

Update on Lisgar District Basement Water Infiltration Investigation

City of Mississauga

June 17, 2014

Presentation Outline

1. *Purpose / Overview of Presentation*
2. *Background*
3. *Recap of where we were as of April 2013*
4. *Scope of Additional Work by Consultant*
5. *Supplemental Work by City Forces*
6. *Preliminary findings*
7. *Future Work / Next Steps*
8. *Other Matters*
9. *Status of Claims*
10. *Questions & Answers*

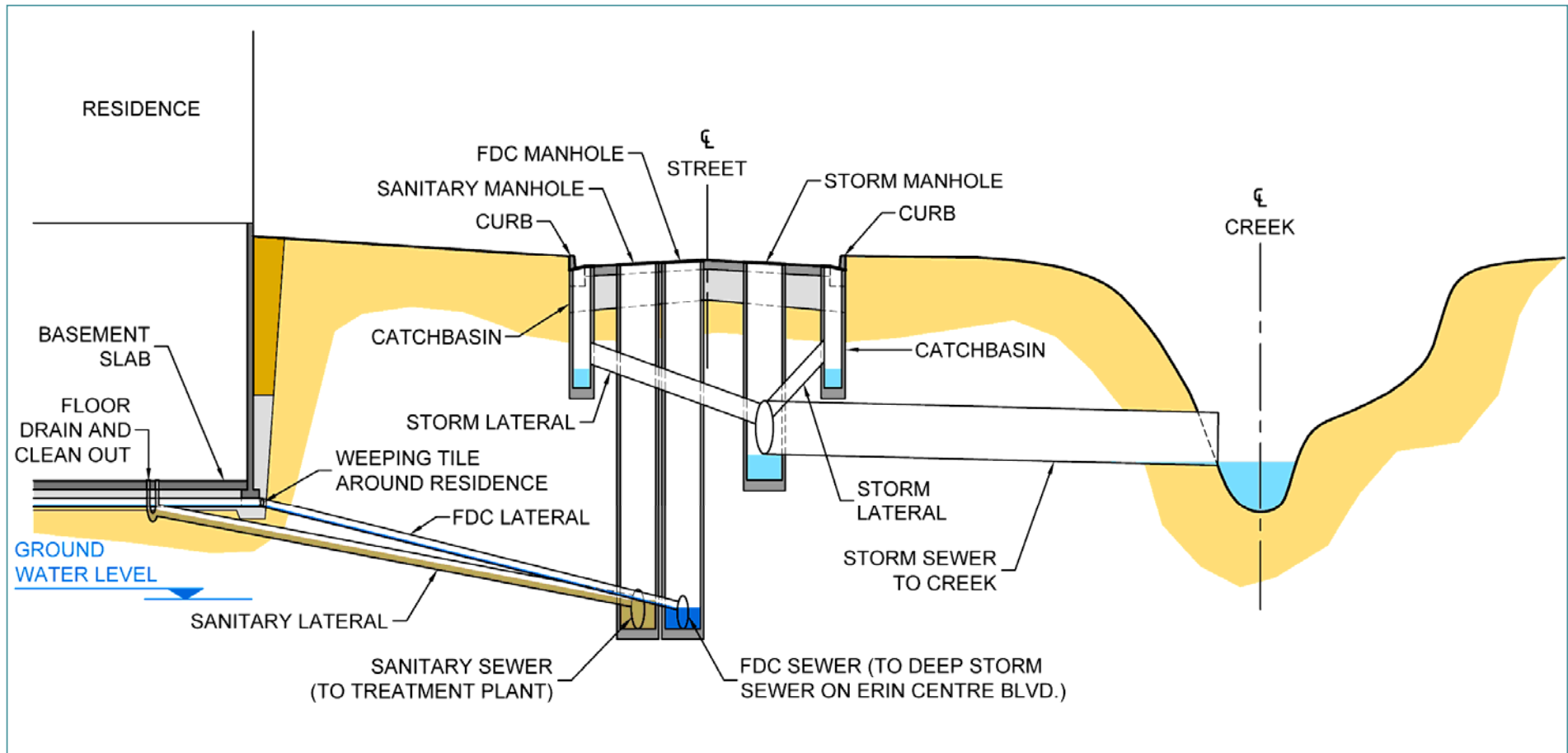
1. Purpose / Overview of Presentation

- Provide public with a status update
- Inform parties of balance of work to completion of study/investigation

2. Background

- Lisgar District experienced basement water infiltration on several occasions over late 2000's with 187 homes reportedly affected (in total) over this period
- City initiated a comprehensive study / investigation of causes (retained AMEC Environment & Infrastructure)
- City advanced a variety of proactive measures (primarily maintenance focused)
- Class Action suit underway; City's Risk Management group engaged
- Two Public Meetings to-date:
 - *December 2011*
 - *April 2013*

Three-pipe System in Lisgar



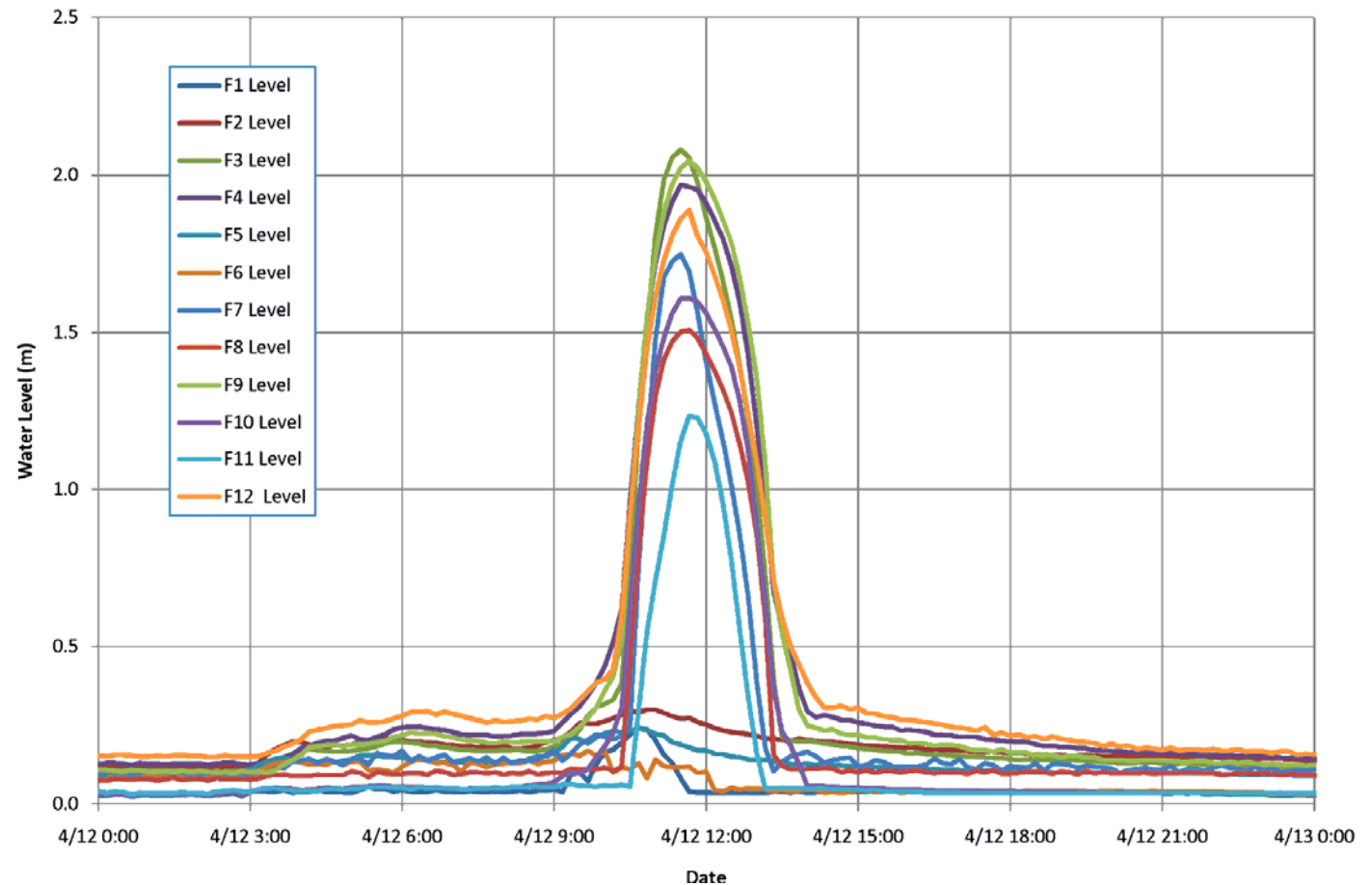


3. Recap of Where we were as of April 2013

- Public Meeting with residents April 16, 2013
 - *Opportunity for City staff and AMEC to describe the activities over 2012 and associated findings*
 - *Opportunity for residents to query City Staff and AMEC*
 - *Provided outline of planned activities over 2013*
- Offered outline of some of the speculated changes since initial development of Lisgar Community
 - *Climate*
 - *Groundwater levels*
 - *Development*
 - *Changes to homes (walkouts / drainage connections)*
 - *Aging basements/infrastructure*
 - *Lot grading*

■ Key Findings

- *Surface water reaching FDC system quicker and in greater amounts than would be expected*

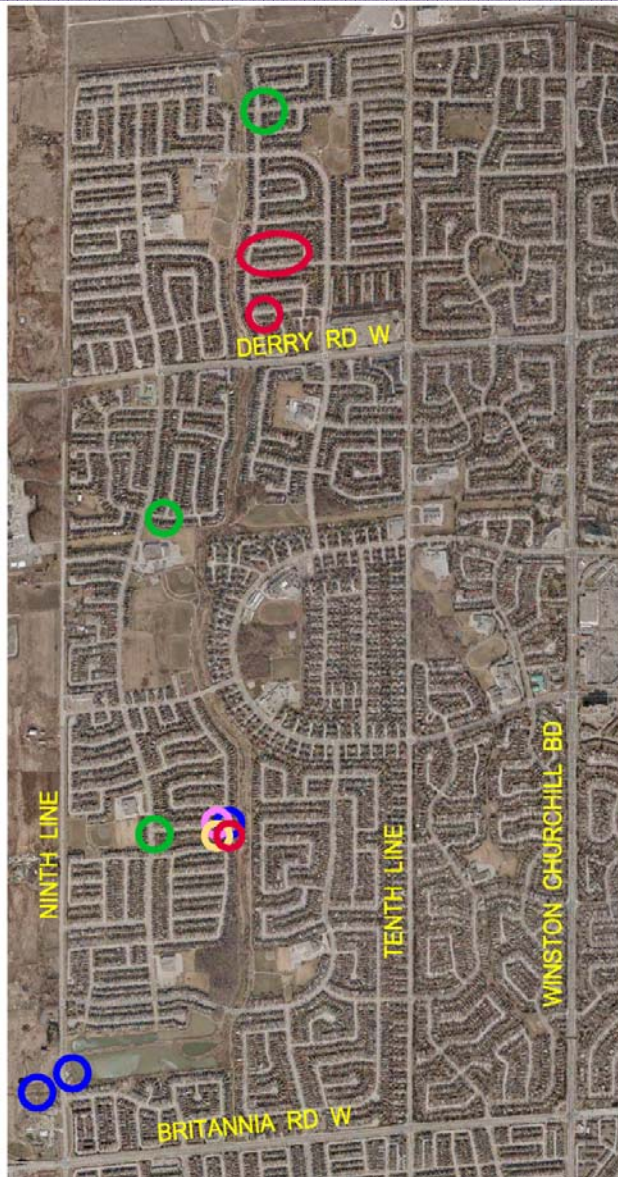


■ What we knew in April 2013

Possible Cause / Factor	Level of Influence – April 2013
Groundwater	Low/Not Applicable
GO Station	Low/Not Applicable
Sanitary System	Low/Not Applicable
Cross-Connections	Low/Not Applicable
Creek Backwater	Further Assessment Required as part of Phase 2
Osprey Marsh Pond (SWM) Backwater	
FDC Inflow/Infiltration	
FDC Hydraulics	
FDC Tailwater	
FDC Depths	
Lot Grading	
Basement Construction/ Changes	
Stormwater to Utility Trench	

4. Scope of Additional Work by Consultant

- Second phase of investigation over 2013 focused on data collection to answer outstanding questions; scope of work included:
 - *Additional monitoring*
 - *FDC, Storm Sewer, Groundwater*
 - *Storm sewer leakage tests*
 - *Other*
 - *Review sanitary sewer data*
 - *CCTV video*
 - *Chemical analyses (water typing)*



■ Additional Monitoring

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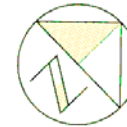
ADDITIONAL AND
RELOCATED FDC
MONITORING GAUGES



ADDITIONAL STORM
SEWER MONITORING
GAUGES



STORM SEWER
LEAKAGE TEST
LOCATIONS



ADDITIONAL SURFACE
WATER MONITORING
GAUGES



ADDITIONAL
GROUNDWATER
MONITORING GAUGES

- Storm Sewer Leakage Tests



- Review of Sanitary Sewer data, CCTV video, Chemical analyses



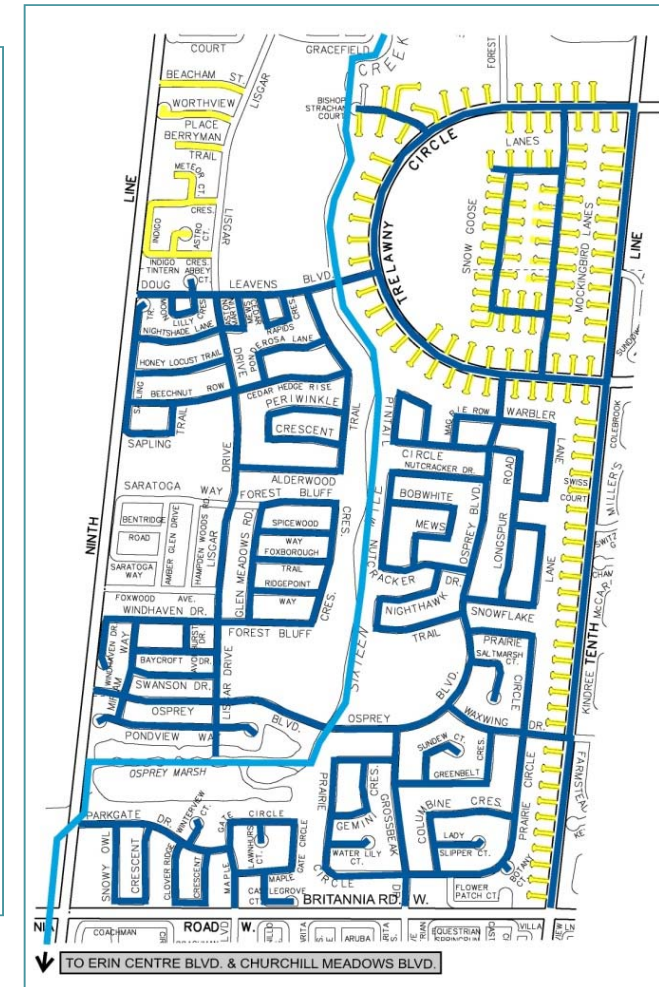
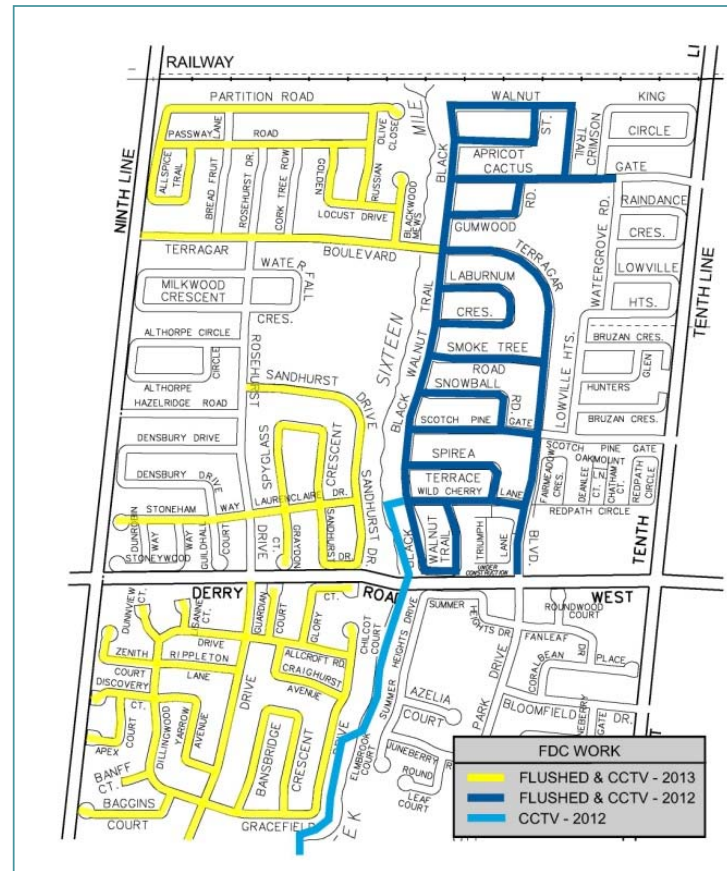
- minor
- not widespread
- City is addressing on an on-going basis

5. Supplemental Work by City Forces

- FDC System
- High Water Protocol
- Maintenance and Inspection
- Support for Consultant-led activities

■ FDC system

- Continued smoke testing of FDC system to identify any remaining cross-connections
- Repairs to address identified leakage/infiltration points within FDC system
- CCTV (video inspection) and flushing of large sections of FDC system where required



- High water protocol (HWP)
 - *Ongoing monitoring of weather conditions and storm events; pumps on standby*
 - *On site for February 20-21, 2014 rain event (no surcharging occurred)*
 - *On site for June 11-12, 2014 rain event (surcharging occurred)*



■ Maintenance and inspection

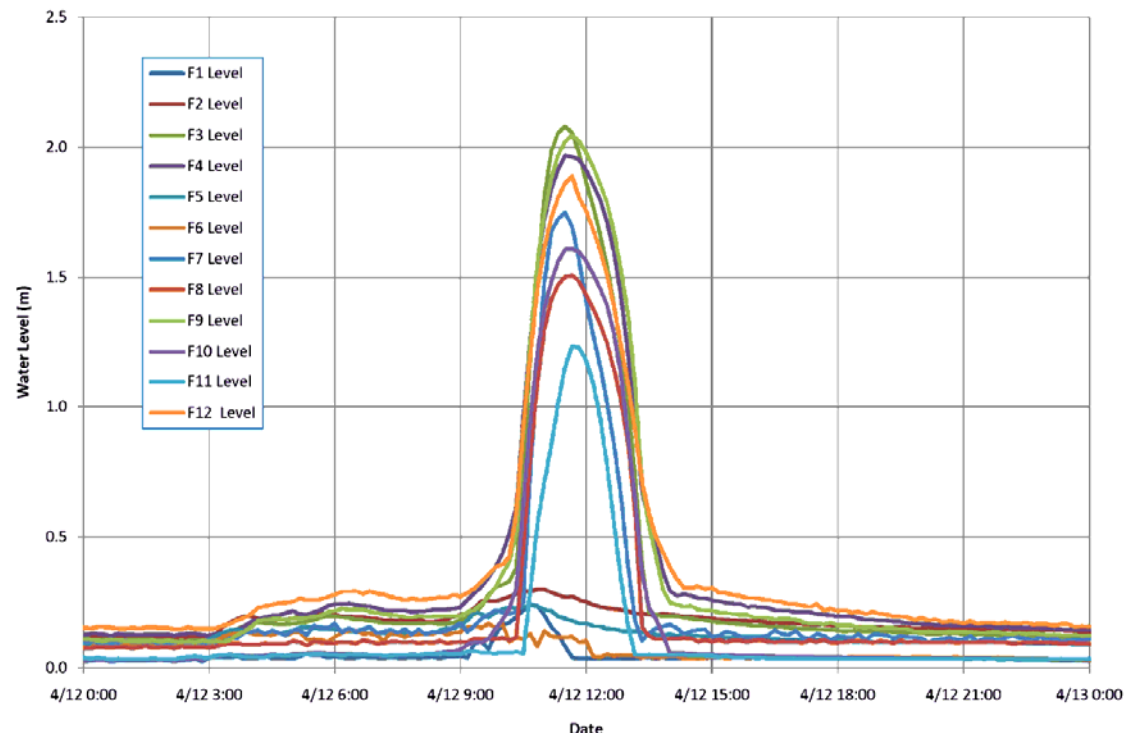
- *Dredged creek crossings at Doug Leavens Boulevard, Osprey Boulevard, and Alderwood Trail*
- *Continued to monitor creek and Osprey Marsh pond to identify any maintenance needs and assess work completed to-date*
- *Lined select storm outlet channels with Armourstone and removed sediment*



- Support for Consultant-led activities
 - *Storm sewer leakage tests*
 - *Creek water level monitoring (equipment and channel maintenance)*
 - *Installation of FDC monitoring gauges in deep sewer locations*

6. Preliminary Findings

- 2013 Monitoring showed:
 - *FDC system surcharge continues*
 - *Downstream FDC capacity may affect upstream system performance*
 - *FDC outlets to a storm sewer which surcharges*
 - *Osprey Marsh SWM facility water levels show no definitive connection to FDC levels (limited 2013 data though)*
 - *No connection to sanitary system's performance*



- Further, 2013 Program showed:
 - *Storm sewer system clearly leaks into FDC system (utility trench)*
 - *Some FDC laterals flow continuously albeit this is minor (based on CCTV); City actively addressing these*
 - *Chemical testing confirms FDC water as being very similar to samples taken from storm sewer utility trench, the creek, and the Osprey Marsh SWM Facility (and dissimilar to groundwater samples)*

- What we know now (May 2014):
 - *Based on 2012 data:*
 - Groundwater
 - GO Station
 - Sanitary system
 - Cross-connections*generally discounted as Not Applicable (N/A) or of Low influence.*
 - *2013 Program definitively validated no relationship to sanitary system and cross connections; too few to be of significance*

- What we know now (May 2014):
 - 2013 Program proved/validated:
 - stormwater is leaking from storm sewers and rapidly moving to utility trenches and FDC; impact could range from a **contributing** to **primary** factor
 - surcharging in FDC is widespread and not generally concentrated in one location (also varies by storm)

- What we know now (May 2014):
 - 2013 Program raised questions about FDC Hydraulics:
 - capacity of trunk FDC; due to flat nature of pipe system, impact could be far reaching
 - influence of FDC outlet on system capacity (i.e. storm sewer surcharges) could impact upstream areas
 - Over the course of 2013, additional review and consultation with City staff resulted in new factors being added into the mix as potential causes:
 - FDC Maintenance (closed system hence clean outs not expected)
 - Creek Maintenance (outlets and creek cleaned; lands regulated by Conservation Halton)
 - FDC Design (detailed information on design standards to be assessed)
 - FDC Construction (limited data)
 - Basement Walkouts (potential to capture and contribute drainage to FDC)

- What we still don't know:
 - *Hydraulics of FDC:*
 - *model to validate*
 - *Effectiveness of pumping*
 - *model to validate*
 - *Aggregate influence of various inflows:*
 - *storm sewer leakage*
 - *basement walkouts*
 - *Definitive influence of creek and stormwater management facility backwater:*
 - *limited data thus far*
 - *field test to validate*

6. Summary of Preliminary Findings

New Factor	Possible Cause / Factor	Level of Influence		Notes
		April 2013	May 2014	
	Groundwater	Low/Not Applicable	Low	
	GO Station	Low/Not Applicable	Not Applicable	
	Sanitary System	Low/Not Applicable	Not Applicable	
	Cross-Connections	Low/Not Applicable	Low	Known cross-connections repaired
	Creek Backwater	Further Assessment Completed as part of Phase 2	Low to Contributing	Additional field monitoring in 2014
	Osprey Marsh Pond (SWM) Backwater		Low to Contributing	Additional field monitoring in 2014
	FDC Inflow/Infiltration		Low	
	FDC Hydraulics		Assessment and Analysis Underway (Phase 3)	
	FDC Tailwater			
	FDC Depths			
	Lot Grading			
	Basement Construction/ Changes			
	Stormwater to Utility Trench		Contributing to Primary	Validated by 2013 storm sewer leakage tests
✓	FDC Maintenance	These items were not originally identified at the April 2013 public meeting and have been subsequently considered based on follow-up analysis and assessment (some have yet to be analyzed). This will be completed as part of Phase 3.	Low	FDC system flushed since study start-up; FDC systems are closed, hence would typically only require nominal maintenance
✓	Creek Maintenance		Not Applicable to Low	Lands regulated by Conservation Halton; work needs to balance ecological impacts. City forces have cleared creek (sediment / vegetation) since study start-up
✓	FDC Design		Assessment and Analysis Underway (Phase 3)	
✓	FDC Construction			
✓	Basement Walkouts			

7. Future Work / Next steps

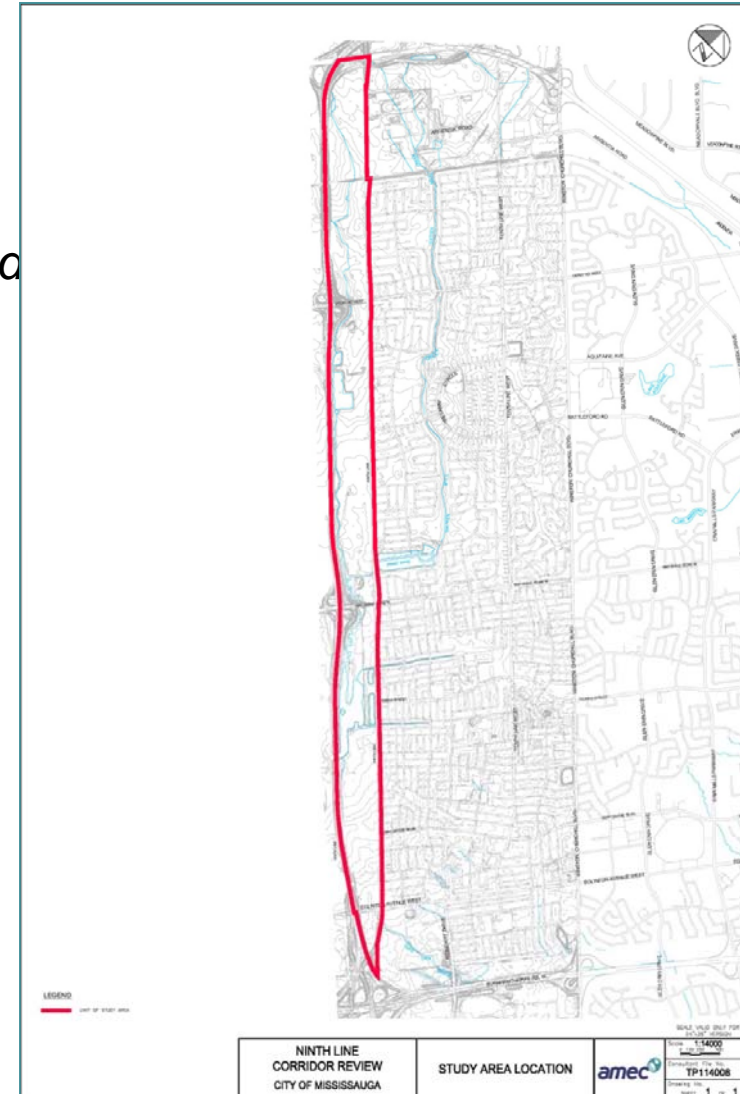
- Phase 3 (Final) of Investigation
 - *Focus on remaining unknowns*
 - *More analytically based (modelling); some supplemental monitoring*
 - *Prepare final documentation, and provide City direction for remediation*
- Corporate Report proposed early 2015
- Public Report will be available also early 2015

8. Other Matters

- Local Area Development Applications (Infills)
 - *City is reviewing each with specific objective to ensure no negative impacts from development*
 - *No connection proposed to FDC; local foundation drainage via sump pumps; additional surface runoff managed via Low Impact Development (LID) Best Management Practices (BMPs)*

■ Ninth Line Lands Study

- *City has initiated a study of the Ninth Line lands, west of Ninth Line to Highway 407*
- *The purpose of that study is to establish preferred land use for this corridor, along with general management strategies*



■ Ninth Line Lands Study

- *The Ninth Line Lands Study will need to meet the provisions of the Planning Act and Environmental Assessment Act, specific to mitigation and management of impacts*
- *The Ninth Line Lands are on a separate downstream tributary from the Lisgar District*
- *any development of these lands would not be expected to influence the current risk of basement water infiltration in the Lisgar Area; however the respective studies will inform each other in terms of technical outcomes and management considerations*



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LISGAR STUDY AREA

NINTH LINE STUDY AREA



9. Status of Claim

■ Damage Claims Filed with the City

- *The City is aware of approximately 187 incidents in the Lisgar Area between 2008 and January 2013; this represents approximately 165 homes that were impacted on one or more occasion; or approximately 2% of all homes in the Lisgar Area*
- *Many have submitted a claim with the City's Risk Management Section seeking compensation for damages*
- *In addition, a Class Action lawsuit has been commenced seeking damages in the amount of **\$200 million** on behalf of all residents in the Lisgar Area*

■ Damage Claims Filed with the City

- *Like other municipalities, the City's insurance program does not allow the City to pay any compensation without **evidence of negligence** on behalf of the City*
- *To date, we have not received any evidence of negligence*
- *Unless the legal test for liability against the City is met, there is no justification for paying out any claims associated with the basement water infiltration in this area.*
- *If our continued efforts to find the causes uncover proof of negligence, the City will then be able to address all reported damage claims*

10. Questions and Answers