Report to: General Committee Meeting Date: June 15, 2020

SUBJECT: Citywide Multi-Phase Sanitary System Downspout Disconnection Program – Annual Progress Update and 2020 Details

PREPARED BY: Gord Miokovic, Manager-System Engineering
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Celia Fan, System Engineer

RECOMMENDATION:

1) That the report entitled "Citywide Multi-Phase Sanitary System Downspout Disconnection Program – Annual Progress Update and 2020 Details" be received; and,

2) That Staff be authorized and directed to do all things necessary to give effect to this resolution.

PURPOSE:

The purpose of this report is to provide a status update on Phases 1 to 6 of the Citywide Multi-phase Sanitary System Downspout Disconnection Program (DDP).

BACKGROUND:

The DDP goal is to:

- Reduce the risk of wastewater based basement flooding;
- Reduce the flow in the sanitary sewer system by reducing extraneous inflow; and
- Enforce the City of Markham Sewer By-Law #2014-71.

The identification of higher risk areas and program phasing were established by taking into account wastewater flow modeling and monitoring, past flooding incidents reported to the City and all other on-going programs/initiatives within Markham.

DISCUSSION:

1. Program Timeline and Status

The DDP is being delivered in 6 phases. Each phase involves the following elements and timing (see **Table 1**). A map overview is contained in **Attachment A** with detailed map per phase in **Attachments B to G.**

Table 1 - Downspout Disconnection Program Timing.

Phase	Year									
	Pre- 2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
1	*a*	*b, c*	*d*	♦	*e*	*f*	*f*			
2	*a*	*b*	*b, c*	*d*	♦, *e*	*f*	*f*			
3		*a*	*b*	*b, c*	*d*	♦, *e*	*f*			
4			*a*	*b*	*b, c*	*d*	♦, *e*	*f*		
5A				*a*	*b*	*c*	*c*	♦, *d*	♦, *e, f*	
5B						*a*	*b, c*	♦, *d*	♦, *e, f*	
6						*a*	*b, c*	♦, *b, c*	♦, *d*	*e, f*

a - Modeling and evaluation of the existing flow monitoring data to assess the extent of extraneous flows in an area;
b - Lot survey identifying all downspouts connected to the underground system;
c - Sanitary and storm sewer smoke testing/analysis and reports of all downspouts connected to the underground system;
d - Resident notification for follow-up action required along with Financial Assistant Plan (FAP) information;
e - Progressive By-law Enforcement for non-compliance with required corrections;
f - Flow Monitoring of area after identified corrective action completed.
♦ - Council Updates.

There are three possible outcomes from the program and **Table 2** indicates the outcome of each phase:

1. Private properties with downspout connection directly to City sanitary sewers.

2. Other Sources of Inflow and Infiltration (I/I) which can be on the public or private side: uncapped lateral cleanouts; damaged sanitary manholes; street/private catch basins, or driveway/stairwell/side /rear drains connected to sanitary sewer; sump pump connection; weeping tile connection; etc.

3. Lateral interactions between the storm and sanitary system is identified when smoke comes out from the downspouts under both storm and sanitary sewer smoke testing. Since the two systems are fully separate, the smoke identified at the downspouts indicates that there may be cracks at the lateral pipe or some cross-connection.

Table 2: Test Results and Progress Summary

Phases	Total no. of Properties	Private I/I Sources					Public I/I Sources
		Connected Downspout Identified	Completed Downspout Disconnection	Other Sources	Lateral Interactions Identified	Lateral Inspection Schedule	
1	**2,256**	**21**	**21**	**19**	**65**	completed 2015	**9**
2	**2,827**	**70**	**70**	**7**	**215**	completed 2015	**30**
3	**3,690**	**4**	**4**	**12**	**6**	completed 2017	**10**
4	**2,305**	**6**	**6**	**11**	**109**	completed 2019	**34**
5A	**1,992**	**9**	**2**	**9**	**58**	2020-2025	**5**
5B	**2,934**	**24**	**5**	**18**	**136**	2020-2025	**51**
6	**6,761**	**27**	**TBD**	**45**	**489**	2020-2025	**70**
Total	**22,765**	**161**	**108+TBD**	**121**	**1,078**		**209**

Note: TBD stands for "To Be Determined".

Phases 1 to 4 Status:
All downspout disconnection works and post flow monitoring was completed in 2019.

Phase 5 (Original Scope 5A and Expansion Area 5B) Status:
33 properties were identified as having downspouts directly connected to the sanitary sewers. Letters were sent out in the Spring of 2019 giving the property owners a period of 12 months to complete the disconnection works.

Phase 6 Status:
Lot survey and smoke testing field work was completed in December 2019. 27 properties were identified as having downspouts directly connected to the sanitary sewers. Letters will be sent out in the Summer of 2020 giving the property owners a period of 12 months to complete the disconnection works.

Staff are continuing to monitor and evaluate the City's wastewater flow monitoring data and other information in order to determine if there are any additional areas that have higher risk of wastewater based basement flooding. Based on the evaluation process, Environmental Services will confirm if there is a need for any future phase of the program. Funding and detail cost breakdown of each phase is provided in **Attachment H**.

A Financial Assistant Plan (FAP), was approved by Council on March 19, 2013 under report, "Citywide Multi-phase Sanitary System DDP – Financial Assistant Plan". The intent of FAP is to decrease the financial burden on property owners that need to disconnect the downspouts and covers:

- 80% of the cost of completing the downspout disconnection, to a maximum of $500; and
- 100% of the cost of a rain barrel purchased by the home owner, to a maximum of $150.

2. Other Related Programs to Reduce Basement Flooding Risks

Pilot Private Plumbing Protection Program
On March 26, 2018 Council approved "Pilot Private Plumbing Protection Program for Flood Risk Reduction" (5P) and associated By-law 2018-20. The by-law established a pilot rebate program for property owner initiating private plumbing protection measures and applying rebate from the City. Amongst various approved eligible rebate measures, some of the "Other Source" as identified in **Table 2** that would need to be addressed by the property owners may be applicable for this rebate program.

Annual Sanitary Lateral Inspection Program
The properties identified as having "Lateral Interactions" in **Table 2** have been added to the Annual Sanitary Lateral Inspection Program. The inspection program inspects and evaluates the condition of the sanitary service laterals on the public portion. If any blockages are identified, flushing operations will be performed by the City contractor. If any structural defects are identified, the repair work on the public side will be conducted under the annual sanitary sewer rehabilitation program by the City contractor. At the same time, home owners will be informed about the approved private plumbing

protection rebate program and encouraged to repair/reline the private side lateral at their cost first and apply for the rebate from the City after the work is completed.

FINANCIAL CONSIDERATIONS

Any remaining funds at completion of on-going projects will be returned to original funding source.

HUMAN RESOURCES CONSIDERATIONS

Resources are available within the Department.

ALIGNMENT WITH STRATEGIC PRIORITIES:

This project aligns with the Building Markham's Future Together Strategic Plan, improving the areas of Managing our Growth, Protecting our Environment and Excellence in Municipal Services. Disconnecting roof downspouts from the sanitary sewer system in accordance with City's By-law, has extensive and long-lasting environmental benefits which include reduced I/I into the sanitary sewer system, reduced energy costs for sanitary sewer pumping and treatment, ground water recharge, water conservation, reduced probability of sanitary sewer backups into basements, and reduced sanitary sewer overflows to receiving waters.

BUSINESS UNITS CONSULTED AND AFFECTED:

The Business units which will be affected most by the Sanitary System DDP include Environmental Services – Waterworks & Environmental Assets, and By-law Enforcement.

Finance Department has been consulted in the preparation of this report.

RECOMMENDED BY:

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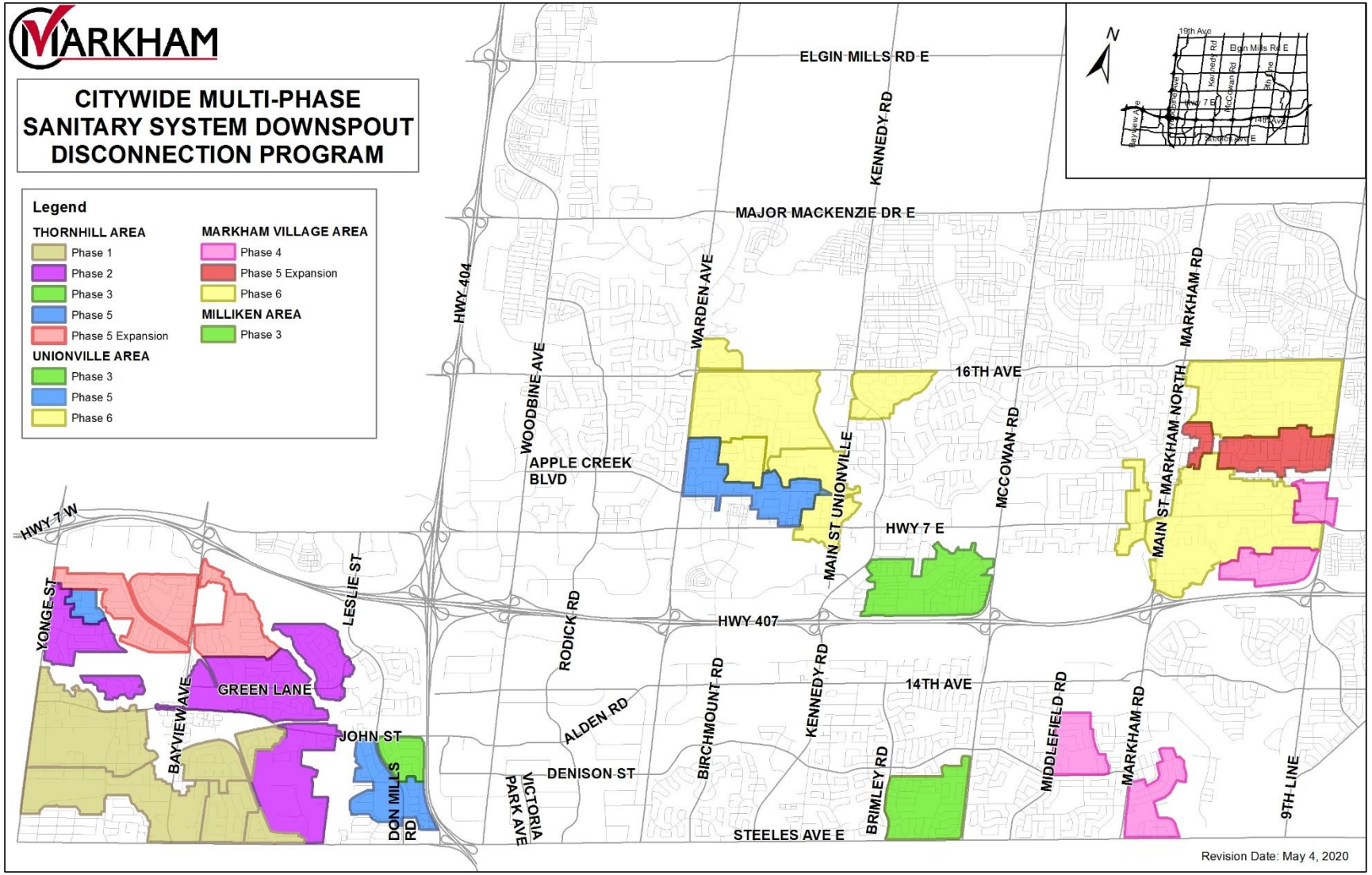
Phoebe Fu, M.Eng., P.Eng., PMP
Director, Environmental Services

Brenda J. Librecz, Commissioner
Community & Fire Services

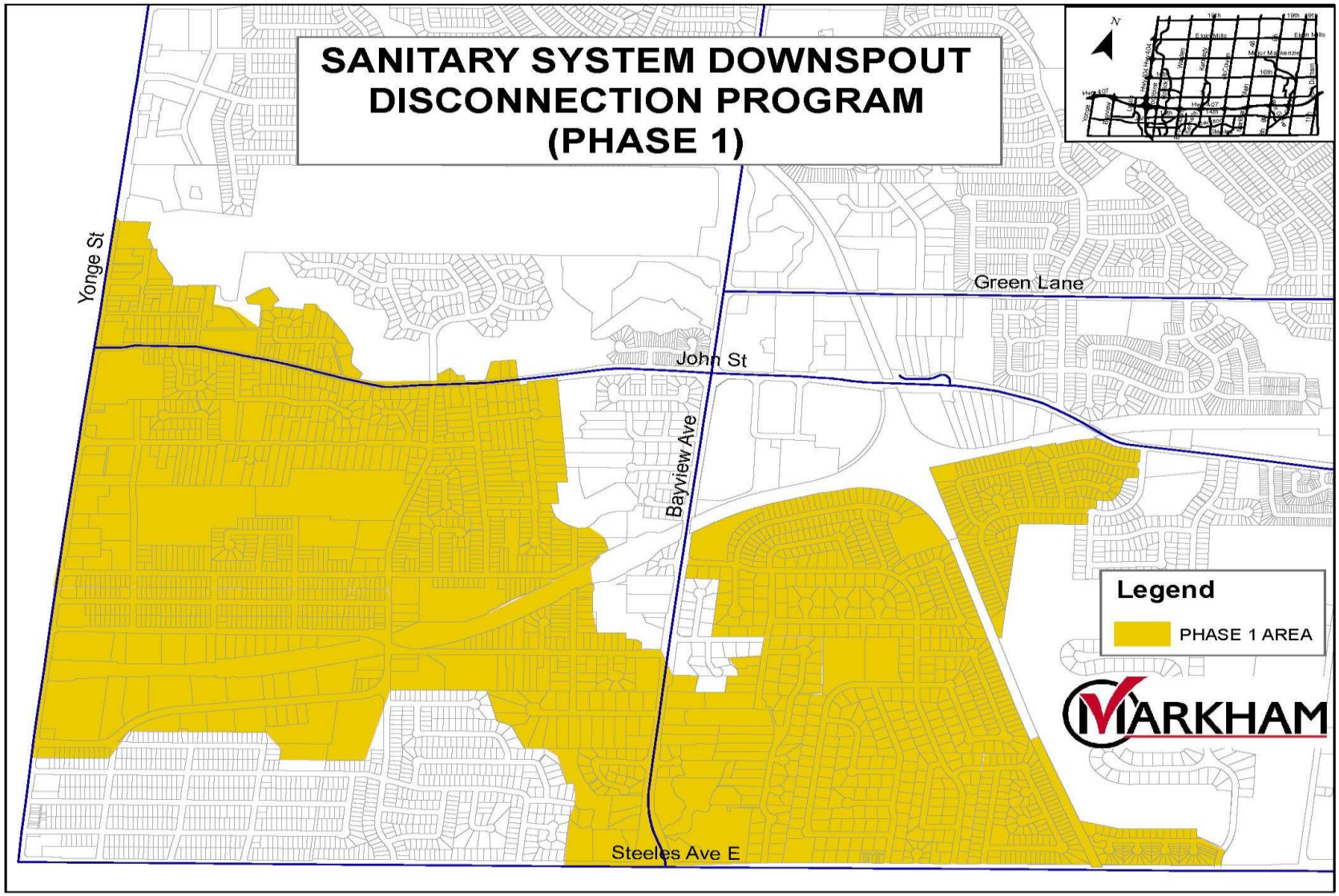
ATTACHMENTS:

Attachment "A" – Citywide Multi-phase Sanitary System Downspout Disconnection Program Areas
Attachment "B" – Phase 1 Area
Attachment "C" – Phase 2 Area
Attachment "D" – Phase 3 Area
Attachment "E" – Phase 4 Area
Attachment "F" – Phase 5 Area
Attachment "G" – Phase 6 Area
Attachment "H" – Financial Breakdown for Each Phase

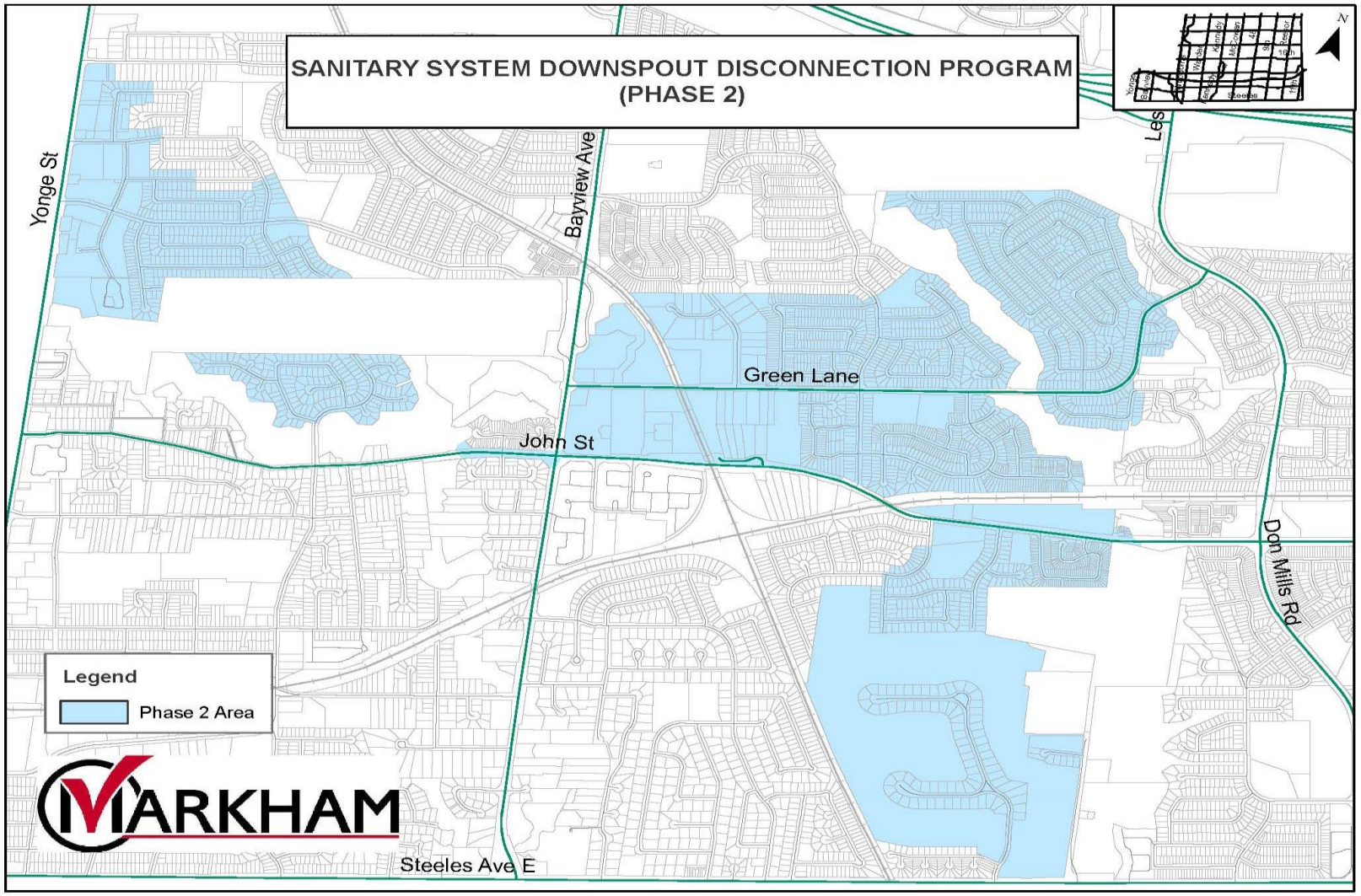
ATTACHMENT A



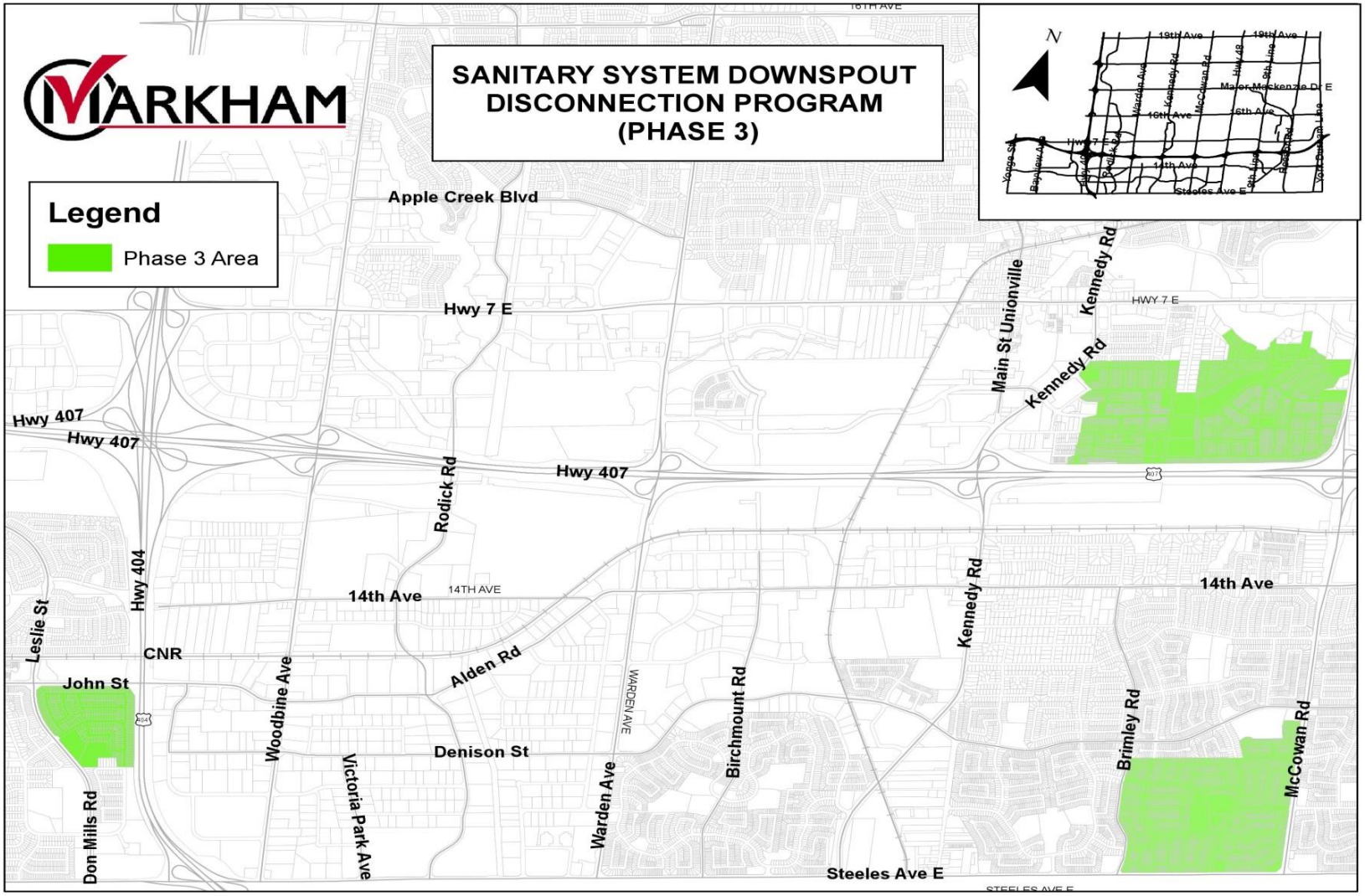
ATTACHMENT B



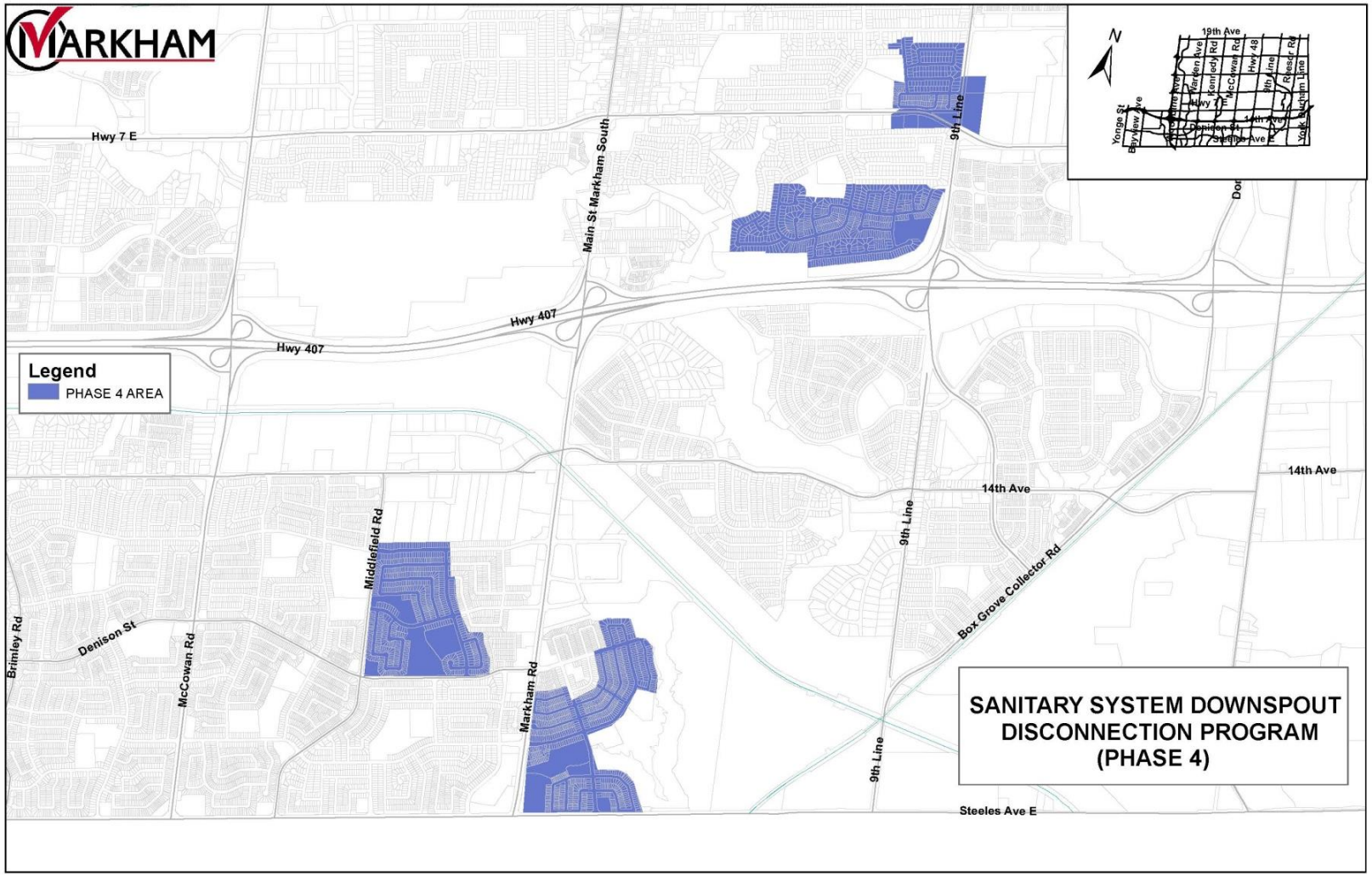
ATTACHMENT C



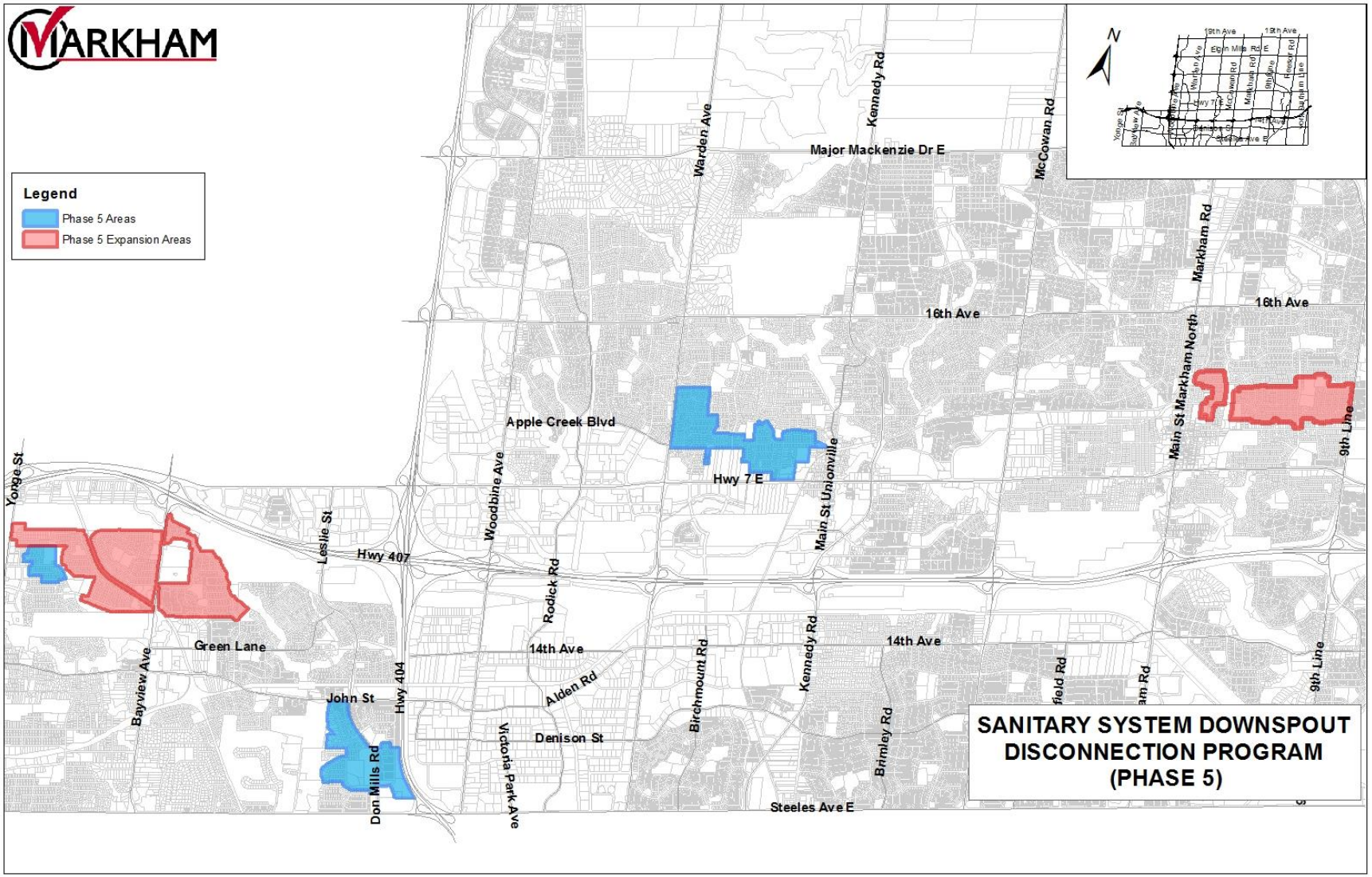
ATTACHMENT D



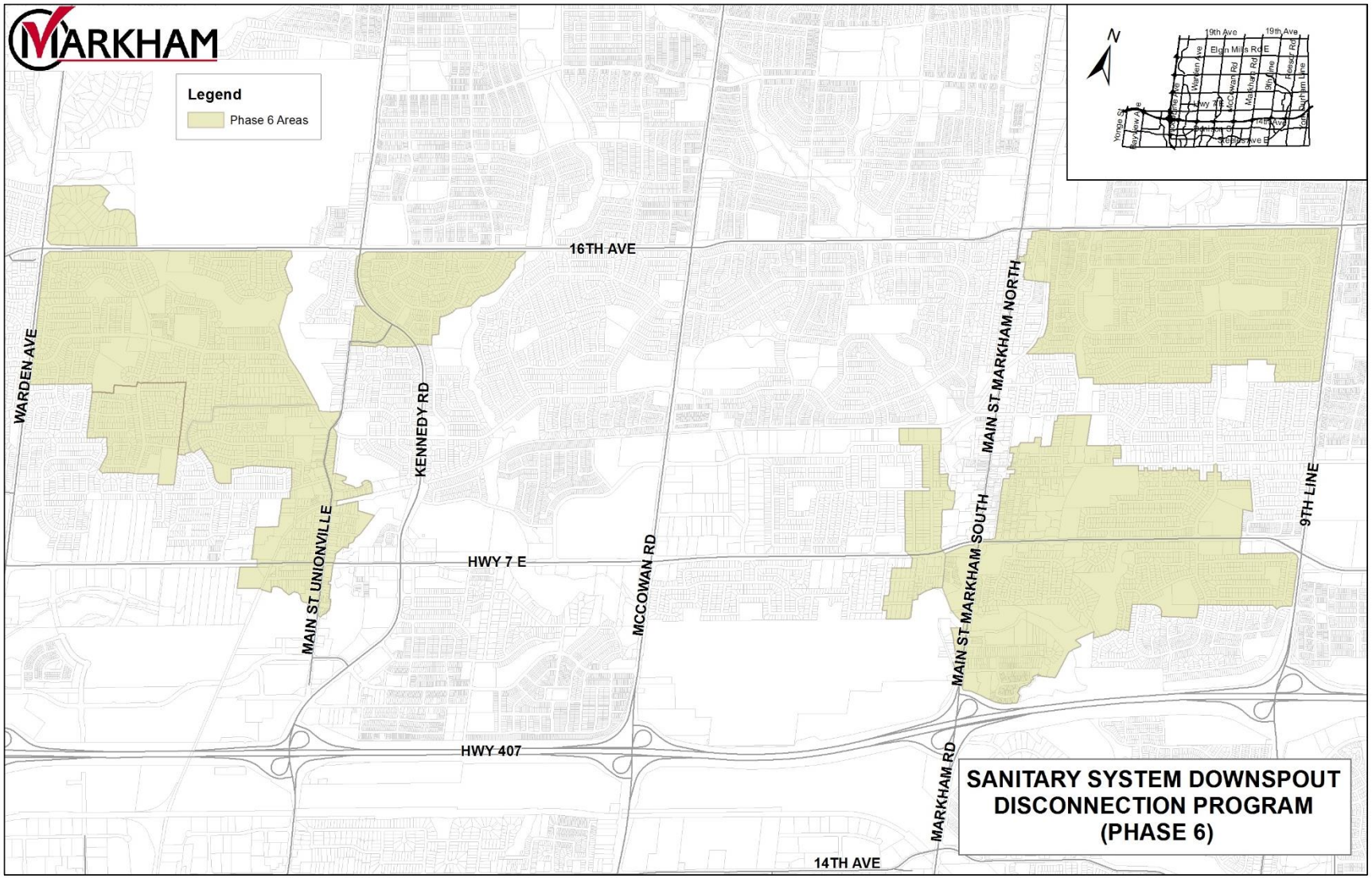
ATTACHMENT E



ATTACHMENT F



ATTACHMENT G



ATTACHMENT H

Financial Breakdown for Each Phase

Activities	Phase 1 (#11382)	Phase 2 (#14313)	Phase 3 (#15294)	Phase 4 (#16238)	Phase 5A (#17221)	Phase 5B (#17221)	Phase 6 (#18281)
	Thornhill	Thornhill	Thornhill, Unionville & Milliken	Markham	Thornhill & Unionville	Markham Village & Thornhill	Markham Village & Unionville
	Actual Expenditure (Account closed in 2015)	Actual Expenditure (Account closed in 2017)	Actual Expenditure (Account closed in 2018)	Actual Expenditure (Account closed in 2019)	Actual Projected Expenditure (Project expected to close by December 2020)	Actual Projected Expenditure (Project expected to close by December 2020)	Approved Budget
Public Communication and Education (A)	$824	$2,387	$845	$840	$996	$1,467	$3,045
Site Investigation (B)	$130,101	$252,272	$68,878	$65,752	$48,824	$84,904	$226,000
Financial Assistant Plan: Downspout Disconnection & Rain Barrel (C)	$0 (Covered under Phase 2)	$6,418 (Phase 1 Assistant - $2,509; Phase 2 Assistant - $3,909)	$685	$162	Estimated $9,000 (In Progress)	Estimated $9,000 (In Progress)	$20,590
Flow Monitoring Program (D)	$0 (Perform under Sanitary Flow Monitoring Project #14300)	$5,767	$0 (Perform under Flow Monitoring Program)	$0 (Perform under Flow Monitoring Program)	$0 (Perform under Flow Monitoring Program)	$0 (Perform under Flow Monitoring Program)	$0 (Perform under Flow Monitoring Program)
Total Expenditure (Incl. HST) (E) = (A) + (B) + (C) + (D)	$130,925	$266,844	$70,408	$66,754	$58,820	$95,371	$249,635
Total Budget (Incl. HST) (F)	**$130,925**	**$266,844**	**$70,408**	**$66,754**	**$75,120**	**$105,880**	**$249,635**
Remaining Budget (H) = (F) – (E)	-----	-----	-----	-----	$16,300	$10,509	-----
Amount Return to Source	**closed**	**closed**	**closed**	**closed**	**$16,300**	**$10,509**	**$0**