Water and Waste
Eaux et déchets

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Environmental Stewardship Division
Environmental Compliance and Enforcement Branch
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April 11, 2025
Client File No.: 3205.10
Our File Nos.: S-734, EMS
020-17-08-11-00
020-17-08-11-0N

Attention: Yvonne Hawryliuk, MSc, Acting Director

RE: ENVIRONMENT ACT LICENCE NO. 3042

The City of Winnipeg is pleased to submit the enclosed 2024 CSO Annual Report in response to the requirements within the Environment Act Licence No. 3042 submitted to the City of Winnipeg September 4, 2013.

This submission complies with the requirements within Clause 13 of Environment Act Licence No. 3042, Clause C of the November 13, 2019 CSO Master Plan approval letter, the December 23, 2019 annual report outline and the September 11, 2023 CSO Annual Report letter.

Should you have any questions on this submission, please contact Mr. Jon Goodbrandson, P. Eng., at 204-952-7258 or by email at jgoodbrandson@winnipeg.ca.

Sincerely,

C Wiebe

Cynthia Wiebe, P.Eng., CAMP
Manager of Engineering Services

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City of Winnipeg
2024 CSO Annual Report

Environment Act Licence No. 3042

Clause 13

Prepared for:

Environment and Climate Change

April 2025

City of Winnipeg 2024 CSO Annual Report

Client File No: 3205.10
City File No. S-734, EMS
020-17-08-11-00
020-17-08-11-0N
Document Title: City of Winnipeg 2024 CSO Annual Report
Revision: 02
Date: April 08, 2024
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Document History and Status

Revision	Prepared by	Reviewed by	Date	Approved by	Date
01	S.Leung, P.Coote	J. Goodbrandson	March 10, 2025	C.Wiebe	April 8, 2025

Executive Summary

In November 2019, Manitoba Environment and Climate Change approved the City of Winnipeg's (the City's) Combined Sewer Overflow (CSO) Master Plan as required by the City's Combined Sewer *Environment Act (EA) Licence No. 3042*. The Licence also requires the City to submit an Annual Report that details progress on the *CSO Master Plan* for the preceding year.

CSO Master Plan Progress

Sewer separation work continued in 2024 with construction contracts awarded for work in the Jefferson East, Cockburn and Polson combined sewer districts. A consultant assignment was also awarded for the Cockburn combined sewer district. Late 2024, the Armstrong detailed design and the Mission / Roland preliminary design consultant assignments were publicly posted. These were subsequently awarded in January 2025. In addition, the Ferry Road Rutland Trunk construction contract was tendered and is expected to be awarded in May 2025.

The 2024 River, Stream, and Combined Sewer Overflow Discharge Water Quality Monitoring Report was submitted to the Province on December 13, 2024.

Budget

The *CSO Master Plan's* estimated capital cost to achieve 85 percent CSO volume capture is $1.15 billion in 2019 dollars. As part of the 2024 capital budget process, an additional $47 million was added to the CSO program. This provided total available program funds of over $109 million. Approximately $14 million was committed in 2024.

A significant amount of the budget is still being held over for the large Ferry Road Rutland Trunk construction contract. The Rutland construction contract was tendered on December 18, 2024 and is expected to be awarded in 2025 (see Section 3.2.2).

The 2025 capital budget added an additional $41.5 million in funding for a total of $137 million of available budget. Approximately $88 million is forecasted to be committed in 2025.

In 2021, City Council approved a $60 million increase to the *CSO Master Plan* budget over 4 years from 2024 to 2027 ($15 million a year). In 2022 and 2023, City Council directed the Public Service to work towards the Provincial deadline of 2045 and to prepare a City-only funding plan to meet this. Various funding scenarios were provided

in the 2024 to 2027 Water and Sewer Rates Administrative Report. The City is working to commit existing budget dollars by advancing studies to create more shovel ready contracts. The Public Service will continue to review required funds to work towards the 2045 deadline and propose rate adjustments as required. To limit the impact of this work on rate payers, the City will also continue to work towards securing Provincial and Federal funding.

Current Year Results

There is a 10 percent CSO volume reduction in the 2024 sewer network[1] for the 1992 Representative Year. This allowed for an increase of CSO volume percent capture from 76 to 77 percent (Section 3.1). These improvements are the result of completed combined sewer separation works on Jefferson projects, completed storm relief sewer (SRS) dewatering projects, and other CSO hydraulic model asset representation improvements based primarily on enhanced monitoring instrumentation data.

Annual CSO results are primarily impacted by precipitation and river levels.

1. Precipitation

   In 2024, there was approximately 40 percent more precipitation for the entire year and 17 percent more precipitation during the recreation season (May – September), when compared to the 1992 Representative Year (Section 4.2). Overall, the last 12 years average total precipitation is similar to the 1992 Representative Year, with only a 0.2 percent difference in values.

2. River Level

   The 2024 river level was lower overall than the 1-in-5-year average and higher than the 1992 Representative Year in the recreation season. A later than typical spring melt caused a delayed reaction to the spring rise and fall of river levels (see Section 4.3).

In 2024, there were 1,332 CSO events with an estimated sewage discharge of 12,186 ML. This represents an increase from 2023 in both the number of CSO events and in overall CSO volume (see Section 4.1).

[1] 2024 sewer network refers to the hydraulic model that contains the best representation of the existing sewer system at the time it was developed.

Next Steps

As directed in the *CSO Master Plan*, the City will continue to work on sewer district separation projects currently underway (see Section 3.5). The anticipated 2025 capital projects include planning, design, and / or construction in Mission / Roland, Armstrong, Ferry Road / Riverbend, Cockburn / Calrossie, Hawthorne, and Jefferson East districts.

The City will continue to engage the Province in discussion regarding the delivery of the *Percent Capture Assessment for Control Option No. 2*.

The City will also continue to explore opportunities for sewer system optimization, green infrastructure (GI), and additional storage options to improve CSO performance monitoring and volume reduction. Furthermore, the City will continue regular communication with regulatory bodies and stakeholders throughout the delivery of the *CSO Master Plan*. The associated risks and opportunities of the *CSO Master Plan* are documented in the 2024 CSO Background document (Appendix A).

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Acronyms and Abbreviations

AACE	American Association of Cost Engineers International
AAF	average annual flow
City	City of Winnipeg
CS	combined sewer
CSO	combined sewer overflow
DEP	district engineering plan
DWF	dry weather flow
EA	Environment Act Licence
ECC	Environment and Climate Change
GI	green infrastructure
LDS	land drainage sewer
ML	megalitre
NEWPCC	North End Sewage Treatment Plant
NPRI	National Pollutant Release Inventory
POC	pollutants of concern
RTC	real time control
SEWPCC	South End Sewage Treatment Plant
SFD	single-family dwelling
SRS	storm relief sewer
WEWPCC	West End Sewage Treatment Plant
WSER	Wastewater Systems Effluent Regulations
WWF	wet weather flow

1. Purpose

The City's combined sewer system is governed by *Environment Act Licence No. 3042*. The Licence requires the City to submit an annual report that details progress on the *CSO Master Plan* implementation for the preceding year.

The CSO Annual Report provides an overview of the cost, schedule, and performance results of the current combined sewer system. This includes information on capital improvements for the previous year and work planned for the coming year. The report also provides an overview of the process used to evaluate CSO discharges, as required by Clause 14 of the Licence.

As part of Clause 14, the City must submit an annual *CSO Results Report* for the preceding year by February 15. The *CSO Results Report* estimates the sewage volume that was discharged to receiving streams from CSO events that year. It complies with the National Pollutant Release Inventory (NPRI) and Wastewater Systems Effluent Regulations (WSER) annual reporting requirements.

2. Recent Changes & Updates

This section reflects changes and updates to the *CSO Master Plan* implementation in 2024. Implementation of the *CSO Master Plan* began in November 2019. The City is required to achieve 85 percent CSO volume capture for the Representative Year by 2045.

2.1 Sewer Network Changes

There were no major sewer network changes in 2024 that affected the overall CSO program performance. Please refer to Appendix B for the list of ongoing and completed projects of 2024 that the City undertook.

In 2024, hydraulic model maintenance was performed and increased the percent capture to 77 percent. This increase is primarily attributed to capital improvements represented in the model for the Jefferson completed contracts and completed storm relief sewer (SRS) dewatering projects. Refer to Section 3.1 for further information.

2.2 Regulation Update & Changes

On December 13, 2024, the *2024 River, Stream, and Combined Sewer Overflow Discharge Water Quality Monitoring Report* was submitted to the Province. This submission fulfilled the 2024 requirements specified in Clause D of the 2019 *CSO Master Plan* approval letter and the related City of Winnipeg Water Quality Monitoring Plan, dated January 6, 2023. See Section 5 for further updates.

A request to further address the ongoing CSO contract work was made as per the Provincial letter received September 11, 2024. This information can be found on the City webpage, see Section 3.5. During the City's forthcoming meeting with the Province on the *CSO Annual Report*, a status update on the CSO consultant projects will be provided.

The City is currently in discussion with the Province regarding the scope of work and deadline for the *Percent Capture Assessment for Control Option No. 2* deliverable, see Section 6 for further details.

2.3 Funding Changes

In 2024, the City's Basement Flood Relief and *CSO Master Plan* Program budget was $47 million.

In 2021, Council approved a $60 million increase to the *CSO Master Plan* budget over 4 years from 2024 to 2027 ($15 million a year). This has been incorporated into the CSO capital budget forecast since 2022.

In 2022 and 2023, City Council directed the Public Service to work towards the Provincial deadline of 2045 and to prepare a City-only funding plan to meet this. Various funding scenarios were provided in the 2024 to 2027 Water and Sewer Rates Administrative Report to illustrate the potential rate impact over the range of a class 5 program cost estimate. This level of funding is approximately equivalent to the median cost estimate of $1.15 billion.

The City is working to commit existing budget dollars by advancing district designs to create more shovel-ready contracts. Many of the designs remain conceptual at this stage, so estimating an overall program cost is difficult. As designs progress, the accuracy of the cost estimate to construct the relief options will improve. The Public Service will continue to review required funds to work towards the 2045 deadline and propose rate adjustments as required through the annual budget process. To limit the impact of this work on rate payers, the City will also continue to work towards securing Provincial and Federal funding.

2.4 Communications Update

The City had a meeting with the Province on April 30, 2024 to provide an overview of the 2023 CSO Annual Report. The meeting minutes are provided in Appendix D.

The City maintains regular communication with the public during the execution of the *CSO Master Plan* and this will continue as the *CSO Master Plan* progresses. The Public Service presented an update on the 2023 performance and financial status of the *CSO Master Plan* to Council on July 18, 2024.

The City website serves as a public education tool to provide Winnipeg residents with information on the Master Plan and its benefits. Plans are in place to update the *CSO Master Plan* webpages to align with the City's latest brand and plain

language standards and the *CSO Master Plan* Public Education Plan requirements.

The City will continue to maintain an open and transparent engagement program with the public, including regular updates on the City website.

2.5 Pollution Prevention Plan Update

The City has a Pollution Prevention Program to protect the sewage collection and treatment system, our rivers and lakes, and the environment. In 2024, there were 586 active business that were part of the Pollution Prevention Program. The program was reviewed in 2024 to remove deactivated companies, leading to a reduction of 17 companies in the total number of active businesses previously reported.

For more information, see the 2024 CSO Background document (Appendix A) or the City's Pollution Prevention Planning Program webpage at winnipeg.ca/pollutionprevention.

2.6 CSO Program Background Information

Please refer to the 2024 CSO Background document (Appendix A) for a summary of the *CSO Master Plan,* including other key components that did not have changes or updates in 2024. The City webpage also contains CSO information with links to relevant historical documents.

3. CSO Master Plan Performance

The 2013 Regional Model Baseline Network with the 1992 Representative Year forms the baseline performance level. The *CSO Master Plan* adopted the year 1992 as the Representative Year for annual rainfall intensities and river levels. Using a Representative Year is crucial as it serves as the benchmark for planning and evaluating both current and future CSO performance. By using data from 1992 as a reference point, we can ensure consistency and accuracy in our assessments, aiding in the effective management and mitigation of CSOs. The performance of the current year's model network, which is the most recent representation of the sewer network condition, is tracked and reported against the baseline.

3.1. CSO Volume Performance Tracking

The 2013 baseline hydraulic model represents the model conditions for the 2013 sewer network. The 2024 sewer network is the most current hydraulic model as it provides the best representation of the sewer network condition. Updates to the model will be made as construction works are completed and modeling resources allow.

The total CSO volume discharged under the 1992 Representative Year for the current 2024 model network is 4,730 ML, 530 ML less than the 2013 baseline CSO volume. The reduction in CSO volume and the increase in percent capture show that the combined sewer relief projects undertaken in recent years have improved the collection system's overall CSO performance. Table 1 shows the CSO performance of the baseline, current year, and the control target (85 percent capture) for the 1992 Representative Year design event. The total wet weather flow (WWF) volume captured for the current (2024) year's performance was calculated based on the baseline (2013) dry weather flows (DWF) and WWF in conjunction with the CSO volume from the current year's performance.

Table 1 - CSO Master Plan Performance Tracking

Condition	Total CSO Volume (ML)	Total DWF Volume (ML)	Total WWF Volume Captured (ML)	Target Reduction in CSO Volume (ML)	*Percent Capture (%)
Baseline Performance - 2013 Baseline with 1992 Rep. Year	5,260	7,749	7,317	-	74
Current (2024) Year's Performance - 2024 Network with 1992 Rep. Year	4,730	7,749	7,847	-	77
Target Performance - CSO Preliminary Proposal 85 Percent Capture with 1992 Rep. Year	2,980	7,749	9,593	2,300	85

$$*Percent\ Capture = \frac{(Total\ DWF\ \ Volume + Total\ WWF\ Volume\ Captured)}{(\text{Total CSO Volume+Total DWF Volume+Total WWF Volume Captured})}$$

There was a ten percent reduction in CSO volume in 2024 for the 1992 Representative Year. This resulted in an increase in the CSO volume percent capture to 77 percent. The improved performance is primarily attributed to model updates that reflect the previous completed contracts in Jefferson and completed storm relief sewer (SRS) dewatering projects. Combined, these decreased CSO volume by 55 ML. Other model improvements were also made based on collected data and installed monitoring instrumentation. For more information on the model maintenance completed in 2024, see Section 4.6.1.

3.2. Financial Tracking

The *CSO Master Plan* developed an overall capital cost in 2019 dollars for each of the combined sewer districts. The total design and construction capital cost to implement the *CSO Master Plan*, including an additional 10 percent for GI costs, is estimated as $1.15 billion. Applying the maximum +100 percent of the Class 5 estimating range, the total capital cost for budgeting purposes is estimated to be $2.30 billion. The capital cost summary is shown in the 2024 CSO Background document (Appendix A).

The following section provides the financial status of the program. The financial budget is based on the current year's actual spending with a three-year window forecast. As preliminary designs are completed for the districts, updated Class 3 cost estimates will be prepared and utilized in the financial tracking process.

3.2.1 Capital Cost Estimation Tracking

No new citywide capital cost estimates have been created since the August 2019 submission of the *CSO Master Plan*. Revised district-wide cost estimates are developed as preliminary designs progress; these are used for budget planning purposes. As district plans progress, individual contract cost estimates are further refined prior to tendering.

3.2.2 Budget Tracking

In 2024, Council approved $47 million, funded from rates, for the CSO and Basement Flood Management Strategy program as part of the capital budget process. This provided total available program funds of over $109 million. The 2025 capital budget adds an additional $41.5 million in funding for a total of $137 million of available budget. Approximately $88 million is forecasted to be committed in 2025.

A three-year budget window of the *CSO Master Plan* and revised 2024 annual budget is presented in Table 2 below.

Table 2 - CSO Master Plan and Revised 2024 Annual Budget Difference

	Budget Year	Forecast Years			Average
	2024	2025	2026	2027	
CSO Master Plan Estimate (2019 Dollar Values)	$34,783,103	$35,826,596	$35,826,596	$36,901,394	$35,834,422
Budget Forecast (from 2024 Capital Budget)	$47,000,000	$41,500,000	$46,500,000	$47,000,000	$45,500,000
% Deviation	35%	16%	30%	27%	27%

The 2024 CSO program budget was $47 million; there was also an additional $63 million held over from the 2023 and prior budgets. Sufficient funds were being held to award the upcoming Ferry Road Contract 6 (Rutland Trunk), which is scheduled for 2025. This contract is a large strategic tunneling project with a Class 3 estimate of over $60 million.

Figure 1 shows the *CSO Master Plan* Estimate and 2024 Capital Budget. It shows that the City is currently committing more funds than the forecasted annual CSO funding of $30 million with 3% inflation.

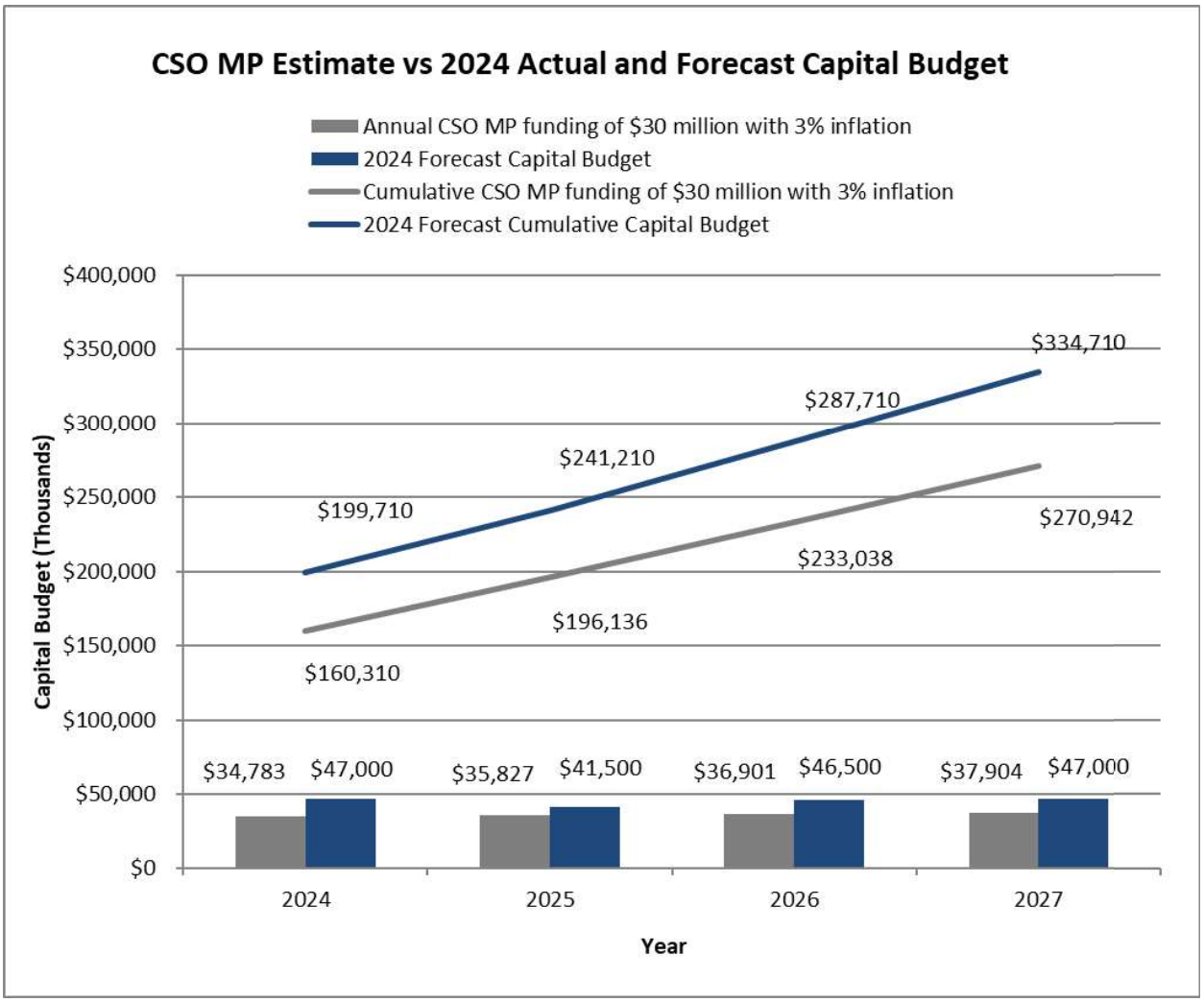


Figure 1 - CSO MP Estimate and 2024 Actual and Forecast Capital Budget

Approximately $14.5 million was committed in 2024. Since 2019, the approximate cumulative committed amount is $123.4 million. Where projects are completed under budget, unspent committed funds are returned to the CSO program funds.

3.3. Schedule Tracking

The *CSO Master Plan* schedule is based on strategically prioritizing districts that will provide a high CSO volume or nutrient reduction, as well as to optimize program funds with other City projects.

To reflect the actual *CSO Master Plan* progress, an updated program schedule estimate is included in Appendix E. The revised schedule reflects completed projects in 2024 and revised estimates for upcoming work. There are sufficient funds budgeted in the 2024 capital budget to undertake all planned investments over the next three years.

Additional funding from the federal and/or provincial governments would be expected to have an impact on overall schedule.

3.4. Districts Design Status

The design status for each of the combined sewer districts is illustrated in Appendix F. Coloured cells represent the design stage for specific districts as of December 31, 2024.

3.5. Capital Projects Tracking

The list of completed and ongoing projects from 2024, with the associated scope, targeted costs, actual costs, and CSO volume reduction are provided in Appendix B.

The list of forecasted work for 2025 and the corresponding capital project's estimated CSO volume reduction are provided in Appendix G.

Information regarding the ongoing construction projects is updated on an annual basis on the City's website at winnipeg.ca/csoprojects.

3.6. Milestones

The 2024 awarded and 2025 planned project milestones are summarized in Table 3 andTable 4, respectively.

Table 3 - 2024 Project Milestones

2024 Committed Projects	Targeted Award Date	Actual Award Date	Comment
CSO Sewer Relief Projects			
NEWPCC			
Jefferson East Construction Contract 8	2024	December-24	Combines Contracts 8A & 8B Construction of LDS
Polson (Inkster) Construction Contract 1	2024	June-24	Opportunistic separation
SEWPCC			
Cockburn / Calrossie Construction Contract 13	2024	October-24	Combines Contracts 9B & 13
Cockburn East Consultant Assignment 1	2024	February-24	Preliminary Design
CSO Monitoring Program			
Annual Rainfall Monitoring Program	2024	April-24	Annual Provision, Installation, Data Hosting and Maintenance for a Rainfall Network Service

Table 4 - 2025 Planned Project Milestones

2025 Planned Projects	Targeted Award Date	Comment
CSO Sewer Relief Projects		
NEWPCC		
Jefferson East Construction Contract 10	2025	Combines Contracts 7B & 10 Construction of LDS
Ferry Road / Riverbed Construction Contract 6	2025	Construction of Rutland Trunk (in award process)
Armstrong Consultant Assignment 2	2025	Detailed Design (awarded in January 2025)
Mission & Roland Consultant Assignment 1	2025	Preliminary Design (awarded in January 2025)
Overall System		
Rainfall Monitoring Program	2025	Annual Provision, Installation, Data Hosting and Maintenance for a Rainfall Network Service
Laboratory Upgrades	2025	Study to Evaluate Expansion to Support CSO Program
CSO Percent Capture Assessment	2025	Provincial Requirement
Note: The above status is subject to change pending available budget and resources		

The planned 2024 project milestones that were not achieved have the following status:

- Jefferson East Construction Contract 7B – combined with Contract 10 for efficiency
- Ferry Road / Riverbend Construction Contract 6A – expected award in May 2025
- Armstrong Consultant Assignment 2 (detailed design) – awarded in January 2025
- Armstrong Construction Contract 1 – planned for 2026

Milestones related to key federal and provincial submissions are outlined in Section 6.

3.7. City Investments on CSO Mitigation to Date

Since 2013, the City has spent approximately $210.5 million in CSO related works. The budget for the next six years is forecasted to be $255 million.

4. Current Year 2024

The City reports annually on CSO events and volume estimates. The amount of rainfall and the river levels during the rainfall events have the most impact on CSO events and sewer network performance.

The annual precipitation in 2024 was more than the 1992 Representative Year and the previous year, 2023. Rainfall in 2024 was approximately 40 percent more than the 1992 Representative Year, and 62 percent more than 2023

Overall, the river levels in 2024 were lower than the 1-in-5-year average and the 1992 Representative Year until the beginning of May. The 2024 levels were then higher in June and July before falling to levels comparable to the 1992 Representative Year and the 1-in-5-year average from August to October.

4.1 CSO Results

Based on the approach outlined in Section 4.6, the 2024 results are provided in Table 5. The location and event volumes are submitted federally and provincially every year by February 15 for the preceding reporting year. The results are also made public on the City webpage by July 31 for the preceding reporting year.

Table 5 - 2024 Overview of CSO Results

Source of Data	Number of Combined Sewer Outfalls	Number of events	Volume of events (ML)
CSO Instrumentation & Detailed Hydraulic Model	46	994	10,252
Detailed Hydraulic Model	30	301	1,583
Flood Pumped Data	N/A	37	351
Total	76	1,332	12,186

The total number of CSO events for 2024 was 1,332, which is an average of 18 events per outfall (based on 76 outfalls). The estimated annual CSO sewage discharged was 12,186 ML. These values are based on the hydraulic model with validation against 46 instrumented locations.

There are currently 41 flood pump locations. This number includes temporary flood pumps installed in specific locations as required based on river levels. There were 28 percent more CSO events in 2024 than in 2023 (1,039) and more than double the volume (5,368 ML). This increase in events and volume is explained by the increased rainfall and different river levels as discussed in the below sections.

In 2024, 87 percent of the CSO results were validated against instrumentation data.

4.2 Rainfall

The 1992 Representative Year and 2024 current year's rainfall events are analyzed to understand the impact a current years' rainfall events have on CSOs. Table 6 summarizes the amount of precipitation and the number of rainfall events in both 1992 and 2024 based on the single rain gauge at the Forks.

The total amount of rain in 2024 was approximately 40 percent more than the 1992 Representative Year. The 2024 recreation season was 17 percent wetter than in 1992. The 2024 shoulder season (January through April and October through December) accounted for 25 percent of the annual precipitation and was nearly three and a half times greater than the precipitation of the shoulder season in 1992. Nine rainfall events greater than 5 mm were recorded outside of the recreation period.

Table 6 - Single Rain Gauge at the Forks

	1992		2024	
	Annual	Rec Season	Annual	Rec Season
Total precipitation (mm)	478	326	547	381
Estimated rainfall (mm)	362	326	509	381
% deviation from average rainfall			40%	17%
Number of Events ≥5mm	22	20	33	24
% deviation from average			50%	20%

The comparison between the total annual precipitation and the 1992 Representative Year precipitation over the last several years is illustrated in Figure 2.

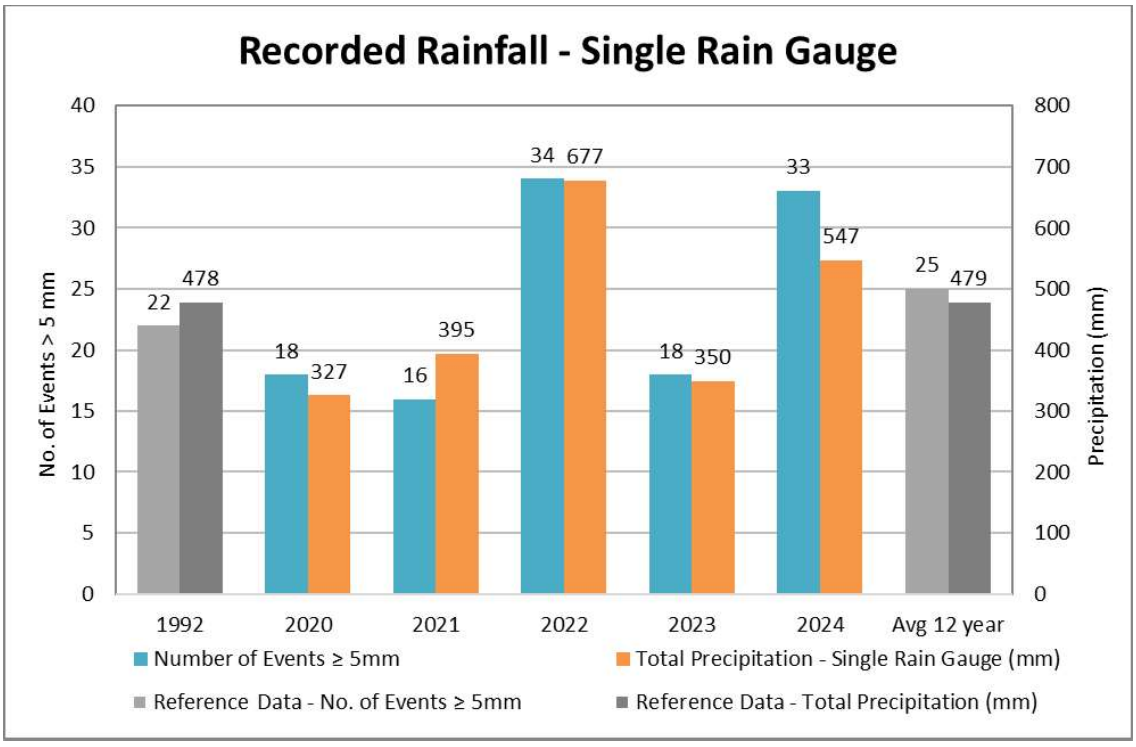


Figure 2 - Total Precipitation Yearly Trend Single Rain Gauge at the Forks

To capture the spatial variation of the rainfall and further improve CSO event, duration and volume estimation, the City uses its network of 36 rain gauges.

Instruments are typically operational from May 1st to September 30th, weather permitting. They can be activated as early as March and turned off as late as November. In 2024 the data from the 36 rain gauges was used from April 1st to November 30th. Two Environment Canada rain gauges (the Forks and Airport gauges) are within combined sewer districts and were used to supplement data for the remaining months of the year.

The average annual rainfall recorded by the City's combined sewer districts' rain gauges was 518 mm. The majority of the rain gauges were reliable, as missing rain gauge data was minimal and interspersed throughout the recreation season. Any missing data was supplemented with the average data of the two closest working rain gauges. Overall, 2024 had 99 percent rain gauge coverage for the recreation season.

4.3 River Elevations

The 2024 river levels were overall lower than the 1-in-5-year average. In comparison to 1992 Representative Year river levels, 2024 spring levels were

significantly lower until the beginning of May, when they began to increase. Levels increased above the 1992 levels and peaked twice in June and July, before returning to slightly higher summer levels at the end of July. The river levels of 1992, 2024, and the 1-in-5-year event levels are illustrated in Figure 3.

The low river levels in spring 2024 were attributed to the delayed spring melt. In August, the river level eventually returned to the normal summer water level set by the control at the St. Andrew's Lock and Dam.

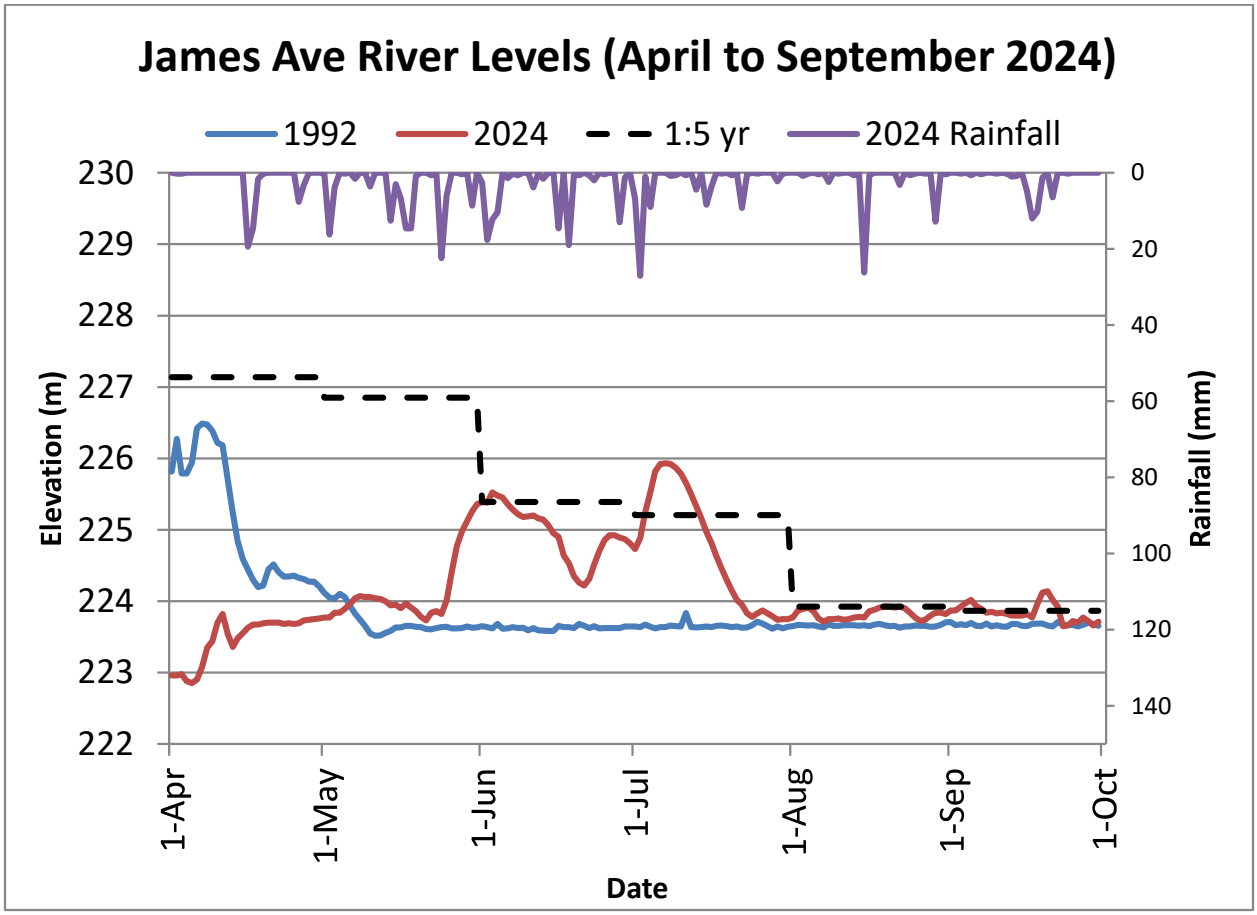


Figure 3 - James Ave River Level Comparison

4.4 Treatment Plant Flows

For 2024, the total citywide volume of treated sewage was 106,011 ML, which is approximately 16 percent more than 2023 (91,013 ML). The average annual flows (AAF) distributed between the wastewater treatment plants were as follows:

- North End Sewage Treatment Plant (NEWPCC) - 200 ML/day

- South End Sewage Treatment Plant (SEWPCC) - 63 ML/day
- West End Sewage Treatment Plant (WEWPCC) - 27 ML/day

The distribution of the treated sewage volume at each of the sewage treatment plants was similar to 2023 and past years.

- NEWPCC - 72,908 ML (69%)
- SEWPCC - 23,078 ML (22%)
- WEWPCC - 10,025 ML (9%)

In 2024, approximately 10 percent of the total annual citywide sewage was lost due to overflows and 90 percent of the sewage flow was captured and treated. The estimated sewage lost from the individual NEWPCC, SEWPCC, and WEWPCC collection systems was 11,360 ML, 460 ML, and 366 ML, respectively.

4.5 Collections System Operational Observations

City crews were responsible for maintaining the outfall monitoring instruments throughout 2024. Non-functional instruments were recalibrated, replaced, or are being investigated as part of the maintenance process. The City continues to provide regular maintenance for all CSO monitoring instruments to maintain data quality for CSO reporting. A record of the 2024 operational observations are documented in the *2024 Annual CSO Results Report* submitted to the Province on February 12, 2025.

Additional information related to untreated sewer discharge is documented on the City website at winnipeg.ca/untreatedsewagereports.

4.6 Reporting Process

The 2024 CSO reporting is based on the City's 2024 regional model network representation. The model performance was validated using 46 instrumented CSO outfalls.

4.6.1 Hydraulic Model Maintenance

The City model network needs to be continually updated to better represent the current year's performance related to CSOs.

The 2024 model updates focused primarily on representing the sewer network changes from completed capital projects. The updates captured sewer separation and CSO work completed up to the end of 2024. These updates include adding completed contracts from Jefferson East, past separation work completed in La Verendrye sewer district and dewatering pump projects completed at five SRS outfalls. Other notable updates included correcting an error in the representation of the SRS upstream of St. John's outfall and adding an area of Marion sewer district that was missing from the network.

The City strives to continually update the hydraulic model based on available information, including past studies, field surveys, and record drawings. The model is calibrated using instrumentation data during updates to ensure that the network is representing actual performance. Sensitivity checks are then undertaken and all changes associated with model maintenance are documented.

4.6.2 CSO Reporting Limitations

Due to the complexities associated with snowmelt, it is not currently possible to numerically model the snowmelt related CSO events at the un-instrumented locations. Therefore, CSO analysis of un-instrumented locations is limited to CSO overflows caused by rainfall.

The calculations of CSO volumes are estimates based on hydraulic model representation of the sewer network, which is based on best available information. The field observed data also has limitations. The estimating process used meets federal guidance for appropriate estimation and includes processes for addressing assumptions for continuous improvement. Model results for the current year are based on observed rainfall data and annual results are validated against using instruments installed at 46 of the 76 CSO locations.

Model updates are completed regularly. There will always be network changes or improved data that is not available at the time of the current update but will be included in subsequent updates.

4.7 Clause 8 Compliance

This section provides context for estimating the increase in runoff from small-scale development approvals compared to the decrease in runoff resulting from sewer separation projects. To comply with the Province's July 8, 2021, June 7, 2022, and August 1, 2023 requests, a separate calculation was developed to estimate increases in runoff resulting from small scale developments. This exercise is independent of the percent capture performance.

From 2014 to 2023, there were 5,883 cumulative small scale property approvals. In 2024, there were an additional 852 approvals, bringing the cumulative property approvals since 2014 to 6,735. These developments represent an estimated increased runoff volume of 6,735 m^3 from 2014 to 2024. This estimate is based on a 1 m^3 average runoff volume for one small-scale development approval.

The 1 m^3 average runoff value was based on a review of small development approvals. Three development scenarios were reviewed: a single-family dwelling (SFD) developing into two duplexes; a SFD going to two SFDs; and a SFD going to two SFDs with secondary suites. For a 5-year design event, the increase in runoff volume for these design scenarios averages to 1 m^3, see Appendix H.

The same approach, using a 5-year design event, was used to determine the decrease in runoff volume as a result of sewer separation projects. In 2023, a cumulative decrease in runoff of 117,972 m^3 was reported. In 2024, as a result of model updates to reflect sewer separation in Jefferson East, the additional runoff volume reduction is 12,199 m^3. This results in a cumulative decrease in runoff of 130,171 m^3 and a net 2024 runoff reduction of 123,436 m^3 when accounting for increased runoff from small developments. As Table 7 demonstrates, sewer infrastructure improvements far exceed the small-scale development contributions.

Table 7 - Cumulative Reduction in Runoff Volume

	Estimated Runoff Volume Increase [m^3] (Small Scale Development)	Estimated Runoff Volume Reduction [m^3] (Sewer Separation*)	Net Runoff Volume Reduction [m^3]
2023 Cumulative Values	5,883	117,972	112,089
2024 Yearly Values	852	12,199	11,347
2024 Cumulative Values	**6,735**	**130,171**	**123,436**

** Values estimated from model maintenance area reductions for completed CSO construction projects and calculated equivalent runoff volume.*

5. Water Quality

The water quality objective of the *CSO Master Plan* is to reduce bacterial loadings to the Red and Assiniboine Rivers by reducing the volume of CSOs discharged. The City will collect CSO discharge samples and river samples to track and report on the river water quality every 5 years throughout the CSO program.

The water quality monitoring data collected in 2014 and 2015 will be used for the 2024 NPRI reporting and will be continually used until a new data approach is established.

The 2019 CSO Master Plan Provincial Approval Letter required the City to prepare the *Water Quality Monitoring Plan* and final report by December 31, 2024.

Water quality monitoring was completed in 2023 and 2024, with results compared to those from the 2014/15 Interim Water Quality Monitoring. Notably, the comparison indicates some degradation in average river and stream water quality during dry weather, an unexpected result that the City will investigate further. An improvement in river and stream water quality during wet weather is also noted. *The 2024 River, Stream, and Combined Sewer Overflow Discharge Water Quality Monitoring Report* was submitted on December 13, 2024. Please refer to the full report for further information.

The City conducts bi-weekly river and stream water quality monitoring for pollutants of concern (POC), including nutrients, dissolved oxygen, and bacteria. The monitoring data provides an updated characterization of the health of Winnipeg's waterways. These reports are published on the City website at winnipeg.ca/riverstreammonitor.

6. Compliance

This section provides an overview and summary of the City's compliance with the regulatory requirements.

Combined sewers are regulated by several federal and provincial requirements. The City reports on CSO discharge data to NPRI, WSER, and the Province on an annual basis to demonstrate regulatory compliance. Table 8 provides a list of required regulatory deliverables with their associated regulators, deadlines, and submission dates.

Table 8 - Regulatory Submissions

Deliverable	Regulator	Reporting Period	Deliverable Deadline	Submission Date
Federal Submission				
2024 CSO Annual Results	WSER	Jan 1 - Dec 31, 2024	Feb 15, 2025	Feb 14, 2025
2024 NPRI CSO Annual Report	Canadian Environmental Protection Act, 1999	Jan 1 - Dec 31, 2024	June 1, 2025	N/A
Provincial Submission				
2024 CSO Annual Results	EA No. 3042 Clause 14	Jan 1 - Dec 31, 2024	Feb 15, 2025	Feb 12, 2025
2024 CSO Annual Report	EA No. 3042 Clause 13	Jan 1 - Dec 31, 2024	March 31, 2025	April 8, 2025
CSO Quarterly Results	EA No. 3042 Clause 14	Every Quarter	15th of May, Aug and Nov of the reporting year	May 1, July 31, and Nov 1 of 2024

Annual CSO Result Submissions

In compliance with both WSER and Clause 14 of *EA No. 3042*, the City is required to submit the Federal and Provincial *CSO Annual Results* that consist of CSO outfall data from both the instrumented and non-instrumented locations by February 15 for the subsequent year. The non-instrumented locations are supplemented with hydraulic modeling data and rainfall estimations to improve confidence in the results.

The *2024 CSO Annual Results* were validated and submitted to both the Provincial and Federal governments on February 12, 2024 and February 14, 2024, respectively.

In addition to the Federal and Provincial *CSO Annual Results* submission, additional annual submissions include the *CSO Annual Report* and the *NPRI CSO Annual Report*, which are due by March 31 and June 1 of the preceding year. The *2023 CSO Annual Report* was originally submitted March 28, 2024 and later resubmitted on April 5, 2024. The 2024 report was submitted on April 8, 2025.

Quarterly CSO Result Submissions

The *Quarterly CSO Results Reports* consist of event, volume, and duration estimation data based on the instrumented outfall sites. The results are not validated and are submitted 45 days after the end of the quarterly reporting period as per Clause 14 of *EA No. 3042*.

The three *2024 Quarterly CSO Results* deliverables were completed and submitted to the Province on May 1, 2024, July 31, 2024, and November 1, 2024, in accordance with the mandated deadlines.

CSO Master Plan Submissions

Additional submissions related to the *CSO Master Plan* development and implementation is provided in Table 9. This table provides a list of submission milestones pursuant to *EA No. 3042*.

Table 9 - CSO Master Plan Submission Milestone

Deliverable	Original Targeted Date	Actual Completion Date
Public Education Plan	31-Dec-13	9-Dec-13
Interim Monitoring Plan	31-Jan-14	28-Apr-14
CSO Public Notification Plan	31-Dec-15	15-Dec-15
CSO Preliminary Proposal	31-Dec-15	17-Dec-15
CSO Master Plan	31-Aug-19	28-Aug-19
River Water Quality Report	31-Dec-24	13-Dec-24
Percent Capture Assessment for Control Option No. 2	30-April-25	TBD
River Water Quality Report	31-Dec-29	TBD
CSO Master Plan Update	30-April-30	TBD
River Water Quality Report	31-Dec-34	TBD
River Water Quality Report	31-Dec-39	TBD
River Water Quality Report	31-Dec-44	TBD
CSO Master Plan Implementation	31-Dec-45	TBD

The City is currently in discussion with the Province regarding the scope of work and deadline for the *Percent Capture Assessment for the Control Option No. 2* deliverable. The City inquired on the delivery timeline strategy for the *Percent Capture Assessment* and the *2030 Master Plan Update* during the 2023 Annual CSO Milestone Meeting on April 30, 2024 (Appendix D). On October 1, 2024 the City met with the Province on this topic (Appendix I). Further engagement will continue in 2025.

7. Risks and Opportunities

There are many risks and opportunities associated with the *CSO Master Plan* due to the complexity of the program that need to be tracked and managed. The 2024 CSO Background document (Appendix A) outlines further risks associated with the *CSO Master Plan*.

7.1 Risks

The *CSO Master Plan* documents several program implementation risks that can affect the budget, capital costs, feasibility, and schedule.

The district engineering plans (DEPs) comprise individual conceptual solutions to CSO mitigation for each combined sewer district. The risks and opportunities applicable to the control solutions recommended for each sewer district to meet Control Option No. 1 (85 percent capture) are documented in Part 3B – District Engineering Plans of the *CSO Master Plan*.

Risks are also tracked on a project-by-project basis. Any changes to the control solution could lead to a reevaluation of risks associated with each of the specific projects.

7.1.1 Risks Tracking

Some significant recent risks which are being tracked, and will need to be assessed with regards to their impact on the *CSO Master Plan*, are identified below:

- The *November 2019 CSO Master Plan acceptance letter* issued by the Province included a requirement for water quality monitoring every five years. The resources and funding needed to meet this requirement were not included in the *CSO Master Plan*.
- In 2021, the City proposed a strategic approach to remove the Clause 8 requirements for smaller developments in combined sewer areas. Any increases in CSO volume associated with these developments is to be mitigated by the *CSO Master Plan* improvements. The cost to offset any increase in discharges to

combined sewer to ensure future control targets are met have not yet been included in the *CSO Master Plan*.

- Qualified City resources are required to deliver the *CSO Master Plan* and for compliance with *EA No. 3042* and associated Provincial correspondence requirements.
- There is a risk that the local consulting and construction industries will not have the capacity to meet the needs of a significantly increased CSO budget.
- There is a risk of increased delivery costs and the risk of lower quality work with expanding the scale of the program quickly over a short timeline.

7.2 Opportunities

Several opportunities to improve the volume percent capture were identified during the development of the *CSO Master Plan*. The following section describes the main areas that the City could benefit from in the coming years throughout the implementation of the program.

7.2.1 Green Infrastructure

Implementation of GI technologies in the design and operation of all new and upgraded infrastructure could promote long term sustainability in CSO volume reduction performance. An allowance of 10 percent of the capital program is included in the *CSO Master Plan* to account for the increased capital cost to include GI in the implementation.

The GI pilot projects that have been undertaken to date include the North East Exchange District Engineering Study (Appendix A, Section 12.2) and aspects of the Cockburn Sewer Separation Project. Pre and post flow monitoring will take place to determine the suitability and performance of GI in Winnipeg's cold climate and heavy clay soils to confirm its benefits to the collections system.

Additional GI opportunities were reviewed in the Armstrong Preliminary Design Project, and will be reviewed in the Mission / Roland Preliminary Design Project.

7.2.2 Floatable Management

Clause 12 of *EA No. 3042* requires the *CSO Master Plan* to demonstrate the prevention of floatable materials in CSO effluent. The *CSO Master Plan* includes the proposed use of end-of-pipe screening to the primary CSO outfall in each combined sewer (CS) district where it was determined to be hydraulically feasible and where complete sewer separation of the district was not recommended. In addition to the traditional approach to floatables management, the *CSO Master Plan* has identified an alternative approach to eliminate the floatables, where the floatables will be captured at the surface runoff level before it enters the sewer system.

There are high capital costs, long-term operation and maintenance costs, and other risks associated with screen facilities. This alternative floatable management approach will undergo a trial to determine its feasibility as an opportunity for addressing the floatables management requirements at a lower life cycle cost compared to screen facilities currently being recommended. The assessment of the alternative floatables management approach will lead to a better understanding of system floatables and will determine the most efficient long-term approach to managing floatables. An allowance has been included in the cost estimates to pilot this alternative floatables management approach.

7.2.3 Real Time Control

The incorporation of real time control (RTC) and monitoring instrumentation will provide an increased understanding of operation and better control on a real time basis, as well as optimization of flows in the sewer system to the treatment plants. This will also provide opportunities to enhance the public notification system. A feasibility study of the requirements for RTC incorporation is anticipated to take place in the coming years as per the *CSO Master Plan's* schedule.

8. Record Keeping and Documentation

In compliance with Clause 16 of *EA No. 3042*, the City will comply with sampling record requirements, requirements for summaries of laboratory analytical results of grab samples, and CSO event and location records. The City will make records available to an Environment Officer upon request and within three months of the end of each year (or earlier as directed with regards to the CSO Annual results). The City will post the results on the public webpage as required by Clause 10 of the Licence.

In compliance with subsection 46(8) of The Canadian Environmental Protection Act, City of Winnipeg's Water and Waste Department will retain copies of all information on which reports are based, including any calculations, measurements, and other related data, for a minimum period of three years. This information will be kept at City of Winnipeg Water and Waste offices at 1199 Pacific Avenue.

9. Next Steps

The next steps are to implement the control technologies recommended as per the *CSO Master Plan*.

The 2025 planned capital construction projects, preliminary design, and other planned work are provided in Table 4. A summary of the 2025 planned capital projects includes:

- Planning and design of control technologies in Armstrong, Jefferson East, Ferry Road, Cockburn, Mission, and Roland districts
- Construction in Ferry Road, Jefferson East, Hawthorne and Cockburn districts and,
- Execution of the Rainfall Monitoring Program

In 2025, the City will continue to engage the Province in discussion regarding the delivery of the *Percent Capture Assessment for Control Option No. 2*.

The City will continue to explore opportunities to further promote CSO volume reduction and maintain regular communication with regulatory bodies and the public on the progress of the *CSO Master Plan* performance.

10. References

AACE International. 1997. Cost Estimate Classification System – As Applied In Engineering, Procurement, and Construction for the Process Industries. AACE International Recommended Practice No. 18R-97. (pg. 3-46).

CH2M HILL Canada Ltd, XCG Consultants Ltd, Dillon Consulting. 2015. *CSO Master Plan Preliminary Report.* Prepared for: City of Winnipeg, Water and Waste Department. Winnipeg, Manitoba. December 2015.

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Manitoba Conservation and Water Stewardship (MCWS). 2013. *Environment Act Licence No. 3042.* Client File No.: 3205.00. September 4, 2013.

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Appendix A – 2024 CSO Background

City of Winnipeg
2024 CSO Background

Environment Act Licence No. 3042

Clause 13

Prepared for

Environment and Climate Change

March 2025

City of Winnipeg CSO Background

Client File No: 3205.00
City File No. S-734, EMS
020-17-08-11-00
020-17-08-11-0N
Document Title: City of Winnipeg CSO Background
Revision: 01
Date: February 20, 2025
Prepared by: City of Winnipeg Water and Waste Department
Wastewater Planning and Project Delivery Branch
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Document History and Status

Revision	Prepared by	Reviewed by	Date	Approved by	Date
01	S.Leung	F. Lee	Jan. 29, 2025	J. Goodbrandson	Feb. 20, 2025

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Acronyms and Abbreviations

AACE	American Association of Cost Engineers International
CEC	Clean Environment Commission
City	City of Winnipeg
CS	combined sewer
CSO	combined sewer overflow
DEP	district engineering plan
EA	Environment Act Licence
EMC	event mean concentrations
GI	green infrastructure
NEWPCC	North End Sewage Treatment Plant
No.	Number
NPRI	National Pollutant Release Inventory
O&M	operations and maintenance
PLUM	Planning and Land Use Model
PWWF	peak wet weather flow
P2	Pollution Prevention
RTC	real time control
SOIS	Sewer Overflow Information System
SRS	storm relief sewer
TP	total phosphorus
TN	total nitrogen
WSER	Wastewater Systems Effluent Regulations

1. Purpose

The operation of the City of Winnipeg (City)'s combined sewer overflow system is governed by Environment Act Licence (EA) No. 3042. To comply with Clause 13 of EA No. 3042, the City is required to submit an annual report documenting Combined Sewer Overflow (CSO) Master Plan implementation progress and work planned for the subsequent year by March 31 of each year (referred to throughout this document as the "annual report").

The CSO Background Information document provides an overview of the key considerations and historic reported changes of the CSO Master Plan. The information within this document is specific to the background information regarding the CSO annual report. For details about the changes and updates that have occurred for a particular year, refer to the corresponding year's annual report.

2. Combined Sewer Overflows

Combined sewer systems are sewers that are designed to collect both land drainage (rainwater and snowmelt) and wastewater (sewage from homes and businesses) in the same pipe. Most of the time, combined sewer systems transport all of the land drainage and wastewater to a sewage treatment plant, where it is treated and then discharged to the river. However, during periods of heavy rainfall or snowmelt, the additional volume in combined sewers systems can exceed the capacity of the sewer system. During these occasions, combined sewer systems are designed to overflow and discharge the excess volumes directly to the river without reaching the sewage treatment plant. These overflows, called combined sewer overflows (CSOs), contain not only land drainage, but also wastewater and debris.

Historically, combined sewers discharged directly to rivers. In the 1930s, diversion weirs were put in place to divert flows to the North End sewage treatment plant. The outfalls were retained to offer a level of protection against large wet weather events that could overload the system and result in basement flooding.

Combined sewers carry all of the wastewater flow to the sewage treatment plants during dry weather conditions. During periods of heavy rainfall or snowmelt, there is the potential for basement flooding due to high volumes of land drainage entering the sewer system. CSOs protect basements from flooding by relieving excess flow to the river.

About a third of the City's sewer system contains combined sewers. Typically, they were built before the 1960s and serve older areas of the city. Every time there is a CSO, there is a temporary discharge to the river of bacteria, floating debris, and organic material (nutrients). By reducing CSOs, we can do our part to help protect the health of our rivers and lakes.

3. Regulations

Combined sewers are regulated by federal and provincial requirements. On an annual basis, the City submits annual CSO discharge data to National Pollutant Release Inventory (NPRI), Wastewater Systems Effluent Regulation (WSER) and the Province to comply with both the federal and provincial regulations.

In 1999, the Federal Government required reporting on estimated sewerage lost from the sewer network under the Canadian Environmental Protection Act, as part of the NPRI.

In 2012, the Federal Government under WSER mandated the City to keep CSO records from 2013 and provide annual CSO Reporting due February 15 each subsequent year.

In 2013, the Province issued the first Combined Sewer Overflow Licence to the City of Winnipeg, EA No. 3042. It contained 16 clauses (see Appendix A) requiring public education, CSO reporting, interim water quality sampling and analysis, public notification and the development of a CSO Master Plan. The City of Winnipeg's responses to date concerning each of regulatory requirements contained within EA No. 3042 are listed below:

- The Public Education Plan was submitted to the Province in December 2013. This plan outlined a high-level schedule for public engagement activities to comply with Clause 9. The Province requested bi-annual report updates; this requirement was completed with the last report dated June 2019.
- The Combined Sewer Overflow Notification Plan was submitted to the Province in April 2014. This plan outlined the significant event, quarterly and annual CSO reporting processes to comply with Clause 14.
- The Interim Monitoring Plan was submitted to the Province in January 2014. This plan outlined the plans to comply with Clause 15 which concluded with the analysis of the samples collected documented in the submission of the December 2015 Preliminary Proposal submission.

- The CSO Public Notification System Plan was submitted to the Province in December 2015. This plan outlined a new notification system to inform the public in the event of an overflow to comply with Clause 10.
- The CSO Master Plan was submitted to the Province on August 28, 2019 (see section 4) and was subsequently approved by the Province on November 13, 2019 (see Appendix B). This triggered Clause 13 of EA No. 3042, which requires the City to submit an annual report documenting the CSO monitoring progress and results of the preceding year, and work plan for the subsequent year by March 31 of each year. Clause 13 specifically states:

The Licencee shall, upon approval of the Master Plan submitted pursuant to Clause 11 of this Licence, implement the plan such that progress towards meeting the required level of treatment is demonstrated annually by submission of an annual report, due March 31 of each year for the preceding calendar year. Annual submissions shall include the progress made on the plan pursuant to Clause 11 including monitoring results and the work plan for the subsequent calendar year.

The Provincial approval letter dated November 13, 2019 contained the following additional requirements:

a) The Licencee shall submit for approval an outline of the content of the annual report as required by Clause 13 of the Licence by December 31, 2019;

b) The Licencee shall, prior to submission of the annual report, submit a monitoring plan for approval;

c) The Licencee shall include in the annual report the monitoring report, the proposed planning for the year ahead, and the milestones achieved;

d) The Licencee shall, from the date of issue of this Letter, collect CSO water samples and model river quality data every 5 years to demonstrate improvements in the river water quality due to implementation of Control Option No. 1. The next river water quality report is due December 31, 2024;

e) The Licencee shall carry out an assessment of the impact of climate change to the performance of the CSO program and shall include the assessment report along with the CSO Master Plan for Control Option No. 2 which is due April 30, 2030; and

f) The Licencee shall, on or before April 30, 2025, submit for approval a report demonstrating that the percent capture performance measure, an alternative to Control Option No. 2 as proposed in the CSO Master Plan dated August 28, 2019, will provide equivalent water quality protection to Control Option No. 2 (i.e., four overflows in a representative year).

The City met with the Province to discuss the proposed outline for the CSO Master Plan annual reports on December 16, 2019. A proposed outline was submitted on December prior to the December 31 deadline.

On July 8, 2021, the Province requested the estimated increase and decrease in CSO volume as a result of small scale developments and infrastructure developments on the overall combined sewer system be documented in the annual report, see Appendix C. Refer to section 5.5 for further information.

The regulation changes in 2023 included the Removal of Requirement to submit Significant Rainfall Event Notifications, as per a Provincial letter received January 13, 2023 (Appendix D). As such, references to Significant Rainfall Event Notifications have been removed from the annual report.

4. CSO Master Plan History

Prior to establishment of the Federal and Provincial regulations summarized in Section 3, the City made major investments in wastewater treatment upgrades and focused on the combined sewer approach to eliminate dry weather overflows and protect the river water quality within Winnipeg. Projects that the City has invested in to relieve CSOs and protect basement flooding prior to the Federal and Provincial licensing requirements include:

- In 1937, diversion weirs and interceptor sewer system were put in place to divert combined sewer flows to the North End Sewage Treatment Plant (NEWPCC).
- Since 1960s, municipal regulations were in place to ensure that no new property developments were permitted to be serviced by combined sewers. All new developments must be serviced by a two-pipe system.
- The City also focused on completing infrastructure upgrades to eliminate CSOs to the river and reduce risks of basement flooding such as sewer separation works, sustainable drainage systems, latent storage dewatering stations, and outfall chamber upgrades.

After proclamation of the Environment Act on March 31, 1988, the Province of Manitoba requested the Clean Environment Commission (CEC) hold hearings on protecting Winnipeg's rivers and waterways. In 1992, the hearings concluded with recommendations to the City that a CSO study be commissioned. The CSO Management Strategy study was completed in 2002 and the final report was presented at the CEC public hearings completed in response to a raw sewage spill which occurred at the North End Sewage Treatment Plant (NEWPCC) in 2003. The 2002 CSO study documented the water quality impacts of combined sewers and formulated remedial measures for CSO control.

Following the 2003 CEC hearings, the CEC provided a report with advice and recommendations in August 2003. It was recommended in this report that the required funding to address CSOs in Winnipeg should be shared by the Federal and Provincial Governments in addition to the City. It was recommended the City be directed to complete the CSO work within the next 25 years, monitor CSOs

and implement a public notification system. An excerpt from this 2003 CEC report is shown below:

> *The City of Winnipeg should be directed to shorten the timeframe to complete its combined sewer overflow plan from the proposed 50 years to a 20 to 25-year period.*
>
> *The City of Winnipeg should be directed to take immediate action to reduce combined sewer overflows by instrumenting outfalls, adjusting weirs, accelerating combined sewer replacement, advancing the pilot retention project and undertaking other reasonable measures to reduce combined sewer overflows within two years.*

Based on the CEC recommendations, the Province issued EA No. 3042 on September 4, 2013, mandating the development of The City's Combined Sewer Overflow Master Plan.

In response to the Clause 11 Licence requirements the CSO Master Plan Preliminary Proposal was completed on December 18, 2015, recommending an 85% CSO volume capture long term control target. This proposal included plans, costs, evaluation criteria and recommendations for the five different targets to address CSOs. These targets are known as Control Options, and each of the five Control Option studied are listed below:

- Control Option 1: 85 Percent Capture in a Representative Year
- Control Option 2: Four Overflows in a Representative Year
- Control Option 3: Zero Overflows in a Representative Year
- Control Option 4: No More than Four Overflows per Year
- Control Option 5: Complete Sewer Separation

The Province responded to the City on November 24, 2017 with approval to the CSO Master Plan Preliminary Proposal. The letter specifically directed the City to:

- *Submit a Master Plan including detailed engineering plans, proposed monitoring plans, and an implementation schedule for Control Option No. 1 as identified in your CSO Master Plan Preliminary Proposal on or before August 31, 2019 and for Control Option No. 2 as identified in*

your CSO Master Plan Preliminary Proposal on or before April 30, 2030, and

- *Implement the CSO Master Plan for Control Option No. 1 by December 31, 2045, unless otherwise approved by the Director.*

On August 28, 2019, the City submitted the CSO Master Plan. The Master Plan included the District Engineering Plans (DEPs), proposed monitoring plans, and an implementation schedule for Control Option No. 1 with potential migration to Control Option No. 2.

Upon receipt of the CSO Master Plan submission, the Province responded to the City with the following requests on November 13, 2019:

- Part 1: complete an outline of the content of the annual report as required by Clause 13 of the Licence by December 31, 2019,
- Part 2: complete a monitoring plan for approval prior to the submission of the annual report, which will include the monitoring report, the proposed planning for the year ahead, and the milestones achieved,
- Part 3: complete a water quality assessment once every 5 years to demonstrate improvements in the river water quality as a result of implementation of Control Option No. 1. The next report is due December 31, 2029.
- Part 4: complete an assessment of the impact of climate change to the performance of the CSO program and an assessment report with the CSO Master Plan for Control Option No. 2, which is to be submitted by April 30, 2030,
- Part 5: complete a report demonstrating that the percent capture performance measure complies with Control Option No. 2, by April 30, 2025, and
- Part 6: implement CSO Master Plan for Control Option No. 1 by December 31, 2045.

The overview of the CSO Master Plan development timeline is illustrated in Figure 1.

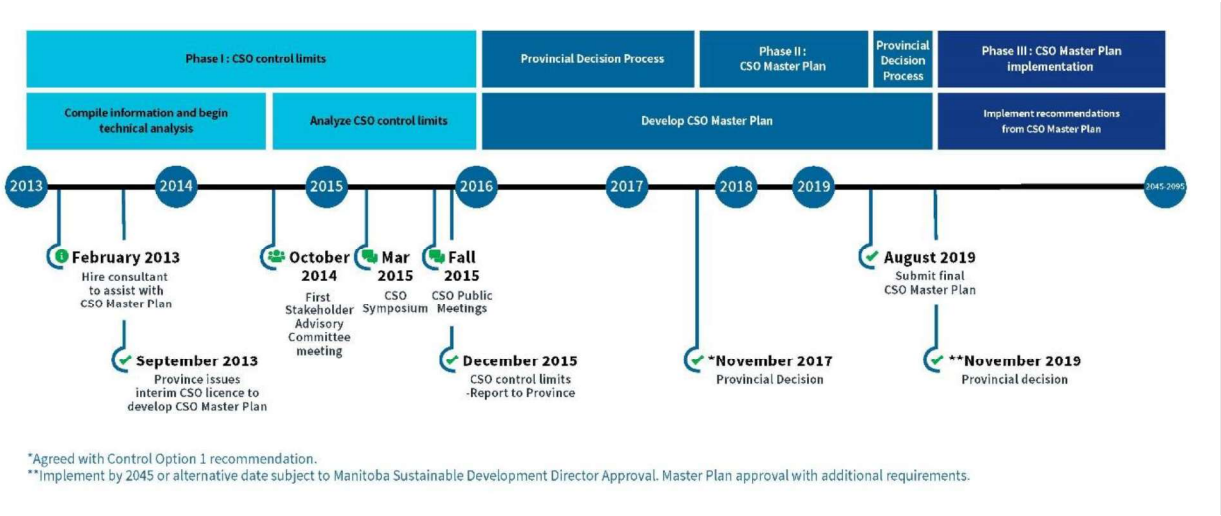


Figure 1 - CSO Master Plan Development Timeline

The CSO Master Plan began its implementation phase upon the receipt of the Provincial approval letter in November 2019. A high level CSO Master Plan Implementation timeline with a number of the future significant milestones is provided in Figure 2.

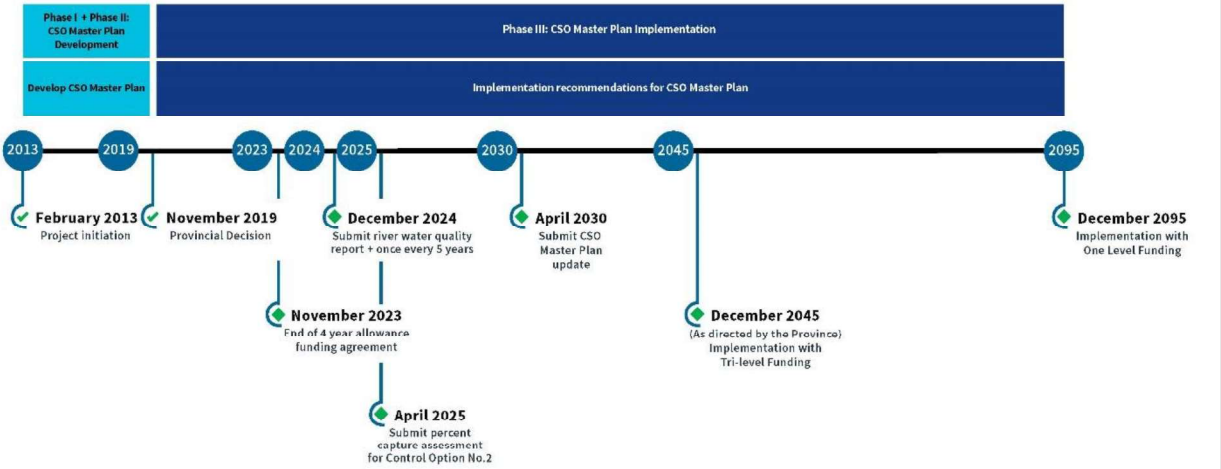


Figure 2 - CSO Master Plan Implementation Timeline

5. Master Plan Key Components

The following subsections identify the major considerations in the design of the CSO Master Plan to meet the requirements of EA No. 3042. These considerations will shape the reporting process for implementation of the CSO Master Plan.

5.1. Hydraulic Modelling

Monitoring instrumentation and analysis tools are crucial components to the development of the proposed solutions for the CSO Master Plan. At the beginning of the federally mandated CSO reporting period in 2002, no permanent CSO outfall instrumentation was in place. The estimation of percent sewerage volume lost from CSOs was solely based on analytical assumptions up until 2012. With the recommendation from the CEC in 2003, the City invested in CSO event monitoring and volume calculation tools to improve the confidence intervals of CSO estimations. The CSO Monitoring Program commenced in 2009 and by 2013, CSO instruments were successfully installed at 25 locations. Using the available data from the 25 monitored locations, the model estimates of wastewater flows from CSOs were validated.

Due to the difficulties of installing and maintaining instruments in harsh conditions with no local power source, detailed modeling of the combined sewer networks was undertaken to estimate the performance of the remaining combined sewer outfalls. An advanced hydraulic and hydrological model was built to represent the existing wastewater collections system. In 2014, the model was calibrated based on temporary instruments at five locations.

This model was further developed as more monitoring data became available. In 2015, the CSO Master Plan Regional Model was completed, which represented each of the CSO districts and outfalls. By 2015, CSO instruments were successfully installed in 14 additional combined sewer outfalls, bringing the total number of outfalls being monitored to 39. The model was then utilized to produce annual CSO results estimation with validation at the 39 permanent CSO instrumented locations.

In 2017, the City created a CSO overflow validation tool to identify and track differences between what the model estimated and the observed instrumented

overflows. This information was used to identify instrument maintenance, model maintenance, and areas for operational improvement.

In 2019, the City upgraded the hydraulic model from sewer systems to an integrated catchment modelling platform software to utilize the hydraulic software's latest and advanced features. Changes and impacts resulting from the software conversion process were documented.

In 2020 and 2021, CSO instruments were installed in three additional outfall locations each year. In 2022, one additional outfall location was monitored. The permanent CSO instrumented locations increased from 39 to 46 locations of the total 76 CSO outfalls.

5.2. Design Basis

The Preliminary Proposal recommended the Control Option No.1: 85 percent capture in a representative year. This option was the highest ranked of the control options considered in the study and was later approved by the Province in 2017.

5.3. Representative Year

The CSO Master Plan adopted the year 1992 as the representative year for annual rainfall intensities and river levels. Based on a detailed review of 53 years of historic rainfall records at the Winnipeg International Airport, it was determined that the year 1992 would be a suitable rainfall year to be representative of typical conditions with respect to accumulated rainfall (i.e. mm per event), number of annual events, and total annual precipitation characteristics.

Similar evaluations of the historic river level records were completed and determined that the year 1992 could also be suitable as representative of typical river level conditions in Winnipeg. As such, the 1992 river level trends and rainfall intensities were used in sophisticated numerical modeling to estimate the volume and frequency of CSO events during the recreation season (May through September, inclusive). It was agreed with the Province as part of the CSO Master Plan Preliminary Proposal development that the year 1992 would form the representative year and would be utilized for planning and evaluation of current and future CSO performance.

5.4. Baseline Conditions

The CSO Master Plan was developed with the 2013 year as the baseline year. The Preliminary Proposal, existing hydraulic models, and other CSO related relevant reports were developed based on this baseline condition.

To ensure a common basis for control system sizing and regulatory compliance that is not affected by the annual variations in precipitation and river levels, the CSO Master Plan adapts the 2013 hydraulic model with the 1992 Representative Year precipitation and river levels as the baseline condition for planning and evaluation of control options.

5.5. Planning Projections

The Master Plan accounts for population growth in the design process. Clause 8 of EA No. 3042 requires no increase in frequency or volume of CSO in the existing system due to new and upgraded land development. Increases in wastewater from growth in population located within a combined sewer district is generally required to be offset with reductions in runoff area.

To demonstrate compliance with the licensing requirements, the City regulates the development process generally by requiring that the post development peak wet weather flows (PWWF) in the combined sewer districts is equal to or less than the pre-development PWWF. As the City continues to regulate the development process and prohibit the use of combined sewers in new developments, it was anticipated that there would be no impact in the combined sewer systems from new development. The CSO Master Plan projections account for an unmitigated increase in sewage flow only in the separate sewer areas.

In 2020, the City started to use the CSO Master Plan to meet Clause 8 for small developments (e.g. single family and two family) by removing additional flows in the combined sewer areas. Strategic CSO mitigation projects from the CSO Master Plan will be used to offset any additional flows that may come from the small scale developments. This approach aligns with the goals of OurWinnipeg and the Complete Communities Direction Strategy by enabling population growth in the intensification target area without costly on-site land drainage management.

The annual report documents the estimated increase in volume of CSOs caused by small scale developments and the estimated decrease in volume as a result of infrastructure development on the overall combined sewer system on an annual basis. This aligns with the requirements detailed in the Provincial letters from July 8, 2021, June 7, 2022 and August 1, 2023.

5.6. CSO Control Technologies

Clause 8 of EA No. 3042 requires the use of green technology and innovative practices in the design and operation of all new and upgraded storm and wastewater infrastructure. Both green and grey infrastructure are considered in the CSO Master Plan design. Green infrastructure (GI) refers to the use of natural hydrologic processes to reduce, store, or attenuate surface runoff from entering the combined or land drainage sewer systems. Many of the GI projects also improve water quality of the surface runoff received. Grey infrastructure refers to the conventional infrastructure projects to address sewer system incapacity, such as pipes and storage tanks.

The control technology selection for each of the combined sewer districts was developed through a two-step approach and selection process. The first step of the review included an evaluation of the applicability of sewer control option for the district. This evaluation was based on a number of criteria, including compatibility with existing sewer infrastructure, proximity to the primary CSO outfall/interceptor sewers, and estimated hydraulic performance. The initial solution configurations were implemented within the model based on system hydraulics. Locations were verified with the City's GIS database with respect to constructability and feasibility.

The second step of the process included the refinement of the initial control option selection to achieve the 85 percent capture target in the most cost-effective manner. These refinements included:

- A review and further evaluation of sewer districts with screening operational challenges
- Incorporation of additional complete or partial sewer separation where cost-effective

- The addition of sewer system control and/or Combined Sewer-Storm Relief Sewer (CS-SRS) interconnection adjustments to accommodate additional latent storage
- Incorporation of additional off-line storage where required to provide the remaining volume capture required to meet Control Option No. 1

Further details to each of these refinements can be found in Section 3.5.4 of CSO Master Plan Part 2.

5.7. Water Quality

As per Clause 15 of EA No. 3042, the City developed an Interim Combined Sewer Overflow Monitoring Plan to aid in the development of the CSO Master Plan. The Interim Plan was a multi-year water quality monitoring program that was conducted to collect and update river and CSO water quality data for the development of the CSO Master Plan. The water quality monitoring data was collected in 2014 and 2015. The event mean concentrations (EMC) of the data collected from the 2014 and 2015 water quality monitoring program are provided in

Table 1. The EMC of ammonia, nitrate, and total phosphorus (TP) were used to determine pollutant loads in the NRPI reports, while TP, total nitrogen (TN), and nutrient loading were used as the baseline for the water quality modeling and loading assessments for evaluation of control option alternatives for the CSO Master Plan. The assessment indicated that the CSO discharge quality varied by location and between events but was within expected ranges for combined sewer discharges, there was very little difference in performance among the control option alternatives.

Table 2 indicates the number of days the bacteria objective may be exceeded for each alternative. The detailed analysis and results of the CSO Master Plan water quality monitoring work are documented in the Preliminary Proposal.

Table 1 - Pollutants EMC from 2014/2015 Water Quality Monitoring Program

Substance Name	Unit	EMC
[1]Ammonia	mg/L N	5.72
[1]Nitrate-N	mg/L N	0.34
[1,2]Total Phosphorus	mg/L P	2.71
[2]Total Nitrogen	mg/L N	15.25

1 – Parameters used in the NPRI reports
2 –Parameters used in the CSO Master Plan nutrient loading assessments

Table 2 - Potential Plans Bacteria Metrics (CH2MHill et al., 2015)

Plan Alternative	Control Limit	Number of Exceedances (days/year)
-	Baseline	44
1	85% Capture in a representative year	44
2	Four Overflows in a representative year	41
3	Zero Overflows in a representative year	35
4	No More Than Four Overflows per year	39
5	Complete Sewer Separation	42

As per the CSO Master Plan approval letter, the City will be implementing Control Option No. 1 while further evaluating the bacteriological water quality improvement identified for Control Option No. 2. A water quality report will be submitted once every 5 years, starting on December 31, 2024.

The City presented a proposed water quality monitoring plan to meet the 2024 requirements which was accepted by the Province in January 2023. See the accepted Water Quality Monitoring Plan.

The implications of maintaining a percent capture program on water quality will be evaluated and will be provided in the 2030 Master Plan update submission.

5.8. Climate Change

Climate change considerations were accounted for in the planning and development of the CSO Master Plan. As documented in the CSO Master Plan Preliminary Proposal, historic precipitation information (1960 to 2012) was reviewed to understand precipitation trends and the impact climate change may have on the precipitation trends over time.

Precipitation trends indicate that climate change is linked to less frequent but larger rainfall events. Winnipeg is expected to experience an increase in the frequency of small rainfall events but a consistent trend for larger events. Since the smaller events can be captured in the CSO control system, it is expected that the trend would not be detrimental to the CSO program performance. However, there is a high degree of uncertainty in long-term trends if the frequency of large events increases.

GI has been identified as an opportunity to improve CSO performance levels and provide resiliency to the potential future impacts of climate change. The City will continue to undertake GI pilot projects to evaluate their benefits and long-term performance for future application. An allowance of 10 percent of the total CSO Master Plan capital cost estimates has been included for future GI implementation and to achieve regulatory compliance for Clause 8 of EA No. 3042.

Furthermore, prioritizing sewer separation work will provide the program with climate change resiliency. Any additional runoff generated from climate change impacts on precipitation trends will continue to be directed to the land drainage sewers for the districts which have been separated.

The City will continue to monitor and track weather patterns to assess any impact to the CSO Master Plan and the use of 1992 as the representative year to represent the long-term typical conditions in the City of Winnipeg.

5.9. Communications

Maintaining an open engagement with stakeholders is essential to the success of the CSO Master Plan. The City will continue to engage with public and the Provincial regulator on progress of the CSO Master Plan execution.

5.9.1. Public Engagement

The City established a public engagement program to inform, engage, and consult the public on the CSO Master Plan in the first stage of the Master Plan. The public engagement program included multiple public consultation events for the public to provide input. In addition to public consultation events, a Stakeholder Advisory Committee (SAC) was established to provide advice and direction on the study phase.

The general public was engaged through various public presentations and workshops, internet-based tools, including a blog open for public comments, an email Q&A option, a CSO educational video, and media interviews. The information gathered from the public engagement was evaluated and integrated into the Preliminary Proposal.

Upon submission of the Preliminary Proposal, the City continued to inform and educate the public on the development of the Master Plan using the internet-based tools. The City optimized the public webpage dedicated to the CSO Master Plan work by restructuring and updating it to allow more content and the most up-to-date information be made available to the public. The updated website also allows the public to access the information and navigate the website in a more effective and user-friendly manner. A screen capture of the updated City public webpage can be found in Figure 3.

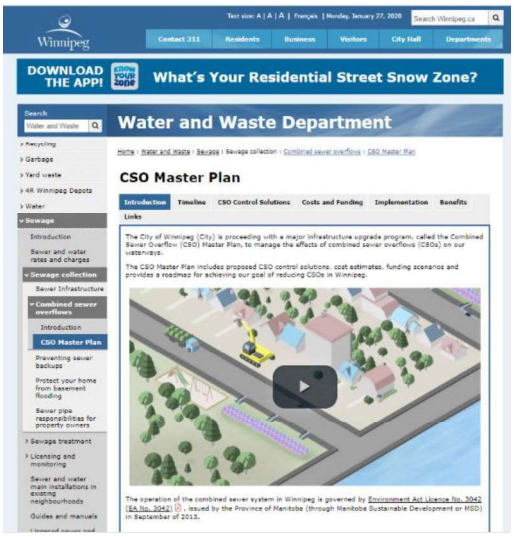


Figure 3 - Screen Capture of the City Webpage

5.9.2. Public Education

The City website contains important information relating to the CSO Master Plan. The website serves as a public education tool to provide Winnipeg residents information on the Master Plan and its benefits. Animated videos and plain language descriptions illustrate and clearly describe the operation of our complex combined sewer systems. The City website also contains information about CSO relief projects and the annual CSO discharge results.

5.9.3. Public Notification System

The City introduced a public notification system called the Sewer Overflow Information System (SOIS) in 2004 to notify the public on the likelihood of overflows as a result of the recommendation from the 2003 Clean Environment Commission hearings. This system indicated the likelihood of overflows into the Red and Assiniboine Rivers based on readings of high-water sensors in the sewers at various overflow locations along with the City's rivers and other monitoring indicators.

In 2013, the City was requested to develop a plan to accommodate a new, enhanced public notification system that would provide a near real-time indication of CSO notifications with overflow occurrences and duration by December 31, 2015 to comply with Clause 10 of EA No. 3042. The CSO Public Notification System Plan, describing the development and implementation plan of the enhanced public notification system, was submitted to the Province on December 15, 2015, and was later approved.

The enhanced public notification system was in the development phase between 2017 and 2021 to test it for reliability and accuracy of the CSO notification predictions. It is linked to the most current hydraulic model for the City of Winnipeg CS system, along with rainfall and outfall instrumentation data at each of the 46 of the 76 combined sewer outfalls. The City engaged with the Province in May 2022 and launched the enhanced public notification system in July 2022. The City of Winnipeg CSO Public Notification Tool notifies the public when a CSO is occurring and estimates its duration in near real-time. Further information related to the tool is available on the City of Winnipeg website:

https://legacy.winnipeg.ca/waterandwaste/sewage/csoNotification.stm.

5.10. Regulatory Engagement

The City worked closely with the Province to develop the CSO Master Plan. During the development phase of the Master Plan, the City met with two different regulatory groups, a regulatory liaison (management) group and a regulatory working group to raise challenges, report on project progress updates, and to promote collaboration with the regulator to ensure successful program delivery.

5.11. District Engineering Plans

The District Engineering Plans (DEPs) were developed to provide conceptual solutions for the Control Option No. 1 performance target (85 percent capture in a representative year) for each of the 43 combined sewer districts.

The DEPs are ongoing, live documents. Each of the districts will undergo preliminary and detailed levels of design based on the solutions recommended in the DEPs, and will be updated throughout the implementation phase as required. The current version of the DEPs can be found in the CSO Master Plan Part 3B.

6. Capital Cost Summary

A conceptual level Class 5 estimate was developed for the CSO Master Plan. A Class 5 estimate is defined by the *American Association of Cost Engineers International,* (AACE) *Cost Estimate Classification System - As Applied in Engineering, Procurement, and Construction for the Process Industries* (AACE, 1997) as having a project definition of zero to two percent to be used in a conceptual study with an expected range of accuracy from -50 percent to +100 percent.

The total capital cost to implement the CSO Master Plan including the 10 percent GI allowance is estimated as $1,150,400,000 in 2019 dollars. Applying the maximum +100 percent of the Class 5 estimating range, the total capital cost for budgeting purposes is estimated to be $2,300,800,000. The capital cost summary is shown in Table 3.

Table 3 - CSO Master Plan Capital Cost Estimate (2019 dollars)

Item	2019 Capital Cost Estimate
Class 5 Estimated Capital Costs	$1,045,800,000
Green Infrastructure Allowance (10%)	$104,600,000
Subtotal – Capital Cost Estimate	**$1,150,400,000**
Class 5 Estimate Range of Accuracy: -50% to +100%	$575,200,000 to $2,300,800,000
Total Capital Cost for Budgeting Purposes	**$2,300,800,000**

7. Funding Scenarios

The current City funding method for the CSO Master Plan is through the Sewer Utility. The sewer rates have been steadily rising to cover the inflation rate and the costs required for assorted water and wastewater infrastructure upgrades. However, to meet the mandated timeframe in EA No. 3042, an aggressive increase in sewer rates is required and this amount was determined to be unaffordable by utility rate payers. An affordability assessment documented in the Preliminary Proposal suggested that the Master Plan would not be able to meet the licencing requirements based on the current and forecast utility rates without additional external funding support.

Based on the recommendation from the CEC for sharing the cost equally between the Municipal/Provincial/Federal governments, the CSO Master Plan was developed with the following three funding scenarios.

- Scenario 1 – Tri-level funding agreement between the Government of Canada, Manitoba Government, and the City of Winnipeg with each contributing $30 million per year each (a total capital budget of $90 million dollars per year)
- Scenario 2 – Bi-level funding agreement between the City of Winnipeg and either the Manitoba Government or the Government of Canada with each contributing $30 million per year each (a total capital budget of $60 million dollars per year
- Scenario 3 – City-only funding with a total estimated capital budget of $30 million per year

The funding scenario is based on the following assumptions:

- Three percent inflation per year for annual funding and construction costs,
- A four-year initialization period at beginning of program, which includes a two-year allowance for alterations of EA No. 3042 and a two-year allowance for securing Federal and Provincial funding commitments, and

- Consistent funding arrangements established throughout the entire implementation period.

The 2019 CSO Master Plan described the funding impacts in detail. The summary of the impact of the three funding scenarios are provided in Table 4.

Table 4 - CSO Master Plan Funding Scenario Evaluation Results [2019 Dollars] (Jacobs, 2019)

Program Scenario	Description	Funding by	Annual Budget	Timeline
Scenario 1	3 Levels of Funding 3 x $30 Million	Tri-level: Government of Canada, Manitoba Government, and the City of Winnipeg	$90 Million	27 years (2047)
Scenario 2	2 Levels of Funding 2 x $30 Million	Bi-Level: City of Winnipeg and either the Manitoba Government or the Government of Canada	$60 Million	39 years (2059)
Scenario 3	City Only $30 Million	One Level: City of Winnipeg Only	$30 Million	75 years (2095)

The City requires funding from the Federal and Provincial governments to meet the 2045 Provincial deadline due to the scale of the work required as per the intent of the 2003 CEC recommendations. However, any changes to inflation rates or delay to annual funding approvals to the request will result in overall project cost increases and a longer implementation timeline.

The CSO Master Plan originally stated that if no additional funding was provided by the Provincial and Federal Governments by 2023 or earlier, the CSO Master Plan would move to the Program Scenario 3 which is based on City only funding and has a longer implementation timeline. The City is currently reviewing the resource needs to meet the target capture for the 2045 Provincial deadline.

The Program Scenario 1 Capital Budget with three percent annual inflation can be seen in see Figure 4 below.

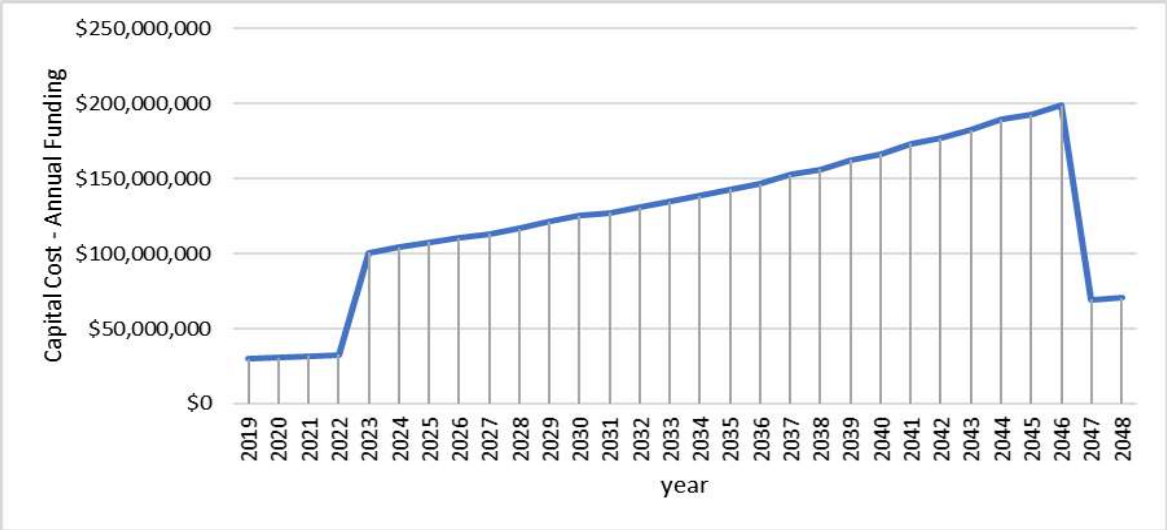


Figure 4 - CSO Master Plan Program Scenario 1 Capital Budget Inflated at Three Percent Annually

8. Design Development of Proposed Projects

The CSO Master Plan and the DEPs were developed to a conceptual level of detail. The individual project selections and designs are based on the hydraulic model evaluations and high-level assessments of constructability. It is expected that the proposed projects identified will change and adapt as further information is collected during the program implementation and individual project design studies. This process is illustrated in Figure 5.



Figure 5 - Key Design Stages in Life of a CSO Project

The City plans to complete a number of additional evaluations based on the details presented in the DEPs to form the basis for further design and construction within each of the sewer districts. Each of the proposed projects will undergo a preliminary and detailed design stage to confirm their constructability. A potential approach to the design process would be for several neighboring sewer districts to the district in question under design to be further refined as a package during the preliminary design phase. Additional detail would be collected and evaluated to fully understand the existing sewer system surrounding each specific district prioritized, and confirm selection of the optimal CSO control technology. This would be followed by detailed design where the parameters of the control technology would be finalized for construction.

Each of the combined sewer districts with the solutions constructed will be monitored to determine the level of performance achieved. This information will be input into the current hydraulic model and applied as part of future design evaluations. CSO volume monitoring and operation and maintenance of sewer systems will continue for the life of the infrastructure.

9. Program Implementation Strategy

In addition to the program criteria, an implementation strategy has been defined in the CSO Master Plan documentation to balance resources, risks, and costs of the projects. Additionally, projects were scheduled based on the funding scenario.

Sewer separation work is an ongoing priority for the program implementation due to the high benefits and low risks. As cost escalation can have significant impacts to the cost of long-term programs, completing more expensive work upfront can reduce the relative impact of cost escalation. Sewer separation reduces basement flooding risk and reduces wet weather runoff to the combined sewer system. It addresses the required CSO reduction targets, while also improving the basement flooding level of service for the area.

There are a number of additional opportunities which require further investigation as part of program implementation, such as GI solutions and floatable management.

GI was assessed separately from the other control options. It was not been included in the base solutions because of unknowns and uncertainty with its application. Each district will require a detailed assessment on potential GI locations and will require the development of policies and design standards with engagement and buy-in from residential, commercial, and industrial customers to optimize opportunities. The analysis of the main technology evaluations and pilot studies are scheduled to be completed within the first ten years. This will provide confirmation that these proposed options are appropriate and suitable for the Winnipeg sewerage system. GI and sustainable solutions should be reviewed as part of every sewer infrastructure project to comply with Clause 8 of EA No. 3042. GI projects will provide the necessary performance improvements to meet CSO volume capture targets and will assist with mitigating detrimental impacts from climate change. An allowance of 10 percent of the total CSO Master Plan capital cost estimates has been included for future implementation of GI solutions.

The floatables management approach in the CSO Master Plan is based on outfall screening. Screening is not the most effective approach for many of our sewer districts due to many factors including; the surrounding environment and the

sewer system hydraulics. Floatables management is required for outfalls in which combined sewage is discharged. For districts in which complete sewer separation is to be completed, combined sewage will no longer be discharged from the outfalls in these districts and floatable management will not be required.

The City has identified an alternative approach to screening to address the floatable management requirements, which is similar to a successful program run by the City of Ottawa. This proposed new approach targets source control as a potential alternative to screening. This is expected to achieve similar or better results while eliminating end-of-pipe screening. The alternative floatables management plan provides a significant opportunity to achieve the intended results, while avoiding the high capital and long-term operations and maintenance (O&M) costs of screening facilities.

Additional sewer storage and mechanical controls solutions are scheduled to follow sewer separation work. In order to appropriately size and operate this type of infrastructure, sewer network, power, communications, monitoring, and operational infrastructure need to be in place to allow for a detailed understanding of network performance.

10. Schedule

The schedule is based on funding and the evaluation of the scope of work involved with each of the districts, CSO volume detriment, cost-benefits analysis, and district prioritization. See Appendix E for the District Program Scenario 1 implementation schedule and Figure 6 for the high-level schedule which shows for the implementation strategy more clearly. Further details on the implementation can be found in the Master Plan (section 7) and within the annual report for updated information.

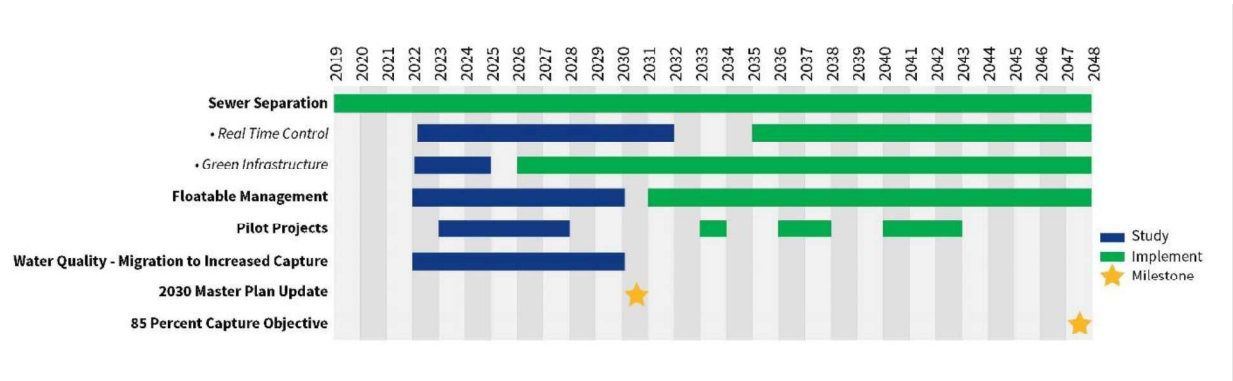


Figure 6 - CSO Master Plan Program Scenario 1 Overview Schedule

11. Capital Projects Overview

To achieve 85 percent CSO volume capture in a Representative Year, sewer separation work is a major component and is proposed for 15 districts. A breakdown of the cost for each control technology applied in the CSO Master Plan is shown on Figure 7.

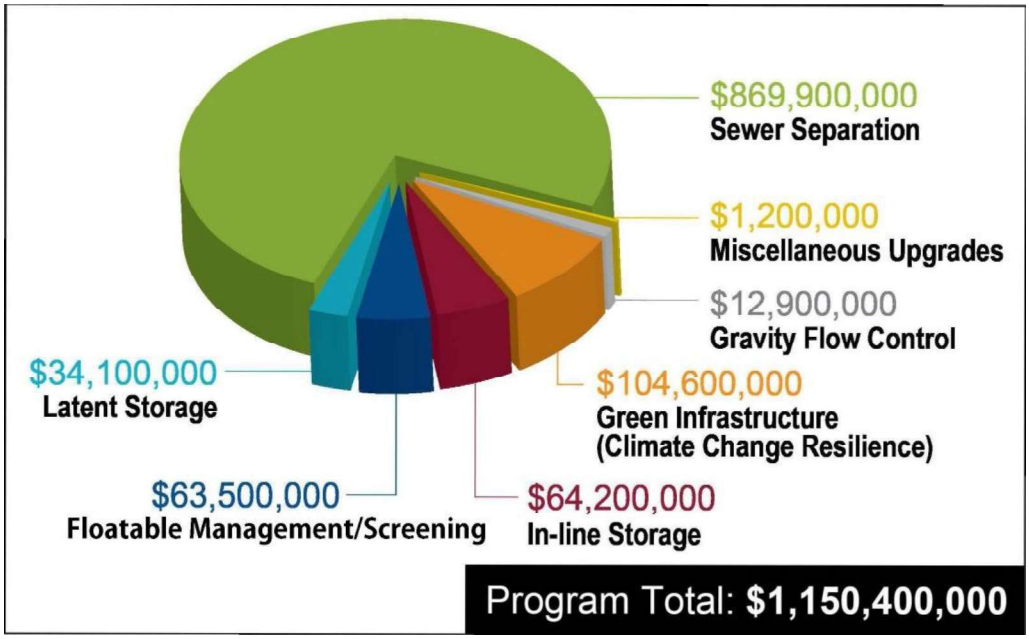


Figure 7 - CSO Master Plan Capital Cost Summary (2019 Dollars)

Figure 8 provides an overview map of the location of the proposed control options for each district.

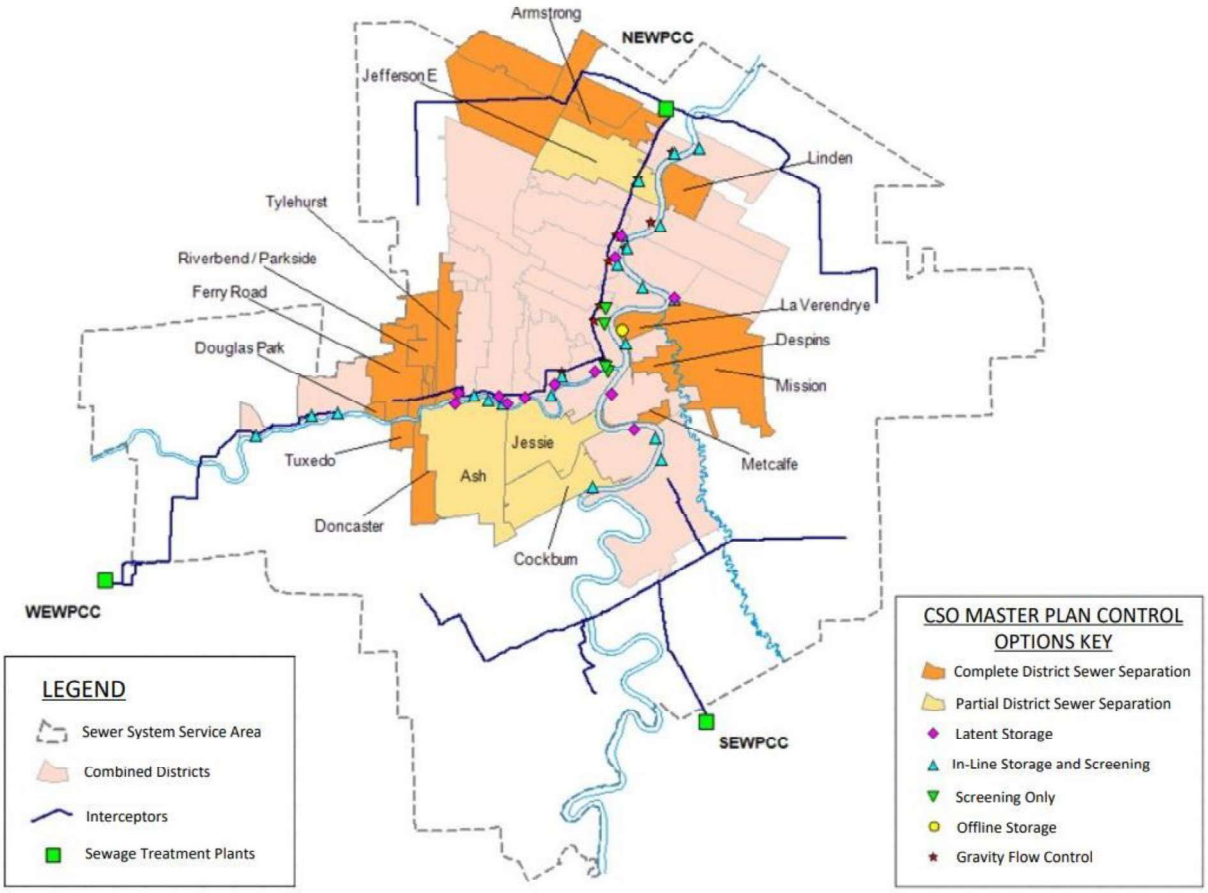


Figure 8 - CSO Master Plan Project Overview Map

12. Risks and Opportunities

This section provides an overview of the risks and opportunities identified in the development of the Master Plan.

12.1. Risks

Program Implementation

Factors that may pose a risk to the program implementation are as follows:

- Funding – There is a risk that funding from other levels of government will not be available over the life of the CSO Master Plan. The City will continue its work with the available allocated annual budget.
- Technology – There is a risk that implementation of the green and innovative technologies as per Clause 8 of EA No. 3042 may not perform as expected. Technologies that are proven to be successful in other jurisdictions may not apply the same to Winnipeg due to the environment. The City will undertake research and seek experience and knowledge from other jurisdictions on the technologies prior to implementation.
- Resource – Market fluctuation and insufficient local resources may pose a risk to a cost increase and a delay in the implementation schedule.
- Schedule – There are many sources of risk associated with the planning and execution of the program. Such risks include funding shortages or high bid costs, limitation of engineering and construction service capacity, and extended project approvals.
- Migration to Control Option No. 2 – The change in performance target (from Control Option No. 1 to Control Option No. 2) would increase costs and likely increase the timeline of the Master Plan due to the increase level of effort required for the increased CSO volume reduction.

Climate Change

An increase in extreme weather events is a potential risk to the performance of the CSO Master Plan program. The program is based on a 1992 Representative Year. Long-term monitoring of rainfall trends will continue during the execution of the Master Plan to monitor any trends.

Basement Flooding

Modification and upgrade of existing infrastructure may pose a risk to basement flooding due to potential system operation issues.

Program Feasibility and Sustainability

Factors to be considered regarding the feasibility and sustainability of the program include: affordability, public impact, City resources, construction capacity, services overlap, and control option re-evaluation.

Affordability: The City's finances its capital and operating budgets for the sewer utility on a user-pay basis through sewer rates. To ensure that the rates are affordable to rate payers, the City takes a longer-term view of rates. The rates have steadily been rising for several years and are expected to continue to rise due to wastewater treatment plant upgrade works and replacement and refurbishment of aging infrastructure.

Public Impact: Sewer separation projects are planned throughout the combined sewer system and will encompass large sections of the sewer districts. Each of these will include large programs that will each take several years to complete. This may pose an impact on both the residents and businesses.

City Resources: City resources will need to increase to achieve the new requirements and implement all components of the CSO Master Plan.

Construction Capacity: With the additional construction projects demand, there is a risk that Winnipeg may not be equipped with sufficient local construction industries to undertake the work, posing a potential risk of a schedule delay.

Services Overlap: There are multiple competing infrastructure needs within the City to consider as well as the possibility of additional requirements in the future that cannot be forecast. Coordination with other City services will be required to minimize impacts and identify planning overlaps.

Control Option re-evaluation: As technologies evolve over time, there is a risk that the selected control option may need to be re-evaluated to validate the best control option available. This implies that there is a possibility of rejection, which may lead to the need for more costly substitutes.

District Engineering Plan Risks

The District Engineering Plan is comprised of individual conceptual solutions to CSO mitigation for each of the combined sewer districts. Each of the risks and opportunities applicable to the control solutions recommended within each sewer district to meet Control Option No. 1 are documented in the Part 3B – District Engineering Plans of the CSO Master Plan.

Any changes to the control solution could cascade to a reevaluation of risks associated with each of the specific projects.

12.2. Opportunities

A number of opportunities to improve the volume percent capture during the program were identified during the development of the CSO Master Plan. The following section describes the main areas that the City could benefit from during the development of the Master Plan.

Green Infrastructure

Clause 8 of EA No. 3042 requires the use of green technology in the design and operation of all new and upgraded infrastructures. In the CSO Master Plan, each of the combined sewer district control solutions contains a GI component. GI technologies will be evaluated to promote additional CSO volume storage and sustainability. A budget of 10 percent of the capital program is included in the CSO Master Plan budget for the implementation of the GI technology. An example of a GI study conducted by the City is the North East Exchange District Engineering Study.

North East Exchange District Engineering Study

The City undertook a pilot study in 2017 using a soil retention green technology, Strata cells, for the reconstruction of the John Hirsh Place in the North East Exchange District. Past studies have demonstrated that Strata cells promote tree growth and reduce loading on combined sewers.

To demonstrate tangible benefits from the study, the City undertook flow monitoring prior to construction and completed post-construction flow monitoring in 2022 to evaluate performance.

The 2022 flow monitoring data showed a delay in runoff response from the catchment aligned with expected performance. Future monitoring will be undertaken to understand how the solution performs.

Floatable Management

Clause 12 of EA No. 3042 requires the Master Plan to demonstrate the prevention of floatable materials in CSO effluent. The Master Plan proposed investigating the use of both screening and the alternative floatable management approach to prevent floatable materials from entering the river.

Real Time Control

Real time control (RTC) provides a method of increasing system performance by improving the operation of the system. With Winnipeg's flat topography and large diameter pipe network, application of RTC becomes very valuable as it can adapt and balance the system for real precipitation events that are spatially and temporally distributed. The incorporation of RTC and monitoring instrumentation will provide an increased understanding of operation and a better control on a real time basis, and an optimization of flows in the system and to the treatment plants.

Stakeholder Collaboration

Working together with other stakeholders including industry groups and the public will provide partnership opportunities that may provide additional benefit to the CSO Master Plan. Furthermore, this will provide an opportunity to further engage, communicate, and educate the community on the ongoing work with the program.

Further details associated with both the risks and opportunities of the program can be found in the CSO Master Plan.

13. Other Initiatives

Undertaking major sewer infrastructure upgrades in an interconnected sewer network is complex as changes in flow and capacity of one area of the system impacts other areas. During the execution of the CSO Master Plan, it is important to consider all ongoing initiatives. The following section describes the ongoing initiatives that are considered while delivering the CSO Master Plan.

13.1. OurWinnipeg

The OurWinnipeg 2045 Development Plan is the City's 25-year development plan that provides the vision, goals, and policies to increase the quality of life for all residents. It guides growth and change for the City to accommodate future residential growth in a sustainable manner. To support the successful delivery of the vision, Complete Communities 2.0 was developed.

The Complete Communities 2.0 is a direction strategy of OurWinnipeg. It is a city-wide secondary plan that guides growth, development, and land use in Winnipeg. With the population increase, the treatment and conveyance demand are also expected to increase. There is a demand for more capacity to service future population growth. The CSO Master Plan incorporates a 35-year design horizon into the design and planning of sewer infrastructure. It uses the City's Planning and Land Use Model (PLUM) forecast data to account for future development and population growth.

13.2. Pollution Prevention Plan and Sewer By-Law

The City has a Pollution Prevention Program to protect the sewage collection and treatment system, our rivers and lakes, and the environment. This is a process that shifts the focus from municipal wastewater treatment to the control of pollutants at the source by:

- Avoiding the use of pollutants wherever possible
- Reducing the amount of pollutants that reach the wastewater system, if avoiding is not possible
- Eliminating pollutants wherever possible by replacing products with more environmentally friendly products

Businesses that are a part of the Pollution Prevention Program are required to submit a Pollution Prevention (P2) Plan outlining the source of the pollutants and measures to prevent, eliminate, or reduce the discharge of those pollutions to the wastewater and/or land drainage system. The City will perform inspections, collect samples, provide reviews, and approvals of the P2 Plans to ensure proper measures are in place to protect the environment.

The purpose of the City of Winnipeg Sewer By-Law is to protect public safety, the environment, and the City infrastructure by setting and regulating sewage discharge limits into the sewer systems and natural water courses.

For further information, refer to the following webpages:

- Winnipeg Pollution Prevention Plan webpage:

  http://www.winnipeg.ca/waterandwaste/sewage/pollutionPrevention/default.stm

- Winnipeg Sewer By-Law webpage:

  https://winnipeg.ca/waterandwaste/sewage/projects/sewerBy-law/default.stm#tab-background

14. References

AACE International. 1997. *Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries*. AACE International Recommended Practice No. 18R-97. (pg. 3-46).

CH2M HILL Canada Ltd, XCG Consultants Ltd, Dillon Consulting. 2015. *CSO Master Plan Preliminary Report.* Prepared for: City of Winnipeg, Water and Waste Department. Winnipeg, Manitoba. December 2015.

Jacobs Engineering Group. 2019. *CSO Master Plan.* Prepared for: City of Winnipeg, Water and Waste Department. Winnipeg, Manitoba. August 2019.

Manitoba Conservation and Water Stewardship (MCWS). 2013. *Environment Act Licence No. 3042.* Client File No.: 3205.00. September 4, 2013.

Wardrop Engineering Inc. (Wardrop), TetrES Consultants Inc., CH2M Hill Canada and EM Services Inc. 2002. *Combined Sewer Overflow Management Study* (2002 CSO Study). Final Report. Prepared for: City of Winnipeg, Water and Waste Department. November 2002.

Appendix A – Environmental Licence No. 3042

THE ENVIRONMENT ACT
LOI SUR L'ENVIRONNEMENT

LICENCE

Manitoba

Licence No. / Licence n° 3042

Issue Date / Date de délivrance September 4, 2013

In accordance with *The Environment Act* (C.C.S.M. c. E125) /
Conformément à *la Loi sur l'environnement* (C.P.L.M. c. E125)

Pursuant to Section 11 / Conformément au Paragraphe 11

THIS LICENCE IS ISSUED TO: / CETTE LICENCE EST DONNÉE À :

CITY OF WINNIPEG;
"the Licencee"

for the operation of the Development being the combined sewers and overflow structures located within the City of Winnipeg with discharge of wastewater into the Assiniboine River and Red River and associated tributaries, and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence,

"accredited laboratory" means an analytical facility accredited by the Standard Council of Canada (SCC), or accredited by another accrediting agency recognized by Manitoba Conservation to be equivalent to the SCC, or be able to demonstrate, upon request, that it has the quality assurance/quality control (QA/QC) procedures in place equivalent to accreditation based on the international standard ISO/IEC 17025, or otherwise approved by the Director;

"approved" means approved by the Director in writing;

"average dry weather flow" means the average daily volume of wastewater entering the combined sewer system in dry weather;

"combined sewer system" means a wastewater collection system which conveys wastewaters (domestic, commercial and industrial wastewaters) and stormwater runoff through a single-pipe system to a sewage treatment plant or treatment works;

"combined sewer overflow (CSO)" means a discharge to the environment from a combined sewer system;

"Director" means an employee so designated pursuant to *The Environment Act*;

"effluent" means treated wastewater flowing or pumped out of the combined sewer system;

"enhanced primary treatment" means wastewater treatment that utilizes a chemical coagulant/flocculant to remove suspended matter and soluble organic matter;

"Environment Officer" means an employee so appointed pursuant to *The Environment Act*;

"Escherichia coli (E. coli) " means the species of bacteria in the fecal coliform group found in large numbers in the gastrointestinal tract and feces of warm-blooded animals and man, whose presence is considered indicative of fresh fecal contamination, and is used as an indicator organism for the presence of less easily detected pathogenic bacteria;

"fecal coliform" means aerobic and facultative, Gram-negative, nonspore-forming, rod-shaped bacteria capable of growth at 44.5° C, and associated with fecal matter of warm-blooded animals;

"five-day biochemical oxygen demand (BOD_5)" means that part of the oxygen demand usually associated with biochemical oxidation of organic matter within five days at a temperature of 20° C;

"floatable material" means items such as, but not limited to, plastics and other floating debris (e.g., oil, grease, toilet paper, and sanitary items);

"grab sample" means a quantity of wastewater taken at a given place and time;

"MPN Index" means the most probable number of coliform organisms in a given volume of wastewater which, in accordance with statistical theory, would yield the observed test result with the greatest frequency;

"overflow event" means an event that occurs when there is one or more CSOs from a combined sewer system, resulting from a precipitation event. An intervening time of 24 hours or greater separating a CSO from the last prior CSO at the same location is considered to separate one overflow event from another;

"overflow point" means a point of a wastewater collection system via which wastewater may be deposited in water or a place and beyond which its owner or operator no longer exercises control over the quality of wastewater;

"percent capture" means the volume of wet weather flow treated in comparison to the volume of wet weather flow collected on a percentage basis;

"real time" means the actual time at which an event occurs;

"sewershed" means the area drained by a particular network of sewers;

"Standard Methods for the Examination of Water and Wastewater" means the most recent edition of Standard Methods for the Examination of Water and Wastewater, published jointly by the American Public Health Association, the American Waterworks Association and the Water Environment Association;

"wastewater" means the spent or used water from domestic, industrial and commercial sources that contains dissolved and suspended matter;

"wastewater collection system" means the sewer and pumping system used for the collection and conveyance of domestic, commercial and industrial wastewater;

"wet weather flow" means the combined flow resulting from:

i) wastewater;
ii) infiltration and inflows from foundation drains or other drains resulting from rainfall or snowmelt; and
iii) stormwater runoff generated by either rainfall or snowmelt that enters the combined sewer system; and

"wet weather period" means the spring thaw period and any period of precipitation capable of generating inflow to a combined sewer system that exceeds the capability of the system to convey wet weather flows to a sewage treatment plant.

GENERAL TERMS AND CONDITIONS

This Section of the Licence contains requirements intended to provide guidance to the Licencee in implementing practices to ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for present and future Manitobans.

Compliance with Licence

1. The Licencee shall direct all wastewater generated within the City of Winnipeg to sewage treatment plants operating under the authority of an Environment Act Licence or discharge wastewater to receiving waters in accordance with this Licence.

Future Sampling

2. In addition to any of the limits, terms and conditions specified in this Licence, the Licencee shall, upon the request of the Director:

a) sample, monitor, analyze and/or investigate specific areas of concern regarding any segment, component or aspect of pollutant storage, containment, treatment, handling, disposal or emission systems, for such pollutants or ambient quality, aquatic toxicity, leachate characteristics and discharge or emission rates, for such duration and at such frequencies as may be specified;
b) determine the environmental impact associated with the release of any pollutant(s) from the Development; or
c) provide the Director, within such time as may be specified, with such reports, drawings, specifications, analytical data, descriptions of sampling and analytical procedures being used, bioassay data, flow rate measurements and such other information as may from time to time be requested.

Sampling Methods

3. The Licencee shall, unless otherwise specified in this Licence:
a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in "Standard Methods for the Examination of Water and Wastewater" or in accordance with an equivalent analytical methodology approved by the Director;
b) have all analytical determinations undertaken by an accredited laboratory; and
c) report the results to the Director, in writing or in a format acceptable to the Director, within 60 days of the samples being taken, or within another timeframe acceptable to the Director.

Equipment Breakdown

4. The Licencee shall, in the case of physical or mechanical equipment breakdown or process upset where such breakdown or process upset results or may result in the release of a pollutant in an amount or concentration, or at a level or rate of release, that causes or may cause a significant adverse effect, immediately report the event by calling 204-944-4888 (toll-free 1-855-944-4888). The report shall indicate the nature of the event, the time and estimated duration of the event and the reason for the event.

5. The Licencee shall, following the reporting of an event pursuant to Clause 4,
a) identify the repairs required to the mechanical equipment;
b) undertake all repairs to minimize unauthorized discharges of a pollutant;
c) complete the repairs in accordance with any written instructions of the Director; and
d) submit a report to the Director about the causes of breakdown and measures taken, within one week of the repairs being done.

Reporting Format

6. The Licencee shall submit all information required to be provided to the Director under this Licence, in writing, in such form (including number of copies), and of such content

as may be required by the Director, and each submission shall be clearly labeled with the Licence Number and Client File Number associated with this Licence.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

Avoid CSOs

7. The Licencee shall operate the combined sewer system and wastewater collection system such that there are no combined sewer overflows except during wet weather periods.

New or Upgraded Developments

8. The Licencee shall not increase the frequency or volume of combined sewer overflows in any sewershed due to new and upgraded land development activities and shall use green technology and innovative practices in the design and operation of all new and upgraded storm and wastewater infrastructures.

Public Education Plan

9. The Licencee shall, on or before December 31, 2013, submit to the Director, a public education program plan documenting how information on combined sewer overflows will be made available to the public.

Public Notification System

10. The Licencee shall, on or before December 31, 2015, submit to the Director for approval, a plan regarding the development and implementation of an internet-based public notification system for all discharges from combined sewer overflow points, including an assessment of making this notification available on a real time basis.

CSO Master Plan

11. The Licencee shall, on or before December 31, 2015, submit a preliminary proposal for approval by the Director, pursuant to Section 14(3) of *The Environment Act,* for the combined sewer overflow system.

    The plan proposed above would consist of an evaluation of a minimum of the following CSO control alternatives:

    - A maximum of four overflow events per year;
    - zero combined sewer overflows; and
    - a minimum of 85 percent capture of wet weather flow from the combined sewer system and the reduction of combined sewer overflows to a maximum of four overflow events per year.

The Licencee shall, on or before December 31, 2017, file a final Master Plan, including the detailed engineering plans, proposed monitoring plan, and implementation schedule for the approved design identified in the preliminary plan above. The Master Plan is to be filed for approval by the Director. The Licencee shall implement the plan by December 31, 2030, unless otherwise approved by the Director.

Effluent Quality Limits

12. The Licencee shall demonstrate, in the Master Plan submitted pursuant to Clause 11, the prevention of floatable materials, and that the quality of the CSO effluent will be equivalent to that specified for primary treatment to 85% or more of the wastewater collected in the CSO system during wet weather periods. The following effluent quality limits summarize what is expected from primary treatment:
    a) five day biochemical oxygen demand (BOD5) not to exceed 50 mg/l;
    b) total suspended solids not to exceed 50 mg/l;
    c) total phosphorus not to exceed 1 mg/l; and
    d) E. coli not to exceed 1000 per 100 ml.

Annual Progress Reporting

13. The Licencee shall, upon approval of the Master Plan submitted pursuant to Clause 11 of this Licence, implement the plan such that progress towards meeting the required level of treatment is demonstrated annually by submission of an annual report, due March 31 of each year for the preceding calendar year. Annual submissions shall include the progress made on the plan pursuant to Clause 11 including monitoring results and the work plan for the subsequent calendar year.

MONITORING AND REPORTING

Reporting

14. The Licencee shall, prior to December 31, 2013, develop a notification plan acceptable to the Director for each overflow event.

Interim Monitoring

15. The Licencee shall by January 31, 2014 submit a plan to the Director for approval of an interim combined sewer overflow monitoring program for implementation between May 1, 2014 and the date upon which the final master plan is approved by the Director. The plan shall identify locations to be sampled, rationale for these locations, and sampling frequency. The plan also shall identify constituents to be monitored including, but not limited to:
    a) organic content as indicated by the five-day biochemical oxygen demand (BOD_5) and expressed as milligrams per litre;

b) total suspended solids as expressed as milligrams per litre;
c) total phosphorus content as expressed as milligrams per litre;
d) total nitrogen content as expressed as milligrams per litre;
e) total ammonia content as expressed as milligrams per liter;
f) pH; and
g) *E*.coli content as indicated by the MPN index and expressed as MPN per 100 millilitres of sample.

Record Keeping

16. The Licencee shall:
    a) during each year maintain records of:
        i) grab sample dates and locations;
        ii) summaries of laboratory analytical results of the grab samples; and
        iii) combined sewer overflow dates;
    b) make the records being maintained pursuant to sub-Clause 16 a) of this Licence available to an Environment Officer upon request and, within three months of the end of each year, post the results on the public notification site required by Clause 10 of this Licence.

REVIEW AND REVOCATION

A. If, in the opinion of the Director, the Licencee has exceeded or is exceeding or has or is failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Director may, temporarily or permanently, revoke this Licence.

B. If, in the opinion of the Director, new evidence warrants a change in the specifications, limits, terms or conditions of this Licence, the Director may require the filing of a new proposal pursuant to Section 11 of *The Environment Act*.

"original signed by"

Tracey Braun, M.Sc.
Director
Environment Act

Client File No.: 3205.00

Appendix B – 2019 CSO Master Plan Provincial Approval Letter

Manitoba
Conservation and Climate
Environmental Stewardship Division
Environmental Approvals Branch
1007 Century Street, Winnipeg Manitoba R3H 0W4
T 204 945-8321 **F** 204-945-5229
www.gov.mb.ca/sd/

File No. 3205.10
Environment Act Licence No. 3042

November 13, 2019

Chris Carroll, P.Eng., MBA
Manager of Wastewater Services Division
110-1199 Pacific Avenue
Winnipeg Manitoba R3E 3S8
Email: ccarroll@winnipeg.ca

Dear Chris Carroll:

Thank you for your submission of the Combined Sewer Overflow (CSO) Master Plan dated August 28, 2019 that sets out the roadmap for implementing a long term program in order to meet the control target objective of 85 percent capture in the Representative Year as required by Clause 11 of Environment Act Licence No. 3042 (Licence).

The November 24, 2017 approval letter required the City to submit, for approval, a Master Plan including detailed engineering plans, proposed monitoring plans, and an implementation schedule for Control Option No. 1 (i.e., 85% capture in a representative year) as identified in the CSO Master Plan Preliminary Proposal on or before August 31, 2019 and for Control Option No. 2 (i.e., four overflows in a representative year) as identified in the CSO Master Plan Preliminary Proposal on or before April 30, 2030.

Upon review of the CSO Master Plan, I hereby approve the implementation of the CSO Master Plan with the following conditions:

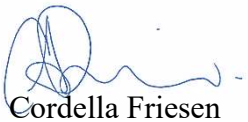
a) The Licencee shall submit for approval an outline of the content of the annual report as required by Clause 13 of the Licence by December 31, 2019;
b) The Licencee shall, prior to submission of the annual report, submit a monitoring plan for approval;
c) The Licencee shall include in the annual report the monitoring report, the proposed planning for the year ahead, and the milestones achieved;
d) The Licencee shall, from the date of issue of this Letter, collect CSO water samples and model river quality data every 5 years to demonstrate improvements in the river water quality due to implementation of Control Option No. 1. The next river water quality report is due December 31, 2024;
e) The Licencee shall carry out an assessment of the impact of climate change to the performance of the CSO program and shall include the assessment report along with the CSO Master Plan for Control Option No. 2 which is due April 30, 2030; and
f) The Licencee shall, on or before April 30, 2025, submit for approval a report demonstrating that the percent capture performance measure, an alternative to Control Option No. 2 as proposed in the CSO Master Plan dated August 28, 2019,

will provide equivalent water quality protection to Control Option No. 2 (i.e., four overflows in a representative year).

The City of Winnipeg shall implement the CSO Master Plan for Control Option No. 1 by December 31, 2045, unless otherwise approved by the Director.

Should you have any questions regarding the foregoing, please contact Asit Dey, Environment Engineer, at (204) 945-2614 or by email at asit.dey@gov.mb.ca.

Yours sincerely,



Cordella Friesen
Director
The Environment Act

c: Duane Griffin/Patrick Coote, City of Winnipeg
Shannon Kohler/Yvonne Hawryliuk/Nada Suresh, Conservation and Climate
Public registries

Appendix C – Clause 8 Provincial Approval Letters

Winnipeg | Water and Waste
Eaux et déchets

April 19, 2020

Client File No.: 3205.00
Our File Nos S-734, S-734(A) EMS
020-17-08-11-00
020-17-08-11-0N

Manitoba Conservation and Climate
Environmental Stewardship Division
Environmental Compliance and Enforcement Branch
1007 Century Street
Winnipeg, MB R3H 0W4

Attention: Yvonne Hawryliuk, MSc - Provincial Manager

RE: ENVIRONMENT ACT LICENCE NO. 3042 CLAUSE 8

This letter is in response to your March 18, 2021 letter requesting the City of Winnipeg (City) provide additional information that demonstrates compliance with Clause 8. Specifically, an estimated volume that small scale developments have increased to the combined sewer system and the estimated volume offset through various technology or infrastructure developments.

The City is providing this information below for the overall combined sewer shed.

It is estimated that a small scale development within a combined sewer district will increase the volume to the combined sewer system by approximately $1m^3$ for a 5 year rainfall event. A review of small scale developments since 2014 in combined sewer districts has been conducted and it has been determined that approximately 2800 have been accepted. From 2014 to 2020, small scale developments have increased the volume to the combined sewer system by approximately $2{,}800m^3$ for a 5 year rainfall event.

It is estimated that the sewer separation work completed up to 2020 in the Cockburn Calrossie combined sewer district has decreased the volume of land drainage to the combined sewer system by approximately $57{,}000m^3$ for a 5 year rainfall event.

This information will be submitted on an annual basis starting with the 2021 CSO Annual Report.

Should you have any questions on this please contact Michelle Paetkau at 204-986-4904 or by email at mpaetkau@winnipeg.ca.

Sincerely,

M Paetkau

Michelle Paetkau, P. Eng.
Acting Branch Head for Wastewater Planning and Project Delivery

WASTEWATER SERVICES DIVISION
109-1199 Pacific Avenue, Winnipeg, Manitoba R3E 3S8
DIVISION DES EAUX USÉES
1199, avenue Pacific, Porte 109, Winnipeg (Manitoba) R3E 3S8
T. | Tél. : 204-986-7550
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winnipeg.ca

Winnipeg | Water and Waste
Eaux et déchets



Tim Shanks, M. Eng., P. Eng.
Acting Manager of Engineering Services Division

MP/dr

c: Siobhan Burland Ross, M. Eng., P. Eng., Manitoba Conservation and Climate (email)
M.L. Geer, CPA, CA, Water and Waste Department (email)
T. Shanks, M. Eng., P. Eng., Water and Waste Department (email)
R. Grosselle, Water and Waste Department (email)
M. Paetkau, Water and Waste Department (email)
C. Carroll, Water and Waste Department (email)

WASTEWATER SERVICES DIVISION
109-1199 Pacific Avenue, Winnipeg, Manitoba R3E 3S8
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Manitoba
Conservation and Climate
Environmental Stewardship Division
Environmental Compliance and Enforcement Branch
1007 Century Street
Winnipeg, Manitoba, Canada R3H 0W4
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www.manitoba.ca

August 28, 2020

Client File: 3205.00
Licence No: 3042

Michelle Paetkau, P. Eng
Acting Branch Head
Wastewater Planning and Project Delivery
110-1199 Pacific Avenue
Winnipeg MB R3E 3S8
Email: mpaetkau@winnipeg.ca

Dear Michelle Paetkau:

RE: Combined Sewage Overflow (CSO) Environment Act Licence 3042
Application of Clause 8

This letter is in follow up to the meeting of February 27, 2020 between Manitoba Conservation and Climate and the Water and Waste Department, regarding the interpretation and application of Clause 8 of Environment Act Licence 3042.

It was agreed upon at the above meeting that the City of Winnipeg would provide Conservation and Climate with a document outlining the strategies and measures the City of Winnipeg will implement to comply with the requirements of Clause 8, namely that there be no increase in the frequency or volume of combined sewer overflows due to development. Conservation and Climate is yet to receive this document. Please submit to Environmental Compliance and Enforcement by September 30, 2020.

In addition, CC has received concerns from the public about how this clause is being applied in the Glenwood neighbourhood. In order to address the concerns and determine compliance, CC is requiring that the City of Winnipeg demonstrate how Clause 8 is being applied within that sewershed by providing supporting documents by September 11, 2020.

If you have any questions, please contact Julie Froese, Environment Officer, Environmental Compliance and Enforcement Branch at Julie.Froese@gov.mb.ca, or 204-945-7104.

Yours sincerely,

Yvonne Hawryliuk
Provincial Manager, Environmental Compliance and Enforcement

c: P. Coote, Water and Waste Department, City of Winnipeg
S. Burland Ross/ A. Dey, Environmental Approvals Branch
P. Crocker/ N. Suresh/ J. Froese, Environmental Compliance and Enforcement Branch

December 21, 2020

Client File No.: 3205.00
Our File Nos S-734, S-734(A) EMS
020-17-08-11-00
020-17-08-11-0N

Manitoba Conservation and Climate
Environmental Stewardship Division
Environmental Compliance and Enforcement
1007 Century Street
Winnipeg, MB R3H 0W4

Attention: Yvonne Hawryliuk, Provincial Manager, Environmental Compliance and Enforcement

RE: ENVIRONMENT ACT LICENCE NO. 3042 CLAUSE 8

This letter is in response to your August 28, 2020 letter regarding the City of Winnipeg's (City) implementation strategies and measures to comply with Environment Act Licence No. 3042 Clause 8.

The City recommends using the Combined Sewer Overflow Master Plan (CSO Master Plan) to meet Clause 8 by removing wastewater and/or land drainage contributions from the combined sewer system from multiple areas of the City in order to offset any additional wastewater and/or land drainage contributions from small scale developments. This applies for the following small scale developments in combined sewer districts:

- New single-family dwellings which are replacing older, smaller homes built prior to 1990
    - Homes built prior to 1990 have weeping tiles connected to the sewer service pipe
- New two-family dwellings which are replacing older, smaller homes built prior to 1990
    - Homes built prior to 1990 have weeping tiles connected to the sewer service pipe
- Residential, commercial and industrial interior renovations/small additions
- New single-family and two-family dwellings on vacant land
- Lot splits, with new small scale development, where the original single-family or two-family dwelling remains

The current City of Winnipeg Sewer Bylaw 106/2018 does not require the restriction of a land drainage discharge rate for a single-family or two-family property on a lot with an area of less than 1,000 square metres (Part 9 Section 64(2)).

Increases in wastewater and/or land drainage contributions from the small scale developments identified above are proposed to be offset by sewer separation works in the CSO Master Plan. As previously stated, the City is currently constructing sewer separation works in the Cockburn Calrossie combined sewer district which will reduce combined sewer overflow volume by approximately 183,000 m3. The incremental contributions from the identified small scale

developments is small and may not be measurable on a single development basis but will grow as this type of development continues.

If the CSO Master Plan is not utilized as a strategic approach to meet Clause 8 requirements, then property owners of these smaller developments will need to accommodate on-site land drainage management to meet Clause 8. On-site land drainage management may limit development and the City's desire to densify older neighbourhoods by adding complexity to the proposed development (e.g. underground storage tank or catch basin leads with above ground storage) and maintenance for the prospective owners.

Larger scale developments in combined sewer districts will continue to comply with Clause 8 via land drainage discharge restrictions in order to offset increased wastewater contributions.

Regarding public engagement, the Department provided information to a representative of the Glenwood Neighbourhood Association via email. There were no registered delegations at the City's Standing Policy Committee on Water and Waste, Riverbank Management, and the Environment meeting on December 1, 2020. The Department is not aware of any other residential enquiries.

Should you have any questions on this please contact Michelle Paetkau at 204-986-4904 or by email at mpaetkau@winnipeg.ca.

Sincerely,



Michelle Paetkau, P. Eng.
Acting Branch Head for Wastewater Planning and Project Delivery



Geoff Patton, P. Eng.
Manager of Engineering Services Division

MP/dr

c: Siobhan Burland Ross, M. Eng., P. Eng., Manitoba Conservation and Climate (email)
M.L. Geer, CPA, CA, Water and Waste Department (email)
G.K. Patton, P. Eng., Water and Waste Department (email)
R. Grosselle, Water and Waste Department (email)
M. Paetkau, Water and Waste Department (email)
Chris Carroll, Water and Waste Department (email)

Environmental Stewardship Division
Environmental Compliance and Enforcement Branch
1007 Century Street
Winnipeg, Manitoba, Canada R3H 0W4
T 204-945-7100 **F** 204-948-2338
www.manitoba.ca

March 18, 2021

File No.: 3205.00
Licence No.: 3042

Michelle Paetkau, P. Eng., Acting Branch Head
Wastewater Planning and Project Delivery
110-1199 Pacific Avenue
Winnipeg MB R3E 3S8
Email: mpaetkau@winnipeg.ca

Dear Michelle Paetkau:

RE: Combined Sewage Overflow (CSO) Environment Act Licence 3042
Application of Clause 8

Manitoba Conservation and Climate, Environmental Compliance and Enforcement Branch acknowledges the receipt of your letter, dated December 21, 2020 in response to Manitoba Conservation and Climate's letter dated August 28, 2020 on the above subject.

Manitoba Conservation and Climate has reviewed the information provided and has determined to fully assess compliance with Clause 8 that additional information is required. Specifically, an estimated volume that developments have increased flows to CSO and the estimated volume offset through various technology or infrastructure developments is required. Manitoba Conservation and Climate is requesting that the above information be provided by April 19, 2021. The information can be provided by sewer district, or for the overall sewershed.

Going forward, this information will be required to be submitted on an annual basis. CSO Annual report outline was initially approved on January 17, 2020. This approval is hereby amended to include the above requested information starting within the 2021 CSO Annual report.

If you have any questions, please contact Julie Froese, Environment Officer, Environmental Compliance and Enforcement Branch at Julie.Froese@gov.mb.ca, or 204-945-7104.

Yours sincerely,



Kristal Harman
Director, Environmental Compliance and Enforcement

Environmental Compliance and Enforcement
1007 Century Street, Winnipeg MB R3H 0W4
T 204-945-7100 **F** 204-948-2338
www.manitoba.ca

File No.: 3205.10

July 8, 2021

Michelle Paetkau, P. Eng.
Acting Branch Head
Wastewater Planning and Project Delivery
110-1199 Pacific Avenue
Winnipeg MB R3E 3S8
Email: mpaetkau@winnipeg.ca

Dear Michelle Paetkau:

This will acknowledge receipt of your letter dated April 19, 2021, in response to our March 18, 2021, letter requesting clarification on your December 21, 2020, submission.

Conservation and Climate has reviewed all the information provided on the estimated increase in volume of Combined Sewer Overflows caused by infill developments and the estimated decrease in volume as a result of infrastructure development on the overall Combined Sewer system, and has determined it satisfies the intent set out in Clause 8 of Environment Act Licence No. 3042. Future compliance with respect to Clause 8 will be assessed through our review of the information provided in the Combined Sewer Overflow (CSO) Annual Reports, starting with 2021 as requested in our March 18, 2021 letter.

As per your letter dated December 21, 2020, the City's strategy to meet Clause 8 provides offsets by sewer separation projects being completed under the CSO Master Plan for the following: increases in wastewater and/or land drainage contributions from new single and two family dwellings replacing older homes; renovations and small additions for residential, industrial, and commercial properties; and new homes on vacant land and lot splits with small scale development where the existing building remains. Further, you have also stated that larger scale developments in combined sewer districts will continue to comply with Clause 8 via land drainage discharges restriction in order to offset increased wastewater contributions.

In addition, Conservation and Climate wishes to confirm that the proposed strategy regarding small development compliance with Clause 8 applies to the overall combined sewer district for the purpose of interpretation of the above Environment Act Licence. It should be noted that the city and Conservation and Climate are of the same understanding regarding the interpretation of 'sewershed' as the overall combined sewer district and using the CSO Master Plan to achieve the Clause 8 requirements as per the deliberations at the recent CSO Milestone meeting held on May 10, 2021. The City should continue to review developments on a case by case basis to enforce compliance with Clause 8 at the broad sewershed level, the CSO Master Plan and other City standards (e.g. Sewer-By-Law, Basement Flood Relief, etc.) as required.

If you have any questions, please contact Yvonne Hawryliuk, Provincial Manager, Environmental Compliance and Enforcement Branch, at Yvonne.Hawryliuk@gov.mb.ca or 204-945-5305.

Sincerely,



Kristal Harman, Director
Environmental Compliance and Enforcement

c: Y. Hawryliuk/N. Suresh/J. Froese, Environmental Compliance and Enforcement Branch
L. Pyles/S. Burland Ross/ B. Assefa, Environmental Approvals Branch
G. Patton, P. Eng., Manager of Engineering Services Division
M.L. Geer, CPA, CA, Water and Waste Department
R. Grosselle, Water and Waste Department
C. Carroll, Water and Waste Department
P. Coote, Water and Waste Department, City of Winnipeg

Appendix D – Provincial Letter on Notification Plan

Environmental Compliance and Enforcement Branch
1007 Century Street Winnipeg, Manitoba, Canada R3H 0W4
T 204-945-7100 **F** 204-948-2338
www.manitoba.ca

Client File. 3205.10

January 13, 2023

Chris Carroll, P.Eng., MBA
Manager of Wastewater Services Division
110-1199 Pacific Avenue
Winnipeg Manitoba R3E 3S8
ccarroll@winnipeg.ca

Dear Chris Carroll:

RE: Combined Sewer Overflow - Environment Act Licence 3042
Clause 14 – Notification Plan
Removal of Requirement to Submit Significant Rainfall Event Notifications

Environment, Climate and Parks has been reviewing the requirements of Clause 14 of Environment Act Licence 3042. The approved plan, which was submitted in April of 2014, required regular notification of Combined Sewer Overflow (CSO) events in the form of quarterly and annual reporting of all CSO events, and the reporting of unique or significant events as required.

In July of 2022, the real time online public notification system was completed as required in Clause 10 of the licence. Now that this system is active, it has been determined that significant rainfall events will no longer be required to be reported to the department. The quarterly and annual reporting of all CSO events is still required to be submitted.

If you have any questions regarding this change, please contact Julie Froese, Environment Officer, Environmental Compliance and Enforcement Branch at Julie.Froese@gov.mb.ca or 204-945-7104.

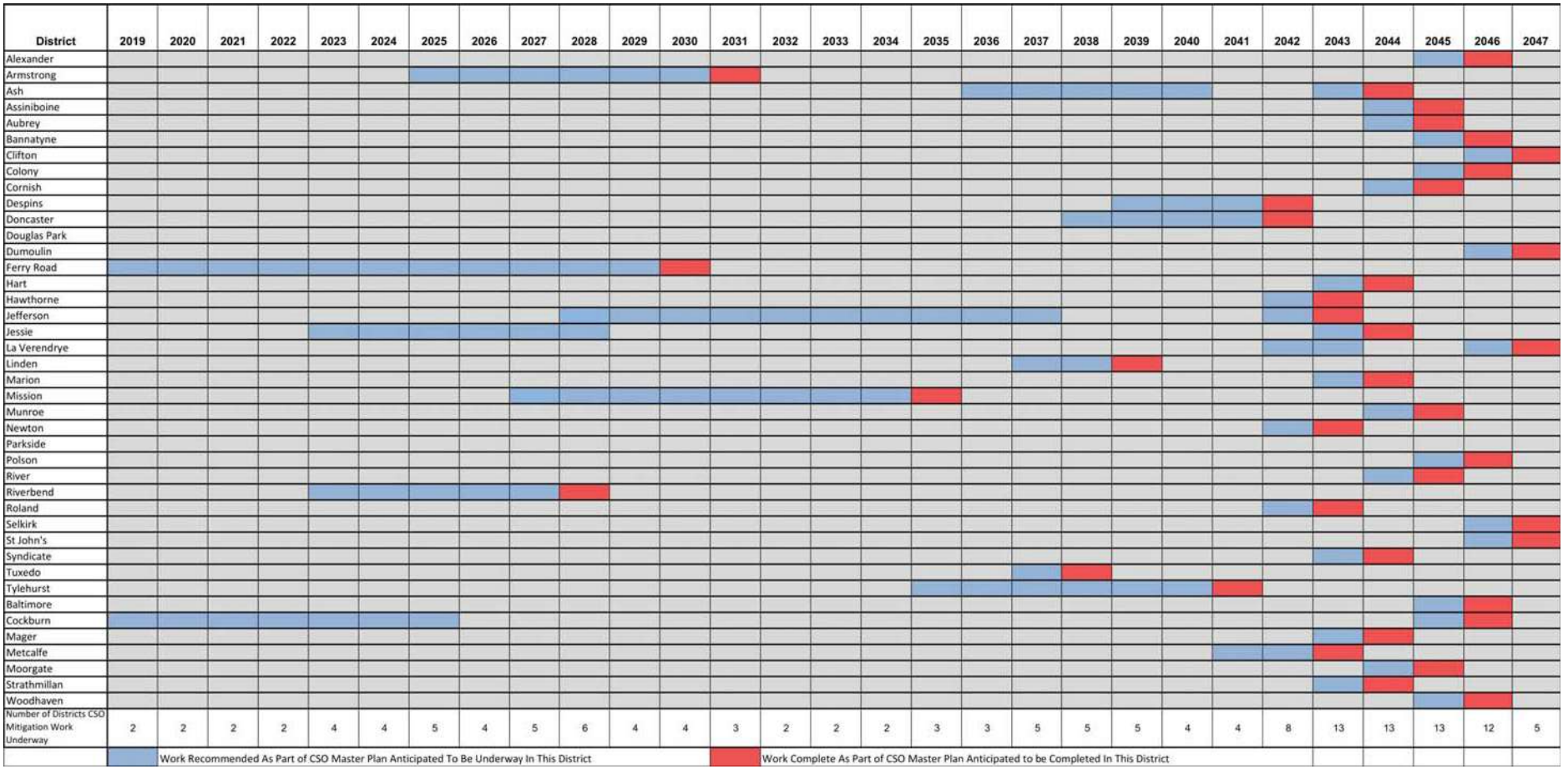
Sincerely,

WR

Warren Rospad
A/Director

c. Michael A. Jack, CAO - City of Winnipeg
Cynthia Wiebe, Renee Grossele, Susan Lambert, Michele Paetkau – City of Winnipeg, Water & Waste Department
Public Registry
James Capotosto, Siobhan Burland Ross, Bereket Assefa - Environmental Approvals
Yvonne Hawryliuk, Nada Suresh, Julie Froese - Environmental Compliance and Enforcement

Appendix E – District Program Scenario 1 Implementation Schedule



CSO Master Plan Program Scenario 1 Sewer District Based Implementation Schedule (Jacobs, 2019)

Appendix B – 2024 Ongoing / Completed Capital Projects

APPENDIX B - 2024 Ongoing / Completed Capital Projects

Project Name	District	Contract #	Project Type	Description	Class of Estimate	Baseline Budget	Committed Cost	Targeted Completion Date	Actual Completion Date	Volume Reduction (m3)	Comments
NEWPCC											
Ferry Road / Riverbend - Consultant Assignment 5	Ferry Road / Riverbend	439-2010	Sewer Separation	Consulting Services for completing Preliminary Design for the district and undertaking Detailed Design and Contract Administrator construction contracts	Class 3	$2,500,000	$2,750,000	2030	TBD	N/A	Ongoing
Jefferson East - Consultant Assignment 3	Jefferson East	440-2010	Sewer Separation	Professional Consulting Services for Detailed Design and Contract Administrator construction Contracts #6 to #10 for the Jefferson East Combined Sewer District	Class 3	$2,500,000	$3,500,000	2025	TBD	N/A	Ongoing
Jefferson East - Construction Contract 6B	Jefferson East	863-2021	Sewer Separation	Sewer separation and land drainage connection from Salter Street to Main Street at Burrin Avenue, Belmont Avenue, Hartford Avenue, and Perth Avenue, and from Burrin Avenue to Hartford Avenue at Aikins Street	Class 3	$3,000,000	$2,100,000	2023	TBD	32,385	Ongoing
Jefferson East - Construction Contract 7A	Jefferson East	556-2022	Sewer Separation	Connection and construction of LDS on Salter Street from Semple Avenue to Jefferson Avenue, and on Kilbride Avenue, Belmont Avenue, Hartford Avenue, and Perth Avenue from Powers Street to Aikins Street	Class 3	$5,000,000	$4,400,000	2023	TBD	13,879	Ongoing (C7 split into C7A and C7B)
Jefferson East - Construction Contract 8	Jefferson East	530-2024	Sewer Separation	Construction of LDS on Andrews Street from Royal Avenue to Hartford Avenue, Royal Avenue, Kingsbury Avenue and Burrin Avenue from Andrews Street to Powers Street, and Kilbride Avenue from McGregor Street to Powers Street	Class 3	$5,084,826	$4,600,000	2025	TBD	18,285	Ongoing
Jefferson East - Construction Contract 9	Jefferson East	332-2023	Sewer Separation	Construction of LDS on McGregor Street from Partridge Avenue to Semple Avenue, Forest Avenue, Royal Avenue, Kingsbury Avenue, Burrin Avenue from CNR Railway to Andrews Street	Class 3	$3,000,000	$3,500,000	2024	TBD	12,619	Ongoing
Armstrong - Consultant Assignment 1	Armstrong	943-2020	Sewer Separation	Professional Consulting Services for Armstrong Combined Sewer District Preliminary Design	Class 3	$3,000,000	$1,500,000	2023	TBD	N/A	Ongoing

Project Name	District	Contract #	Project Type	Description	Class of Estimate	Baseline Budget	Committed Cost	Targeted Completion Date	Actual Completion Date	Volume Reduction (m3)	Comments
Hawthorne - Consulting Assignment 1	Hawthorne	802-2022	Basement Flood Relief	Professional Consulting Services for McLeod Creek Drainage Improvements	Class 3	$1,000,000	$425,000	2023	TBD	N/A	Ongoing
Hawthorne - Construction Contract 1	Hawthorne	350-2023	Sewer Separation	McLeod Creek Drainage Improvements and combined sewer separation along Kildonan Drive and Irving Place	Class 3	$4,000,000	$5,300,000	2024	TBD	TBD	Ongoing
St Johns (Redwood) Consultant Assignment 1	St John's	528-2021	Sewer Separation	Professional Consulting Services for 2022 Redwood Reconstruction Project	Class 3	$80,000	$78,000	2023	TBD	N/A	Ongoing
St Johns (Redwood) Construction Contract 1	St John's	453-2022	Sewer Separation	New LDS at Redwood Ave from Salter Street to Charles Street	Class 3	$700,000	$1,100,000	2025	TBD	TBD	Ongoing
Mager Construction Contract 1	Mager	541-2022	Sewer Separation	Extending an LDS along Des Meurons St, Guay Av and the back lane of Guay Avenue / Fifth Avenue. Installing new catch basins along the back lane of Guay Avenue / Fifth Avenue	Class 3	$294,675	$280,000	2024	2024	TBD	Complete
Polson (Inkster) Construction Contract 1	Polson	155-2024	Sewer Separation	Westbound catch basin leads connection to SRS on Inkster Boulevard from Sinclair Street to Main Street	Class 3	$1,026,995	$1,026,995	2024	TBD	TBD	Ongoing
SEWPCC											
Cockburn / Calrossie - Consultant Assignment 5	Cockburn / Calrossie	441-2010	Sewer Separation	Professional consulting services for detailed design and contract administration services for phase 5 of the Cockburn and Calrossie Combined Sewer Relief Works	Class 3	$2,100,000	$2,200,000	2025	TBD	N/A	Ongoing
Cockburn / Calrossie - Construction Contract 6B	Cockburn / Calrossie	212-2020	Sewer Separation	Sewer separation and new LDS at Carter and Weatherdon Avenue between Stafford Street and Pembina Highway, Wentworth Street, Lilac Street and Arbuthnot Street	Class 3	$9,000,000	$5,300,000	2022	TBD	4,385	Ongoing
Cockburn / Calrossie - Construction Contract 7	Cockburn / Calrossie	537-2021	Sewer Separation	Sewer separation and new LDS at Harrow Street, Grant Avenue, Weatherdon Avenue, Carter Avenue, Hector Avenue, Ebby Avenue, Harrow Street E, and Sparling Avenue	Class 3	$8,500,000	$6,900,000	2022	TBD	9,813	Ongoing
Cockburn / Calrossie - Construction Contract 9a	Cockburn / Calrossie	104-2023	Sewer Separation	Construction of LDS on Taylor Avenue from Wilton Street to Poseidon Bay	Class 3	$9,000,000	$12,900,000	2025	TBD	13,542 between C9A and C9B	Ongoing

Project Name	District	Contract #	Project Type	Description	Class of Estimate	Baseline Budget	Committed Cost	Targeted Completion Date	Actual Completion Date	Volume Reduction (m3)	Comments
Cockburn / Calrossie Construction Contract 13	Cockburn / Calrossie	375-2024	Sewer Separation	Construction of new LDS on Poseidon from Taylor Avenue to Grant Avenue	Class 3	$6,000,000	$5,900,000	2025	TBD	4,387	Ongoing (Combines C9B and C13)
Cockburn East Consultant Assignment 1	Cockburn	496-2023	Sewer Separation	Consulting Services for Cockburn East Combined Sewer District Preliminary Design	Class 5	$2,679,000	$2,100,000	2025	TBD	N/A	Ongoing
Overall System											
River, Stream and Combined Sewer Overflow Discharge Water Quality Monitoring	N/A	949-2022	Water Quality Monitoring	River, Stream & CSO Discharge WQ Monitoring	Class 3	$1,300,000	$900,000	2024	TBD	N/A	Ongoing
Flow Monitoring Program Instrumentation Supply	N/A	817-2019 Ext 1	Flow Monitoring Program	Supply and delivery of wireless portable area velocity sewer flow meters from Aug 1, 2021 to July 31, 2023	N/A	$80,000	$76,000	2023	2024	N/A	Complete
Flow Monitoring Program Instrumentation Supply	N/A	817-2019 Ext 2	Flow Monitoring Program	Supply and delivery of wireless portable area velocity sewer flow meters from Aug 1, 2021 to July 31, 2024	N/A	$125,000	$214,000	2023	TBD	N/A	Ongoing
Rainfall Monitoring Program - Annual Provision, Installation, Data Hosting and Maintenance	N/A	910-2021 Ext 1	Rainfall Monitoring Program	Provision, Installation, Data Hosting and Maintenance for a Rainfall Network Service from May 1, 2023 to March 31, 2024	Class 3	$77,678	$96,000	N/A	N/A	N/A	Annual

Unvalidated

Committed costs are subject to change as projects progress

Note:
1) All costs are rounded to the nearest relevant whole number
2) The above table includes the list of projects that were either in progress or completed in the reporting year. The list of historic projects is referenced in the past CSO Annual Reports.

Appendix C – Provincial Letter on Previous Year's Annual Report

Manitoba
Environment and Climate
Environmental Compliance and Enforcement
Box 36, 14 Fultz Blvd.
Winnipeg MB R3Y 0L6
T 204-945-7100
ECEBranch@gov.mb.ca

Client File: 3205.10

September 11, 2024

Chris Carroll, P.Eng., MBA
Manager of Wastewater Services Division
110-1199 Pacific Avenue
Winnipeg Manitoba R3E 3S8
Email: ccarroll@winnipeg.ca

Dear Chris Carroll:

RE: Combined Sewer Overflow (CSO) 2023 Annual Report

Environment and Climate Change reviewed the 2023 Combined Sewer Overflow (CSO) Annual Report, dated April 5, 2024, which was submitted as per the requirements of Clause 13 of Environment Act Licence No. 3042.

The department has noted the following during the review:

1. CSO percent capture increased from 75% to 76% in 2023, based on the 1992 representative year. This was due to:
   - Improved hydraulic modelling
   - Capital improvements for Ferry, Jefferson, and Cockburn completed contracts.
2. A review of the funding plan is ongoing.
3. Total number of CSO events for 2023 was 1039 with an estimated volume of 5369 ML.
4. Rainfall in 2023 was 313 mm total, with 2021 mm during the recreational season. This was 13% lower than the 1992 representative year.
5. River elevations were higher in 2023 compared to the 1992 representative year from mid-April to mid-June then returned to 1992 levels from mid-June to September.
6. Approximately 6% of total annual sewage flows were lost to overflows in 2023.
7. A total of $28,000,000 was budgeted in 2023 for CSO capital projects, with an additional $59,000,000 held over from 2022 for Ferry Road Contract 6. Total cost to achieve the 85% diversion is $2,300,800,000 (in 2019 dollars).
8. A total of nine projects were awarded in 2023, including five for NEWPCC, one for SEWPCC and three for the overall system.

…2

9. An increase of 844 m^3 of runoff was a result of new small developments. This was offset by the 60,972 m^3 runoff reduction from sewer separation as projected by the model maintenance updates. These measurements are independent of the percent capture performance.
10. Appendix B is listed as 2024 Ongoing/Completed Capital Projects. This should be 2023 Ongoing/Completed Capital Projects.
11. Financial planning is based on city-only funding scenario. If funding from other levels of government is needed to meet the 2045 deadline, it is critical that such funding requests are made. This department is not aware of any such requests for funding.
12. Appendix E indicates that in 2023, work was ongoing for Armstrong, Ferry, Hawthorne, Jefferson, Riverbend, St. John's, and Cockburn. Work on Jessie was anticipated to begin in 2023. It would be helpful to include, in the body text of the report, details on the work that was completed and initiated during the reporting year.

If you have any questions, please contact Sonja Bridges, A/Regional Supervisor at 204-918-4271, or by email: Sonja.Bridges@gov.mb.ca

Yours sincerely,

Yvonne Hawryliuk
A/Director

c. Michael A. Jack, CAO, City of Winnipeg MJack@winnipeg.ca
Cynthia Wiebe CWiebe@winnipeg.ca Renee Grosselle RGrosselle@winnipeg.ca Susan Lambert SLambert@winnipeg.ca Michelle Paetkau, MPaetkau@winnipeg.ca Water & Waste Department, City of Winnipeg
Kelly-Anne Richmond, Joy Kennedy - Water Science & Watershed Management
Agnes Wittmann, Siobhan Burland Ross, Barsha Sagan - Environmental Approvals Branch
Kristy Forrestall, Sonja Bridges - Environmental Compliance and Enforcement Branch
Public Registry

Appendix D – Previous Year's Record of Meeting Minutes

Date of Meeting:	April 30, 2024	**Time of Meeting:**	2:00 PM
Meeting Location:	Microsoft Teams	**Minutes Issued:**	May 6, 2024

Meeting Type/Purpose: 2023 Annual Combined Sewer Overflow (CSO) Report Presentation to the Province

Project File No.: S-734

Chairperson: Patrick Coote

Recorder: Selina Leung

Attendees

Name & Initials	Title	Organization
Eshetu Beshada (EB)	Senior Environmental Engineer	MB Environment & Climate Change | Environmental Approvals
Robert Boswick (RB)	Senior Environmental Engineer	MB Environment & Climate Change | Environmental Approvals
Sonja Bridges (SB)	Acting Regional Supervisor of the Winnipeg Regional Office	MB Environment & Climate Change | Environment Compliance & Enforcement
Kristy Forrestall (KF)	Regional Supervisor	MB Environment & Climate Change | Environment Compliance & Enforcement
Joy Kennedy (JK)	Water Quality Specialist	MB Environment & Climate Change | Water Science & Watershed Management
Matt Morison (MM)	Senior Lake Winnipeg Specialist	MB Environment & Climate Change | Water Science & Watershed Management
Neil Rentz (NR)	Senior Strategic Environmental Analyst	MB Environment & Climate Change | Environment Compliance & Enforcement
Barsha Sagan (BS)	Environmental Engineer	MB Environment & Climate Change | Municipal and Industrial
Patrick Coote (PTC)	Senior Project Manager	City of Winnipeg | Water & Waste | Engineering Division
Jon Goodbrandson (JG)	Wastewater Planning and Project Delivery Branch Head	City of Winnipeg | Water & Waste | Engineering Division
Selina Leung (SL)	Project Coordinator	City of Winnipeg | Water & Waste | Engineering Division
Linda McCusker (LM)	Acting Manager of Engineering	City of Winnipeg | Water & Waste | Engineering Division
Ian Neil (IN)	Project Coordinator	City of Winnipeg | Water & Waste | Engineering Division

Regrets

Name	Title	Organization
Siobhan Burland-Ross (SBR)	Engineering Manager, Industrial & Wastewater	MB Environment & Climate Change | Environmental Approvals
Yvonne Hawryliuk (YH)	Acting Director	MB Environment & Climate Change | Environment Compliance & Enforcement

Cynthia Wiebe (CW)	Manager of Engineering	City of Winnipeg | Water & Waste | Engineering Division

Item	Description	Action By

City of Winnipeg Treaty Acknowledgement:

I would like to acknowledge that we are in Treaty One Territory, the home and traditional lands of the Anishinaabe (Ojibwe), Ininew (Cree), and Dakota peoples, and in the National Homeland of the Red River Métis. Our drinking water comes from Shoal Lake 40 First Nation, in Treaty Three Territory.

1.0	Introduction & Presentation	Action By
1.1	2023 Annual CSO Report Presentation was provided to MB Environment & Climate. The presentation is attached to these meeting minutes	

2.0	City Inquiries to the Province	Action By
2.1	Percent Capture Assessment for Control Option No.2 and the 2023 CSO Master Plan Update: PTC asked what the next step for discussing the delivery timeline strategy for these upcoming deliverables should be? NR advised that this discussion should be brought to the Environmental Approval Branch formally and brought to the attention of Yvonne Hawryliuk and Siobhan Burland-Ross. PTC will reach out to them for further discussion on this topic.	PTC

3.0	Presentation Questions	Action By
3.1	Percent Capture (Slide 27): JK asked if the Total Dry Weather Flow Volume value would change due to the model maintenance work being done in 2024? IN explained that this value would remain the same and model maintenance would not affect this value. PTC mentioned that if an entire district was separated the corresponding CSO volume would be removed from the total CSO volume, increasing the percent capture value.	

4.0	Report Questions	Action By
4.1	Clause 8 Compliance (section 4.7):	

4.0	Report Questions	Action By
	SB inquired how the City is reviewing infill developments in CSO districts and how it relates to Clause 8 Compliance. Noting that areas including Ferry Road and Rutland appear to be having many small-scale developments approved. PTC explained that the Clause 8 Compliance section was revised for the 2023 report to address the August letter from the Province. This section of the report produces an estimate of the associated increase in run-off from small-scale developments. Developments that are greater in size go through a different review process where the pre and post flows are analyzed. IN confirmed that as per the Sewer bylaws, triplexes or smaller developments are represented by a nominal value when going through the approval process and any greater size development will be reviewed as PTC mentioned. SB asked how the City is accessing small-scale development on a long-term bias? PTC noted that the amount of flow increased from small-scale developments is very small in comparison to the major reductions in flow from the sewer separation work being done from the CSO program. Therefore, the focus is on the major projects for long term planning. As well the approval of small-scale developments is needed to meet the broader City of Winnipeg goals and the OurWinnipeg strategy plans to increase densification.	

Meeting adjourned at: 3:00 PM

Report any errors or omissions in the meeting minutes within **3 business days** to Selina Leung by e-mail at selinaleung@winnipeg.ca, otherwise these minutes are considered accurate and accepted.

Attachment(s):
- 2023 CSO Annual Report Overview PowerPoint Presentation

Distribution (to be completed by Chairperson)
- Attendees
- Regrets
- Other:

2023 CSO Annual Report Overview

MB Environment and Climate
Annual Milestone Meeting
Presented by: City of Winnipeg
April 30, 2024

Acknowledgement

- “We would like acknowledge that we are in Treaty One Territory, the home and traditional lands of the Anishinaabe (Ojibwe), Ininew (Cree), and Dakota peoples, and in the National Homeland of the Red River Métis. Our drinking water comes from Shoal Lake 40 First Nation, in Treaty Three Territory."

Outline

- Highlights
- Annual CSO Results
- Results Analysis
- Status of Reporting
- Capital Projects Overview
- CSO Program Progress
- Future Highlights

- Successes Reported in 2023
- What Changed in 2023

2023 Highlights

Successes Reported in 2023

- $26.8M committed capital
- 5 sewer separation contracts awarded
- 2 consultant assignments awarded
- Percent capture increased to 76%
- Below average rainfall and average river level year
- Initiated Water Quality Monitoring Plan
- 2022 CSO Annual Report and all annual Provincial reporting requirements submitted before deadlines

What Changed in 2023

- SPC – not meeting 2045 seen as unacceptable, direction provided to review budgets and assess the feasibility of City only funding
- 2023 Significant construction cost increases
  - 20-30% higher the class 3 cost estimates
  - Industry wide trend
- Capital Projects
  - Ferry Rd Scope Change reduced Rutland Trunk sewer size from 3m to 2.4m dia.
    - Rutland Class 3 cost estimate $65M (total $165M)
  - Armstrong Class 3 cost estimate of $55M slightly lower then 2019 CSO MP capital cost

What Changed in 2023 Cont.

- Model Maintenance
  - Completed increased volume capture attributed to updates to reflect Cockburn West, Jefferson East and Ferry Road Capital projects
- Annual Report
  - Further refinements to streamline the report, updates to reflect the latest City Branding standards
  - Additional clarification added to compliance section to address August 2023 Provincial letter
  - Background document created to capture historic information and allow more streamlining of the annual report

2023 Annual CSO Results

2023 Annual CSO Milestone Meeting

2023 Annual CSO Results

- No. of events total – 1,039 (average 14 based on 76 outfalls)
- Volume of events total – 5,368 ML

2022 – 2,046 & 27,524 ML

Gravity Overflows			
Source of Data	**Number of CS Outfalls**	**Number of events**	**Volume of events (ML)**
CSO Instrumentation & Detailed Hydraulic Model	46	731	4,471
Detailed Hydraulic Model	30	195	608
Pumped Overflows			
Flood Pump on/off data	N/A	113	288
Total	76	1,039	5,368

89% of the estimated volume was validated against instrumented data

- Rainfall
- River Level
- Treatment Plant
- Pumped Events
- Trends

2023 Results Analysis

2023 Annual CSO Milestone Meeting

Rainfall

- Network of rain gauges (36) - consideration of spatial rainfall variation
- 16 city rain gauges (RGs) associated with the combined system used in 2023
  - **In 2024 all 36 rain gauges will be used**
- Generally operational from May 1 to Sept 30, weather permitting
  - April 1 to October 31 in 2023
  - **98% rain gauge coverage in 2023**
    - Missing data coverage supplemented with mean rainfall data
- Outside of the recreation season, data supplemented with Environment Canada weather stations

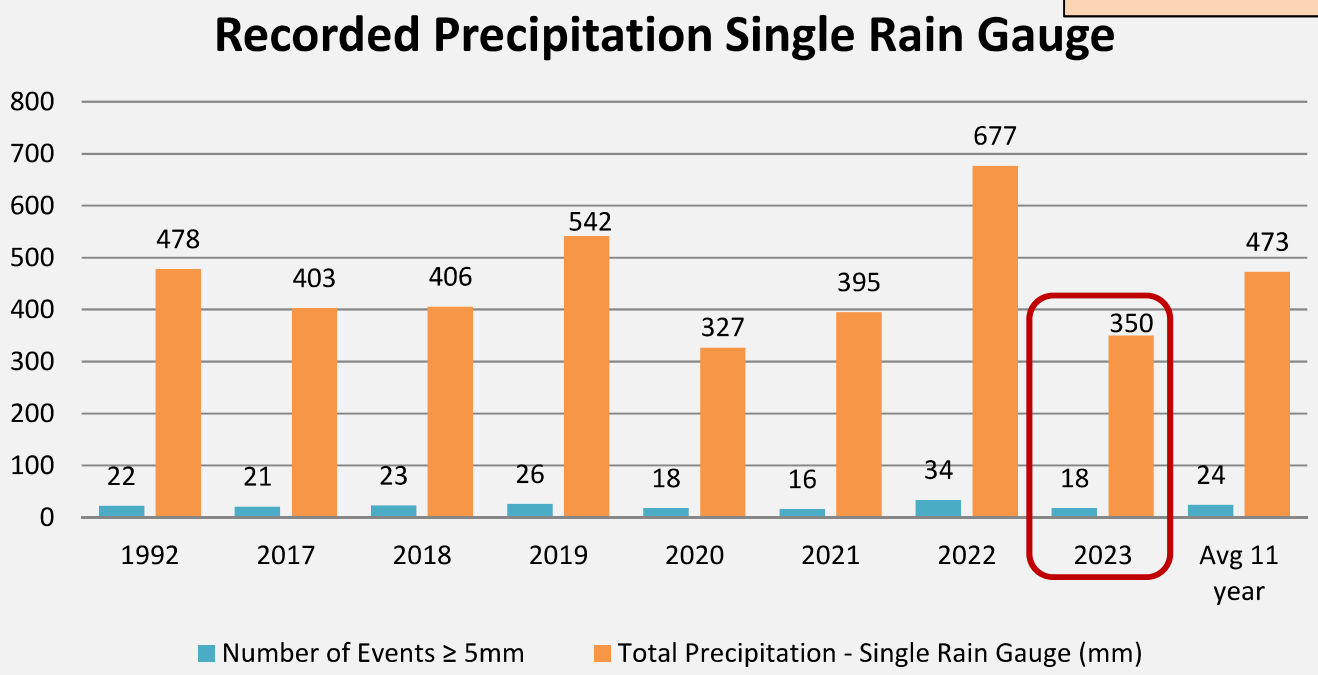
2023 Results Analysis: Rainfall

- Single Rain Gauge at the Forks

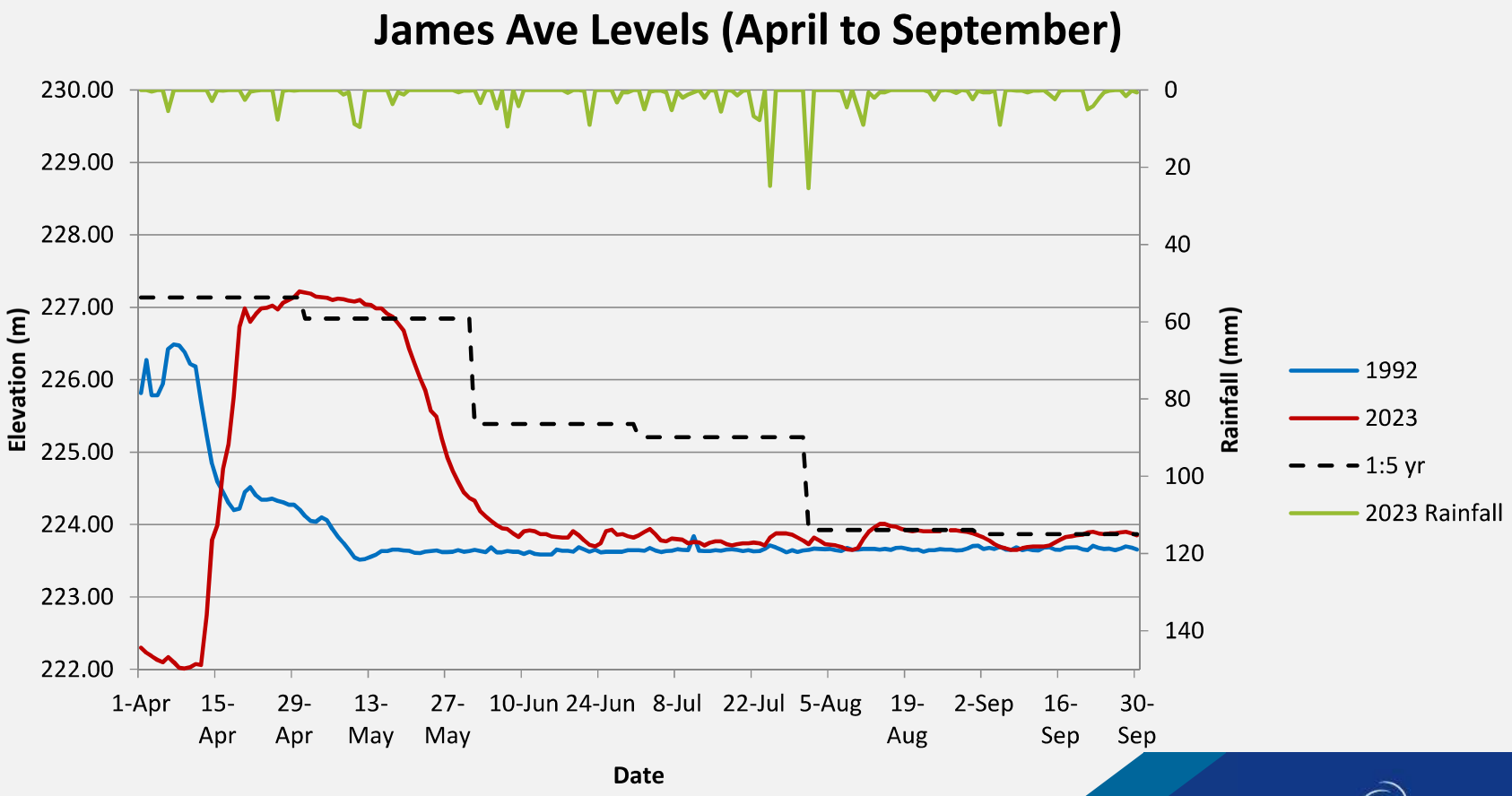
	1992 Representative Year		2023 Current Year	
	Annual	Rec Season	Annual	Rec Season
Total precipitation (mm)	478	326	350	212
Estimated rainfall (mm)	**362**	**326**	**313**	**212**
% deviation			13%	35%
Number of Events ≥5mm	22	20	18	14
% deviation			18%	30%

2023 Results Analysis: Precipitation

The 11 Year Average vs 1992
- 1% less volume
- 10% increase in 5mm events



2023 Results Analysis: River Level

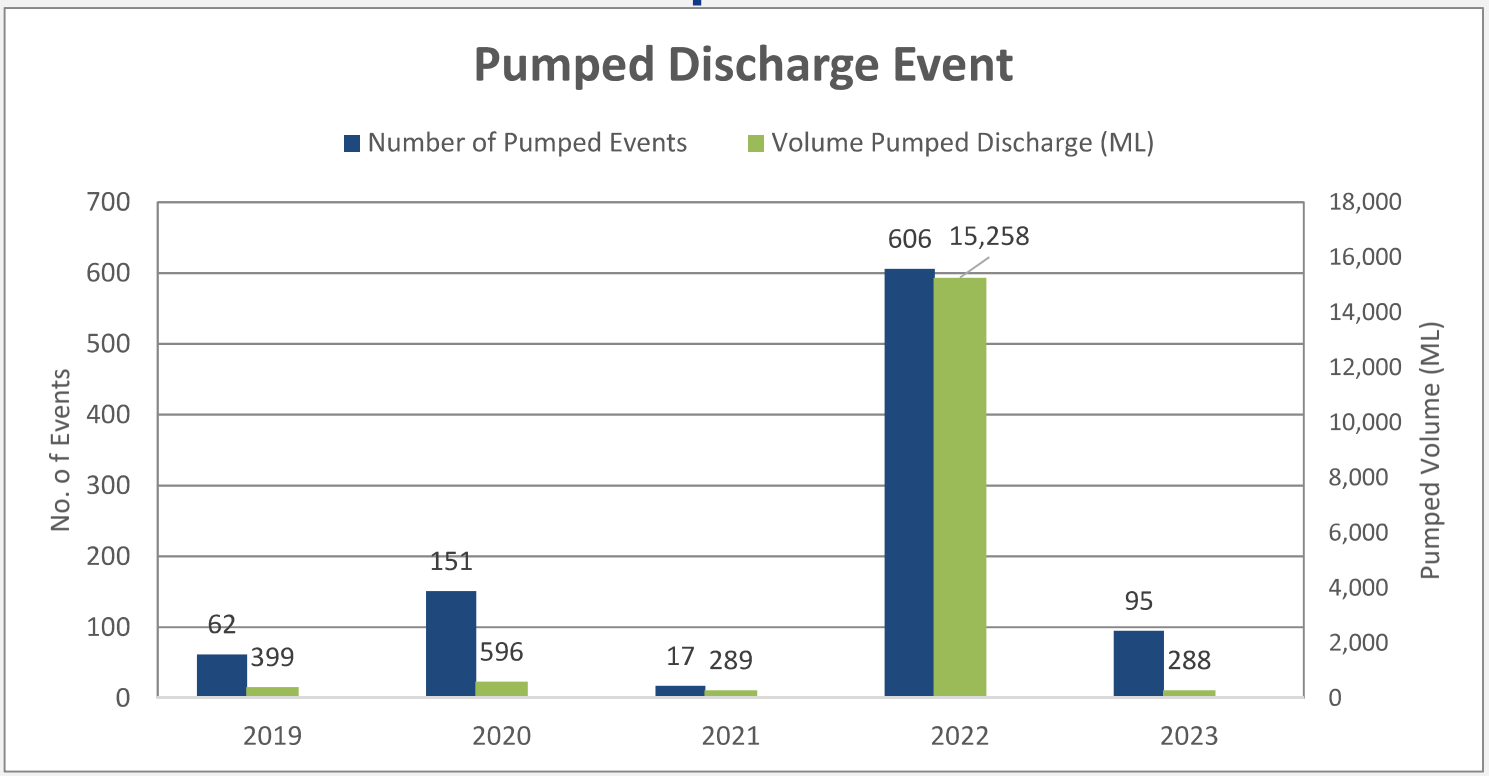


2023 Annual CSO Milestone Meeting

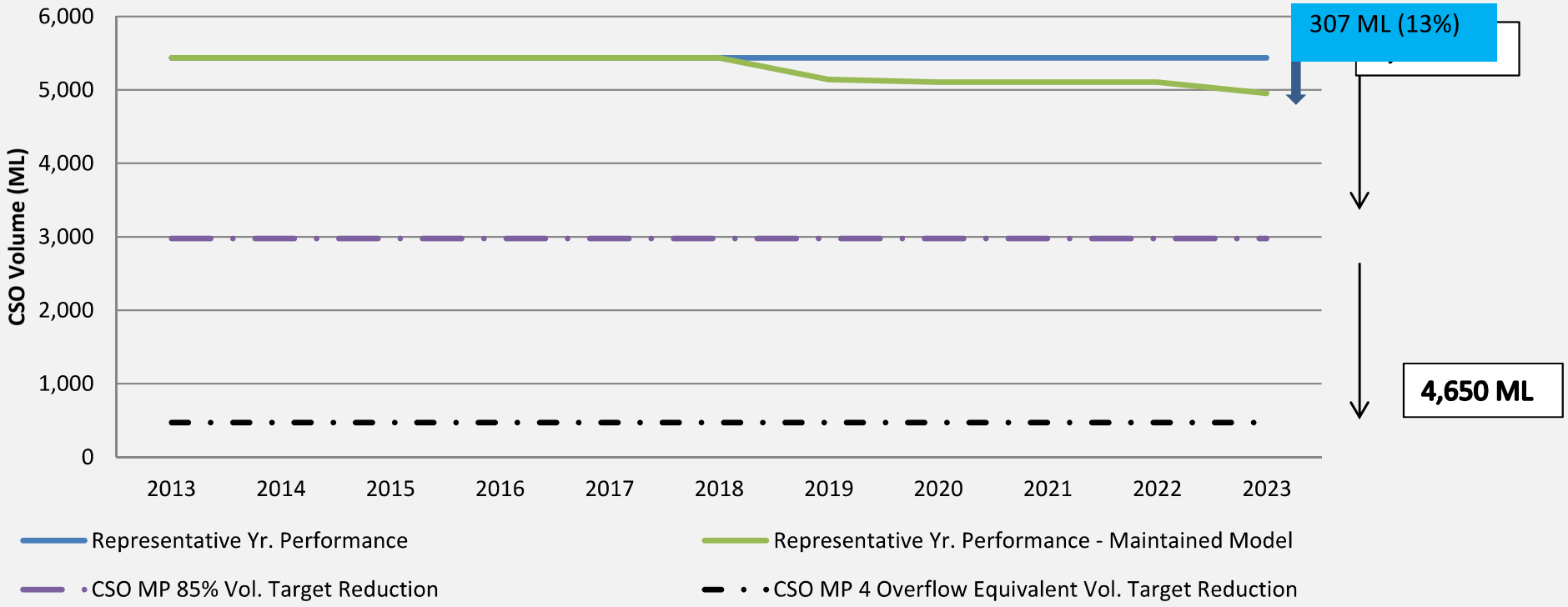
2023 Results Analysis: Treatment

- The total citywide treated sewage estimate is 91,013 ML ≈ 25% less than 2022 (121,510 ML)
- Breakdown of total (similar to previous years)
  - WEWPCC – 8,404 ML (9%)
  - SEWPCC – 20,625 ML (23%)
  - NEWPCC – 61,984 ML (68%)
- CSO volume lost was 6% of total sewage collected
  - 18% CSO lost in 2022
  - 10% is the past 11-year average CSO Volume Lost

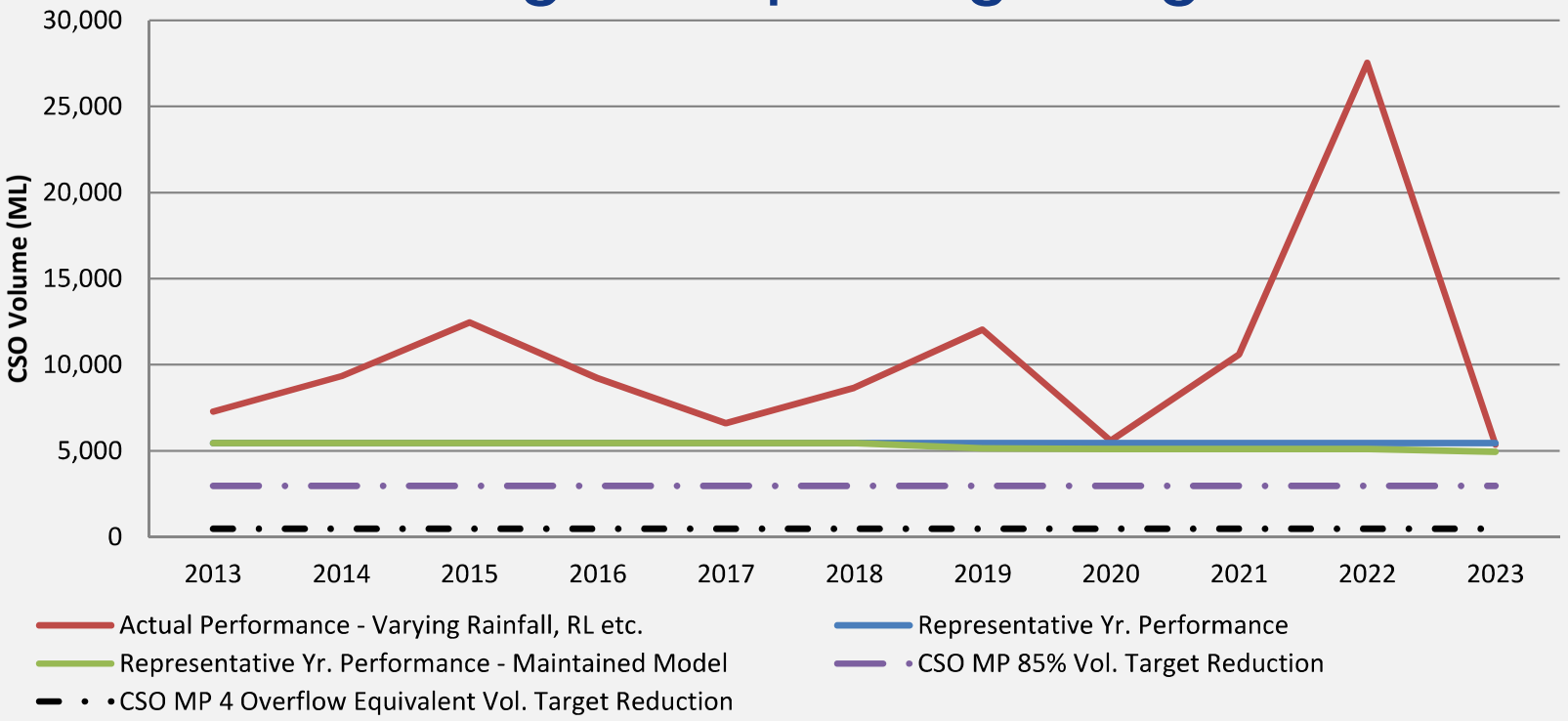
2023 Results Analysis: Pump Monitored Sites



2023 Results Analysis: Tracking & Reporting Progress



2023 Results Analysis: Tracking & Reporting Progress



Status of Reporting

- Provincial CSO Reporting
  - Quarterly Reports (3 per calendar year)
    - Submission required 45 days after quarterly period
    - May 9, August 3 and November 7, 2023
  - Annual CSO Results (submission by February 15)
    - Validated data
    - Submitted on February 8, 2024
  - Annual CSO Report (submission by March 31)
    - Initially submitted March 28, 2024
      - » Re-submitted April 5, 2024

- Budget
- Planned

Capital Project Overview

Capital Projects: Budget

Budget Source	Budget	2023 Committed Capital Projects To Date	2023 Forecast Capital Projects	% of Annual Budget Committed	
2022 (hold over)	$59,636,056				
2023 Budget	$28,000,000	$26,808,134		31%	5 separation contracts
Total Budget Available in 2023	**$87,636,056**				
2023 (hold over)	$62,547,846				
2024 Budget	$47,000,000		$108,165,400	99%	6 separation contracts
Total Budget Available in 2024	**$109,547,846**				
2024 (hold over)	$1,210,446				
2025 Budget	$41,500,000		$29,408,016	69%	3 separation contracts
Total Budget Available in 2025	**$42,710,446**				
2025 (hold over)	$13,302,430				
2026 Budget	$46,500,000		$33,710,222	56%	3 separation contracts
Total Budget Available in 2026	**$59,802,430**				

2024 Planned Projects

- Ferry Road / Riverbend - Construction Rutland Trunk
- Jefferson East - Sewer Separation Construction
  - Contracts 7B and 8A
- Armstrong - Consultant Assignment Detailed Design
- Armstrong - Construction
- Cockburn / Calrossie - Sewer Separation Construction
  - Contracts 9a and 13
- Cockburn East - Consultant Assignment

- Overview
- Schedule
- Percent capture
- Cost

CSO Program Progress

2023 Annual CSO Milestone Meeting

CSO Program Progress: Overview

Assessing CSO program progress Nov 2019 to Dec 2045 (Dec 2023)

Schedule	**Volume Capture**	**Cost**
2019 to 2045 = 26 Years	**85% CSO Volume Capture= 2,300 ML**	**$1.15B capital cost estimate** (2019)
2023: 4 years → **15%** complete	15% complete = **345 ML** capture	15% complete = **$173 mill** spend
Actual Estimated **9%** complete	Actual Estimated **307 ML** (~13%) capture	Actual **$78 million (7%)** From 2020 to 2023

CSO Master Plan 2019 Schedule



District	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Alexander																													
Armstrong																													
Ash																													
Assiniboine																													
Aubrey																													
Bannatyne																													
Clifton																													
Colony																													
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Linden																													
Marion																													
Mission																													
Munroe																													
Newton																													
Parkside																													
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River																													
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Selkirk																													
St John's																													
Syndicate																													
Tuxedo																													
Tylehurst																													
Baltimore																													
Cockburn																													
Mager																													
Metcalfe																													
Moorgate																													
Strathmillan																													
Woodhaven																													
Number of Districts CSO Mitigation Work Underway	2	2	2	2	4	4	5	4	5	6	4	4	3	2	2	2	3	3	5	5	5	4	4	8	13	13	13	12	5

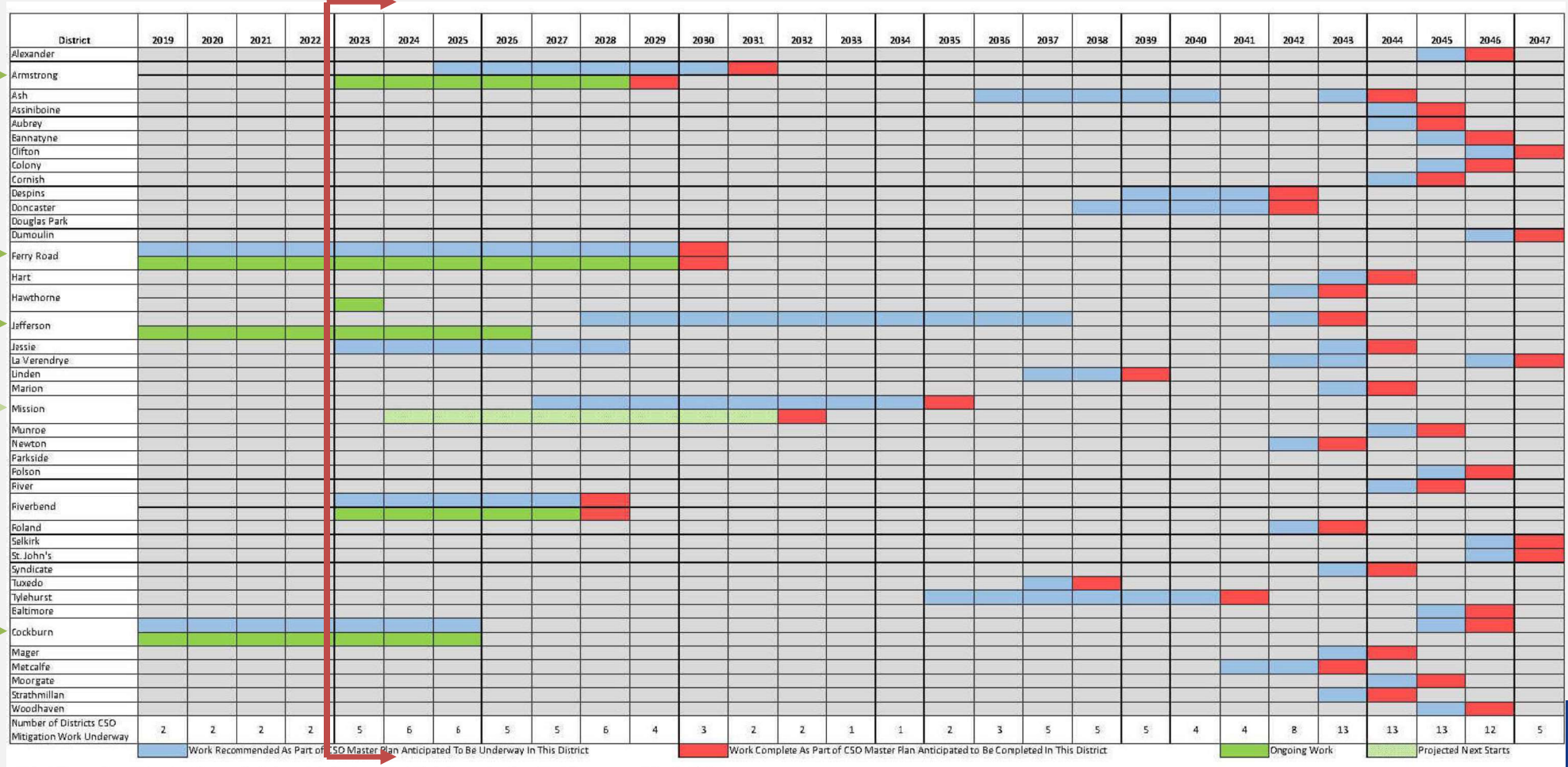
Work Recommended As Part of CSO Master Plan Anticipated To Be Underway In This District

Work Complete As Part of CSO Master Plan Anticipated to be Completed In This District

2023 Annual CSO Milestone Meeting

Winnipeg

2023 Updated Schedule



District	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Alexander																													
Armstrong																													
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Woodhaven																													
Number of Districts CSO Mitigation Work Underway	2	2	2	2	5	6	6	5	5	6	4	3	2	2	1	1	2	3	5	5	5	4	4	8	13	13	13	12	5

Work Recommended As Part of CSO Master Plan Anticipated To Be Underway In This District

Work Complete As Part of CSO Master Plan Anticipated to Be Completed In This District

Ongoing Work

Projected Next Starts

CSO Master Plan Program Scenario 1 Sewer District Based Implementation Schedule (Jacobs, 2019)*

*Updated to reflect ongoing and project work as per Fall 2023

CSO Program Progress: Percent Capture

Condition	Total CSO Volume (ML)	Total Dry Weather Flow Volume (ML)	Total Wet Weather Flow Volume Captured (ML)	Target Reduction in CSO Volume (ML)	*Percent Capture (%)
Baseline Performance - 2013 Baseline with 1992 Rep. Year	5,260	7,749	7,317	-	74
Current (2023) Year's Performance - 2023 Network with 1992 Rep. Year	4,953	7,749	7,624	-	76
Target Performance - CSO Preliminary Proposal 85 Percent Capture with 1992 Rep. Year	2,980	7,749	9,593	2,300	85

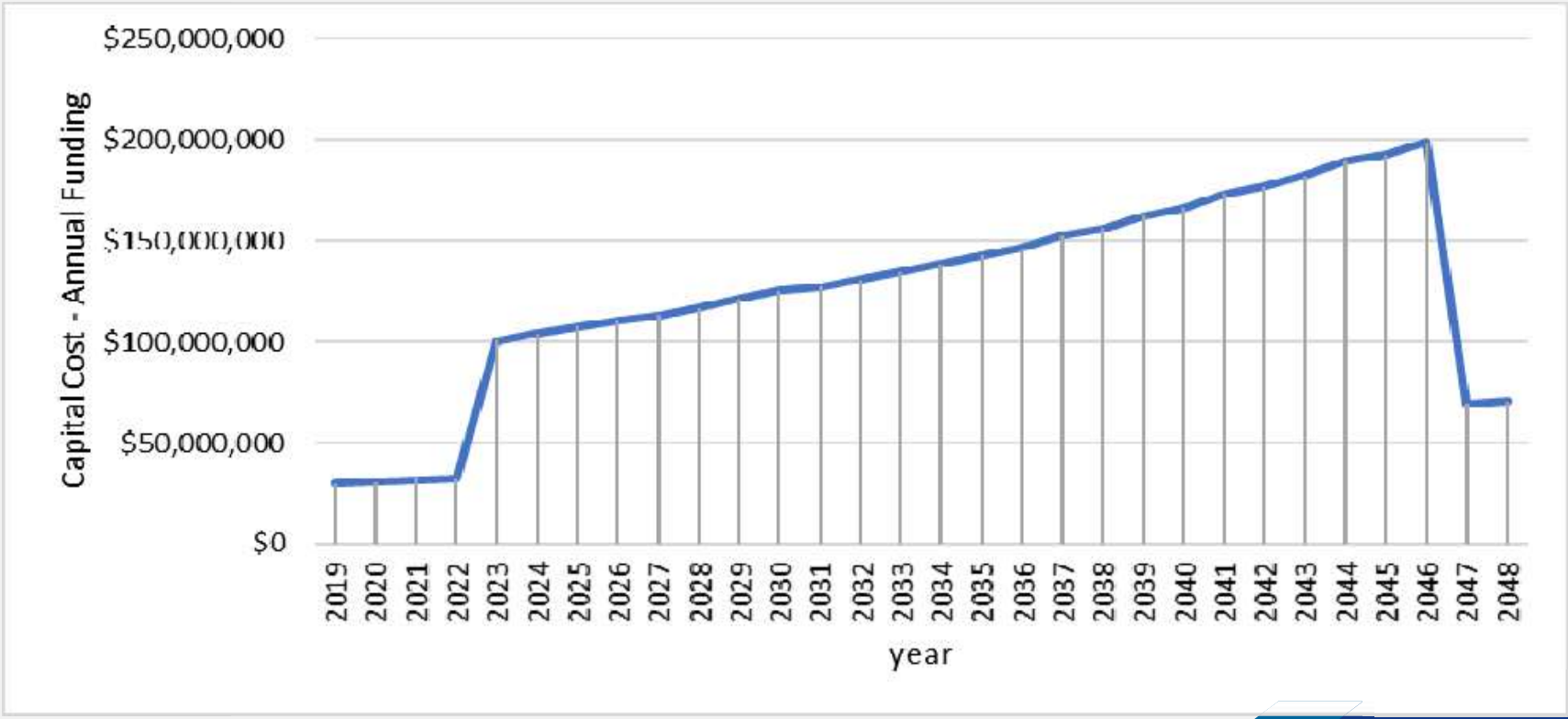
$$*Percent\ Capture = \frac{(Total\ Dry\ Weather\ Flow\ Volume + Total\ Wet\ Weather\ Flow\ Volume\ Captured)}{(\text{Total CSO Volume+Total Dry Weather Flow Volume Total Wet Weather Flow Volume Captured})}$$

CSO Program Implementation: Cost

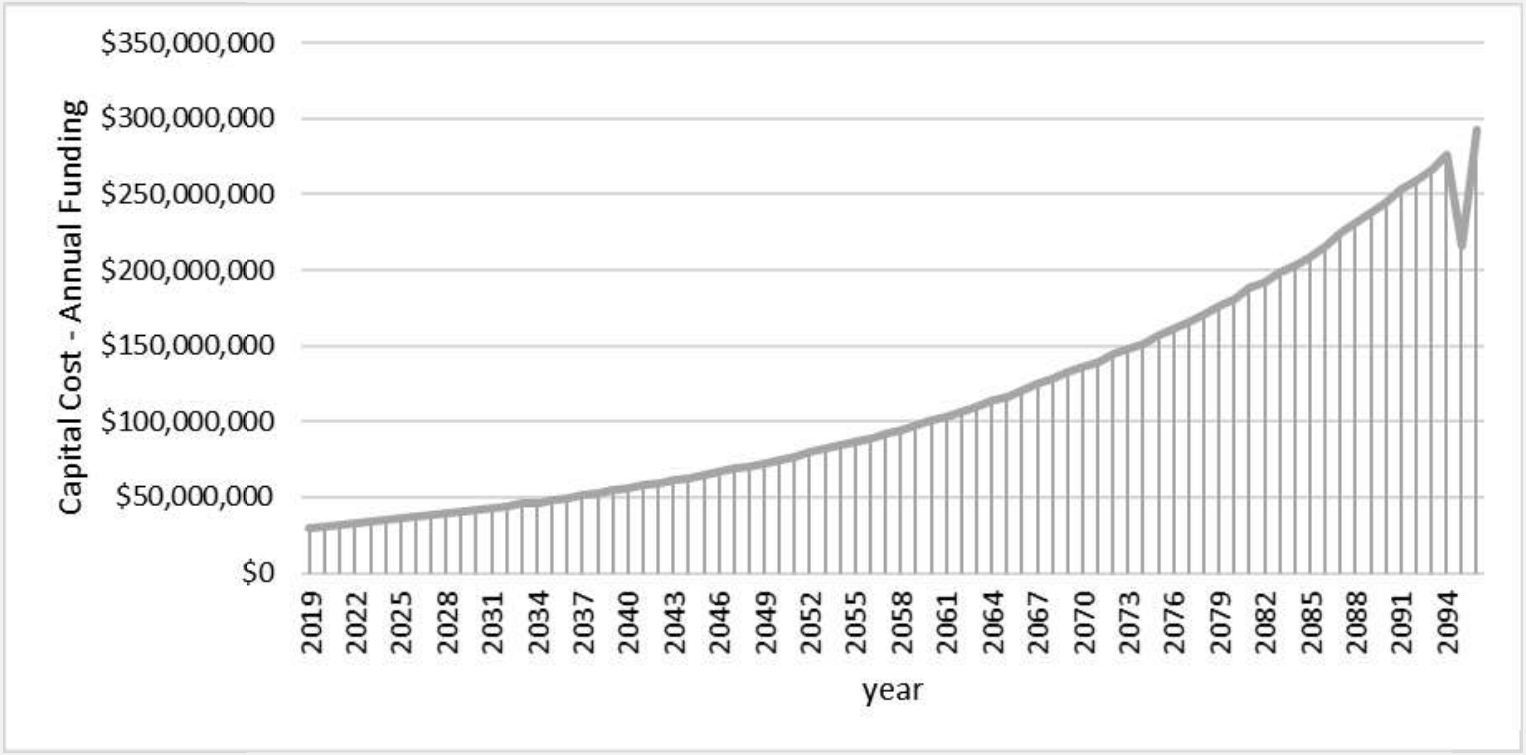
Program Scenario	Description	Funding by	Annual Budget	Total Capital Expenditure	Timeline
Scenario 1	3 Levels of Funding 3 x $30 Million	Tri-level: Government of Canada, Manitoba Government and the City of Winnipeg	$90 Million	$3,667,000,000	27 years (2047)
Scenario 2	2 Levels of Funding 2 x $30 Million	Bi-Level: City of Winnipeg and either the Manitoba Government or the Government of Canada	$60 Million	$4,482,000,000	39 years (2059)
Scenario 3	City Only $30 Million	One Level: City of Winnipeg Only	$30 Million	$8,659,000,000	75 years (2095)

2045 is the Provincial deadline

CSO Program Implementation: Cost



CSO Program Implementation: Cost



- 2024 Model Maintenance
- Capital Program
- River Water Quality Report
- Upcoming Reports

Future Highlights

Future Highlights

- ICM Cloud Modeling
  - 2024 Model Maintenance
- Capital Program
  - Cockburn East, Mission and Roland Preliminary Design
  - Ferry Rd Rutland Contract, Armstrong Detailed Design and Leila Trunk & GI Contract

Future Highlights: River Water Quality Report

2023 Sample Collection

- Rivers and Streams – 2 dry weather events and 1 wet weather
- CSO Discharges – 3 events collected at two location (Ash and Hawthorne)

2024 Sample Collection

- Rivers and Streams – 2 wet weather events
- Weather dependent
- May collect more events if possible

Future Highlights: River Water Quality Report

2023 Data Updates

- On site pH for Rivers and Streams
- E.coli end-point method used starting August 24, 2023
- City of Winnipeg's Total Phosphorus method EPA Method 200.8
- TKN data to be added to COAs

Date Results to be posted online with CSO annual updates by July 1, 2024

Future Highlights: Upcoming Reports

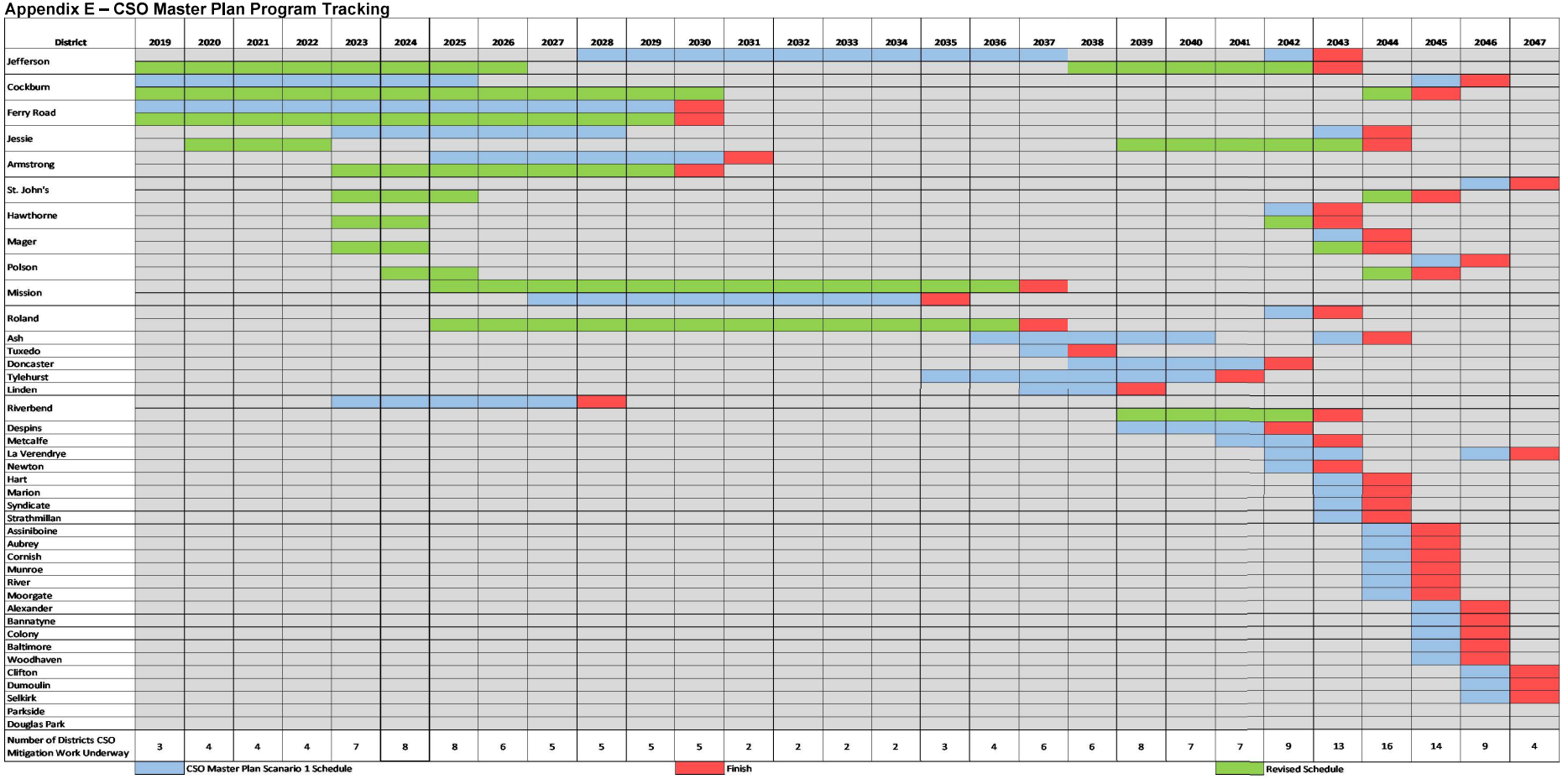
- Percent Capture Assessment for Control Option No.2
  - Due April 2025
- CSO Master Plan Update
  - Due April 2030

- **Discussion on delivery timeline strategy**
  - Resources focused on Capital project delivery
  - Proposing to combine 2025 and 2030 deliverables under same consultant assignment for synergy

Questions

Appendix E - CSO Master Plan Program Tracking

Appendix E – CSO Master Plan Program Tracking



CSO Master Plan Program Scenario 1 Sewer District Based Implementation Schedule (Jacobs, 2019)*

*Updated to compare initial and latest ptoject schedules as per end of reporting year evaluation

Appendix F - District Plans Design Status

APPENDIX F - District Plans Design Status

	Completion Progress			
CS Districts	Conceptual Design	Preliminary Design	Detailed Design	Construction
Parkside				
Cockburn				
Jefferson E				
Ferry Road				
Douglas Park				
Armstrong				
Hawthorne				
Bannatyne				
St John's				
Assiniboine				
River				
Riverbend				
Mission				
Roland				
Ash				
Tuxedo				
Doncaster				
Tylehurst				
Despins				
Jefferson W				
Aubrey				
Colony				
Hart				
Clifton				
Jessie				
Mager				
Strathmillan				
Munroe				
Marion				
Linden				
La Verendrye				
Metcalfe				
Moorgate				
Dumoulin				
Baltimore				
Syndicate				
Newton				
Alexander				
Woodhaven				
Cornish				
Selkirk				
Polson				
	Progress update as per end of reporting year evaluation The shaded cells represent the amount of work that has been completed.			

Appendix G - 2025 Planned Capital Projects

APPENDIX G - 2025 Planned Capital Projects

Project Name	District	Project Type	Class of Estimate	Forecasted Budget	Volume Reduction (m3)
NEWPCC					
Ferry Road / Riverbend - Construction Contract 6 Rutland Trunk - Rutland St (Assiniboine River to Silver Ave)	Ferry Road / Riverbend	Sewer Separation	Class 3	$65,700,000	TBD
Jefferson East Construction Contract 10 - McKenzie St (Jefferson Ave to Semple Ave), Kilbrige Ave, Belmont Ave, Hartford Ave, Perth Ave, St Anthony Ave, Royal Avenue - Aikens St - Semple Ave - Andrews Street	Jefferson East	Sewer Separation	Class 3	$8,300,000	TBD
Armstrong - Consultant Assignment 2 - Detailed Design	Armstrong	Sewer Separation	Class 3	$5,000,000	N/A
Mission & Roland Consultant Assignment 1 – Preliminary Design	Mission / Roland	Sewer Separation	Class 3	$6,450,000	N/A
Overall System					
Rainfall Monitoring Program – Annual Operation and Maintenance	N/A	Rainfall Monitoring Program	Class 3	$120,000	N/A
Laboratory Upgrades	N/A	Strategic Infrastructure	Class 3	$2,000,000	N/A
CSO Percent Capture Assessment	N/A	Study	Class 5	$2,500,000	N/A
Note: The status of the planned contracts is subject to change					

Appendix H – Small Scale Development Runoff Estimate Tables

Pre and Post Development Land Drainage Runoff Flow Estimate Example 1 for Two Duplexes

SFD to 2 duplexes						
Lot	**"C"-value**	**Existing**	**Post Lot 2**	**Post Lot 1**	**Post Total**	**Increase**
Total Area		557 m²	279 m²	279 m²	557 m²	
Building and Paved Area	0.9	180 m²	120 m²	140 m²	260 m²	
Gravel Area	0.5	0 m²	0 m²	0 m²	0 m²	
Pervious Area	0.1	377 m²	159 m²	139 m²	297 m²	
Weighted C-value		0.36	0.44	0.50	0.47	
Storage		21.7 m3			22.4 m3	0.7 m3
Q_{stm}		**6.1 L/s**	**3.8 L/s**	**4.3 L/s**	**8.0 L/s**	**32.07%**

Note: Q uses t_c of 10 min and intesity of 109.5 mm/hr

Note: Storage is for a 5 year event

Pre and Post Development Land Drainage Runoff Flow Estimate Example 2 for Two Duplexes

SFD to 2 duplexes						
Lot	**"C"-value**	**Existing**	**Post Lot 2**	**Post Lot 1**	**Post Total**	**Increase**
Total Area		557 m²	279 m²	279 m²	557 m²	
Building and Paved Area	0.9	130 m²	150 m²	150 m²	300 m²	
Gravel Area	0.5	0 m²	0 m²	0 m²	0 m²	
Pervious Area	0.1	427 m²	129 m²	129 m²	257 m²	
Weighted C-value		0.29	0.53	0.53	0.53	
Storage		21.3 m3			22.8 m3	1.5 m3
Q_{stm}		**4.9 L/s**	**4.5 L/s**	**4.5 L/s**	**9.0 L/s**	**85.18%**

Note: Q uses t_c of 10 min and intesity of 109.5 mm/hr

Note: Storage is for a 5 year event

Pre and Post development Land Drainage Runoff Flow Estimate Example for Two SFDs

SFD to 2 SFD						
Lot	**"C"-value**	**Existing**	**Post Lot 2**	**Post Lot 1**	**Post Total**	**Increase**
Total Area		474 m²	238 m²	238 m²	475 m²	
Building and Paved Area	0.9	151 m²	130 m²	130 m²	260 m²	
Gravel Area	0.5	0 m²	0 m²	0 m²		
Pervious Area	0.1	323 m²	108 m²	108 m²	215 m²	
Weighted C-value		0.35	0.54	0.54	0.54	
Storage		18.5 m3			19.5 m3	1.0 m3
Q_{stm}		**5.1 L/s**	**3.9 L/s**	**3.9 L/s**	**7.8 L/s**	**51.94%**

Note: Q uses t_c of 10 min and intensity of 109.5 mm/hr

Note: Storage is for a 5 year event

Pre and Post Development Land Drainage Runoff Flow Estimate Example for Two SFDs with Secondary Suites

SFD to 2 SFD w/ Secondary Suites						
Lot	**"C"-value**	**Existing**	**Post Lot 2**	**Post Lot 1**	**Post Total**	**Increase**
Total Area		557 m²	280 m²	280 m²	559 m²	
Building and Paved Area	0.9	200 m²	138 m²	138 m²	276 m²	
Gravel Area	0.5	0 m²	0 m²	0 m²	0 m²	
Pervious Area	0.1	357 m²	142 m²	142 m²	283 m²	
Weighted C-value		0.39	0.49	0.49	0.5	
Storage		21.9 m3			22.6 m3	0.7 m3
Q_{stm}		**6.6 L/s**	**4.2 L/s**	**4.2 L/s**	**8.4 L/s**	**28.27%**

Note: Q uses t_c of 10 min and intensity of 109.5 mm/hr

Note: Storage is for a 5 year event

Appendix I – CSO Percent Capture Assessment Deadline Meeting Minutes

Meeting Date/Time:	October 1, 2024 1:30 PM	**Project File No.:**	S-734
Meeting Location:	Microsoft Teams	**Minutes Issued:**	October 10, 2024
Meeting Purpose:	ELA No. 3042 Percent Capture Assessment Deadline		
Chairperson:	Patrick Coote	**Recorder:**	Selina Leung

Attendees

Name & Initials	Title	Organization
Siobhan Burland-Ross	Engineering Manager, Industrial & Wastewater	MB Environment & Climate Change | Environmental Approvals
Sonja Bridges	Acting Regional Supervisor of the Winnipeg Regional Office	MB Environment & Climate Change | Environment Compliance & Enforcement
Neil Rentz	Senior Strategic Environmental Analyst	MB Environment & Climate Change | Environment Compliance & Enforcement
Barsha Sagan	Environmental Engineer	MB Environment & Climate Change | Municipal and Industrial
Cynthia Wiebe	Manager of Engineering	City of Winnipeg | Water & Waste | Engineering Division
Jon Goodbrandson	Wastewater Planning and Project Delivery Branch Head	City of Winnipeg | Water & Waste | Engineering Division
Patrick Coote	Senior Project Engineer	City of Winnipeg | Water & Waste | Engineering Division
Florence Lee	Project Engineer	City of Winnipeg | Water & Waste | Engineering Division
Selina Leung	Engineer Designate	City of Winnipeg | Water & Waste | Engineering Division

City of Winnipeg Treaty Acknowledgement:

Winnipeg is located in Treaty One Territory, the home and traditional lands of the Anishinaabe (Ojibwe), Ininew (Cree), and Dakota peoples, and in the National Homeland of the Red River Métis. Our drinking water comes from Shoal Lake 40 First Nation, in Treaty Three Territory.

1.0	Introduction & Presentation	Action By
	The purpose of the meeting was to discuss a revision to the 98% Capture Assessment report deadline from April 30, 2025 to either December 2027 or to combine the deliverable with the April 30, 2030 CSO Master Plan Update Report. The presentation went over the background of this report and the rationale for change. Presentation slides are attached to these meeting minutes.	Info

2.0	Discussion	Action By
	• The Province clarified the intent of the 98 Percent Assessment report (98% report), is to have the City assess if the 98 percent capture target can achieve equivalent water quality as the 4 overflow per year target (Control Option No. 2). • The November 2019 CSO Master Plan Approval Letter stated the City must implement the CSO Master Plan for Control Option No. 1 by December 31, 2045. The Province's expectation was that the 2030 CSO Master Plan Update will detail how the City plans to meet Control Option No. 2 following the completion of Control Option No.1 in 2045. The City did not interpret the letter this way. The City's interpretation was the 98% report would assess the water quality impact and evaluate how that would affect the CSO Master Plan (i.e. cost analysis and timelines) which would inform a decision on if further control would be required. • The Province acknowledged that the 98% report would be reviewed regarding future direction of the CSO program, but the primary concern it was meant to review was related to water quality and not cost of implementation. • The Province will not approve combining the 98% report with the 2030 deliverable. Since it is intended to address the difference between what is in the licence and what the City would like to do (change the metric from percent capture to number of overflows). This water quality analysis is required to inform the 2030 Update. • The Province may accept a revision to the 98% report based on the rationale provided (i.e. City focus on executing capital projects, additional deliverables and resource constraints). • The City noted that the current CSO capital projects are all separation projects which do not risk meeting a further control option like 98% capture.	Info

3.0	Next Steps	Action By
	1. Discuss the intent and timelines of the 98% Report and 2030 deliverable internally, provide a response to the City and propose a meeting time to discuss. 2. If required, submit a Notice of Alteration requesting a deadline revision.	Province City

Meeting adjourned at: 2:15 PM

Report any errors or omissions in the meeting minutes within **3 business days** to Selina Leung by e-mail at selinaleung@winnipeg.ca, otherwise these minutes are considered accurate and accepted.

Attachment(s):
- 2024-10-01 Percent Capture Assessment Deadline PowerPoint Presentation

Percent Capture Assessment Deadline

CoW meeting with Environment and Climate

MS Teams

October 1, 2024

Winnipeg

Treaty Acknowledgement

I would like to begin by acknowledging that we are in Treaty One Territory, the home and traditional lands of the Anishinaabe (Ojibwe), Ininew (Cree), and Dakota peoples, and in the National Homeland of the Red River Métis. Our drinking water comes from Shoal Lake 40 First Nation, in Treaty Three Territory.

Purpose & Agenda

Purpose: provide rationale for revising the 98% Capture Assessment report deadline and discuss options with Provincial Regulators

Proposing:

- Revising the 98% Capture deadline to December 31, **2027**
- **Or** combined with the 2030 Master Plan Update deliverable

Agenda:

- Background
- Rationale for Change
- Discussion

Background

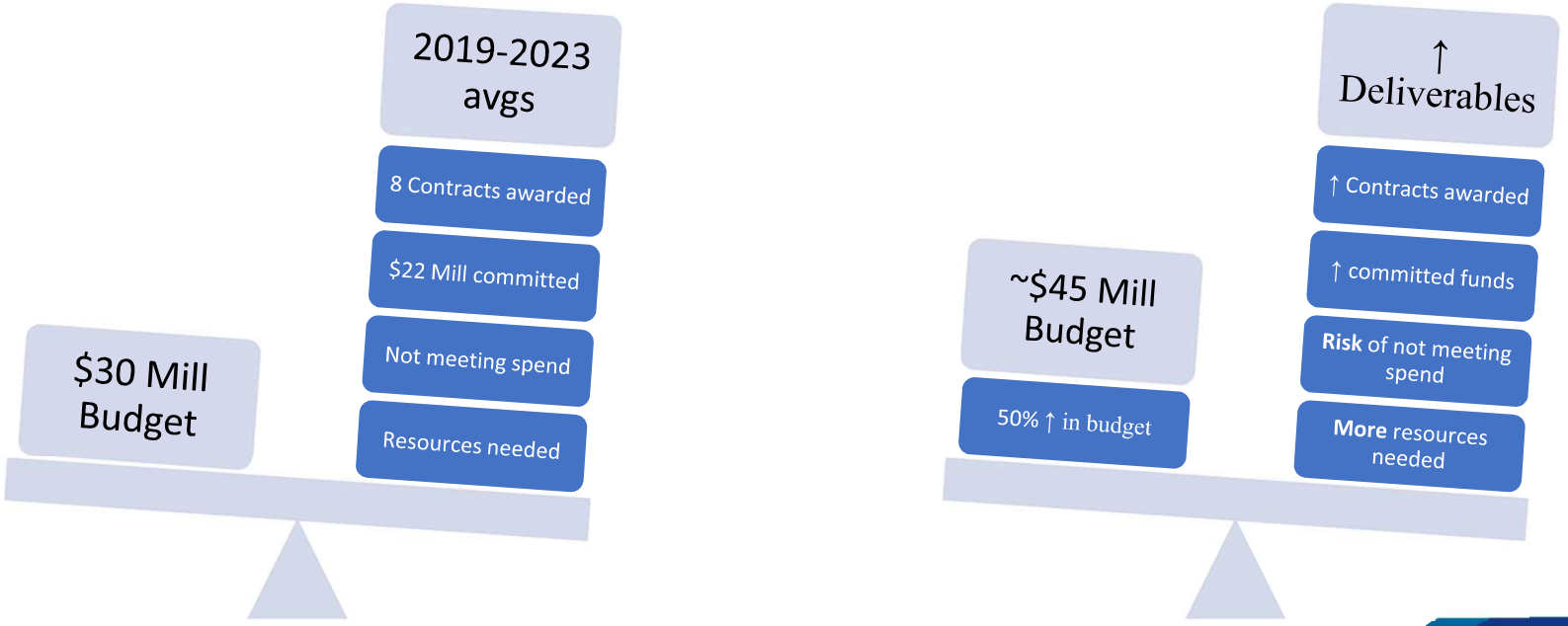
A condition of the November 2019 CSO Master Plan approval letter, is to submit a report demonstrating that the percent capture performance measure will provide equivalent water quality protection to Control Option No. 2 (4 overflows or 98% capture).

"The Licencee shall, on or before April 30, 2025, submit for approval a report demonstrating that the percent capture performance measure, an alternative to Control Option No. 2 as proposed in the CSO Master Plan dated August 28, 2019, will provide equivalent water quality protection to Control Option No. 2 (i.e., four overflows in a representative year)."

Rationale for Change

Focus on capital projects to take advantage of increased City CSO Budget

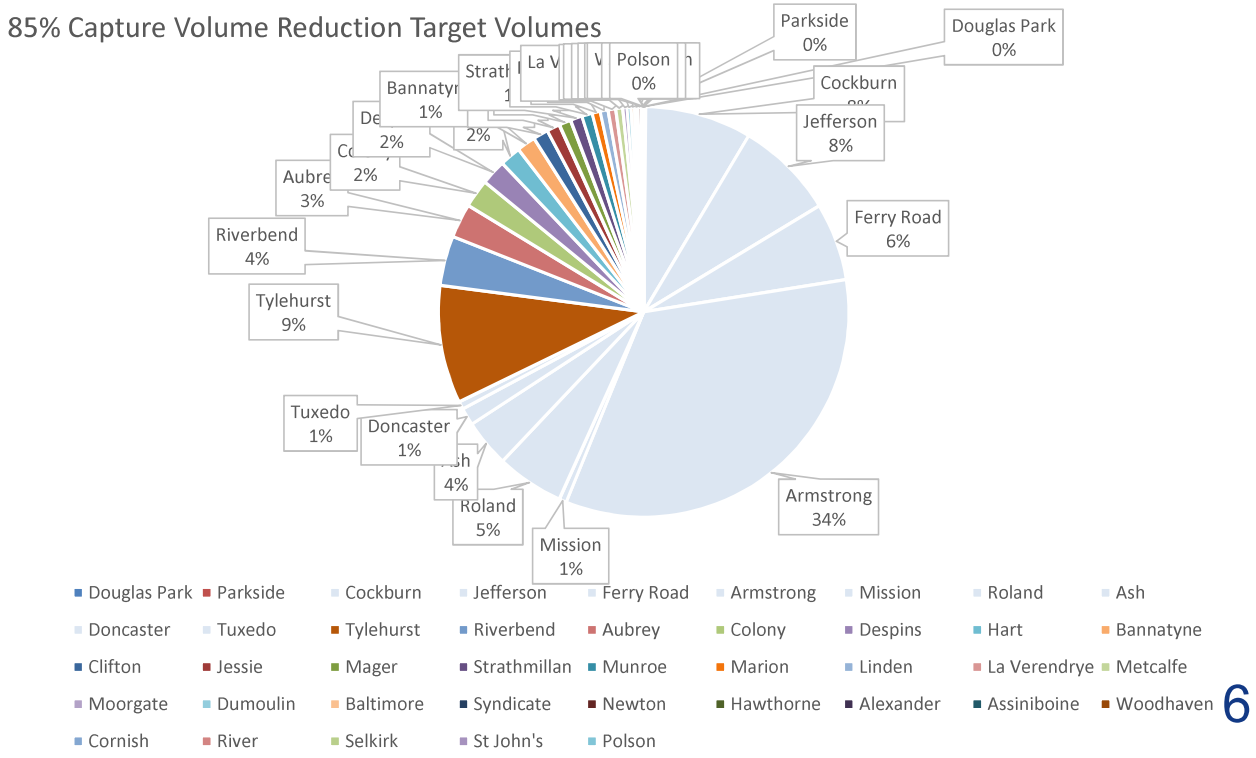
- An additional $15M a year between 2024 to 2027



Rationale for Change

Optimizes Resource Allocation

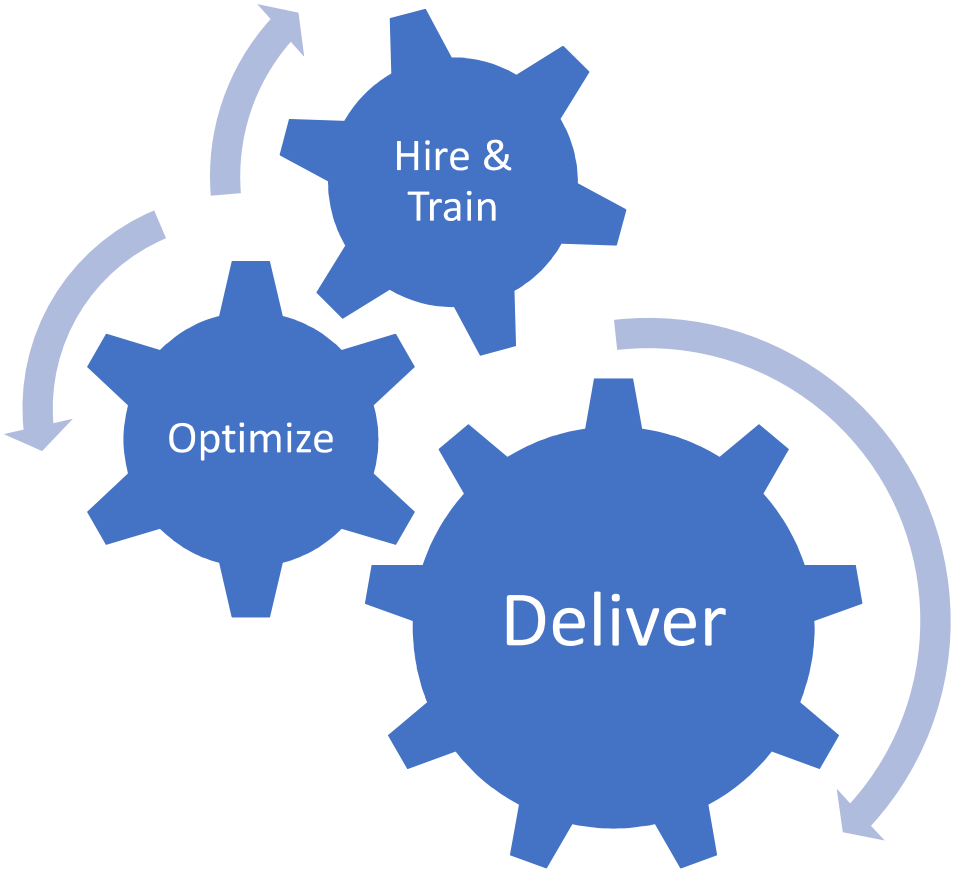
- By focusing on capital projects now, we increase the amount of sewer separation and physical solutions upfront and can later redirect our resources to other program work



Rationale for Change

Time to Fill and Train New Resources

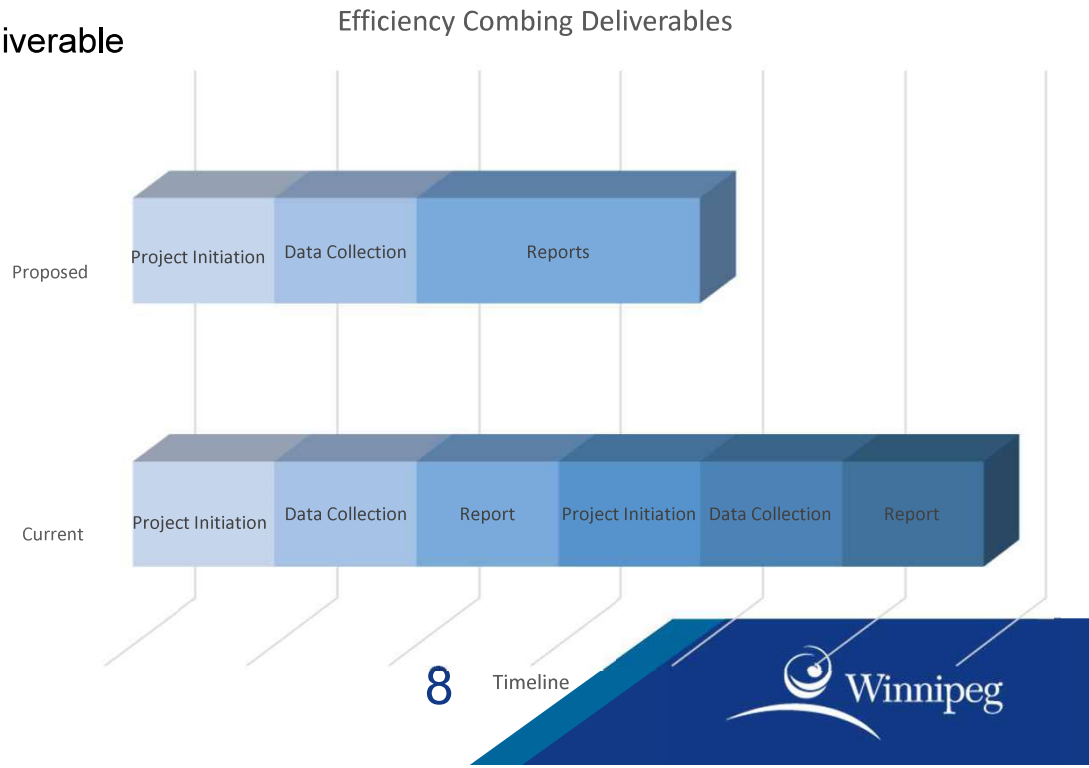
- Expanded requirements put a strain on our resources, consultant and contractor resources, time is needed to expand sustainably
- Developing and modifying our project delivery processes



Rationale for Change

Efficient Delivery of Deliverables

- 2030 Master Plan Update (condition E of 2019 Approval Letter) due April 30, 2030
- Consolidating the two deliverables under one consultant assignment would significantly enhance efficiency
  - Delay the 98% Capture Assessment deadline
  - Combine 98% deliverable with 2030 Update deliverable



Discussion

The City is requesting that the 98% Capture Assessment report deadline be revised:

- to December 31, **2027**
- **Or** combined with the 2030 Master Plan Update deliverable

- Province's thoughts and questions
- Next steps

Percent Capture Assessment Deadline

CoW meeting with Environment and Climate

MS Teams

October 1, 2024