



The Corporation of the District of Saanich

Report

To: Mayor and Council
From: Harley Machielse, Director of Engineering
Date: October 17, 2024
Subject: Integrated Stormwater Management Planning Update
File:

RECOMMENDATIONS

That Council receive this report on the Integrated Stormwater Management Plan (ISMP) project progress.

PURPOSE

The purpose of the report is for Council to receive an update on how the District continues to advance development of Integrated Stormwater Management Plans and related work.

BACKGROUND

Stormwater planning and service delivery is evolving from what was traditionally perceived as a pipe-capacity exercise, towards a comprehensive management approach that reflects water quality, water quantity, environmental services, and climate change resiliency, among other factors. This approach is reflected in Integrated Stormwater Management Plans (ISMPs) which provide a roadmap to meet service objectives while helping the District maintain or improve overall catchment health. Integrated stormwater management is founded upon five fundamental pillars:

- Drainage infrastructure asset management
- Policy
- Environmental protection
- Land use planning
- Working in partnerships

Adopting an integrated approach to stormwater management that reflects the fundamental pillars, also aligns with several diverse goals and initiatives identified in District strategic plans and strategies, intended to direct the actions, decisions, and the work of staff. Such goals relate to stormwater quality, natural systems/areas (i.e., natural assets), drainage infrastructure and development. ISMPs primarily guide the actions and decisions of engineering staff but also influence broader stakeholders such as those in other departments, developers, community groups, etc.

Council's 2019 to 2023 strategic plan identified the development of a District-wide Drainage Master Plan and the 2023 to 2027 strategic plan includes an initiative to continue to advance

this work as baseline ISMPs over the next four years. Climate Plan objectives include the acceleration of this work and the integration of climate change impacts on infrastructure and assets.

DISCUSSION

Saanich has 15 primary watersheds, with some differing and unique characteristics. To make the ISMPs more manageable and tailored to the needs of the catchments, an ISMP Development Strategy was created for Saanich which includes developing four ISMPs, in each of (1) Cordova Bay, (2) Douglas Creek-10 Mile, (3) Colquitz, and (4) Boundary Streams (across several inter-boundary streams along its borders). A fifth plan, the Rural Areas Stormwater Plan, addresses catchments in areas mostly outside the Urban Containment Boundary of Saanich.

The original schedule for implementing the strategy presented to Council in 2021 projected that several ISMPs would be complete by the end of 2025, except for Rural Areas which would be completed in 2026. The timeline has now been extended, mainly due to:

- Additional time needed to complete the pilot ISMP for Cordova Bay. This was the first ISMP and the shift away from drainage to integrated stormwater management required new approaches which have taken more time than anticipated, and there have been many lessons learned which will be applied to future ISMPs.
- Concurrent with developing the ISMP for Cordova Bay, we also completed an update to the Intensity Duration Frequency (IDF) Curves, a complex and data intensive project. IDF curves illustrate the relationship between rainfall intensity, duration, and return periods (or probability of occurrence). This is the data set that defines rainfall events and helps us establish the amount of run-off the drainage system will experience in any given storm. The rainfall data informing the previous IDF curve was based on data from 1925-1986, and changes in precipitation since 1986 are significant. We also integrated climate modeling into the data, so we could take the latest global modeling standards and build them into our rainfall calculations to inform the results.
- In 2021, Saanich took an important step to start developing dual drainage models across all five core catchments. These models differentiate from the conventional approach in that they combine (rather than isolate) the underground piped-flow performance with the overland runoff conditions. The Cordova Bay model was built as part of the ISMP and the Douglas model is nearly complete. We underestimated the amount of time needed to build these complex models; it's not weeks but several months for development.
- Flood risk modeling for the Colquitz watershed has also been added to the workplan. This will provide additional information to inform flood mapping and inland Flood Construction Levels and achieve more of our Climate Plan objectives to build resiliency into the infrastructure and conduct hazard planning.

The District's initial ISMP Development Strategy laid out an approach for developing drainage models and ISMPs on a catchment-by-catchment basis; however, a decision was made to expedite the District-wide drainage model ahead of completing baseline ISMPs. The rate and extent of development in Saanich, combined with the accelerated need to be agile to support development driven by recent provincial housing targets, is precipitating the need for a model that District staff can use to confirm system capacity and/or upsizing needs. This tool will enable staff to test the effects of climate change, land-use changes, and development under various scenarios with consideration to risk presented in the pipe network and from surface run-off. The baseline ISMPs will be completed subsequently, building on the drainage model results.

There are a number of components to the ISMP Development Strategy. Below is an overview of what has been accomplished and next steps.

Pre-ISMP Work

A substantial amount of work was done initially to provide a foundation of reliable information for developing the ISMPs, such as:

- GIS Review and Closing Data Gaps
- Development of a Drainage Asset Management Investment Plan
- Stormwater Flow Monitoring Program
- Colquitz and Cordova Bay Rainfall and Flow Data Review
- Environmental Monitoring Framework

Watercourse and Drainage Bylaw Review

- To support the ISMP work, an extensive review of the bylaw was undertaken, and several amendments are recommended, such that a replacement bylaw is being prepared.
- Anticipate bringing to Council by the end of 2024

Intensity Duration Frequency (IDF) Curves - Updated

- These are key parameters for modeling rainfall impacts on the drainage system.
- Staff undertook an extensive technical study to update this data; it helped us to understand rainfall patterns across Saanich (more intense in the east and less so in the westward direction).
- Includes climate change implications
- Applied in all stormwater modeling scenarios

Cordova Bay ISMP

- Dual drainage model built
- Draft Baseline ISMP report completed and being circulated internally for comment
- Report to Council anticipated by end of 2024

Douglas Creek ISMP

- Dual Drainage model almost complete
- Baseline ISMP report to begin in 2025

Colquitz River ISMP

- Data Baseline report almost complete
- Dual Drainage and Flood Hazard Model in progress as part of district-wide model development
- Baseline ISMP report to follow

District-Wide Dual Drainage Model

- Presentation made to Natural Areas, Parks and Trails Committee on October 10 (part of overall ISMP update)
- Work underway to complete by end of 2025

COUNCIL OPTIONS

1. That Council receive this report on the Integrated Stormwater Management Plan (ISMP) project progress.

2. That Council provide alternate direction to staff.

FINANCIAL IMPLICATIONS

To support of the implementation of the ISMP Development Strategy, funding was needed and obtained to engage consultants. As a result of the adoption of the Climate Action Plan (CAP), one-time funding in the amount of \$1.65M was identified to support the acceleration of initiatives related to stormwater management planning for Master plans (ISMPs), software and flood hazard planning. The CAP Financial implementation plan included a multi-year cashflow projection for funds needed to support ISMP development. The updated cashflow breakdown is noted in the table below. Staff will be bringing forward a one-time resource request in the 2025 Budget process to continue to advance this work.

Table - Project Budget Cash Flow (CAP Funding)

2022	2023	2024	2025	TOTAL
\$475,000	\$325,000	\$450,000	\$400,000	\$1,650,000

STRATEGIC PLAN IMPLICATIONS

This work aligns with the District of Saanich Strategic Plan (2023 – 2027) initiative 1.1.5 to “Continue to advance the Integrated Stormwater Management Plans over the next four years, including completing baseline studies for Cordova Bay, Colquitz Creek and Douglas Creek”.

POLICY IMPLICATIONS

The ISMP Development Strategy advances broader goals to improve stormwater quality, develop a District-wide drainage model and report on the network’s capacity to respond to storm events with climate change considerations. Contributions towards the improved resiliency of District infrastructure accomplished through these ISMPs is also a direct response to strategies and actions outlined in the District’s Climate Plan: 100% Renewable and Resilient Saanich. The goals of the strategy also align with the actions and goals of several recently updated or developed strategic documents such as the Official Community Plan (2024), Asset Management Strategy (including the Natural Assets Inventory), Biodiversity Conservation Strategy, Urban Forest Strategy.

CONCLUSION

Staff are making significant advancements to understand and establish baseline stormwater conditions in Saanich’s watersheds. The Draft Cordova Bay ISMP is approaching finalization, and modeling of Douglas Creek ISMP area is almost complete, while models of the remaining catchments in the Urban Containment Boundary (Colquitz and Boundary Streams) have been initiated.

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Approved by: Harley Machielse, Director of Engineering

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ADMINISTRATOR'S COMMENTS:

I endorse the recommendation from the Director of Engineering.

Brent Reems, Chief Administrative Officer