



City of  
**Parksville**



**FINAL** Rev. 1

# Parksville Community Park Stormwater Management Master Plan 06/2021





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This project was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.



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**Cover Image:** Trail in Parksville Community Park – Parksville, BC Canada (Photo: EOR)

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June 3, 2021

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Dear Mr. Lonsdale:

**Regarding: Parksville Community Park Stormwater Management Master Plan Final Report**

EOR is pleased to submit the final report for the Parksville Community Park Stormwater Management Master Plan.

We would like to thank the City of Parksville for their assistance throughout the study and the valuable input we received from you, Ayla Defoor, Deb Tardiff, Guy Martin and other City staff.

We would also like to acknowledge the invaluable funding provided by Federation of Canadian Municipalities Green Municipal Fund without which this project would not have been completed with the level of detail included.

Sincerely,  
**Emmons & Olivier Resources Canada Inc.**

A handwritten signature in black ink, appearing to read 'KR' followed by a long horizontal stroke.

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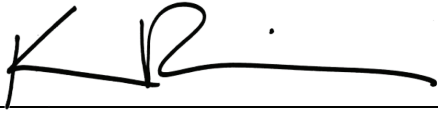
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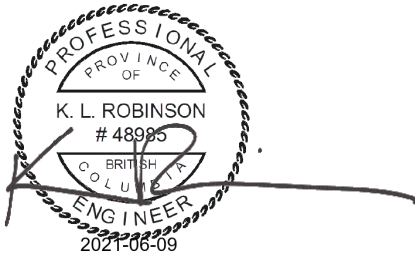


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### Issues and Revisions Registry

Identification	Date	Description of Issue and/or Revision
Draft Report	November 29, 2020	For City Review
Final Report	April 30, 2021	Final Submission
Final Report Rev1	June 3, 2021	Remove sensitive information from Final Submission



## **ACKNOWLEDGEMENTS**

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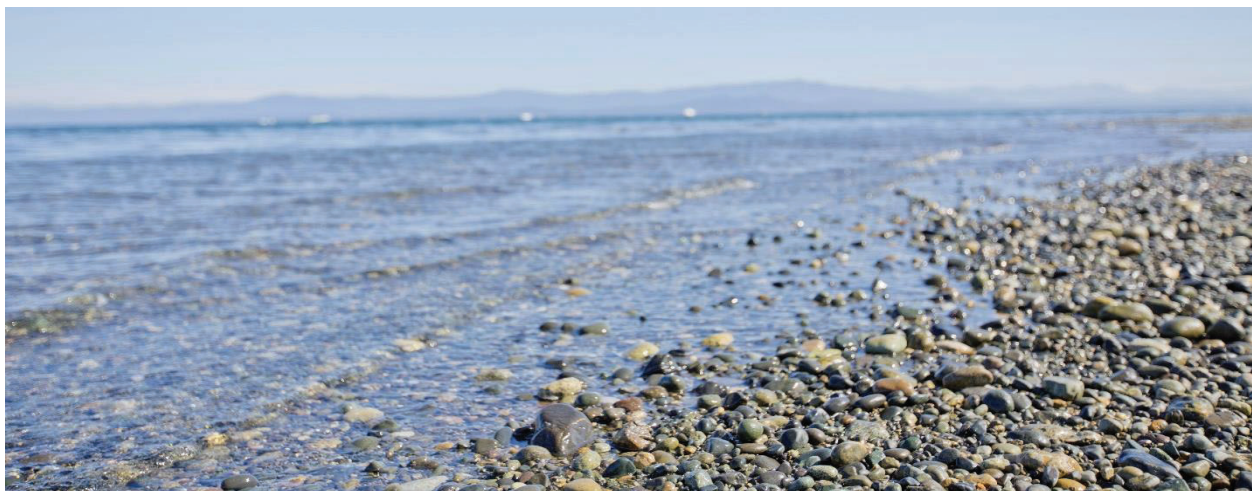
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## EXECUTIVE SUMMARY







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Originally developed in the 1900's, Parksville Community Park (the Park) remains a popular recreational hub for both local residents as well as regional use. Located on the eastern shore of Parksville Bay and on the western border of the Englishman River Estuary, the Park is within the core asserted traditional territory of the Snaw-Naw-As, Qualicum and K'omoks First Nations.

The existing stormwater system within the Park is intended to convey drainage away from frequently used park amenities. Currently, runoff from approximately 35% of the Park is not treated to capture pollution before discharging into Parksville Bay and the Englishman River Estuary, while other areas are managed by isolated systems that retain the majority of rainfall events each year. Assessment of current stormwater management infrastructure in the Park has identified deficiencies and gaps in terms of water quality and quantity management that need to be addressed to improve the performance and resiliency of the system into the future. Deficiencies in the existing stormwater management system detailed in Section 3 are summarized as follows:

- Areas serviced by storm sewers discharge without any stormwater quality management
- Infrequently maintained and undersized stormwater infrastructure requires rehabilitation or replacement followed by annual inspection and maintenance to restore necessary stormwater volume and quality management
- Isolated areas experiencing surface ponding during frequent and multi-day storm events require establishment of positive drainage and overland flow pathways
- Tidal inundation and coastal sedimentation of the outfall limit discharge timing and capacity, resulting in stormwater surcharge and temporary ponding during design events
- Available storage detention volumes are underutilized due to site grading and storm sewer configuration

Recreational facility upgrades envisioned in the Parksville Community Park Master Plan (CPMP), as approved in 2017, will increase the impervious area. The increase will result in higher runoff volumes, peak flows and stormwater quality degradation. The Parksville Community Park Stormwater Management Master Plan (PCPSWMMP) outlines the long-term strategies, capital improvements, and maintenance programs needed to improve the capacity of the current stormwater management system, support future development and protect the natural environment. The PCPSWMMP addresses the following stormwater management objectives using the preferred approaches of treatment train stormwater management and non-structural solutions:

-  Flood Mitigation and Resiliency
-  Collaborate with First Nations
-  Ecosystem Health and Resiliency
-  Operations & Maintenance
-  Monitoring & Data Management
-  Education & Outreach



**The PCPSWMMP was developed to achieve the following performance objectives outlined in Section 4.2:**

1. Mitigate flood risk during extreme rainfall and coastal inundation events to acceptable levels of risk with measures such as allowing up to 0.15 m of flooding on roads and parking lots or temporarily closing areas where flood mitigation is cost prohibitive.
2. Mitigate non-point source pollution impacts to receiving waters and their ecosystems by capturing and treating the first flush event (31 mm 24-hour event).
3. Offset potable water demand to the extent feasible.
4. Be resilient to coastal inundation within the Park, such as excessive erosion from wave action, debris, and saltwater.
5. Prevent nuisance flooding during the late-century 10-year 24-hour rainfall event, considering the late-century astronomical tide as a potential constraint to sea outfall capacity.
6. Support future use and development of the Park and associated increases in imperviousness.
7. Support PCPSWMMP goals with public awareness and education initiatives, cost effective operation and maintenance plans, strengthened environmental stewardship and awareness by park users of the cultural importance of the First Nation archaeological site.



The recommended implementation schedule for the PCPSWMMP provided in Section 5.3 includes estimated costs in order to facilitate budgeting, partnerships and grant applications over the next 20 years. Implementation timing of stormwater retrofit projects are aligned with the proposed schedule for park infrastructure upgrades identified in the CPMP. Overall, the recommended schedule will maintain the existing stormwater management system in Year 1, with additional efforts to rehabilitate existing infrastructure by clearing clogged inlets, initiate groundwater monitoring and the Inspection and Maintenance Program. Available funding may alter anticipated construction scheduling and care must be taken in evaluating alterations to ensure the environmental integrity of the PCPSWMMP and CPMP is always preserved.



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## 1. INTRODUCTION

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The City of Parksville (City) has retained EOR to develop the Stormwater Management Master Plan (SWMMP) for the Parksville Community Park (the Park) to assess current and future stormwater infrastructure needs to mitigate stormwater related limitations on planned developments and usage in the Park. A SWMMP is required to increase resiliency of the stormwater system to extreme climate conditions, support continued use and development of the Park, and leverage opportunities for environmental and cultural sustainability. This plan introduces stormwater management improvements to protect key park features from nuisance flooding while also providing room to manage flood water under extreme conditions.

### 1.1. Background

Stormwater is rain and melted snow that runs off streets, parking lots, and lawns. Natural areas soak up stormwater like a sponge, nourishing plants and replenishing streams, lakes, wetlands, and aquifers. Impervious surfaces such as pavement and roofs prevent precipitation from naturally soaking into the ground. Instead, the water runs quickly into storm drains, sewer systems, and drainage ditches.

Parksville Community Park is a popular recreational hub located on the eastern shore of Parksville Bay and on the western border of the Englishman River Estuary (see Figure 1). The Park is within the core asserted traditional territory of the Snaw-Naw-As, Qualicum and K'omoks First Nations. The Park was developed in the 1900's using fill to raise the elevations of the north and central areas of the Park that were originally part of Parksville Bay, a wider beach area, and potentially formed the natural western edge of the Englishman River Estuary. Today, the Park's stormwater system is intended to convey drainage away from frequently used park amenities (see Figure 2). Continued development of the Park will increase impervious cover, runoff volumes and associated pollutants. Currently, runoff from approximately 35% of the Park is not treated to capture pollution before discharging into the Bay and Estuary while other areas are managed by isolated systems that retain the majority of rainfall events each year. Existing inland flooding issues will be exacerbated by climate change, including higher sea levels, more rainfall and potential additional impacts that have not yet been assessed, such as groundwater flooding. In addition, extreme sea levels are anticipated to inundate a substantial extent of the Park based on late-century climate change projections while higher "normal" tides will reduce discharge capacity. A significant archaeological site extends through the southern third of the Park, along the pre-developed shoreline, and provides an opportunity to educate the public of Indigenous presence in the past, present and future of the Park.

Goals for stormwater management in the City, included in Plan Parksville: A Vision for our Future – Official Community Plan (City of Parksville 2013), include improving discharged water quality, using rainwater capture, infiltration and detention to mimic pre-development conditions, reducing imperviousness and incorporating scientific information on climate change into municipal infrastructure planning. These directives, combined with the planned updates to programming and infrastructure in Parksville Community Park outlined in the Parksville Community Park Master Plan

(Vancouver Island University and City of Parksville 2017), provide context, vision and a timeframe for the approach taken to managing stormwater in the Parksville Community Park. The City's Storm Drainage Master Plan (Koers & Associates Engineering Ltd. 2016) defines a resilient approach to stormwater infrastructure and recommends protection of downstream aquatic ecosystems through treatment of the first flush prior to discharge. Stormwater management in British Columbia (BC) is regulated by multiple pieces of legislation administered by provincial, and municipal levels of government and summarized in the appendices of the Design Criteria Memo in Appendix D. Relationships between the Parksville Community Park Master Plan (CPMP) and this SWMMP are outlined in Section 5.

Additional background reports and studies provided by the City of Parksville were reviewed to understand the design of existing stormwater management facilities in the Park and in the City. Stormwater management standards and best practices are rapidly changing in Canada, as well as standards to support the resiliency of coastal communities to climate change and expected sea level rise. The background reports, plans and legislation reviewed as part of this study are summarized below and are discussed in more detail in the SWMMP Technical Memo: Characterization and Design Criteria.

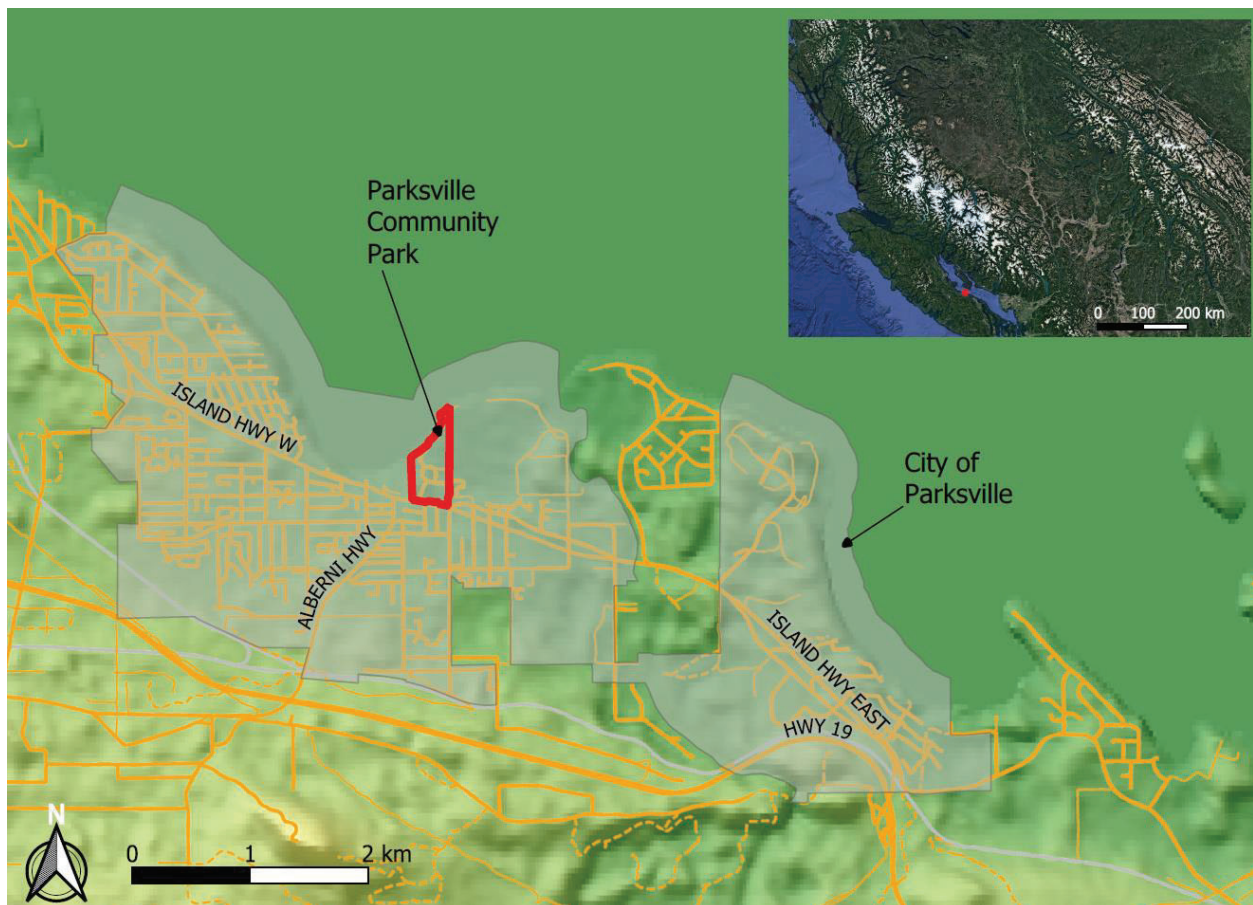


Figure 1. Study Area





Figure 2. Park Amenities