



**HIGHWAY 417 WEST A
EMERGENCY WATERMAIN REPAIR**

Presented by
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THE BREAK – NOVEMBER 14, 2024



THE RESPONSE TEAM



City DWS	Design & Construction Municipal
Asset Management	Inspections



THE LOCATION: HWY 417 BETWEEN FAIRMONT AND BAYSWATER



SITE MEETING - NOV 15, 2025



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THE BREAK SITE



Nov 16 2025 4:06 PM
 45° 24' 33" N, 75° 43' 01" W
 133B Young St
 Ottawa ON K1Y 3P8
 Canada
 85 Water breakdown

- MTO installing noise wall along HWY417
- Damage to 5 Properties (basement water damage and mud in backyards)
- DWS isolated the 1220WM to stop the leak
- MTO Dewatering the break site



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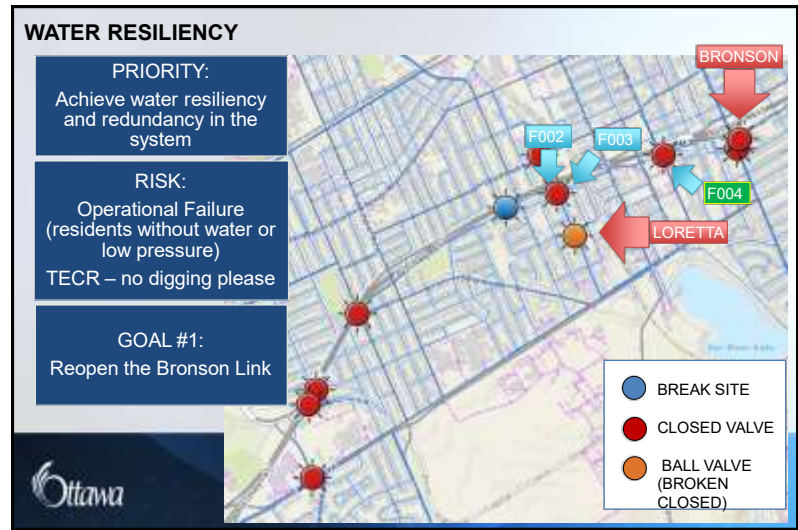
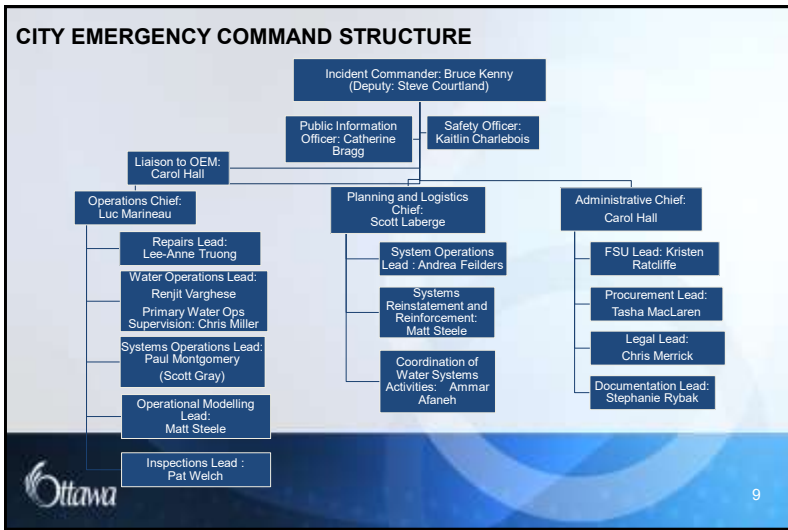
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WM RESILIENCY – CLOSE VALVE F004

- Valve F004 - Seized Valve, rusted gear box
- Located on the Highway side slope of Orangeville Street, where MTO is staged



EXERCISE AND WATERJET VALVE F004 TO GET A GOOD SHUT


Move KDMP's material out of the way.
Coordinate with MTO to work on this site.

➔

Build a ramp to fit DWS hydraulic valve turning truck

➔

Control up to 100L/s of discharge to prevent water from entering the break site.





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WATERMAIN REPAIR

EXPLORATORY INVESTIGATIONS

- MTO Hydrovaced and exposed the WM
- Obtained MTO Data including Geotech info, vibration monitors, noise wall post locations
- Completed additional boreholes

Break located by MTO Contractor Nov 20, 2025



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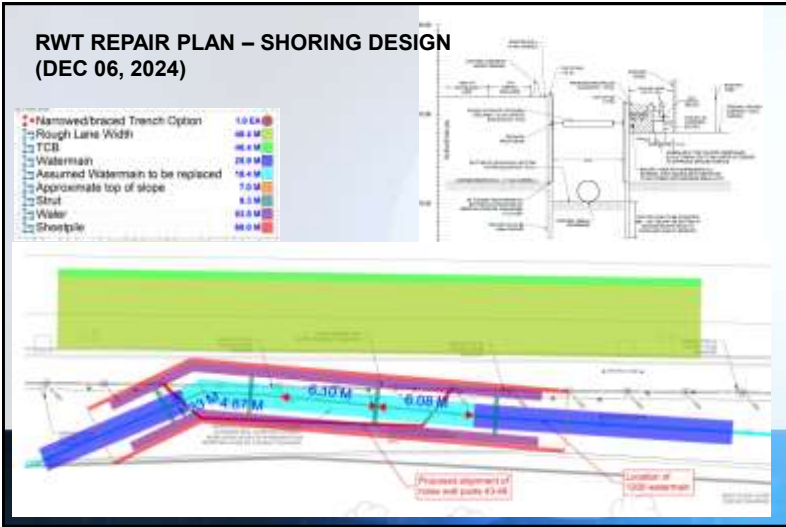
BREAK LOCATION – INITIAL FINDINGS



WATERMAIN REPAIR – OPEN CUT

REPAIR PLAN	RISKS
Location – challenging, between 417 and private properties with a steep side slope MTO Approvals Required <ul style="list-style-type: none"> • Traffic Staging Plans • Site Access Plans • ATMS Cable conflict / Utility Coordination • Design Approval • Encroachment Permit Health and Safety / MOL MTO Site Hand over	<ul style="list-style-type: none"> • Location of WM bend West of break location not certain • Damage to adjacent properties • Shoring (sheet piles) near the WM • Undermining HWY417 • Work site on HWY 417





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REPAIR PLAN – CAN WE LINE THIS PIPE?

What about lining?
Avoid all risks associated with Open Cut?

Ottawa

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REPAIR PLAN: CFRP LINING

- V-Wrap [®] Carbon Fiber Reinforced Polymer System
- Structural strengthening system for the restoration of damaged/weakened pressure pipe.
- Restores full function capacity of pressure pipe
- Overall system thickness reduces the pipe inside diameter only slightly (.25" to .75").
- Polymer finish coat surface resistance mitigates any loss in pumping head.
- Corrosion resistance provides long service life.
- Fits both straight and curved pipe sections.
- Requires no excavation as all repairs can be made with access via existing manhole points.



REPAIR PLAN: WHAT'S NEEDED FOR LINING?

Confirm Access Locations



Confirm Environmental Control Locations



Confirm Double Shut was possible



Dewater the Pipe



TOMLINSON EMERGENCY RESPONSE

- Mobilized quickly to respond with dewatering services in winter conditions.
- Significant dewatering setup with numerous pumps setup along the line to continuously dewater the watermain
- Found all the access chambers and hatches. Excavated valve access chamber that was buried.
- Helped find water diversion paths to determine valve shut locations.
- Prepared risk assessment for entry and excavation.
- Analyzed options for excavation and shoring to access the break.
- Quick turnaround on shoring design.
- Maintained all safe working site conditions, traffic control and public protection.



REPAIR PLAN: HEALTH AND SAFETY

- Brought Pullman on board for manned entry and Pure Technologies for pipe assessment.
- Valve chambers investigated and cleaned, double shut valves were required prior to manned access to the WM.
- Worked with Pullman to help develop the emergency rescue plan.
- Emergency rescue teams always at each manhole during confined space entries.



REPAIR PLAN: HEALTH AND SAFETY

- Communication always maintained during entries. Clean air supply and circulation setup.
- Maintained chlorination of all new parts and materials for work inside the pipe, including having all personnel entering in full hazmat suits and chlorination of all personal effects like hard hat and boots.
- No issues or incidents on the project.



THE RESPONSE TEAM



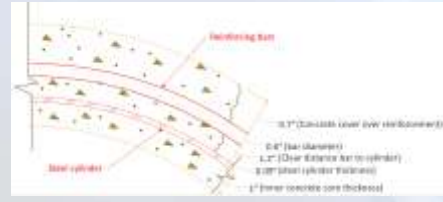
CFRP LINING PREP
Manned Inspection (Jan 15-24, 2025)

- Manned Inspection completed between Holland to Loretta
- Recommendation to repair four pipe
 - 2 at the break site
 - 1 showed longitudinal cracks
 - 1 showed concrete spalling
- Several anomalies along the pipe but these were recommended to be monitored



CFRP LINING PREP:
Identification of Pipe Properties

- Exposed a section of pipe located within a City Easement
- Remove concrete, exposed rebar
- Took Measurements



**CFRP LINING PREP:
WM Access Points**

- Required for manned entry, ventilation and rescue
- Bayswater IP030 was eventually located once the manned entry was completed and we confirmed dimensions to the IP

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CFRP LINING

SATURATING MACHINE

HOLE REPAIR

TERMINATION JOINT

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THE PIPES ARE FIXED!**COMMISSIONING**

- Started March 12, 2025
- Priority Loretta line: Back in service (Yellow and light Green)
 - DWS was able to force open the Ball Valve
 - Commissioned in time for Max Day
- Emergency status was lifted
- The saga is complete



THINGS WE DIDN'T TALK ABOUT BUT ALSO DID

Ordered gear boxes and installed them on three valves

Ordered parts to replace the broken ball valve on Loretta

Reviewed feasible locations for a stopple

Completed the quest to find Bayswater IP

Closed Holland Valve to minimize the western isolation limit

Set up many pumps and dewatered a lot of pipe

Blanked the by-pass at F001 / F002 / F003 Valves

Cleaned valves F001 and F002 – there was a lot of gunk on the valves

Internal inspection to ensure no rodents had entered the pipe during repairs

Developed a cleaning plan post CFRP to remove the sandblasting material

Completed a pipe inspection using Pure Technologies. Reviewed the feasibility of a PICA electromagnetic investigation

Kept residents, councillors and management informed.

THANKS TO THE PROJECT TEAM!

QUESTIONS?