

Yellow Creek Restoration and Water Infrastructure Protection Study Geomorphic Systems Master Plan

Public Consultation: November 2023

Yellow Creek Geomorphic Systems Master Plan

In 2020 the City of Toronto initiated the Yellow Creek Geomorphic Systems Master Plan (GSMP) Municipal Class Environmental Assessment (MCEA), as one of five ongoing GSMPs across the City, to identify and assess water and storm sewer infrastructure in Yellow Creek that is at risk of erosion from high flows due to storms and snow melt runoff.

Study Purpose:

- To identify concerns related to erosion that may damage the City's water and storm sewer infrastructure
- To develop solutions that protect the City's water and storm sewer infrastructure from excessive erosion processes within the stream
- To improve stream functions, such as increasing stream bank stability, reducing erosion, enhancing stormwater conveyance, and improving habitats

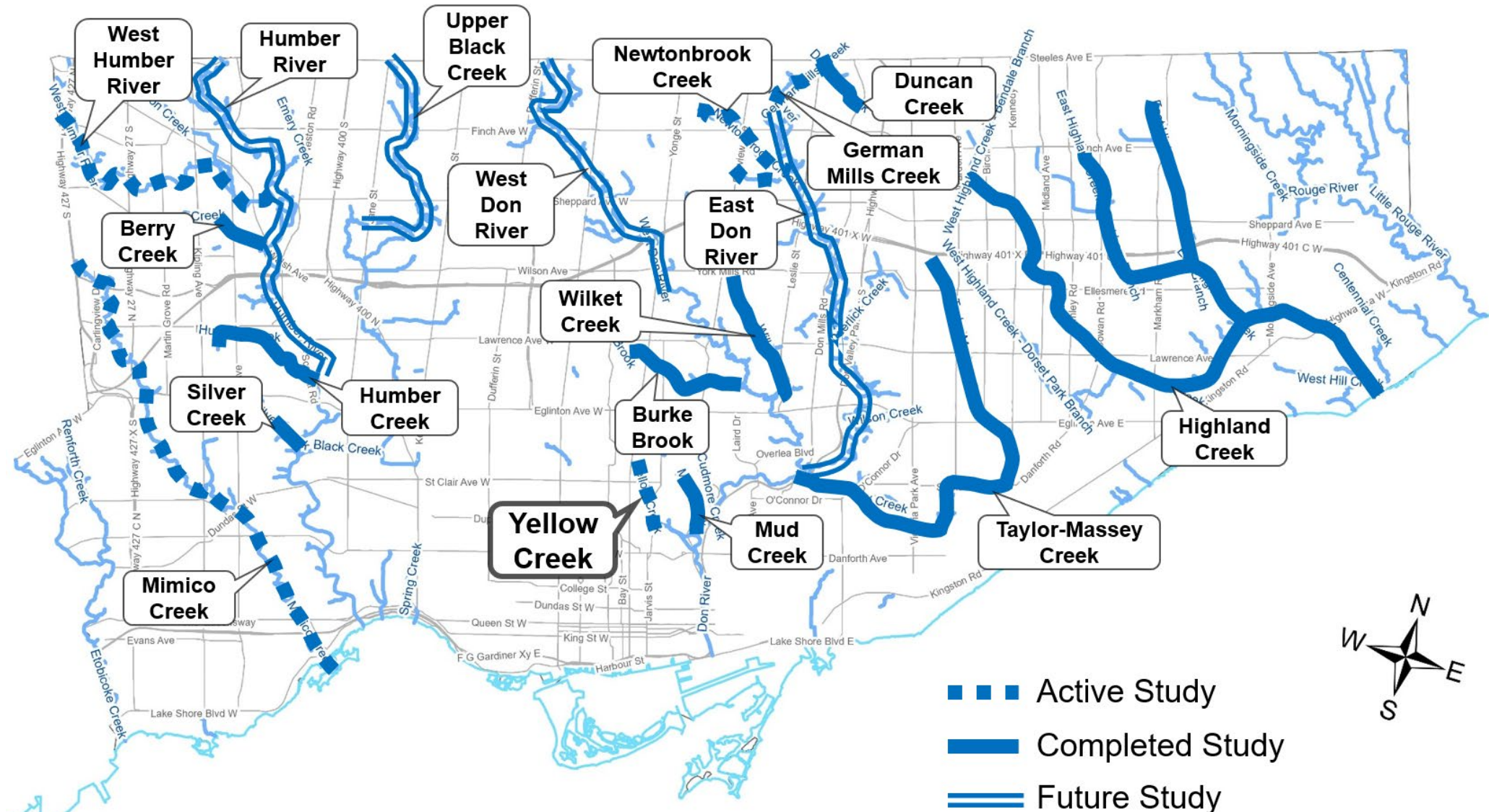


The City's sewer and water infrastructure in and alongside streams include:

- **Watermains** to supply drinking water to homes and businesses
- **Storm sewers** to collect rain and snow-melt from streets and properties and discharge it into streams (via outfalls)
- **Sanitary sewers** to collect and transport sewage from homes and businesses for treatment

This study is not focused on trails, trail access, trees, invasive species or other park features.

Watercourse studies across the City



Study Process

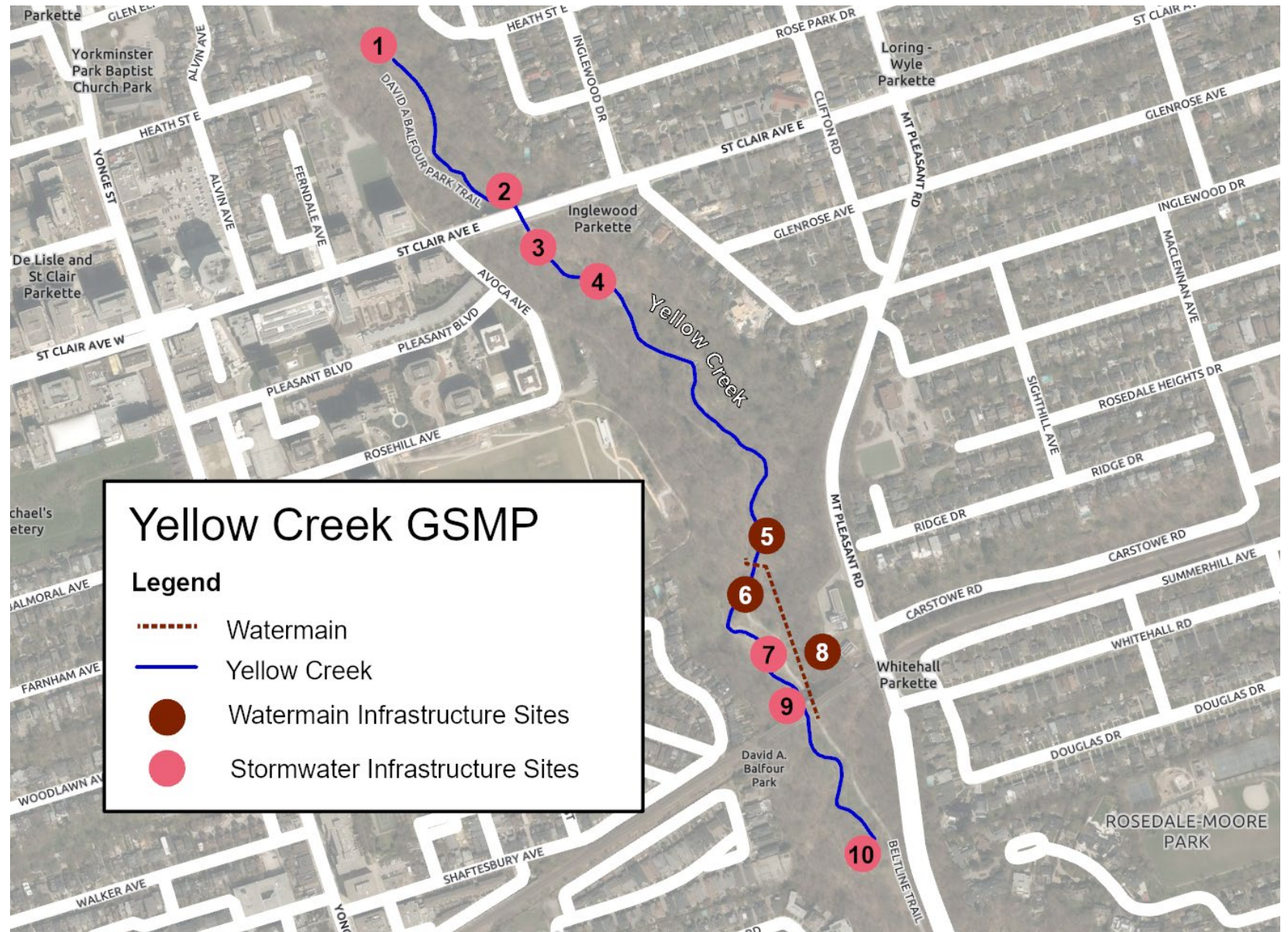
This study is being undertaken as a Master Plan which is a long-range plan that examines the needs within a geographic area and provides a framework and vision for recommended improvements. The study will follow the Municipal Class Environmental Assessment study process, an approved planning process under the Ontario Environmental Assessment Act, which includes providing opportunities for public input.



Study Area

The study area is the 1.3 km aboveground length of Yellow Creek from south of Mt. Pleasant Cemetery to the southern part of David A. Balfour Park near Mount Pleasant Road.

Sites	Stormwater Infrastructure
1	Source storm sewer outfall
2, 3, 4, 7 & 9	Storm sewer outfalls
10	Storm sewer inlet
Sites	Watermain Infrastructure
5	Reservoir outlet
6	Watermain crossing
8	Watermain parallel to stream



Level of Erosion Risk

The level of risk to water infrastructure caused by erosion was based on a technical assessment characterizing risk probability (time to exposure), existing bank protection, and risk severity should damage occur.

Low-Risk Sites

- Infrastructure and site conditions are stable
- Limited monitoring is required

Moderate-Risk Sites

- Infrastructure and site conditions are relatively stable
- Limited/some monitoring may be required

High-Moderate-Risk Sites

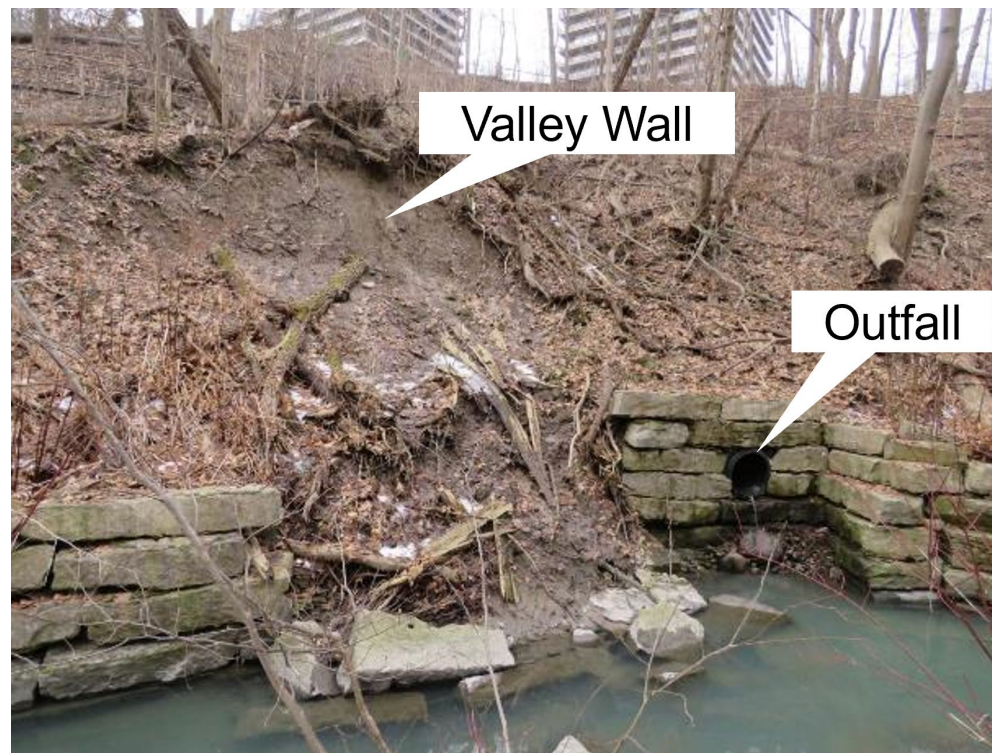
- Infrastructure and site conditions show signs of erosion
- Regular monitoring is required

High-Risk Sites

- Infrastructure is exposed and/or at significant risk of failure
- Regular monitoring and improvements to the infrastructure are required



Risk Assessment Example – Site 4



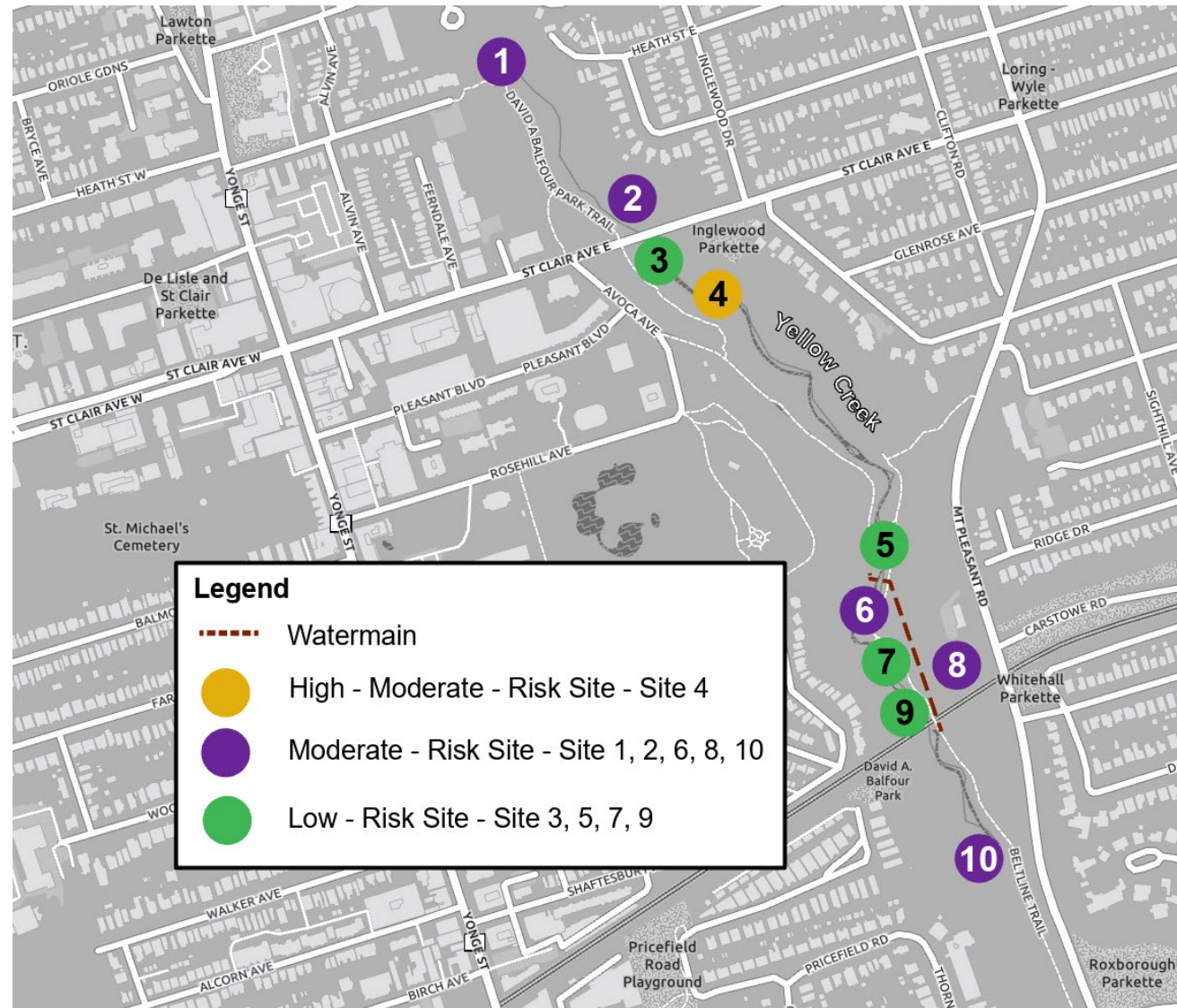
Site Location	Site 4 – Storm Outfall (South of St Clair)
Description	<ul style="list-style-type: none">• Erosion has put the storm sewer outfall at risk• Erosion of stream channel and valley wall• Overall: Poor condition
Level of Erosion Risk to City infrastructure	High-Moderate Risk

Sites Based on Risk

Of the 10 City of Toronto storm sewer and watermain infrastructure sites, only the storm sewer outfall at Site 4 was identified as a high-moderate risk.

The remaining sites were identified as low or moderate-risk.

There were no high-risk sites identified



Alternative Solutions

Three potential solutions to address erosion risks have been evaluated.

Alternative 1: Do Nothing

- No improvements

Alternative 2: Local Works and Protection

- Single phase construction over a short section of channel, subject to City-wide priority and budget availability
- Project sites less than 100 metres
- Local bed and/or bank work in the stream to protect Toronto Water infrastructure

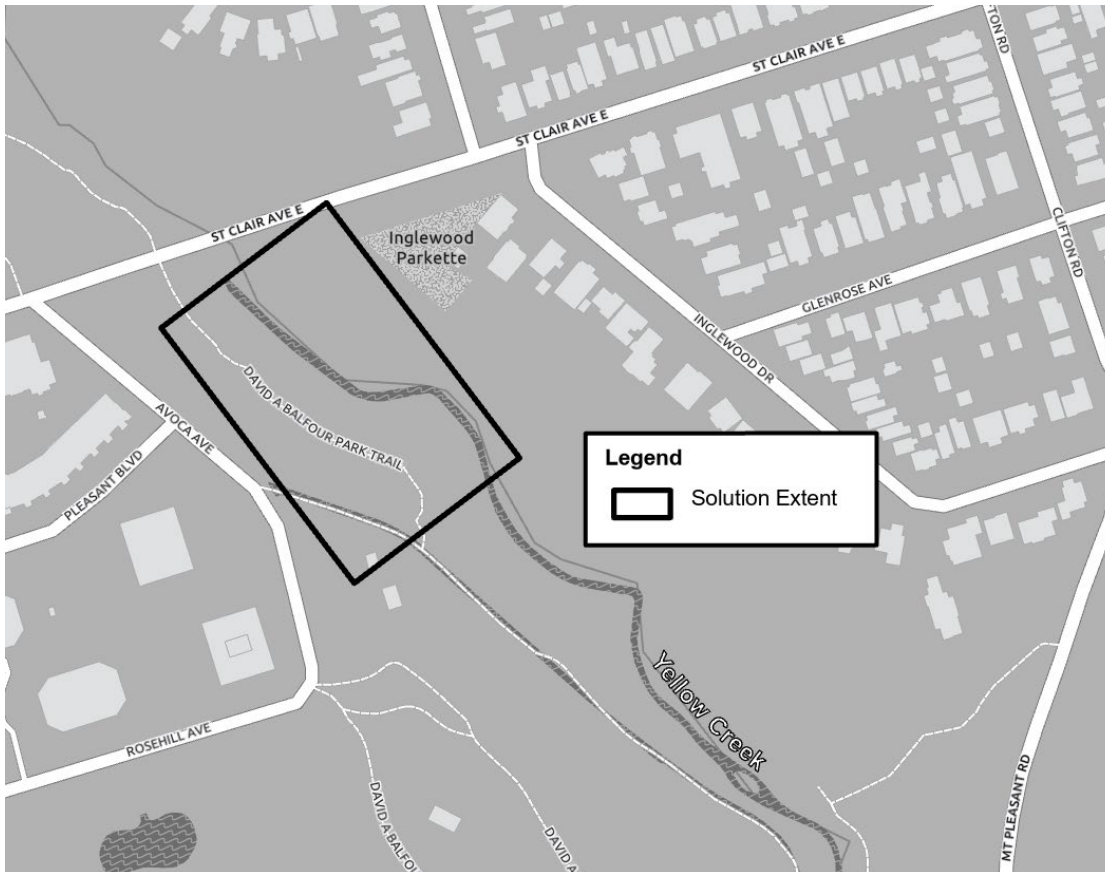
Alternative 3: Sub-Reach Based Works

- Single or multiple phase construction over a long section of channel, subject to City-wide priority and budget availability
- Project sites greater than 100 metres
- Engineered channel design consisting of bed and bank work in the stream and floodplain to protect Toronto Water infrastructure
- Channel will be regraded or locally realigned to improve creek flow by reducing water velocities and erosion

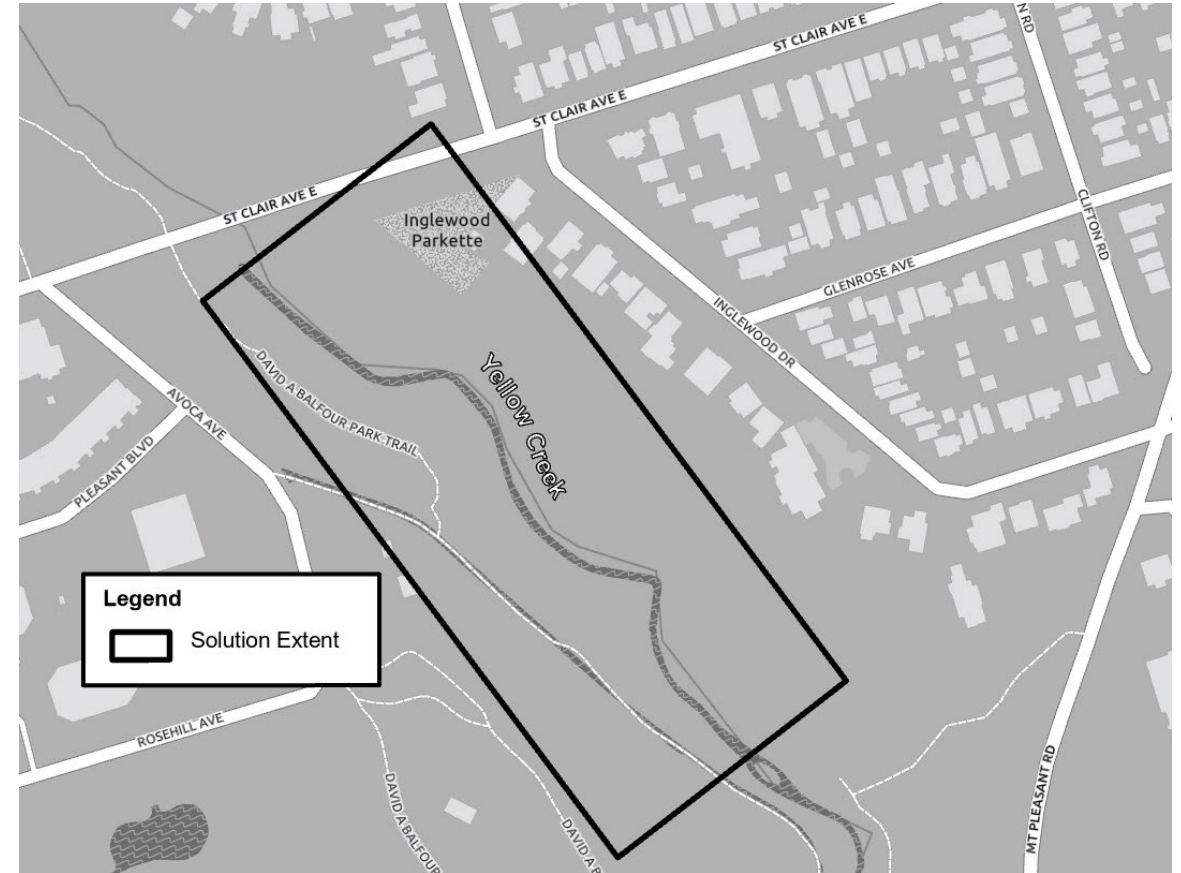
Alternative Solutions, with the threshold difference at 100 m

Local Works and Sub-Reach Based Works differ in their geographic extent.

Alternative 2 – Example of Local Works
Local channel works less than 100 m



Alternative 3 – Example of Sub-Reach Based Works
Extensive channel works greater than 100 m



Example of Alternative 2 – Local Works and Protection

In 2021, the storm sewer outfall at Site 3, south of St. Clair Avenue East, was repaired. Photos on this slide show a before-and-after example of local works and protection where natural stone was used for erosion control.

Before



After



Example of Alternative 3 – Sub-Reach Based Works, from Duncan Creek



Duncan Creek Phase 2
Deteriorated Gabion Lined Channel
(Pre-Construction)



Duncan Creek Phase 2
Rehabilitated Creek Corridor
(Post-Construction)

Examples of Stream Restoration Methods

Both Local Works (Alternative #2) and Sub-Reach Based Works (Alternative #3) will require reconstruction of the stream bed and banks using methods like what is shown in the photos on this slide.

These erosion control methods integrate Natural Channel Design guidelines and principles.

The specific restoration methods will be determined after the completion of this study.



Mud Creek: Stream bank constructed with a vegetated stone buttress



Berry Creek: Stream realigned and bends to move away from previously exposed sanitary sewer crossing



West Highland Creek: Rock weirs allow for grade control that reduces flow speed, provides pool and riffles, and stabilizes stream bed material

Evaluation Criteria

The following 5 categories of criteria were used to evaluate alternative solutions

Physical & Natural Environment

Improves stability of stream and valley walls, flood conveyance, groundwater quality, vegetation, aquatic and terrestrial habitats including habitat for at-risk species, and minimised tree removals

Economic Considerations

Evaluate total capital costs against recurring costs for maximum improvements and outcomes over a span of 50 years

Infrastructure Risk

Addresses erosion and risk to City's water and sewer infrastructure

Social & Cultural Environments

Protects built and cultural heritage as well as landscape and archaeological resources, long term benefits for the community, minimum or short-term negative impacts, and consideration for impacts on private property

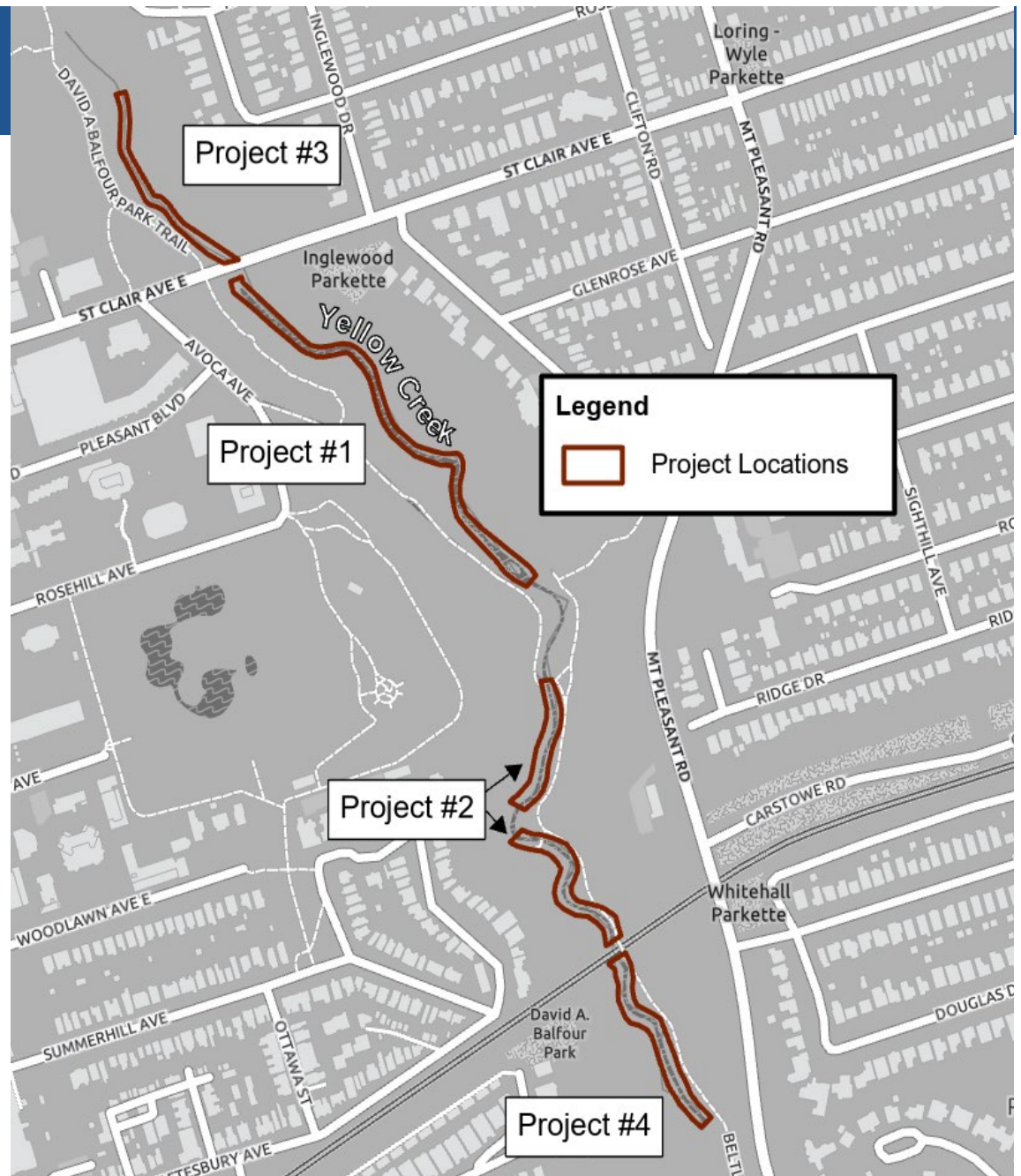
Technical & Engineering Considerations

Evaluate regulatory agency standards, availability of staff and technical resources, maximum improvement for ecosystem and infrastructure



Recommended Projects

Based on the risk assessment and evaluation of alternatives, improvements to the creek in segments greater than 150 metres are recommended for four separate sub-reach projects (Alternative 3).



Recommended Solution

Sub-Reach Based Works (Alternative 3) is the best option for all projects, as it:

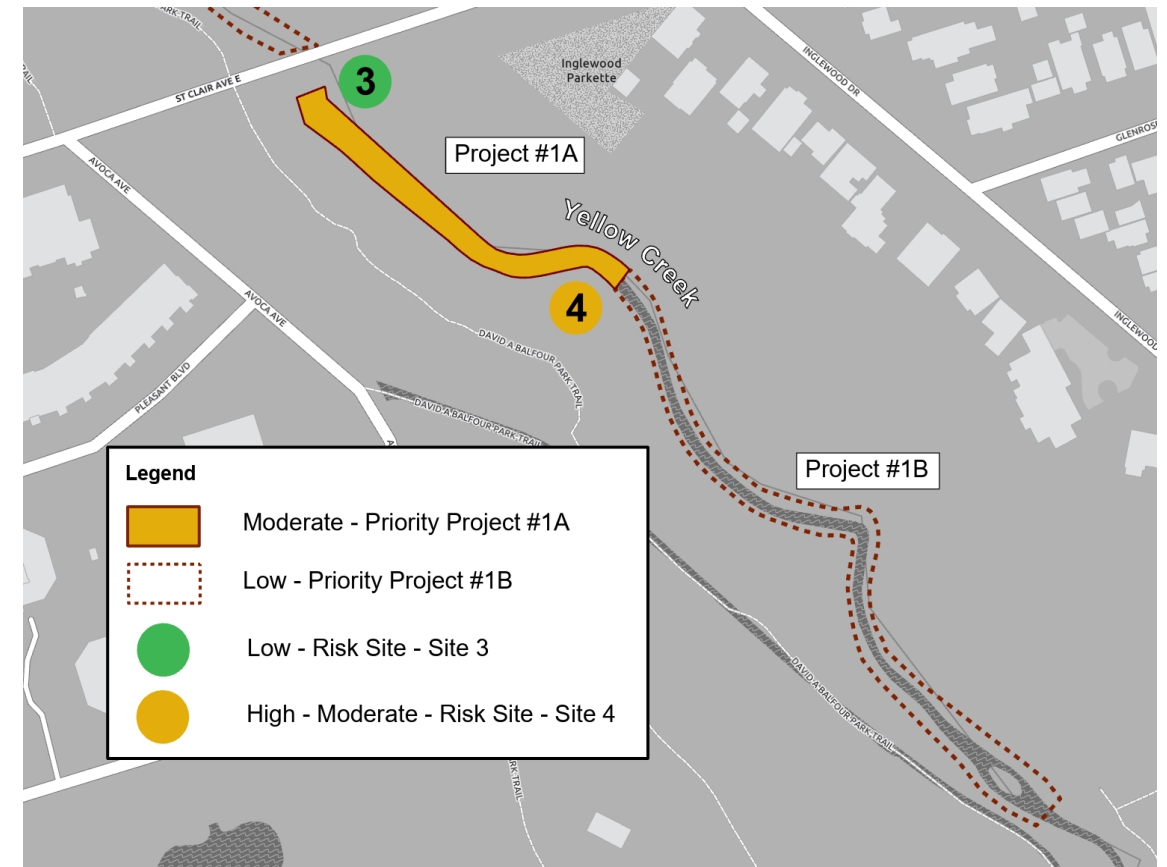
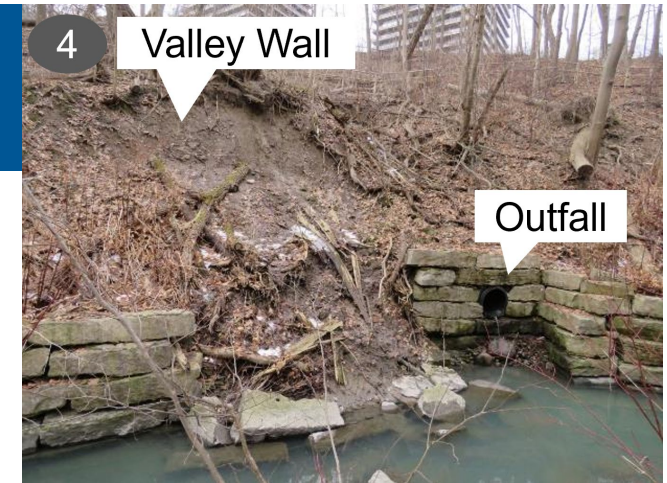
- Protects water infrastructure and reduces the risk of damage.
- Limits the release of suspended solids into the creek which helps maintain the functionality of the City's downstream sewers and reduces City maintenance needs.
- Provides a greater length of natural creek banks and bed.
- Improves geomorphic and slope stability, as well as aquatic habitat and floodplain connectivity.
- Creates a stable channel for establishing native trees along the creek.

Recommended Solution: Project #1

Project #1 addresses priority Site 4

Recommended Solution: Alternative 3 – Sub-Reach Works

- Project #1 consists of channel engineering works for approximately 340 m of channel. It has been divided into Project #1A and Project #1B to reflect the higher priority need of the Site 4 storm sewer outfall
- Project #1A is 85 m and will retrofit the storm sewer outfall at Site 4 and provide a local realignment to protect the outfall.
- Project #1B is 255 m and will remove the failed concrete spillway at the historic sawmill site.



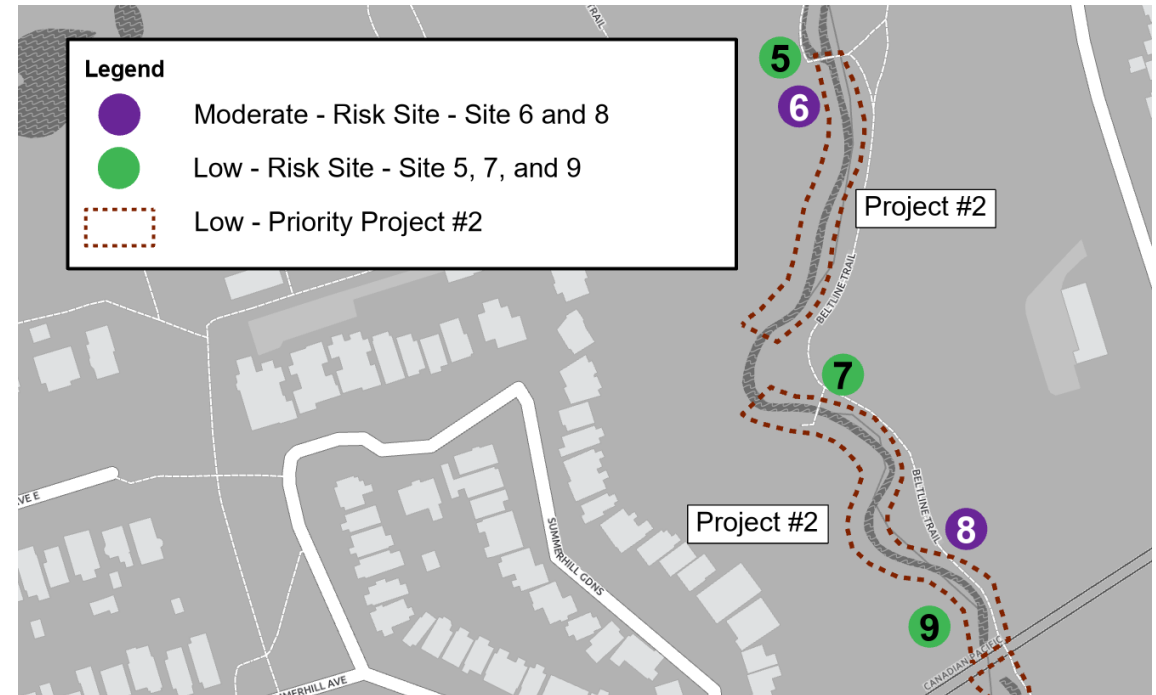
Recommended Solution: Project #2

Project #2 addresses priority Site 5, 6, 7, 8 and 9

Recommended Solution: Alternative 3 – Sub-Reach Works

- Channel engineering works for approximately 245 m.
- Engineered natural channel design to protect storm sewer outfall and watermain infrastructure.
- Channel alteration will require that the upstream pedestrian bridge be replaced.
- Includes lowering banks and reconnecting the floodplain.

TRCA is undertaking separate work to address Yellow Creek near Sites 7, 8 and 9 and is in communication with the City.



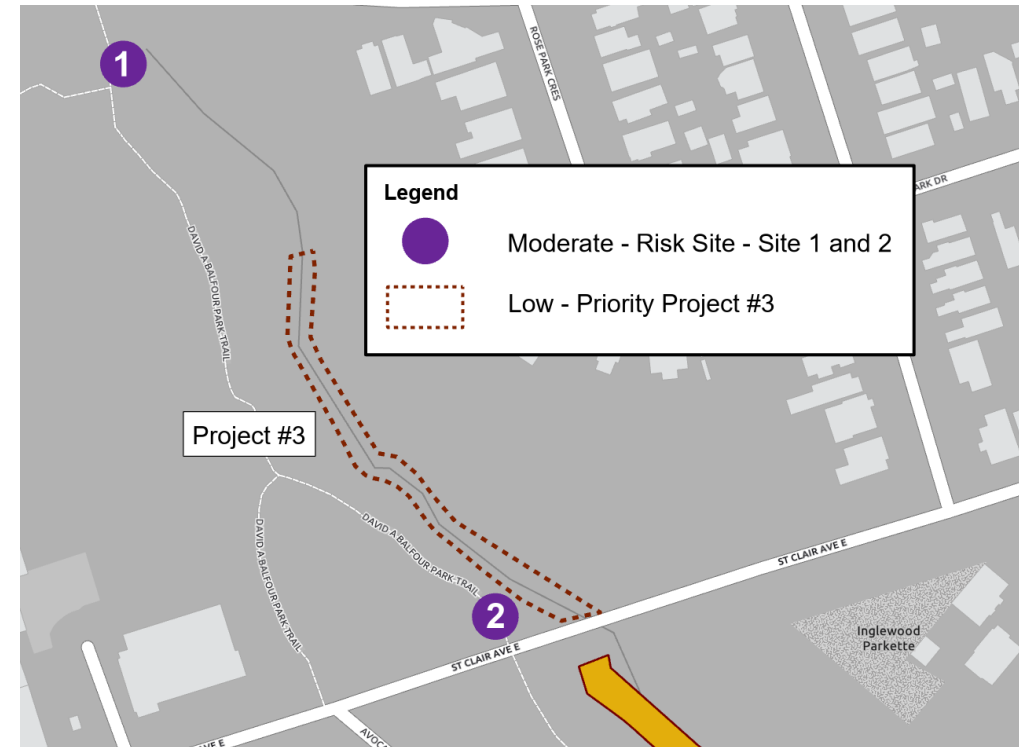
Recommended Solution: Project #3

Project #3 addresses priority Site 2

Recommended Solution: Alternative 3 – Sub-Reach Works

- Channel engineering works for approximately 170 m.
- Engineered natural channel design and retrofit of the storm sewer outfall at Site 2.
- Creek work at the northern limit overlaps with private property.

TRCA is undertaking a separate Class Environmental Assessment study to address the conditions at Site 1 and is in communication with the City.

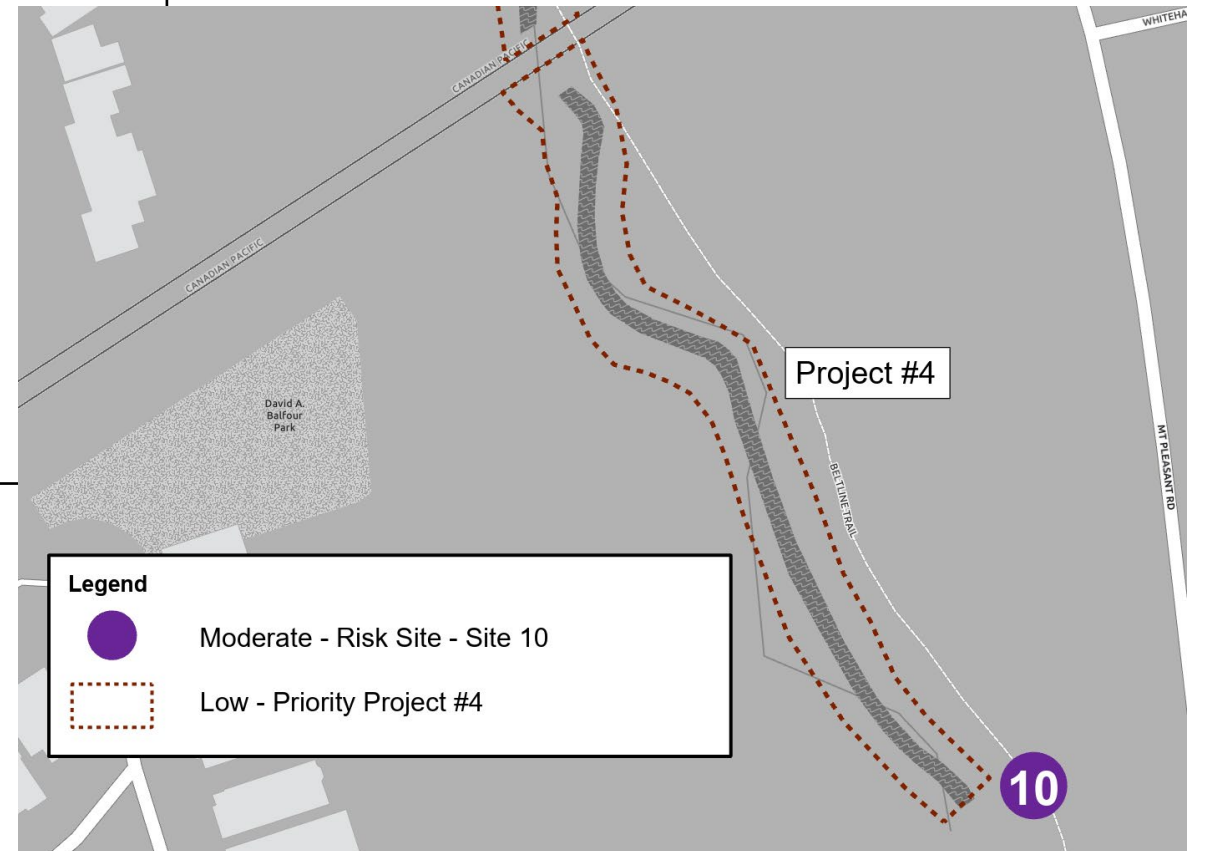


Recommended Solution: Project #4

Project #4 addresses priority Site 10

Recommended Solution: Alternative 3 – Sub-Reach Works

- Channel engineering works for approximately 180 m.
- Includes retrofitting the storm sewer inlet to update the trash rack intake structure at Site 10.
- Involves lowering the banks and regrading the floodplain.



Creek Restoration and Protection Work Requirements

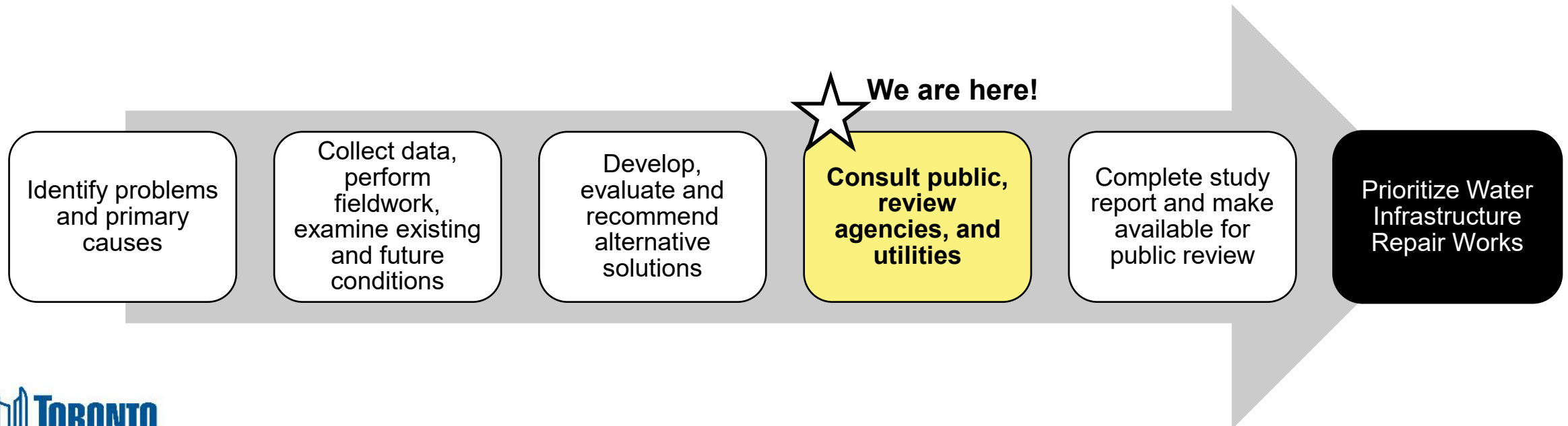
Future implementation of the recommended projects require:

- Tree and vegetation removal followed by native species replanting. A restoration plan will be developed prior to construction as part of a future design phase after the study.
- Possible trail closures to accommodate construction activities. Details will be confirmed as part of a future design phase after the study.

Residents will be notified prior to any construction.

Next Steps

- Complete the Study and make the study report available for a 30-day public comment period.
- Following a successful public comment period, the recommended solutions will be included in the City's Stream Restoration and Erosion Control Program. Implementation will be prioritized across all GSMPs city-wide.
- Share study results with the City's Parks, Forestry and Recreation division and TRCA for coordination and collaboration to advance a long-range plan for Yellow Creek.



Prioritization and Timing

Prioritization of Critically Exposed Sanitary Sewers

- Toronto Water has numerous critically exposed sanitary sewers across the City, such as in Highland Creek, Humber Creek, Mimico Creek, Newtonbrook Creek and Taylor-Massey Creek.
- In addition to this study, the City is undertaking numerous similar studies for other watercourses across the City.
- Exposed sanitary sewers are the highest priority sites to repair as there are greater negative impacts due to a broken sanitary sewer when compared to a broken storm sewer outfall or watermain.
- There are no sanitary sewers in Yellow Creek.
- Exposed sanitary sewer sites in other City watercourses will take precedence when planning, budgeting and undertaking future work to repair Toronto Water infrastructure.
- The Yellow Creek recommended projects are anticipated to be implemented in the medium to long-term because the City must first address other more urgent water infrastructure protection work in other City creeks.



Exposed sanitary sewer in Humber Creek



Exposed sanitary sewer in Mimico Creek

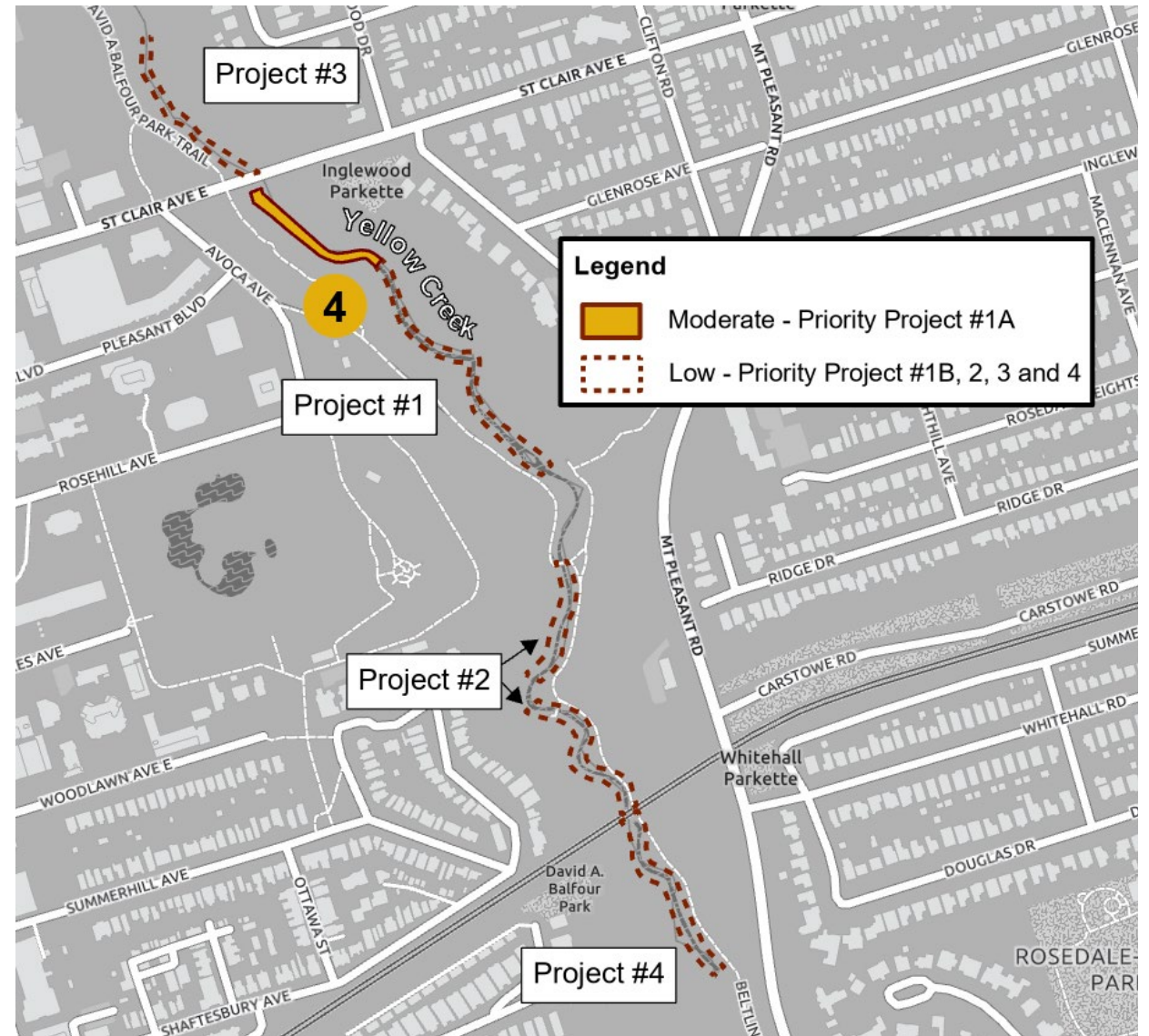
Prioritization of Yellow Creek Projects

- Project #1A is the highest priority project for Yellow Creek and will be implemented in the medium-term to address the most at-risk water infrastructure site, storm outfall Site 4.
- The remaining projects are identified for implementation in the long-term.
- Shorter lengths of Yellow Creek projects may be implemented ahead of #1B, 2, 3, or 4.

High-Priority Projects – no projects

Moderate-Priority Projects – Project #1A

Low-Priority Projects – Project #1B, 2, 3 and 4



Prioritization of Yellow Creek Projects

Yellow Creek Block Wall Liner

- Located along most of Yellow Creek
- Is generally in good shape
- The condition of the block wall will be monitored. Deteriorating conditions will be used as an indicator for when low-priority projects need to be considered in the long-term



Public Consultation

Public Consultation

Public Consultation Closes December 17, 2023

To provide feedback,

Complete an online survey or submit comments by email or phone



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