Emergency Repair
Coxwell Sanitary Trunk Sewer
(CSTS)

Presentation to

Public Works and Infrastructure Committee

January 6, 2009

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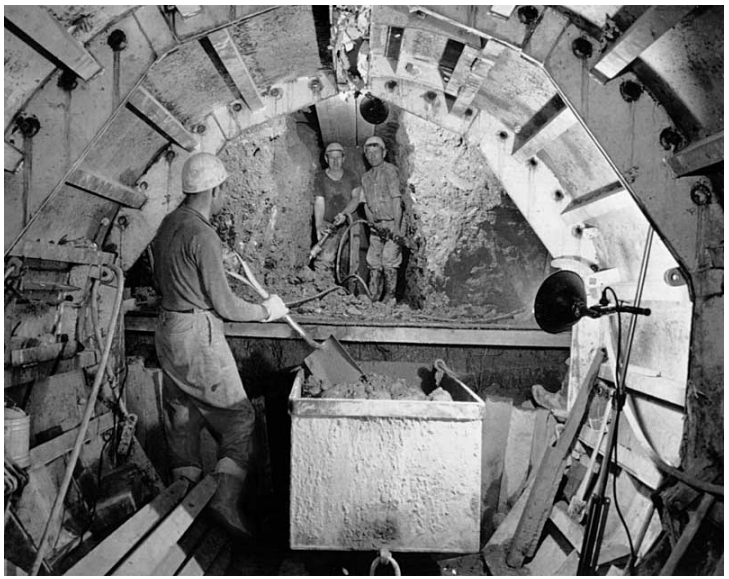
Background

- September 2006, Council approved the start of an Environmental Assessment (EA) of Don and Waterfront Trunk Sewers and Combined Sewer Overflow Control Strategy to improve water quality along the waterfront beaches and clean up the Inner Harbour and Lower Don River.

- After competitive proposal call, the consulting team began work in July 2008, on the EA including assessment of Coxwell Sanitary Trunk Sewer (CSTS).

Background (cont'd.)

- CSTS built in the 1950s; services 750,000 residents; conveys 400 million litres of wastewater flows per day to Ashbridges Bay Treatment Plant.
- CSTS is the most critical trunk sewer section in the City.
- 4.8 kilometres in length and runs from approximately O'Connor Drive to the Ashbridges Bay Treatment Plant.
- 2.7 metre diameter, 56 centimetres thick concrete pipe wall, hand dug in the late 1950s to depths reaching 40 metres, maintenance hole spacing extending to distances of 1.5 km, well over today's design standards.
- Dry weather flows estimated at 6 cubic metres per second – three times the Don River's dry weather flow.



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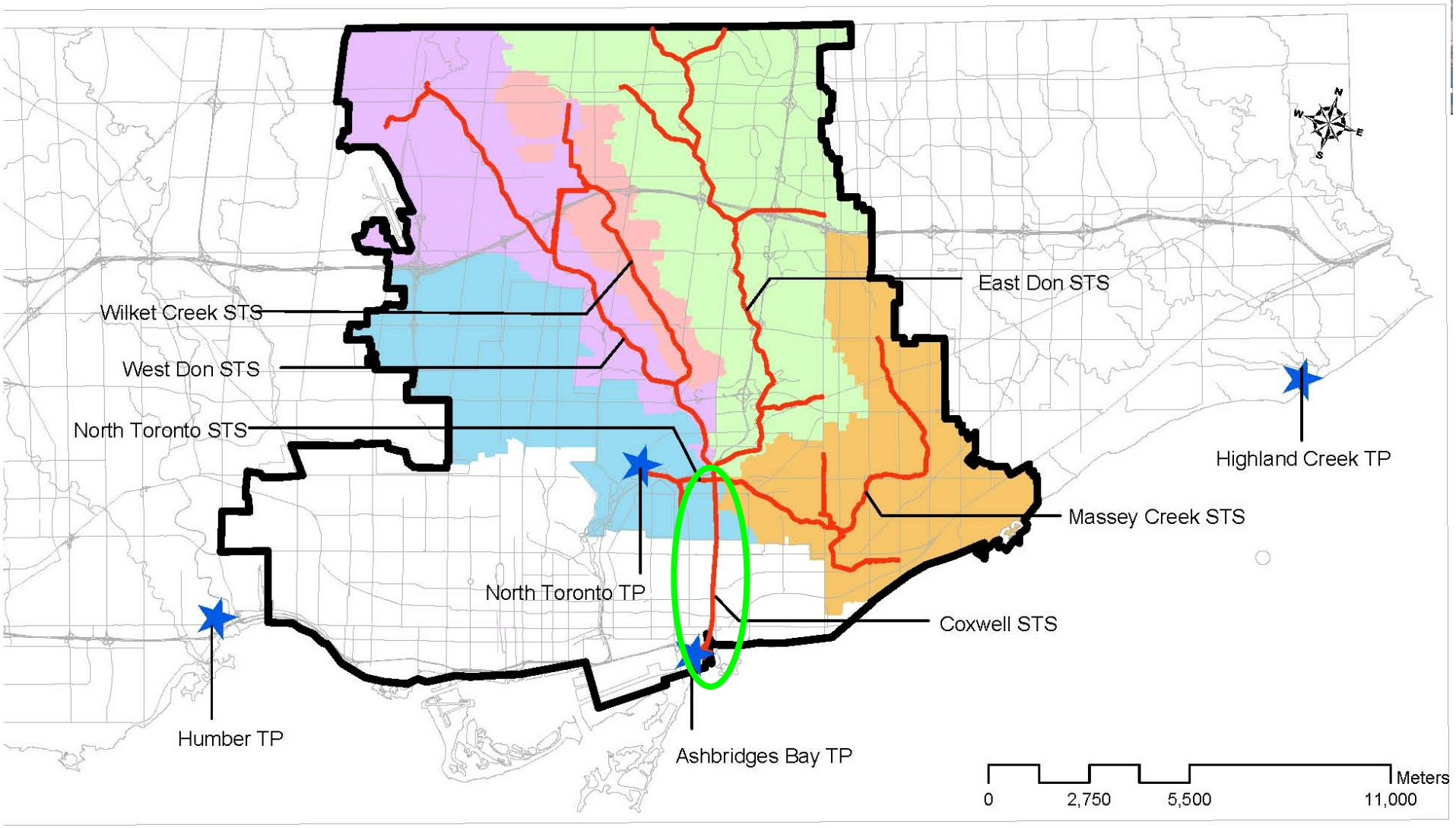
Sewershed Areas



Sewershed Area Served by:

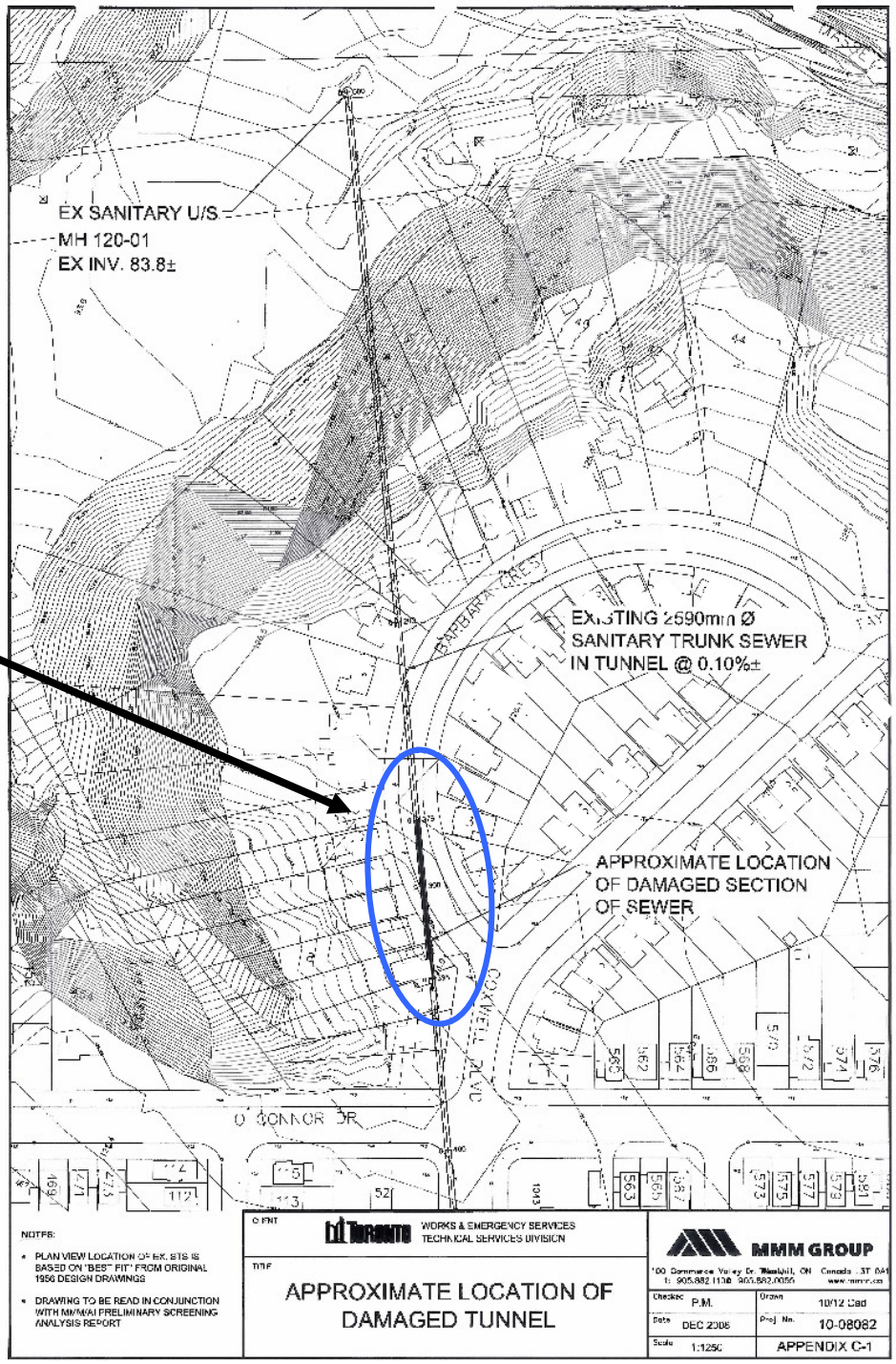
- Massey Creek STS
- North Toronto STS
- East Don STS
- Wilket Creek STS
- West Don STS

- Treatment Plant
- Sanitary / Combined Trunk
- Study Area boundary

Background (cont'd.)

- During the EA condition assessment it was discovered that approximately 60 meters (200 feet) of the trunk sewer is damaged.
- It is unknown how long the pipe has been damaged.
- Location of damage: north of Coxwell Avenue and O'Connor Drive.
- The sewer is working as it should with no backups or flow restrictions.
- Given trunk sewer's depth, long maintenance hole spacing and high flow velocities, detailed inspections and condition assessments have not been possible.
- CSTS has no redundancy to allow for re-routing of flows in the event of an emergency, such as a significant blockage or collapse of the sewer.
- There is potential for a blockage to develop should there be further deterioration or a collapse of the sewer.

Location of damaged trunk



Trunk Sewer Damage

CCTV images, as part of EA process, when problem was first identified, October 2008.

Trunk Sewer Damage

New robotic technology used showing cracks in sewer, November 2008.

Initial Actions

- Engineering consultant firm retained by the City on an emergency basis to assess feasibility, logistics, cost and timelines associated with:

  (i) completing an investigation into the damaged section of the sewer;

  (ii) development and implementing an emergency response; and

  (iii) developing a permanent repair or diversion for the damaged section and preliminary geotechnical assessment of subsurface conditions.

- Regulatory agencies informed including: Ministry of Environment, Toronto and Region Conservation Authority, Ministry of Natural Resources and Department of Fisheries and Oceans and communication is ongoing.

Findings & Recommendations

- Preliminary screening analysis by consultants of damaged section recommends further testing be conducted.
- Recommendations include:
  - settlement monitoring and geotechnical investigation
  - site inspection to assess ground settlement and measure/observe changes at the site that might reflect deterioration of the sewer or ground loss into the sewer
  - field work (borehole drilling)
  - Preliminary Geotechnical Design Report that will include design parameters and construction methods.

Steps Taken to Date

Toronto Water has undertaken the following:

- daily monitoring of the sewer flow rates upstream and downstream of the affected section of the damaged sewer for blockages
- surveying of the ground surface in the general area above the sewer to determine if any ground surface settlement is occurring
- meeting held on December 31, 2008 of the City's Control Group in accordance with the provisions of the Chapter 59, Emergency Planning, Municipal Code
- purpose of Control Group meeting was to give authority for any indemnity agreements; coordinate contingency planning; and provide notification to Councillors and affected homeowers of the status of the CSTS
- GM of Toronto Water met individually on Friday, January 2 with homeowners located closest to the damaged section and a letter has been delivered to other residents in the vicinity.

Steps Taken to Date (cont'd.)

- **Emergency sole-source Purchase Orders (PO) in the total of $657,680.00 have been issued to obtain professional engineering and legal services:**
  - MMM Consulting Engineer: $400,000 to develop mitigation and repair procedures
  - Andrews Infrastructure: $9,680 to determine the extent and severity of the distressed section of the CSTS
  - D.M. Robichaud Associated Ltd.: $148,000 to use a robotic crawler equipped with sonar, video and laser to complete the CSTS inspection work; and
  - Borden Ladner Gervais LLP: $100,000 to provide external legal assistance in connection with remedial work.

- **Additional Emergency POs in process of being issued:**
  - Sole-source PO for $350,000 to provide implementation of an emergency settlement site monitoring program related to the damaged portion of the CSTS; and
  - Sole-source PO for $500,000 to provide emergency geotechnical engineering services regarding an investigation of subsurface conditions relating to proposed alignments of a permanent relief sewer to CSTS.

Proposed Bypass

Recommendations

- To begin emergency work as expeditiously as possible, it is recommended the General Manager of Toronto Water be given authority to retain various professional and engineering consultants either a sole source basis, or by other means of procurement.
- Toronto Water's 2009 Capital Budget and 2010-2013 Capital Plan be increased by up to $30 million requiring a cash flow of $10 million in 2009 and $20 million in 2010 to be funded from the Wastewater Capital Reserve fund.