

WELCOME

Environmental Assessment for Lower Rambo Creek Flood Mitigation

PUBLIC INFORMATION CENTER

May 27, 2025

Your comments are encouraged and appreciated, as this will provide us an opportunity to address project issues and concerns.

Aquafor Beech Limited

CITY OF Burlington

FIRST NATIONS LAND ACKNOWLEDGEMENT

Burlington as we know it today is rich in history and modern traditions of many First Nations and the Métis. From the Anishinaabeg to the Haudenosaunee, and the Métis – our lands spanning from Lake Ontario to the Niagara Escarpment are steeped in Indigenous history. The territory is mutually covered by the “Dish with One Spoon Wampum Belt Covenant”, an agreement between the Iroquois Confederacy, the Ojibway and other allied Nations to peaceably share and care for the resources around the Great Lakes.

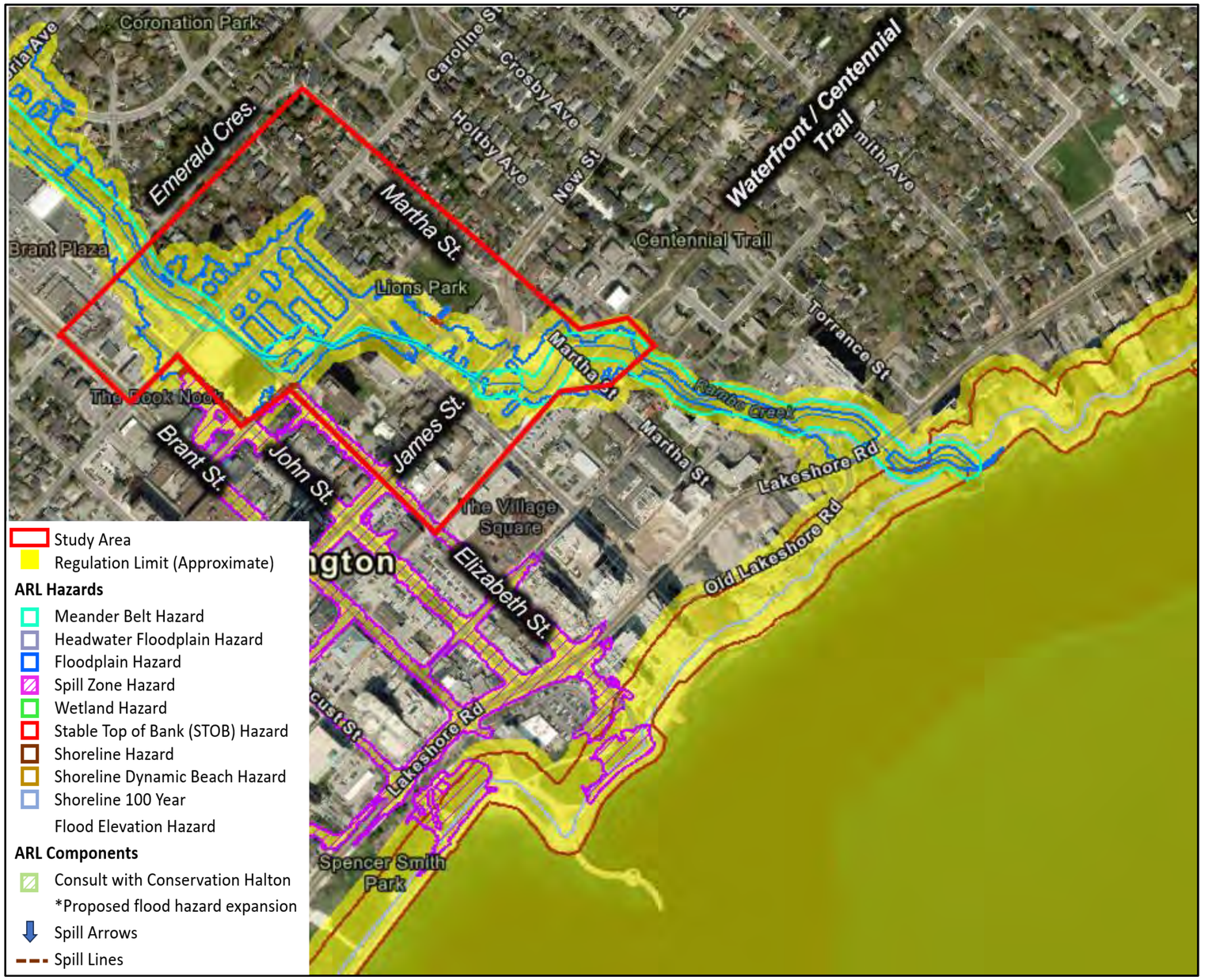
We would like to acknowledge that the land on which we gather is part of the Treaty Lands and Territory of the “Mississaugas of the Credit”.

STUDY AREA OVERVIEW

- The study encompasses a section of the Lower Rambo Creek in the City of Burlington's downtown core.

- Bounded by:
  - North – Emerald Crescent;
  - East – Martha Street;
  - South – Waterfront / Centennial Trail; and
  - West – John Street / Elizabeth Street.

- The area includes enclosed portions of the creek which experience significant riverine flooding beginning at Caroline Street.



Source: Conservation Halton Online Mapping

STUDY AREA IMAGES



Open Channel North of Caroline St. – Facing Upstream Towards Pedestrian Bridge



Open Channel North of Caroline St. – Facing Downstream Towards Caroline St.



Open Channel North of Maria St. – Facing Upstream Towards Elizabeth St.



Open Channel East of Pearl St. – Facing Upstream Towards James St.

STUDY AREA IMAGES



Open Channel East of Pearl St. – Facing Downstream Towards Martha St.



Open Channel North of Waterfront Trail – Facing Upstream towards Martha St.



Open Channel North of Waterfront Trail – Facing Upstream towards Waterfront Trail



Open Channel North of Waterfront Trail – Facing Downstream away from Waterfront Trail

STUDY PURPOSE / PROBLEM DEFINITION

The City of Burlington is undertaking a Municipal Class Environmental Assessment (Class EA) Study for the Lower Rambo Creek Flood Mitigation Project. The EA will be used to develop a preferred strategy to reduce flooding from Lower Rambo Creek between Caroline Street and Martha Street.

The objective of the project is to find potential infrastructure improvements to help reduce flood hazard risks, build climate change resiliency, and support growth and development in the downtown area.

PUBLIC INFORMATION CENTER PURPOSE

The Public Information Center (PIC) is designed to:

- Present information on existing conditions
- Present alternative approaches for flood mitigation
- Gain community input on the preferred alternative

MUNICIPAL CLASS EA PROCESS

Many projects related to municipal systems that are similar in nature, are carried out routinely, and have predictable and mitigatable environmental effects which are addressed in accordance with the Municipal Engineers Association “Municipal Class Environmental Assessment” (October 2000, as amended in 2007, 2011, 2015 & 2023).

This study is being undertaken as a “Schedule B” project under the Municipal Class Environmental Assessment process. The flow chart below illustrates the key steps to be undertaken as part of the EA process.

Phase 1 – Identify Problems

- ✓ Identify Problem or Opportunity
- Public Consultation



We Are Here →

Phase 2 – Alternate Solutions

- ✓ Identify Alternative Solutions
- ✓ Inventory Natural, Social, Economic Environment
- ✓ Environmental Impacts and Mitigation
- Alternatives Evaluation
- Review Agency and Public Consultation
- Select Preferred Solution
- Review and Confirm Choice of Schedule
- Notice of Completion to Review Agency & Public
- Implementation

VEGETATION COMMUNITY CLASSIFICATION

Vegetation communities within the study area were identified in 2024 as a part of the Natural Heritage Assessment in accordance with the Ecological Land Classification (ELC) protocol.

The overall study area is highly developed with very limited natural habitats or vegetated areas remaining.

The creek corridor north of Caroline St. contains a narrow strip of deciduous forest with a high proportion of non-native species. Norway Maple is dominant with some Siberian Elm, Manitoba Maple, White Ash, and Red Ash.

South of James St., the creek corridor is more tightly constrained by adjacent development and consists of a small amount of woody vegetation directly along the banks, but mostly is urban parkland or hard structures.



Vegetation at Open Channel North of Caroline St.



Vegetation at Open Channel South of James St.

TERRESTRIAL WILDLIFE AND HABITAT ASSESSMENT

Targeted wildlife surveys, including breeding bird inventories, were completed in 2024 by a qualified biologist. A total of 6 species were recorded during surveys, with results as follows:

Common Name	Scientific name
Eastern Grey Squirrel	*(Sciurus carolinensis)*
Raccoon	(*Procyon lotor)*
American Robin	(*Turdus migratorius)*
American Goldfinch	(*Spinus tristis*
Blue Jay	(*Cyanocitta cristata)*
Northern Cardinal	(*Cardinalis cardinalis*)

SPECIES AT RISK (SAR)

For the purpose of this study, SAR listed as endangered (END) or threatened (THR) may have regulatory considerations should any impacts to habitat be proposed. Species listed as special concern (SC) do not have regulatory protection, but important habitat features or areas for those species may qualify as Significant Wildlife Habitat and have requirements under municipal policy.

1. Chimney Swift – THR
2. Eastern Small-footed Myotis – END
3. Little Brown Myotis – END
4. Northern Myotis – END
5. Tri-colored Bat – END

AQUATIC ECOSYSTEMS

To assess the existing aquatic habitat within the study area, the following studies were undertaken:

- Aquatic assessments of historic data;
- Field confirmation of site conditions.



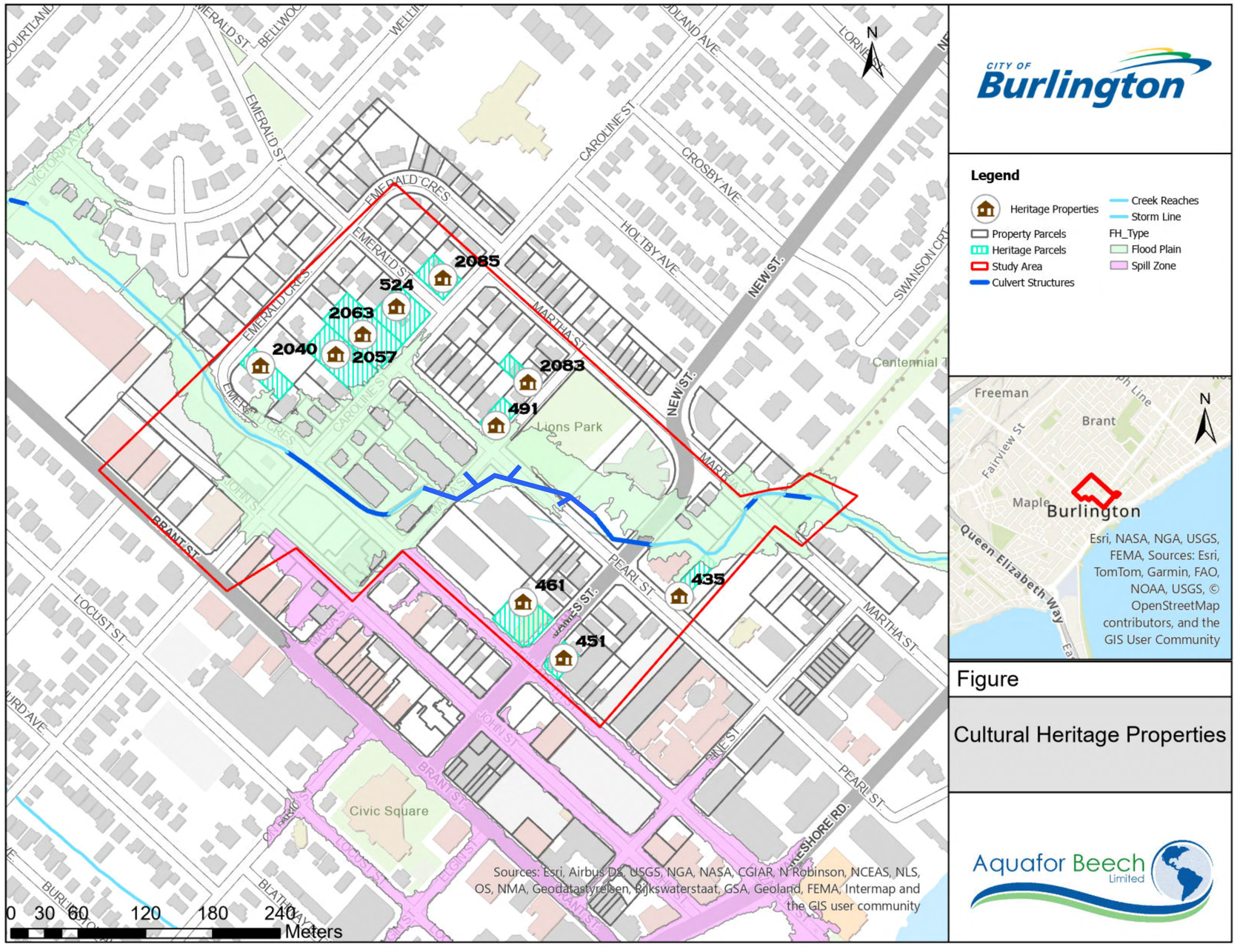
White Sucker (*Catostomus comersonii)*
Photo Credit: USGS

Key Findings:

- Significantly urbanized and degraded conditions
- Little riparian vegetation present throughout
- Significant contaminant sources contributing directly to the watercourse
- Habitat to the White Sucker (*Catostomus comersonii)* from the Ministry of Natural Resources
- No record of species-at-risk within the study area
- No in-water work should take place from March 15 to July 15 of any given year

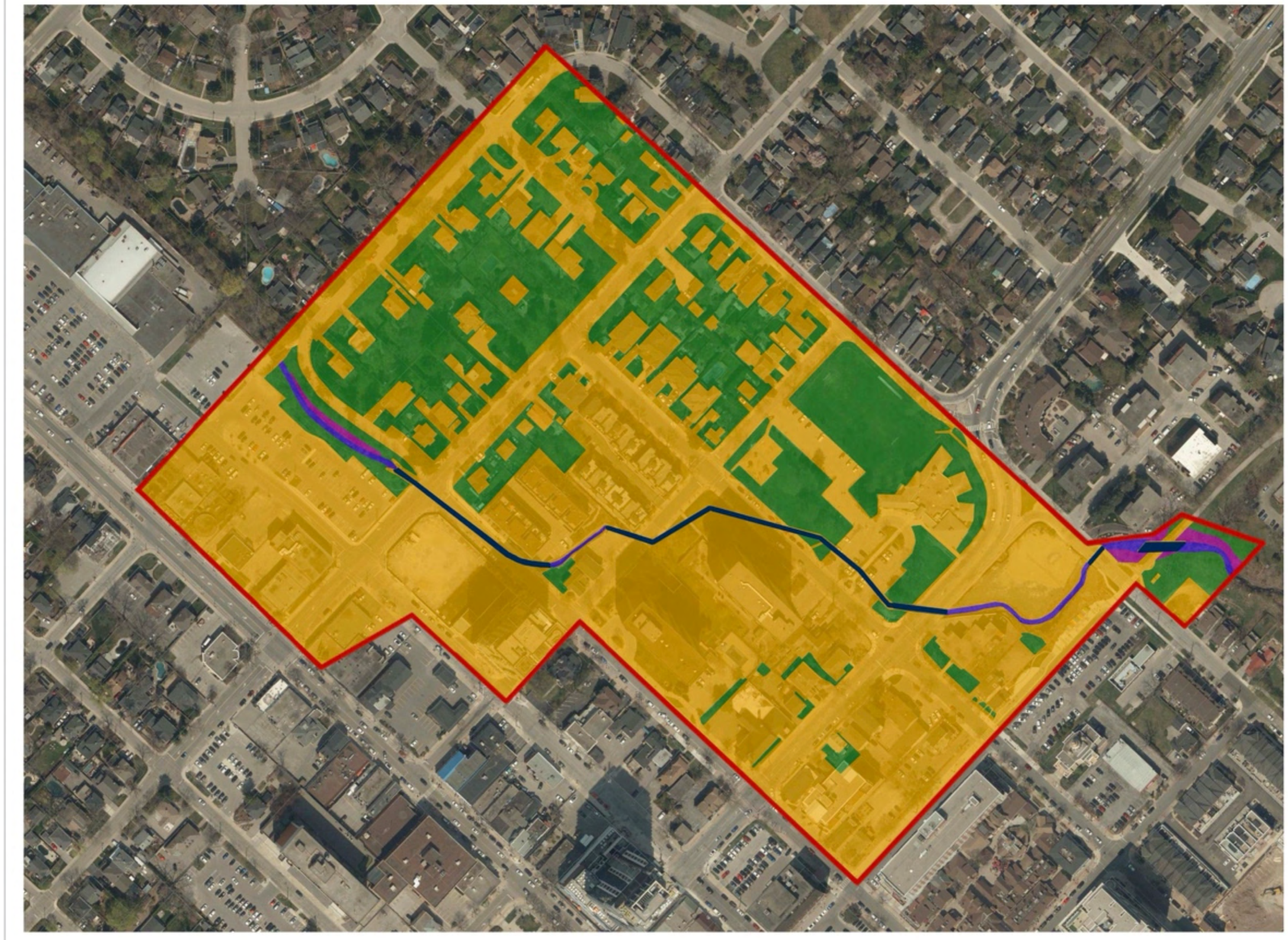
CULTURAL HERITAGE

- A screening for Cultural Heritage properties within the Study Area was completed and 10 properties were identified
- Alternative 7 proposes infrastructure within the Right-of-Way on Elizabeth Street in front of 2 Cultural Heritage Properties
- Cultural Heritage properties to be protected during construction.



ARCHAEOLOGY

- A Stage 1 Archaeological Assessment was completed for the Study Area, to determine areas of Archaeological potential.
- The locations within the Study Area which contain archaeological potential will have a Stage 2 Assessment completed prior to any proposed construction.



Lower Rambo Creek
Part of Brant's Block, (Former Township of Nelson, County of Halton), City of Burlington, RM of Halton



Legend

- Project Area
- Stage 2 Test Pit Survey Recommended (Archaeological Potential)
- Disturbed (Potential Removed)
- Low-Lying and Wet (No Potential)
- Steep Slope (No Potential)
- Existing Culvert (No Potential)

Title: Stage 1 Results and Recommendations

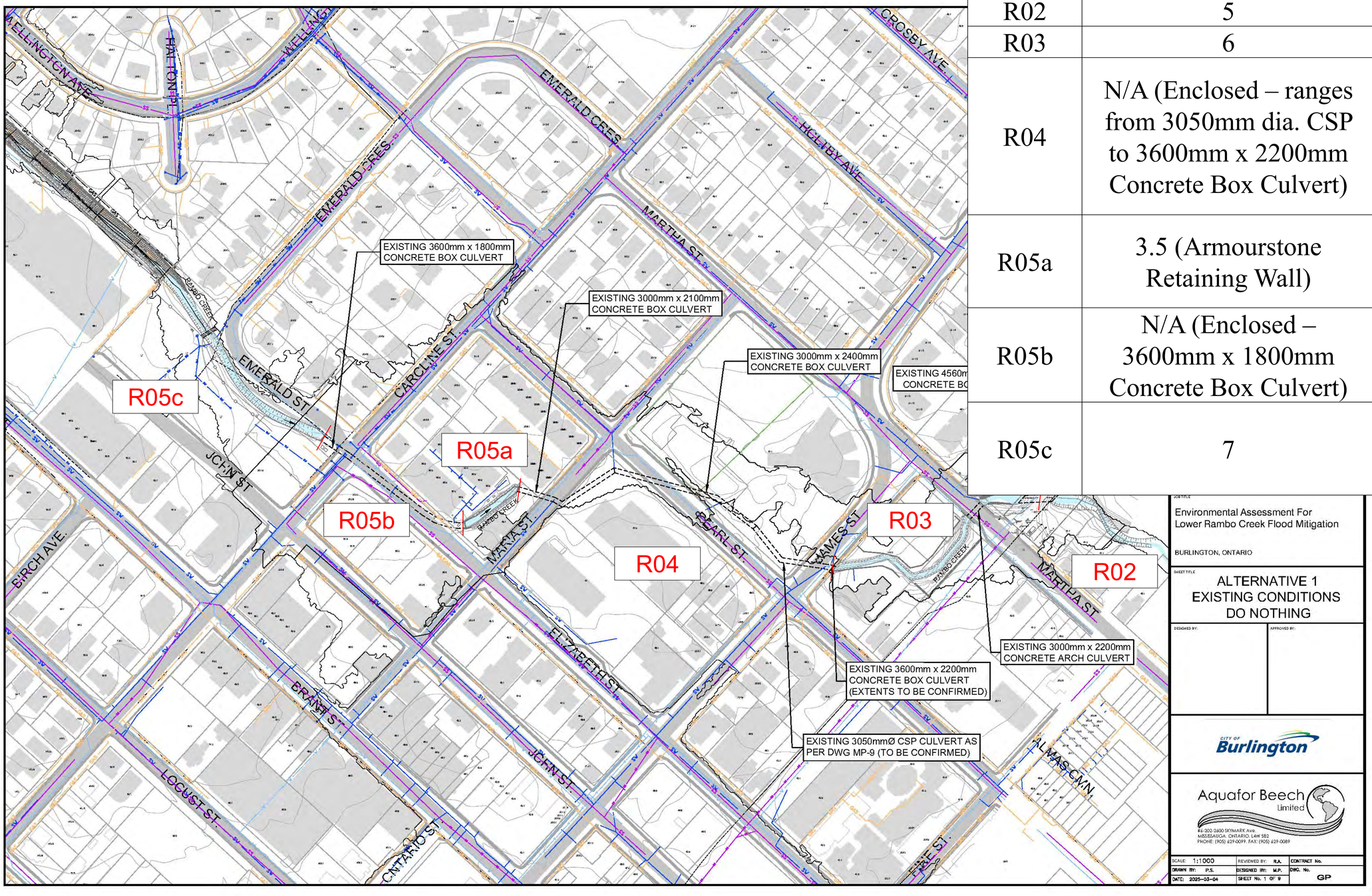
Scale
40m

New Era ARCHAEOLOGY

FLUVIAL GEOMORPHOLOGY

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Environmental Assessment for
Lower Rambo Creek Flood Mitigation



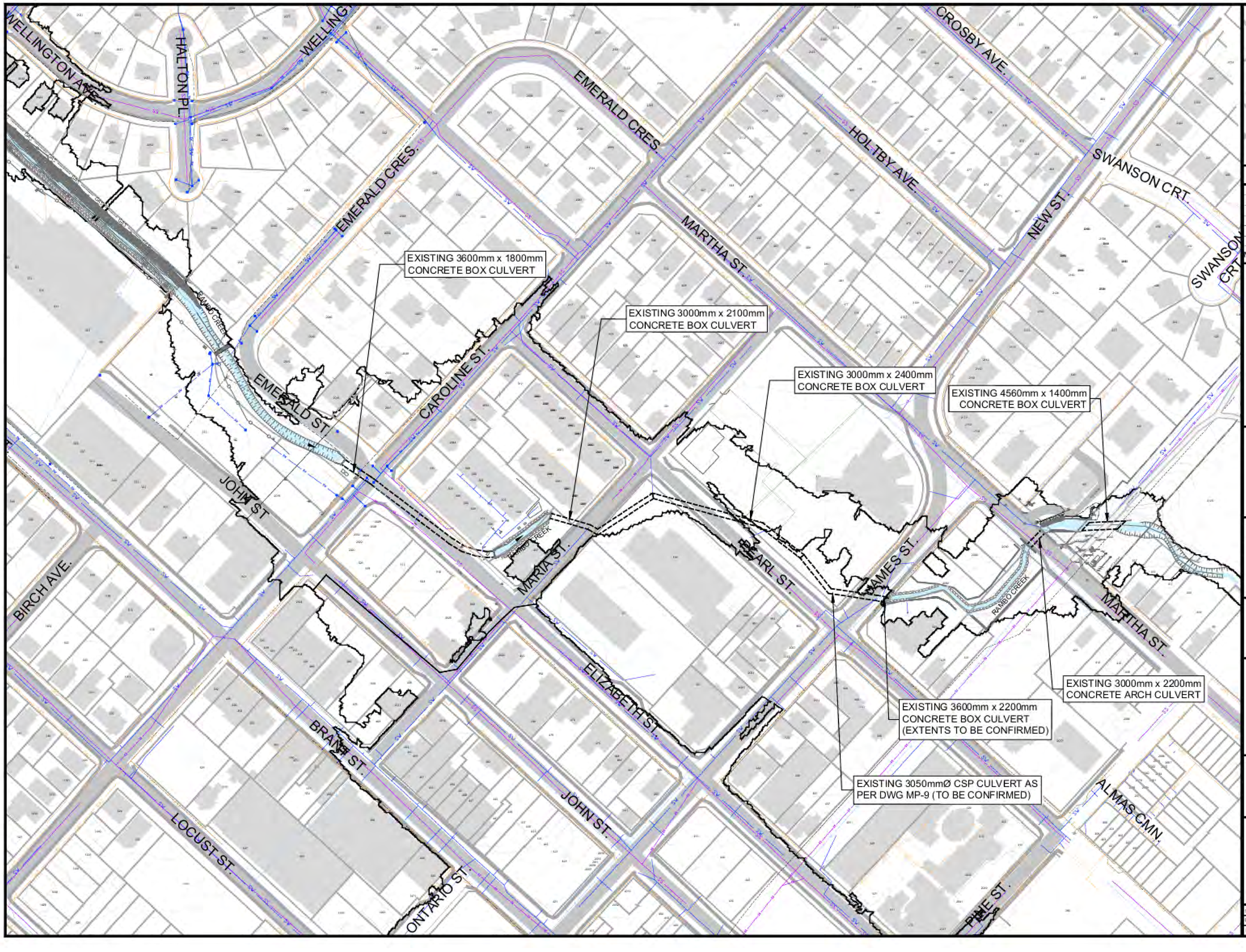
Reach	Average Bankfull Width (m)	Average Bankfull Depth (m)
R02	5	1
R03	6	1
R04	N/A (Enclosed – ranges from 3050mm dia. CSP to 3600mm x 2200mm Concrete Box Culvert)	N/A (Enclosed – ranges from 3050mm dia. CSP to 3600mm x 2200mm Concrete Box Culvert)
R05a	3.5 (Armourstone Retaining Wall)	2.5
R05b	N/A (Enclosed – 3600mm x 1800mm Concrete Box Culvert)	N/A (Enclosed – 3600mm x 1800mm Concrete Box Culvert)
R05c	7	0.5

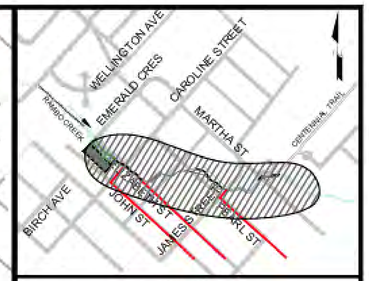
EXISTING CONDITIONS GENERAL PLAN

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Lower Rambo Creek Flood Mitigation





Key Map - NTS

No.	REVISION	By	YY-MM-DD
1	ISSUED FOR DISCUSSION	R.A.	25-03-04

LEGEND

PROPERTY/BUILDING LINE
EXISTING TOP OF BANK
EXISTING CONTOUR
STORM SEWER/ CATCH BASIN
SANITARY SEWER
WATERMAIN
UNION GAS LINE
GABION BASKETS
ARMOURSTONES

THE POSITION OF THE POLE LINES, CONDUITS, WATERMAINS, SEWERS, AND OTHER UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK

THE CONTRACTOR SHALL CONFIRM THE POSITION AND EXACT LOCATION OF ALL SUCH UTILITIES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM MADE DURING THE COURSE OF THE CONTRACT WORK.

JOB TITLE

Environmental Assessment For
Lower Rambo Creek Flood Mitigation

BURLINGTON, ONTARIO

SHEET TITLE

ALTERNATIVE 0
EXISTING CONDITIONS
DO NOTHING

DESIGNED BY:

APPROVED BY:

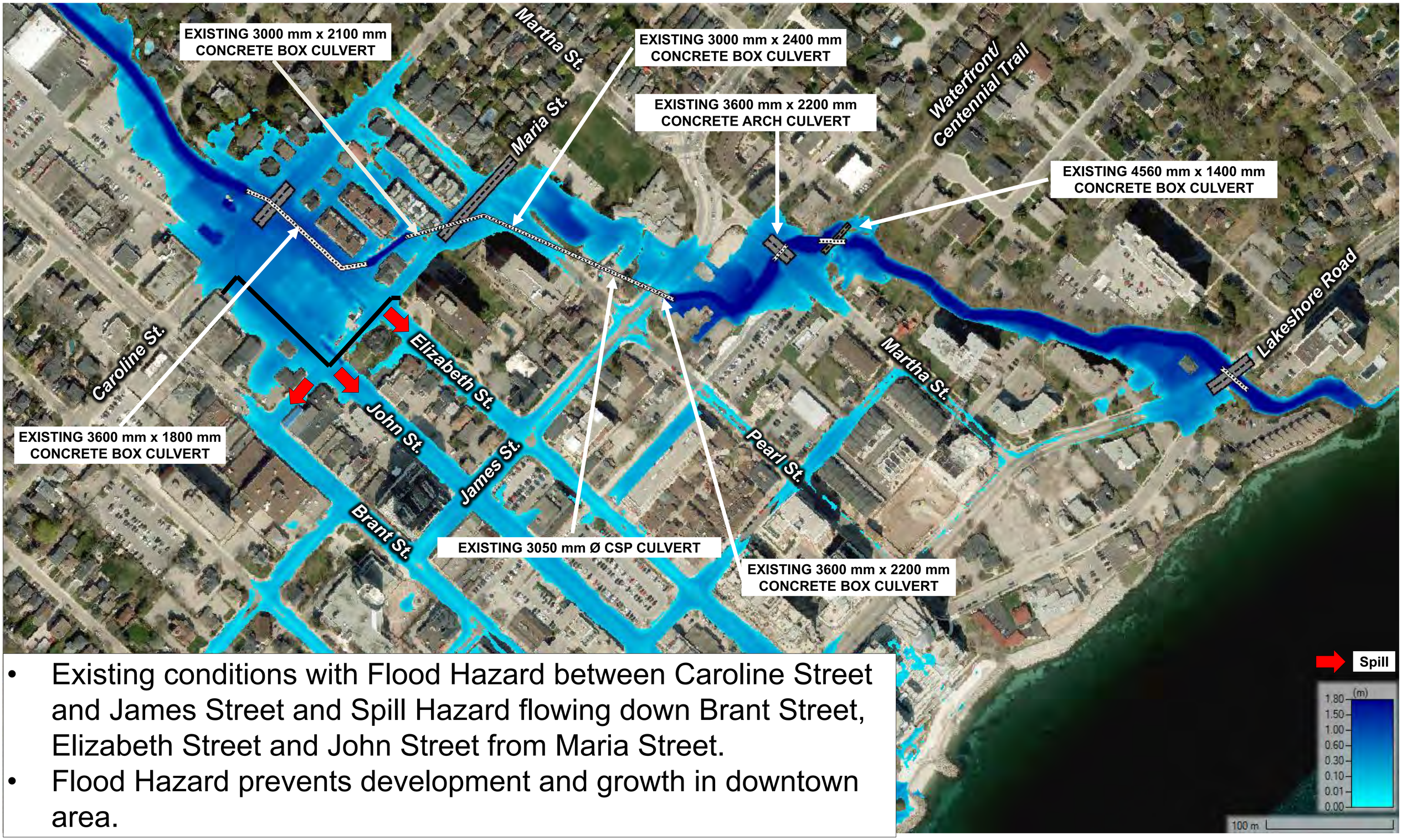
CITY OF Burlington

Aquafor Beech Limited
#A-222-2600 SKYMARK Ave.
MISSISSAUGA, ONTARIO L4W 5B2
PHONE: (905) 629-0099 FAX: (905) 629-0089

SCALE: 1:1000	REVIEWED BY: R.A.	CONTRACT No.	
DRAWN BY: P.S.	DESIGNED BY: M.P.	DWG. No.	GP
DATE: 2025-03-04	SHEET No. 1 OF 9		

Existing Conditions / Alternative #0 – Do Nothing

Environmental Assessment for
Lower Rambo Creek Flood Mitigation

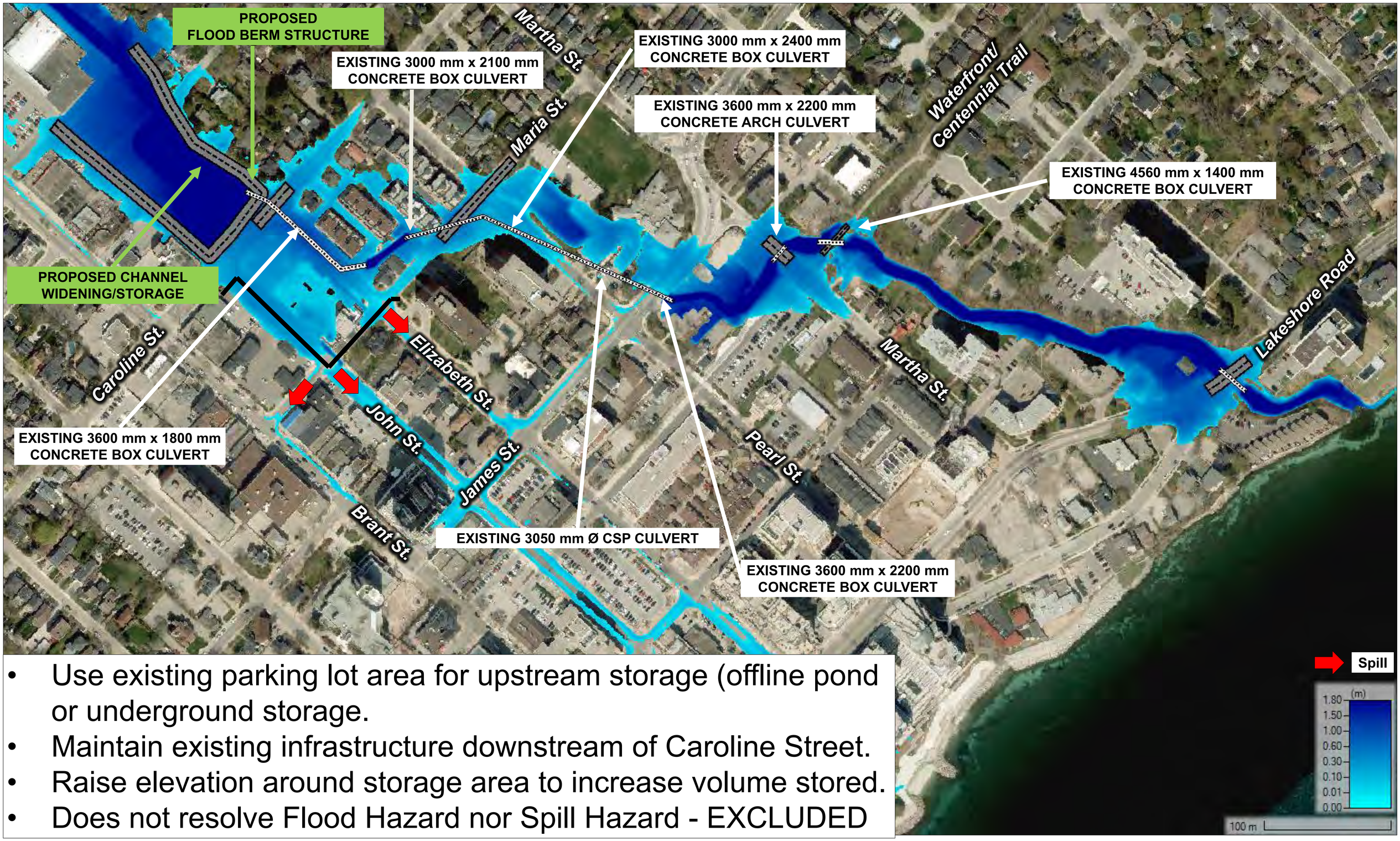


- Existing conditions with Flood Hazard between Caroline Street and James Street and Spill Hazard flowing down Brant Street, Elizabeth Street and John Street from Maria Street.
- Flood Hazard prevents development and growth in downtown area.

ALTERNATIVE #1/6 & 5 – Upstream Storage (EXCLUDED – Does not meet Study Objectives)

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Environmental Assessment for
Lower Rambo Creek Flood Mitigation

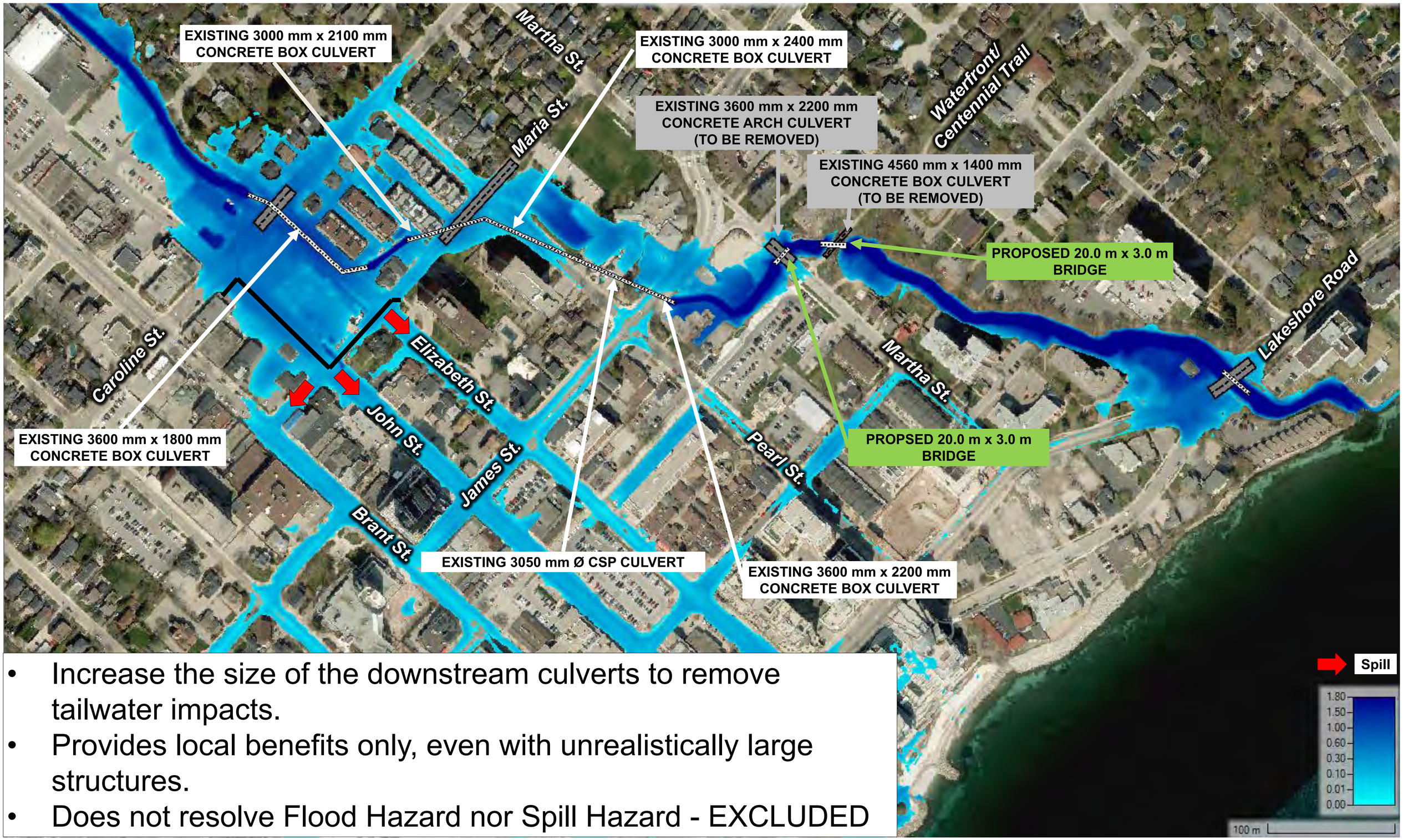


- Use existing parking lot area for upstream storage (offline pond or underground storage.
- Maintain existing infrastructure downstream of Caroline Street.
- Raise elevation around storage area to increase volume stored.
- Does not resolve Flood Hazard nor Spill Hazard - EXCLUDED

ALTERNATIVE #3 – Upsize Downstream Culverts (EXCLUDED – Does not meet Study Objectives)

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Environmental Assessment for
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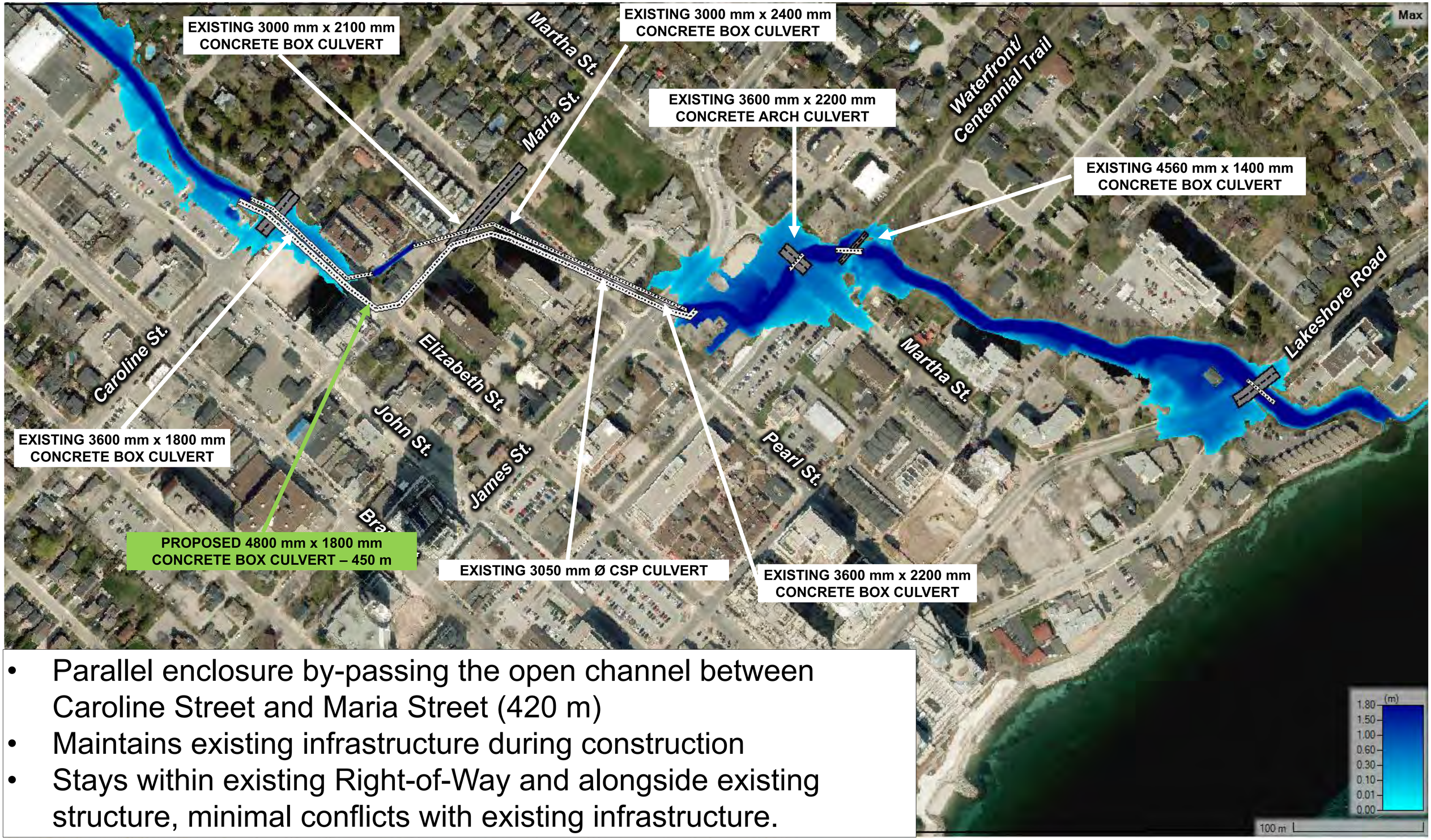


- Increase the size of the downstream culverts to remove tailwater impacts.
- Provides local benefits only, even with unrealistically large structures.
- Does not resolve Flood Hazard nor Spill Hazard - EXCLUDED

ALTERNATIVE #2 – Parallel Enclosure
Caroline Street to James Street

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Lower Rambo Creek Flood Mitigation



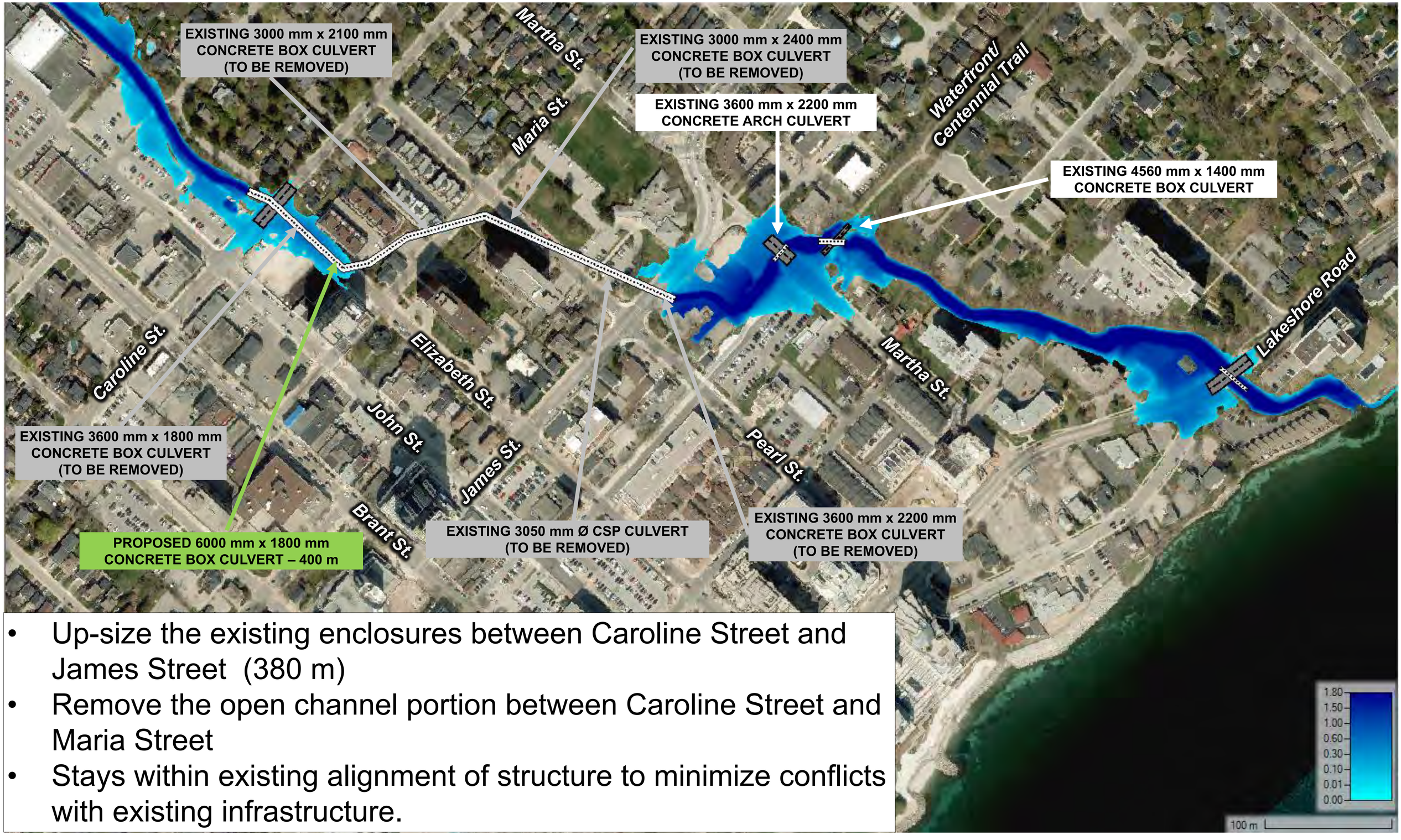
- Parallel enclosure by-passing the open channel between Caroline Street and Maria Street (420 m)
- Maintains existing infrastructure during construction
- Stays within existing Right-of-Way and alongside existing structure, minimal conflicts with existing infrastructure.

ALTERNATIVE # 4 – Up-size the Existing Enclosures

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Environmental Assessment for
Lower Rambo Creek Flood Mitigation



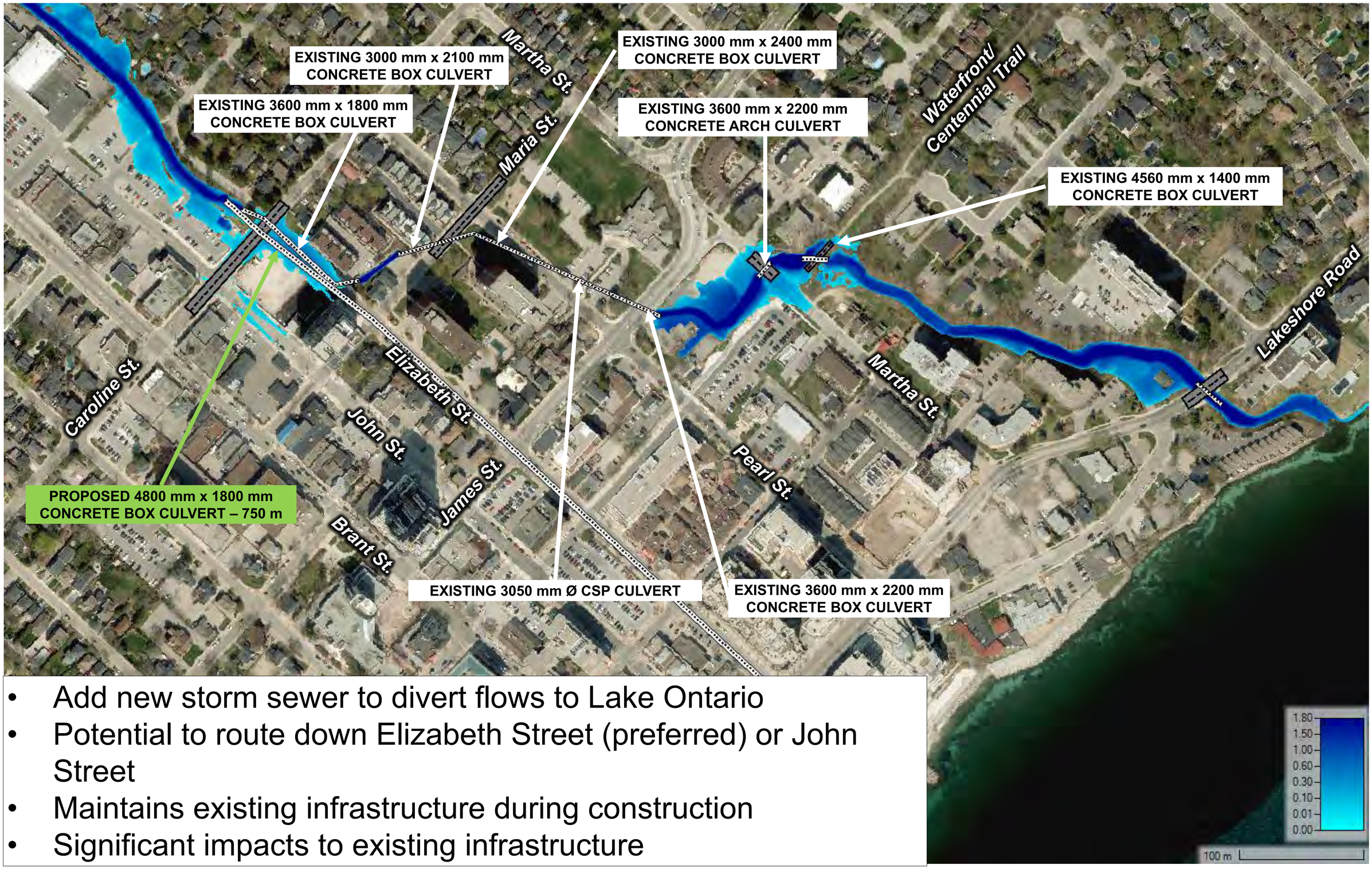
- Up-size the existing enclosures between Caroline Street and James Street (380 m)
- Remove the open channel portion between Caroline Street and Maria Street
- Stays within existing alignment of structure to minimize conflicts with existing infrastructure.

ALTERNATIVE # 7 – Linear Diversion to Lake Ontario

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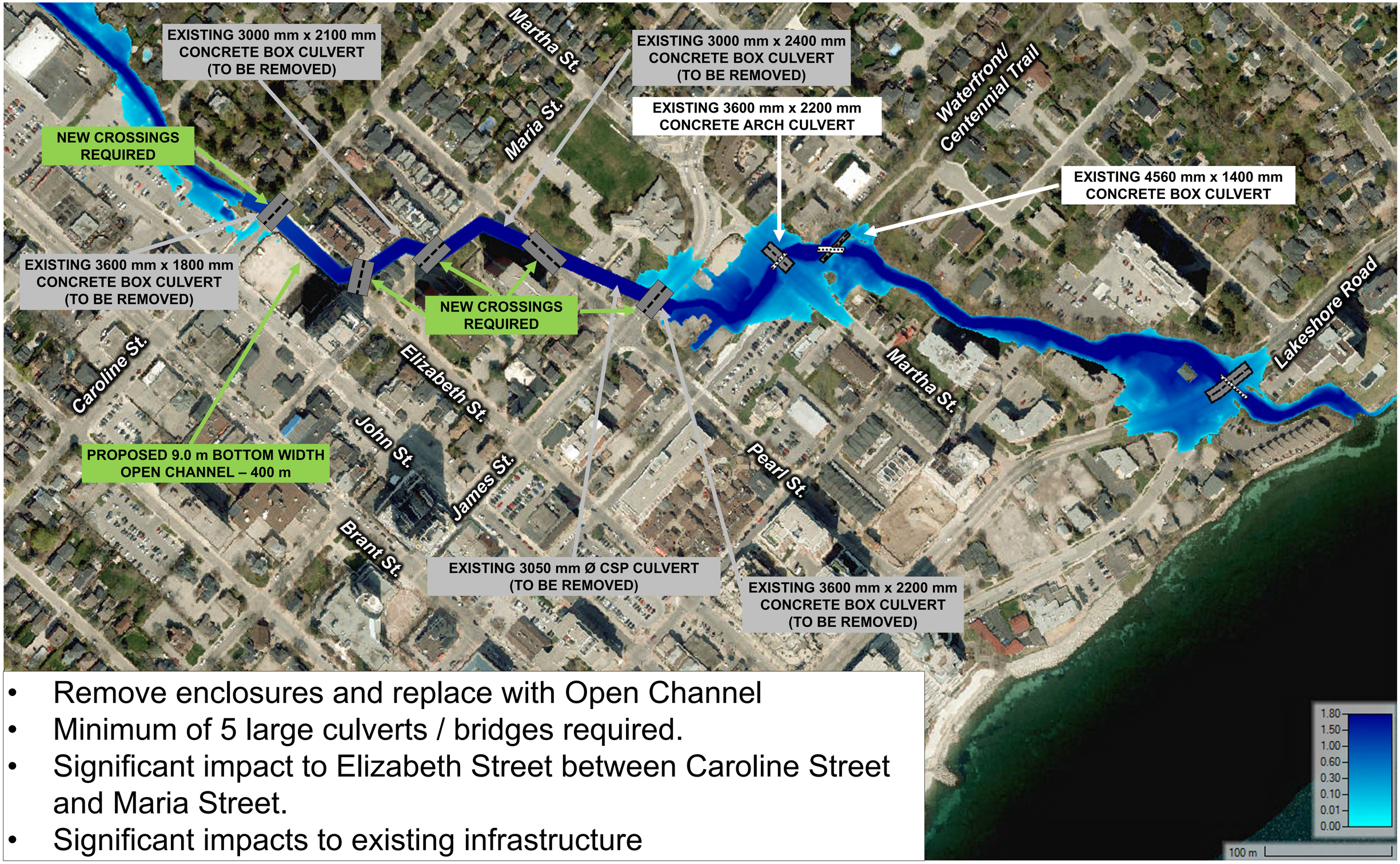
- Add new storm sewer to divert flows to Lake Ontario
- Potential to route down Elizabeth Street (preferred) or John Street
- Maintains existing infrastructure during construction
- Significant impacts to existing infrastructure

ALTERNATIVE # 8 – Naturalize Lower Rambo Creek

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Environmental Assessment for
Lower Rambo Creek Flood Mitigation



- Remove enclosures and replace with Open Channel
- Minimum of 5 large culverts / bridges required.
- Significant impact to Elizabeth Street between Caroline Street and Maria Street.
- Significant impacts to existing infrastructure

Evaluation Criteria

Environmental Assessment Categories	Criteria
Study-Specific Flood Mitigation	• Potential impact on building/properties within the Flood Hazard • Potential impact on building/property within the Spill Hazard • Potential to improve conveyance capacity for urban drainage (Major/minor system flows) • Impacts to potential developable area (Infrastructure outside of Right-of-Way) • Climate change resiliency
Physical/Natural Environment	• Potential impact/benefit on aquatic systems, aquatic life and vegetation (Fish Passage) • Potential to reduce downstream erosion & flooding (South of James Street) • Potential to reduce localized erosion (Maria Street Open Channel) • Potential impact/benefit on existing terrestrial systems (Vegetation, Trees, Wildlife) • Integration with the existing natural environment
Social/Cultural Environment	• Aesthetic/recreational benefits • Compatibility with adjacent Land-use • Potential community disruption / Landowner impacts (Traffic impacts and construction on private property) • Potential to improve health & safety objectives (Open-channel hazards) • Impacts to downtown/street parking availability
Economic/Financial	• Capital Construction Costs • Parking Revenue Costs • City Liability • Operation/Maintenance Costs
Technical/Engineering Environment	• Technical Feasibility • Agency Acceptance • Lifespan of Works • Integration with New/Existing Infrastructure (Utilities & New Developments) • Policy/by-law requirements

Alternatives Evaluation Matrix

PRELIMINARY PREFERRED

Evaluation Criteria	Alternative #0 - Existing Conditions (Do Nothing)		Alternatives #1/6 & 5 - Upstream Storage		Alternative #2 - Parallel Additional Enclosure		Alternative #3 - Downstream Culvert Upgrades		Alternative #4 - Enclosure Upsizing		Alternative #7 - Diversion Using Linear Infrastructure to Lake		Alternative #8 - Naturalize Lower Rambo Creek	
Flood Mitigation														
Building/Property Risk within Flood Hazard		No change to flood risk.		Negative impact to flood risk.		Highest improvement to flood risk.		Minor improvement to flood risk.		Highest improvement to flood risk.		Highest improvement to flood risk.		Highest improvement to flood risk.
Building/Property Risk within Spill Hazard		No change to spill hazard.		Minor improvement to spill hazard.		Highest improvement to spill hazard.		No change to spill hazard.		Highest improvement to spill hazard.		Highest improvement to spill hazard.		Highest improvement to spill hazard.
Conveyance Capacity (Major System and Minor System flows)		No change.		Negative effect to system performance.		Minor improvement to system performance.		No change.		Greatest improvement to system performance.		Minor improvement to system performance.		Greatest improvement to system performance.
Impacts to Potential Developable Area (Infrastructure out of Right-of-Way)		No impact.		Significant impact.		Minor impact.		No impact.		Minor impact.		No impact.		Greatest Impact.
Climate Change Resiliency		No impact.		Minor improvement.		Major improvement.		Minor improvement.		Major improvement.		Major improvement.		Greatest improvement.
Physical/Natural Environment														
Potential Aquatic Habitat Benefit		No effect to aquatic habitat.		Positive impact to improvement to aquatic habitat.		No effect to aquatic habitat.		No effect to aquatic habitat.		Negatively impacts aquatic habitat.		No effect to aquatic habitat.		Greatest improvement to aquatic habitat.
Potential to Reduce Downstream Erosion and Flooding		No effect to Downstream Erosion and Flooding.		No effect to Downstream Erosion and Flooding.		Negatively impacts Downstream Erosion and Flooding.		Positive impact to Downstream Erosion and Flooding.		Negatively impacts Downstream Erosion and Flooding.		Positive impact to Downstream Erosion and Flooding.		Greatest benefit to Downstream Erosion and Flooding.
Potential to Reduce Erosion (Maria Street)		Positive impact to erosion.		Negatively impacts erosion.		Positive impact to erosion.		No effect to erosion.		Positive impact to erosion.		Positive impact to erosion.		Greatest benefit to erosion.
Potential to Improve/Negatively Impacts Terrestrial Habitat		No impact to terrestrial habitat.		Negatively impacts terrestrial habitat.		No impact to terrestrial habitat.		Some negative impacts to terrestrial habitat.		No impact to terrestrial habitat.		No impact to terrestrial habitat.		Potential improvement to terrestrial habitat.
Integration with the Existing Environment		No impact to existing environment.		Minor improvement to existing environment.		Minor improvement to existing environment.		No impact to existing environment.		Negatively impacts existing environment.		Minor improvement to existing environment.		Major improvement to existing environment.
Social/Cultural Environment														
Aesthetic/Recreational Benefits		No aesthetic/ recreational benefit.		Reduction in aesthetic/ recreational benefit.		Improvement to aesthetic/ recreational benefit.		Reduction in aesthetic/ recreational benefit.		Reduction in aesthetic/ recreational benefit.		Improvement to aesthetic/ recreational benefit.		Best improvement to aesthetic/ recreational benefit.
Compatibility with Adjacent Land Use		High compatibility with adjacent land use.		Somewhat compatible with adjacent land use.		Good compatibility with adjacent land use.		High compatibility with adjacent land use.		Somewhat compatible with adjacent land use.		Good compatibility with adjacent land use.		Low compatibility with adjacent land use.
Community Disruption/Landowner Impacts		No community disruption/impacts.		Significant community disruption/impacts.		Significant community disruption/impacts.		Minor community disruption/impacts.		Significant community disruption/impacts.		Highest community disruption/impacts.		Highest community disruption/impacts.
Public Health and Safety Objectives		Low benefit to public health and safety.		Some benefit to public health and safety.		High benefit to public health and safety.		Some benefit to public health and safety.		Greatest benefit to public health and safety.		High benefit to public health and safety.		Low benefit to public health and safety.
Impacts to downtown/street parking availability		No impact to parking availability.		Greatest impacts to parking availability.		Minor impacts to parking availability.		No impact to parking availability.		No impact to parking availability.		Minor impacts to parking availability.		Impacts to parking availability.
		Represents a low score for the alternative in the relevant criteria.						Represents a high score for the alternative in the relevant criteria.						

Alternatives Evaluation Matrix

Environmental Assessment for
Lower Rambo Creek Flood Mitigation

PRELIMINARY PREFERRED

Evaluation Criteria	Alternative #0 - Existing Conditions (Do Nothing)		Alternatives #1/6 & 5 - Upstream Storage		Alternative #2 - Parallel Additional Enclosure		Alternative #3 - Downstream Culvert Upgrades		Alternative #4 - Enclosure Upsizing		Alternative #7 - Diversion Using Linear Infrastructure to Lake		Alternative #8 - Naturalize Lower Rambo Creek	
Economic Criteria														
Capital Cost		No cost.		Lower cost.		Lower cost.		Lower cost.		Greatest cost.		High cost.		Greatest cost.
Parking Revenue Costs		Lowest impact on parking revenue.		Greatest impact on parking revenue.		Minor impact on parking revenue.		Lowest impact on parking revenue.		Lowest impact on parking revenue.		Minor impact on parking revenue.		Significant impact on parking revenue.
City Liability		No change in liability.		Greatest increase in liability.		Decrease in liability.		No change in liability.		Decrease in liability.		Decrease in liability.		Increase in liability.
Operation & Maintenance Costs		No O&M cost.		Greatest O&M cost.		Major O&M cost.		Minor O&M cost.		Minor O&M cost.		Major O&M cost.		Minor O&M cost.
Technical/Engineering Considerations														
Technical Feasibility		Highly feasible.		Technically feasible.		Highly feasible.		Somewhat feasible.		Highly feasible.		Technically feasible.		Least feasible.
Agency Acceptance		Acceptable.		Low agency acceptance.		Greatest acceptability.		Greatest acceptability.		High agency acceptance.		Acceptable.		Greatest acceptability.
Lifespan of Works		No impacts to lifespan of works.		Slightly improves lifespan of works.		Improvement to lifespan of works.		Slightly improves lifespan of works.		Improvement to lifespan of works.		Improvement to lifespan of works.		Highest improvement to lifespan of works.
Integration with New/Existing Infrastructure (Utilities & New Developments)		No change to integration with new/existing infrastructure.		Minor challenges to integrate with new/existing infrastructure.		Minor challenges to integrate with new/existing infrastructure.		Major challenges to integrate with new/existing infrastructure.		Minor challenges to integrate with new/existing infrastructure.		Major challenges to integrate with new/existing infrastructure.		Least integrable with new/existing infrastructure.
Policy/By-law Requirements		Low acceptance of policy and by-law requirements.		Low acceptance of policy and by-law requirements.		Highest level of acceptance of policy and by-law requirements.		High level of acceptance of policy and by-law requirements.		Highest level of acceptance of policy and by-law requirements.		Highest level of acceptance of policy and by-law requirements.		High level of acceptance of policy and by-law requirements.
OVERALL RANKING														

Represents a low score for the alternative in the relevant criteria.

Represents a high score for the alternative in the relevant criteria.

Alternatives Evaluation Matrix

Alternative #0	Alternative #1/6 &5	PRELIMINARY PREFERRED Alternative #2	Alternative #3	Alternative #4	Alternative #7	Alternative #8
Existing Conditions (Do Nothing)	Upstream Storage	Parallel Additional Enclosure	Downstream Culvert Upgrades	Enclosure Upsizing	Diversion Using Linear Infrastructure to Lake	Daylight Lower Rambo Creek
Flood Mitigation Criteria						
						
Natural Environment						
						
Economic Criteria						
						
Social/Cultural Environment						
						
Technical/Engineering Consideration						
						
Total						
						

EXAMPLES OF RESTORATION SOLUTIONS



Increased Culvert Size – Box Culvert



Stormwater Management Pond – Upstream Storage Area



Restored Open Channel



Twin Culverts – Parallel Enclosures

NEXT STEPS

Receive Input from Public – June 2025

Indigenous Consultation and Meetings (Phase 2) & Agency Consultation – August 2025

Conceptual Design and Project File Report – August/September 2025

To provide comment, please contact:

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THANK YOU

For Participating In Environmental Assessment for Lower Rambo Creek Flood Mitigation