Staff Report

Infrastructure Services Department *www.kitchener.ca*

REPORT TO:	**Community and Infrastructure Services Committee**
DATE OF MEETING:	**May 13, 2024**
SUBMITTED BY:	**Bu Lam, Director, Sanitary and Stormwater Utilities** **519-741-2200 ext. 4212**
PREPARED BY:	**Nick Gollan, Manager, Utility Planning and Programs** **519-741-2200 ext. 7422, and** **Jean Hao, Design & Construction Project Manager** **519-741-2200 ext. 4156**
WARD(S) INVOLVED:	**All**
DATE OF REPORT:	**May 2, 2024**
REPORT NO.:	**INS-2024-223**
SUBJECT:	**Integrated Sanitary Master Plan Final Report**

RECOMMENDATION:

That the Environmental Study Report: Integrated Sanitary Master Plan Schedule 'B' Municipal Class Environmental Assessment prepared by Stantec Consulting Ltd. dated May 2, 2024, together with the recommended approaches be approved; and

That staff be directed to file the report for the 30-day public review period as required by the Environmental Assessment Act.

REPORT HIGHLIGHTS:

- This report summarizes the master plan efforts which examined the city's sanitary system and programs, growth projections, and current needs and issues, and identified recommendations to support system reliability and growth.
- The key findings of the master plan is to proceed with:
    - Alternative 2 – Shaping community growth through regular growth reviews to identify and address system constraints;
    - Alternative 3 – Infrastructure upgrades to address both capacity and system based solutions; and
    - Alternative 4 – to advance data acquisition, flow monitoring, and inflow and infiltration mitigation programs. These programs aim to reduce flows in the sanitary sewer system and improve the city's understanding of its state, allowing it to assess the system's condition, capacity and necessary interventions more effectively.
- The master plan estimates $75 million of additional capital investment is needed to 2051, beyond what was already budgeted before the 2024-2027 Water Infrastructure Program Summary and Rate Options Review (WIP Review INS-2023-437). Sufficient funding was allocated through the WIP Review to begin addressing the most critical risks and collecting

additional condition and capacity information. No additional funding or rate structure recommendations are being made at this time.
- Community engagement included government agencies, community members, special interest groups, and Indigenous Rights Holders.
- This report supports **the delivery of core services.**

BACKGROUND:

Before 2019, Kitchener's Sanitary Utility was organized into a committee structure with involvement from several divisions. In 2019, under an administrative restructuring, the Sanitary and Stormwater Utilities Division was created. It centralized accountability into an "Operating Authority" model to enhance the focus on the sanitary utility, similar to what occurred when the stormwater utility was established in 2010. These are two of the city's most critical infrastructure asset categories. As the Integrated Stormwater Management Master Plan was relatively recently completed in 2016, the priority at this time was to establish Kitchener's Integrated Sanitary Master Plan (ISAN-MP).

The ISAN-MP aims to develop a sanitary strategy to guide the city's future servicing needs. The existing natural, social, and economic features were considered when evaluating the alternatives to identify preferred solutions. The ISAN-MP examined the city's sanitary infrastructure needs, considered new planning policies, growth projections, and current needs and issues, and identified recommendations to support growth. The ISAN-MP accounts for asset renewal and current projected growth and development to 2051 – aligning with the timeframe of the Region's Official Plan.

This master plan is being completed under the Municipal Class Environmental Assessment (MCEA, as amended in 2015) process. It follows Approach #2 of the Master Planning Process. This report meets the requirements of Schedule B projects and completes Phases 1 and 2 of the MCEA process, allowing any identified projects to proceed to detailed design and construction.

REPORT:

At the start of the MCEA process, a problem and opportunity statement was developed. To support the development of the statement, a review of the existing system was completed.

This included reviewing previous studies and assessing the state of repair of the existing sewer system. The project team collected data on rainfall, sewer flow, and sanitary pumping station performance. Sanitary flows were updated in the computer model, and rainfall events (for 10 and 30-year storms) were simulated per industry best practice.

The following problem and opportunity statement was developed for this study:

The City of Kitchener has significant sanitary sewer infrastructure which needs to be managed to ensure it is resilient and sustainable for future generations. The growing population in the City, as identified in the Official Plan, will lead to an increase in the production of wastewater, causing additional strain on aging infrastructure and may require new infrastructure.

This sanitary servicing review will assess the current state of the City's sanitary sewers and pumping stations. Where issues are identified, the City will identify preferred solutions that will continue to service existing homes and businesses as well as provide the ability to service identified growth areas. The City is committed to providing a reliable and sustainable sanitary servicing system.

Alternative Solutions
Four alternative solutions considered for the ISAN-MP included:

- **Alternative 1 – Do Nothing**

- **Alternative 2 – Shaping Community Growth**

Community growth can increase sanitary flows. It is important to plan growth where the system can handle it or prepare for infrastructure upgrades. Regular growth reviews are essential to identifying system constraints. Conducting regular hydraulic computer model updates to identify and mitigate development restrictions is important.

- **Alternative 3 – Infrastructure Upgrades**

Upgrades are important to improve the capacity and condition of the existing system.

  - *Capacity-based Solutions*

  Capacity-based solutions increase the sewage conveyance capacity in the system, improving sanitary flow. Identified solutions focus on immediate, medium-term (by 2031), and long-term (by 2051) needs.

  - *Condition-Based Solutions*

  Condition-based solutions improve sewers and pumping stations in poor condition and at risk of catastrophic failure. Upgrades may include repair, rehabilitation, or replacement. The city will identify renewal projects based on available condition information from inspections.

- **Alternative 4 – Data Acquisition, Flow Monitoring, and I/I Mitigation Programs**

This solution refers to a broad collection of programs. The programs aim to reduce flows in the sanitary sewer system and improve the city's understanding of its state, allowing it to assess the system's condition and necessary interventions more effectively.

  - *Inflow & Infiltration Reduction Program*

  This involves analyzing data collected as part of other programs. It would determine specific areas where inflow and infiltration sources enter the sanitary system. The program would then recommend short and long-term actions to remedy the source of additional flows.

  - *Rainfall & Flow Monitoring Program*

  This program will manage all rainfall and sewer flow monitoring equipment and contracts. It will provide valuable data to the city. The data will identify how the sanitary system responds to storm events. The city will be able to better target system improvements with this information.

- *Computer Model Updates & Maintenance*

This program will further improve the existing computer model of the sanitary sewer system developed for the ISAN-MP. Staff will regularly update the model with the latest infrastructure, population, and flow data. The model is used for capital planning, operations, and infrastructure decision-making.

- *Sanitary Trunk Sewer & Forcemain Investigation Program*

There is no condition information for 75% of the sanitary trunk sewers larger than 600mm. This presents a significant risk to the city's ability to meet minimum service levels if a trunk sewer collapses due to poor condition, as occurred on the Ottawa Street trunk sewer in 2022. This program enhances the city's existing sewer inspection program. It will allow all larger-diameter sewers to be inspected on a variable-year frequency based on age and condition, allowing issues to be more promptly identified and addressed.

- *Hydrogen Sulfide Monitoring and Dosing Program*

Hydrogen Sulfide occurs naturally in wastewater as it ages. It is an issue in sewer systems because it creates odours and corrosively affects concrete pipes and manholes, leading to catastrophic infrastructure failure. Reducing Hydrogen Sulfide is an important goal for the city. This program involves monitoring hydrogen sulfide levels in key locations in the sanitary sewer system. It will identify areas of high hydrogen sulfide within the system. The program would then recommend actions to remedy the high hydrogen sulfide levels.

Preferred Alternative

The recommended preferred alternative is Alternative 2, 3 and 4. These alternatives are interconnected and provide the necessary data and long term planning considerations that best mitigate system risk and ensure reliable sanitary services can be consistently achieved under current and future growth scenarios.

Implementation Plan

The Environmental Study Report marks the end of Phases 1 and 2 of the MCEA planning process and meets all the requirements of a Schedule B EA. None of the projects contemplated by this study require additional study work; however, community engagement will continue to be an important component of any detailed design and construction that proceeds from this planning work.

The implementation plan outlines the project schedule and scope of work for data collection. The projects currently identified in the implementation plan are largely high-priority capital works projected to be completed within the next 5 years. Concurrently, the implementation plan also has data acquisition activities planned for the first four years. Given the degree of data gaps that currently exist within Kitchener's sanitary system, there is a strong likelihood that the data acquisition work will identify new projects that will need to be incorporated into the Sanitary Master Plan implementation schedule. As such, the current implementation plan that highlights additional capital needs of $75M until 2051 represents a current projection in the absence of more robust data. This value is likely to change as data acquisition activities yield more information on sewer pipe condition. Further, it is anticipated that some short term priorities will be shifted into the medium term (2028+) due to available funding. These projects will be shifted based on an assessment of risk, ensuring projects of greatest risk of failure are addressed first.

Implementation details and priorities will be updated annually and aligned with funding availability as part of the budget process.

STRATEGIC PLAN ALIGNMENT:

This report supports **the delivery of core services.**

FINANCIAL IMPLICATIONS:

The Opinion of Probable Costs provided by Stantec Engineering Ltd. for all identified capital works are classified as Class D estimates, with a variance of +/- 25-30% and are calculated in 2022 dollars. The ISAN-MP estimates $75 million of additional capital investment needed to 2051 beyond what was already budgeted before the 2024-2027 Water Infrastructure Program Summary and Rate Options Review (WIP Review INS-2023-437). The estimated $75M of capital funding needed to 2051 does not include any new infrastructure priorities that might be identified through upcoming data acquisition activities. Financial implications of additional infrastructure priorities discovered through data acquisition will be reflected in longer-term capital renewal plans for the utility and any associated financial costs will be considered as part of future sanitary utility budgets.

Sufficient funding was allocated through the WIP Review to begin addressing the most critical risks and collecting additional condition and capacity information. No additional funding or rate structure recommendations are being made at this time.

COMMUNITY ENGAGEMENT:

Consultation is a vital part of the Class EA process. A Consultation Plan was developed to ensure all mandatory requirements were met while providing a more innovative approach.

INFORM – This report and the agenda have been posted to the City's website ahead of the council/committee meeting.

CONSULT – The project contact list includes agencies, stakeholders, the public, and Indigenous Rights Holders. All notices were published in the Record newspaper, posted on the City's Engage Kitchener website, and emailed to the project contact list. The Public Information Centres were also promoted through targeted advertisements on Facebook and Instagram social media.

Project notices include:
- Notice of Study Commencement (September 2021)
- Notice of Virtual Public Information Centre (PIC) 1 (July 2022)
- Notice of Virtual PIC 2 (December 2023)
- Notice of Completion (2024)
- Further consultation meetings were held with Indigenous Rights Holders:
    - Mississaugas of the Credit First Nation (March 28, 2023, and Feb 09, 2024)
    - Six Nations of the Grand River (Feb 28, 2023)

COLLABORATE – Two Virtual PICs were hosted on the City's website to allow the public to ask questions, share feedback, and express concerns throughout the study process while assisting in developing a preferred plan.

PREVIOUS REPORTS/AUTHORITIES:
There are no previous reports/authorities related to this matter.

APPROVED BY:
Denise McGoldrick, General Manager Infrastructure Services

ATTACHMENTS:

- Volume 1: Integrated Sanitary Master Plan Municipal Class Environmental Assessment Report
- Appendix A: Consultation
- Volume 2: Technical Memos
    - Technical Memo 1 – Background Review
    - Technical Memo 2 – Hydraulic Analysis
    - Technical Memo 3 and 4 – Sanitary Servicing Analysis & Capital Infrastructure Funding and Risk Analysis and Implementation Plan
    - Technical Memo 5 – Design Criteria and Level of Service