount of debt intended to be authorized by this bylaw;

E. Pursuant to sections 407(3)(c) of the *Local Government Act*, participating area approval is required for this borrowing and shall be obtained by municipal council consent under s. 346 of the *Local Government Act*; and

F. Financing is proposed to be undertaken by the Municipal Finance Authority of British Columbia pursuant to agreements between it and the Capital Regional District;

NOW THEREFORE the Capital Regional District Board in open meeting assembled hereby enacts as follows:

1. The Board is hereby empowered and authorized to undertake and carry out or cause to be carried out the planning, study, public consultation, site selection, design, land and material acquisition, construction, supply and installation of all material, equipment and components and all construction necessary for the collection, conveyance, treatment and disposal of wastewater, as well as other related works, facilities and equipment therein before described and to do all things necessary in connection therewith and without limiting the generality of the foregoing:

    a) to borrow upon the credit of the Capital Regional District a sum not exceeding seven million seven hundred twenty thousand dollars ($7,720,000); and

b) to acquire all such real property, easements, rights-of-way, licenses, rights or authorities as may be requisite or desirable for or in connection with the design and construction of a system for the collection, conveyance, treatment and disposal of sewage and all related ancillary works, studies and equipment deemed necessary by the Board.

2. The maximum term for which debentures may be issued to secure the debt intended to be created by this bylaw is fifteen (15) years.

3. This Bylaw may be cited as “Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024”.

READ A FIRST TIME THIS	day of	202_
READ A SECOND TIME THIS	day of	202_
READ A THIRD TIME THIS	day of	202_
APPROVED BY MUNICIPAL COUNCIL CONSENT PROCESS PER S.346 OF THE *LOCAL GOVERNMENT ACT* THIS	day of	202_
APPROVED BY THE INSPECTOR OF MUNICIPALITIES THIS	day of	202_
ADOPTED THIS	day of	202_

CHAIR CORPORATE OFFICER

FILED WITH THE INSPECTOR OF MUNICIPALITIES THIS day of

April 30, 2024

Via email to: kmorley@crd.bc.ca

Capital Regional District
Corporate Services
625 Fisgard Street
Victoria, BC V8W 2S6

Attention: Kristen Morley, Corporate Officer and General Manager, Corporate Services

Dear Kristen Morley:

Re: Municipal Consent for Bylaw No. 4596 – Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024

At the Regular Council meeting held April 29, 2024, the District of North Saanich Council defeated the following motion:

> *"That Council consent to the CRD adopting Bylaw No. 4596 "Saanich Peninsula Wastewater Services Loan Authorization Bylaw No. 1, 2024"."*

Should you have any questions or concerns relating to this matter, please do not hesitate to contact me at 250-655-5453 or RDumas@northsaanich.ca.

Sincerely,

Rachel Dumas
Deputy CAO/Director of Corporate Services

RD/la