

SCHEDULE F – PROJECT COMPLETION REPORT TEMPLATE

VERY IMPORTANT:

Timing: You need to email a report, to your GMF project officer (contact info is in Schedule C), on the dates indicated in Schedule C or whenever FCM asks for such a report.

Copyright: Before you submit a report to FCM, make sure you hold the copyright for the report. If you're hiring a consultant to prepare the report, please make sure to get the copyright (see FCM's copyright tips document), or else FCM will not be able to disburse the Grant Amount.

Accessibility for people with disabilities: Please do not change the format, font, layout, etc. of this report. This template has been specially designed, following FCM's Accessibility Guidelines, in order to be accessible to people with disabilities.

Confidentiality: If your report contains any Confidential Information that you would prefer not be made available to the public (e.g. through a case study or other materials produced by FCM that relate to your Project), please submit two versions of the report:

- 1. Complete report including Confidential Information:** Please clearly label this report with the word "**Confidential**" or similar wording and FCM will treat it as confidential.
- 2. Abridged report excluding Confidential Information:** This report may be posted on the FCM website and otherwise made available to interested third parties, to help FCM meet its knowledge sharing objectives.

Please contact your project officer to receive an electronic copy of the Completion Report Template.

Upon completion of the project, a copy of the Final Deliverable must be submitted along with this Completion Report.

FCM will post your report on the [Green Municipal Fund™ \(GMF\) website](#). This is because one of FCM's mandates is to help municipal governments share their knowledge and expertise regarding municipal environmental projects, plans and studies.

How to complete the Completion Report

The purpose of the Completion Report is to share the story of your community's experience in undertaking your project with others seeking to address similar issues in their own communities.

Please write the report in plain language that can be understood by people who are not specialists on the subject. A Completion Report is typically in the range of 5–10 pages, but may be longer or shorter, depending on the complexity of the project.

GMF grant recipients must enclose **final** copies of the Completion Report and the Final Deliverable with their final Request for Contribution. The reports, including all attachments and appendices, must be submitted in PDF format with searchable text functionality. Reports that are not clearly identifiable as final reports, such as those displaying headers, footers, titles or watermarks containing terms like "draft" or "for internal use only," will not be accepted by GMF. Additionally, reports must be dated. If you have questions about completing this report, please consult GMF staff.

GMF number	16989
Name of lead applicant (municipality or other partner)	City of Vancouver
Name, title, full address, phone, fax and e-mail address of lead technical contact for this study	Daniel Klein Senior Engineer – Utilities Planning – Project Manager City of Vancouver, Engineering Services #1100-450 SW Marine Drive Vancouver, BC V5X 0C3 E-mail: daniel.klein@vancouver.ca Phone: 604-829-9738
Date of the report	May 12, 2022

1. Introduction

- a) Who was involved in doing the Feasibility Study, and what are their affiliations? Please include name, title and contact information. Those involved could include municipal staff, engineers and other consultants, a representative from a non-governmental organization, and others.
- The City of Vancouver were the project leads and project managers, who initiated the project, and hired a consultant (Urban Systems) to complete the feasibility study.

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Urban Systems	Glen Shkurhan	Project Manager (Consultant)	E-mail: gshkurhan@urbansystems.ca Phone: 604-235-1701

2. The Feasibility Study

- a) Describe the process that you undertook to make this feasibility study a reality, from concept, to council approval, to RFP, to final deliverable.
- The project was initially identified as a possible candidate for focus several years ago by City of Vancouver (CoV) staff due to the specific characteristics of the catchment, and its location within the [Broadway Plan](#) area. The catchment sewer system is almost separated, has an existing pond within the catchment, and is in an area of anticipated future growth.
 - Internal CoV discussions at the staff level established the project scope, and high-level opportunities for stormwater management within the catchment. Furthermore, staff aligned project objectives with overarching City of Vancouver goals and targets. The project working group involved representatives from a range of City departments and branches that included:
 - Engineering
 - Integrated Sewer and Drainage Planning
 - Transportation Planning

- Engineering Strategy and Standards – Geotechnical, Archaeology & Indigenous Relations
 - Sewers and Drainage Design
 - Real Estate and Facilities Management
 - Environmental Services
 - Park Board
 - Planning, Policy and Environment
 - Planning, Urban Design and Sustainability
 - Sustainability
- CoV staff developed a scope of work for the feasibility study, which went out for bid within the CoV Engineering Services pre-qualification program process (RFP).
- Council approval was not required for this project to proceed, as the project falls out of previously council approved plans and strategies including:
 - Rain City Strategy (2019 – [Report](#), [Appendix A](#), [Appendices B-F](#))
 - Integrating Blue-Green Systems Planning (2019 – [Report](#))
 - Climate Change Adaptation Strategy (2012, updated 2018 – [Report](#))
 - VanPlay: Vancouver's Parks and Recreation Services Masterplan (2019 – [Website](#))
 - Biodiversity Strategy (2016 - [Report](#))
 - Water Conservation Action Plan (2017 - [Report](#))
 - False Creek Water Quality Improvement Initiative (2018 - [Report](#))
- Urban Systems was selected as the successful consultant, and conducted the feasibility study that included sewer modelling and analysis, stormwater opportunities identification and evaluation, scenario analysis, and final reporting.
- Both internal departments and groups (listed above) and Metro Vancouver, the regional authority, reviewed the report produced by Urban Systems with the final report incorporating the feedback.
- The final report includes a long list of further work and next steps as opposed to a clear concept for moving forward. Due to the complexity of the project several issues and challenges could not be resolved as part of this project scope. The report provides a range of options that require some further work and internal coordination to advance.

b) What were the objectives of the Feasibility Study (what was it seeking to determine)?

- The feasibility study was undertaken to understand the potential to fully separate the Charleson Catchment in order to eliminate the combined sewer overflows to the receiving body, and remove stormwater from the regional trunk system in order to create capacity for future growth.
- The study aimed to quantify the sewer separation work, and its impacts on water quality to the system. Furthermore the study aimed to identify and evaluate opportunities to manage and treat stormwater within the catchment, and the potential for a wide range of co-benefits associated with those opportunities (such as new green space, ecological functioning, and urban canopy impacts).

c) What approach (or methodology) was used in the Feasibility Study to meet these objectives?

- The study methodology included: sewer system modelling and analysis (sanitary, storm, and water quality); stormwater management opportunities identification and evaluation using both quantitative and qualitative targets and metrics; an Environmental Overview Assessment and Archaeological Overview Assessment; and an internal stakeholder workshop.

d) Please describe any public consultations conducted as part of the Feasibility Study and their impact on the Study.

- Public consultation was not conducted as part of this feasibility study, but is intended for future project phases.

3. Feasibility Study Findings and Recommendations

- a) What were the environmental findings related to the options explored in the Feasibility Study? Please provide quantitative results and summary tables of these results (or the page numbers from the Feasibility Study report).
- Relevant sections/pages of the Final Report:
 - Section 3: Existing Environmental Conditions (p.11)
 - Section 7.3: Water Quality Analysis (p.99)
 - Section 8.4: Charleson Park Pond (Wetland) (p.127)
 - Section 8.6.2: Potable Water Supply (potential reduction in potable water use) (p.138)
 - Section 9: Environmental Management Options (p.142)
 - Section 11: Evaluation Matrix (p.154)
 - This section includes details of the environmental implications for the various options. Further details are throughout the report.
- b) What were the financial findings related to the options explored in the Feasibility Study (for example, results of a cost-benefit analysis, financial savings identified, and so on)? Please provide quantitative results and summary tables of these results (or the page numbers from the Feasibility Study report).
- Relevant sections/pages of the Final Report:
 - Section 10: Costs (p.147)
- c) Based on the environmental and financial findings above, what does the Feasibility Study recommend?
- Section 12: Summary and Recommendations (p.156) provides details on the projects recommendations.

4. Lead Applicant's Next Steps

- a) Taking the Feasibility Study's recommendations into account, what next steps do you as the municipality plan to take? What potential benefits or internal municipal improvements would result from these next steps?
- Section 12: Summary and Recommendations (p.156) provides a list of recommendations that includes next steps. In general, completing the sewer separation of the catchment is the likely next step, along with detailed technical analysis, monitoring, and design. The potential benefit of the completion of the sewer separation would be the elimination of the combined sewer overflow that discharges to False Creek, therefore eliminating the untreated sewage that enters the receiving waters during some rainfall events through the combined sewer overflow outfall. Interim water quality treatment measures for the stormwater (for example, a hydrodynamic separator or maintaining a first flush connection to the sanitary system) will be considered as part of the sewer separation design, in the likely case that green rainwater infrastructure and/or wetland implementation lags behind.

5. Lessons Learned

In answering the questions in this section, please consider all aspects of undertaking the Study — from the initial planning through each essential task until the Final Study was prepared.

- a) What would you recommend to other municipalities interested in doing a similar Feasibility Study? What would you do differently if you were to do this again?

- This project explores a range of nature-based solutions to manage stormwater and remove contaminants, such as wetlands and green rainwater infrastructure (GRI). Leveraging these natural solutions, alongside more traditional approaches such as sewer separation can lead to a decrease of contamination to receiving bodies. This study compared the sewer system's existing configuration, sewer separation, and nature-based water management solutions to allow decision makers to assess various options for meeting the City's environmental and service delivery goals. The study helps to highlight the trade-offs, challenges, costs, and co-benefits of various options. We would recommend other municipalities undertake similar studies to fully account for key factors and to aid in decision-making.
 - If doing this project again, we would consider doing the following differently:
 - Allocating more time for the project – because of the project complexity many project components were challenging to move forward at times, so allowing more time in the schedule would have been beneficial (the project took much longer than expected).
 - Align internal targets and goals early – because of the scope and scale of the project, internal alignment of goals and targets, as well as trade-off conversations were required. These discussions happened during the project, which caused delays; it would have been more efficient if some of these alignment issues were resolved prior to the project. However, it should be noted that this project represented a newer direction for utility planning within the City, and therefore these issues were being addressed for the first time.
- b) What barriers or challenges (if any) did you encounter in doing this Feasibility Study? How did you overcome them?
- While the identification of stormwater management opportunities was reasonably straightforward for this catchment, combining opportunities into scenarios for analysis and the evaluation criteria used for the opportunities/scenarios proved more challenging. Both components required significant work and discussion by the City of Vancouver internal stakeholder technical team on the project, which included clarifying of objectives, clear delineation of City-Wide and catchment specific target (qualitative and quantitative), and alignment with anticipate future projects.
 - Stormwater management scenarios were built around key objectives with a focus on balancing sewer system objectives, ecological objectives, land use/footprints, and co-benefits. The main goal for the scenarios was to group opportunities in way that was suable for analysis, but also provided sufficient information for comparison and “plug-and-play” selection/implementation in anticipation of unforeseen opportunities and changes to the catchment in the future.
 - The evaluation criteria for the stormwater management opportunities were developed based on existing City of Vancouver targets, with some additions/modifications to suite the project.

6. Knowledge Sharing

- a) Is there a website where more information about the Feasibility Study can be found? If so, please provide the relevant URL.
- This project does not have a dedicated website. An overview of the general approach the City of Vancouver is taking to managing stormwater is available on this site: <https://vancouver.ca/home-property-development/one-water.aspx>.
- b) In addition to the Feasibility Study results, has your Feasibility Study led to other activities that could be of interest to another municipality (for example, a new policy for sustainable community development, a series of model by-laws, the design of a new operating practice, a manual on public consultation or a measurement tool to assess progress in moving toward greater sustainability)? If so, please list these outcomes, and include copies of the relevant documents (or website links).

- While no specific tools were developed as part of this feasibility study, other municipalities may be interested in the evaluation of stormwater opportunities:
 - Stormwater Management opportunities were evaluated using a matrix of quantitative outcomes that touch on objectives that include sewer system capacity, stormwater quality, as well as ecological functioning and benefit, among others. The matrix can be seen in Section 11: Evaluation Matrix (p.154) of the report.
 - This project falls under the umbrella of the Rain City Strategy (2019), which can be found here: <https://vancouver.ca/home-property-development/green-infrastructure-documents-and-policies.aspx> The Rain City Strategy provides a roadmap and sets rainwater management targets to reduce pollution from urban runoff, adapt to climate change impacts, reduce the volumes of CSOs and ease the burden on infrastructure associated with increased rainwater volumes and urbanization. The Vancouver Park Board also endorsed this strategy in February 2020.

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