



Niagara Peninsula
CONSERVATION
nature for all

Oswego Creek Floodplain Mapping

Third Public Engagement Meeting
February 15, 2024

Oswego Creek Floodplain Mapping Third Public Engagement Meeting

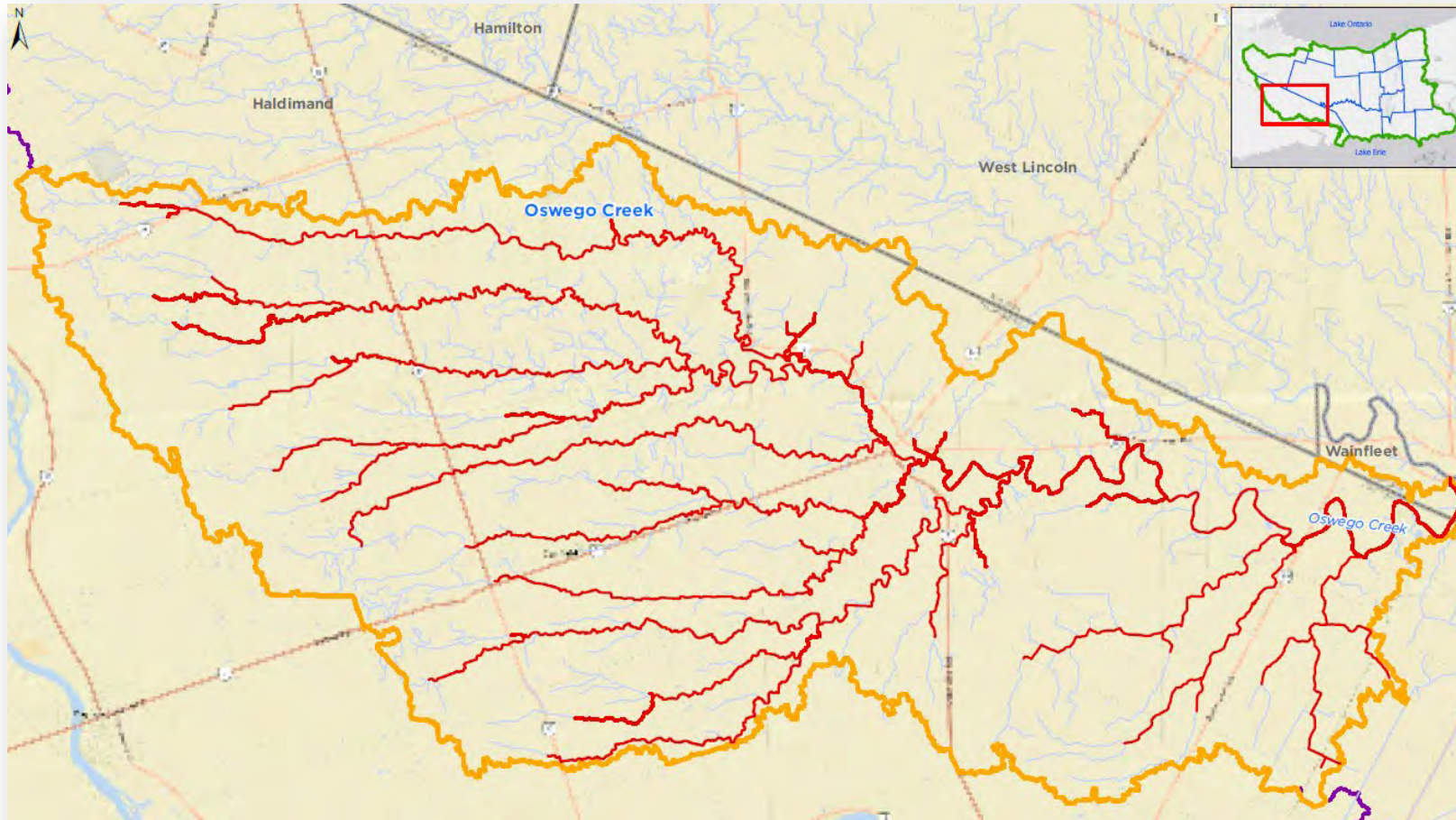
Speakers

- Leilani Lee-Yates, Director, Planning and Development, NPCA
- Tim Mereu, Program Manager, NPCA
- Brian Greck, Senior Design Review Engineer, Greck and Associates
- David Deluce, Senior Manager, Environmental Planning & Policy, NPCA

Project Milestones



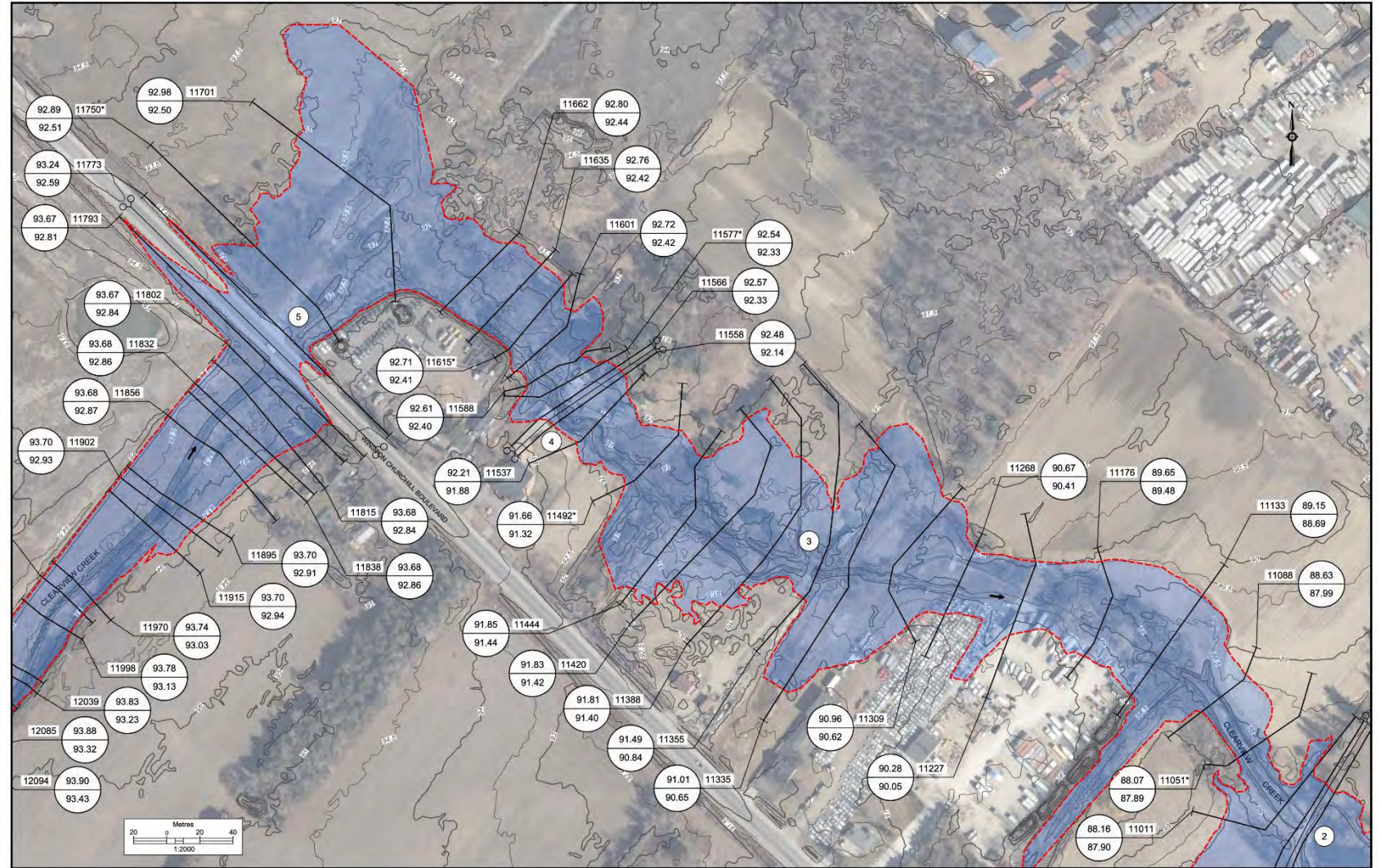
Oswego Creek Study Area



Typical Floodplain Map

The first step to reduce the cost of flood damage within a community is to have mapping that accurately shows the flood hazard.

These maps help people prepare for and respond to potential flooding.

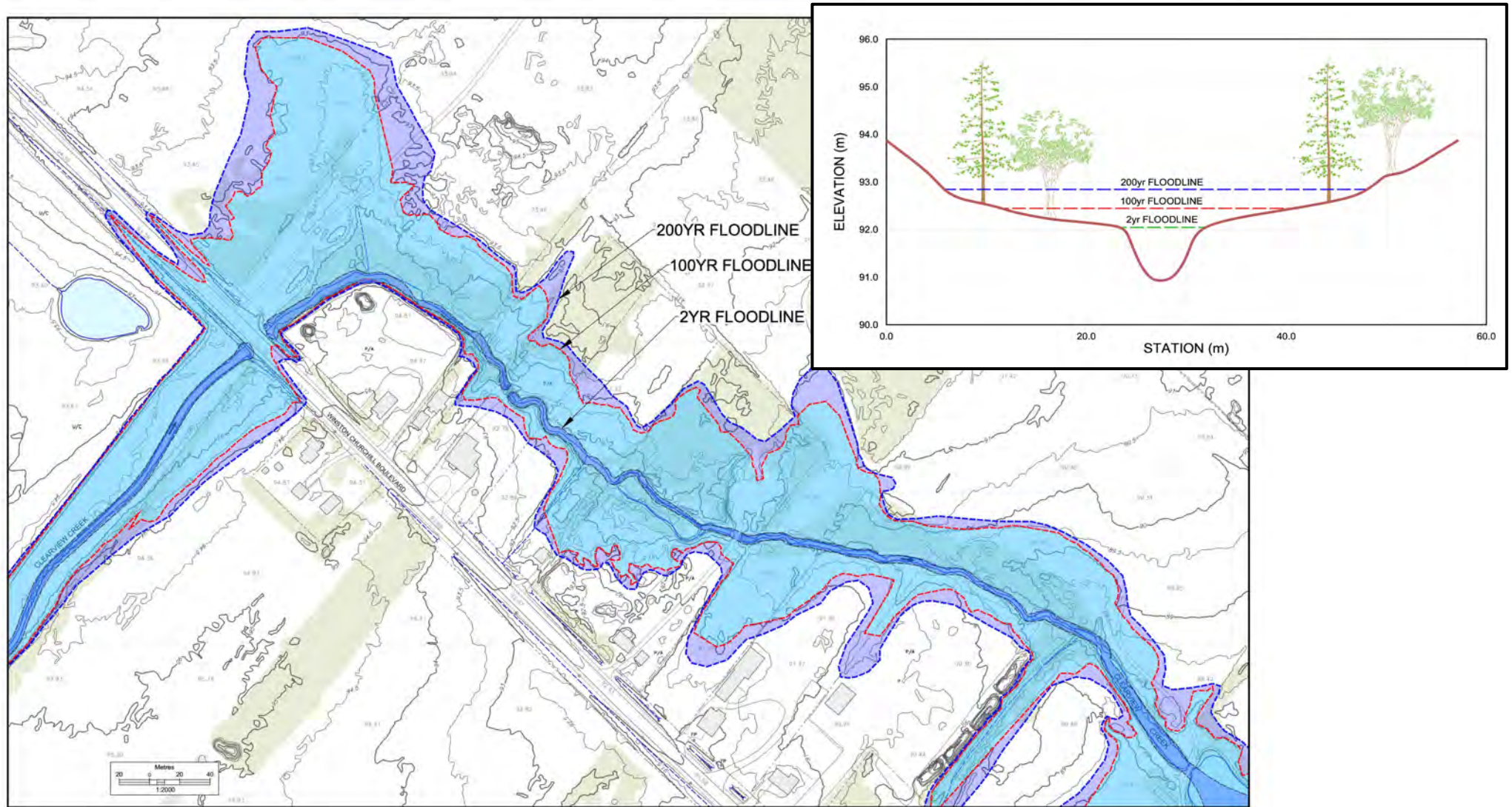


What is the 1:100 year flood and why is it used to map and regulate floodplains?

- 1% chance of happening in any given year
- The Province requires the 1:100-year flood to be mapped and the lands in the floodplain to be regulated
- To illustrate more severe flooding associated with climate change, also map floodplain with 20% increase in flows



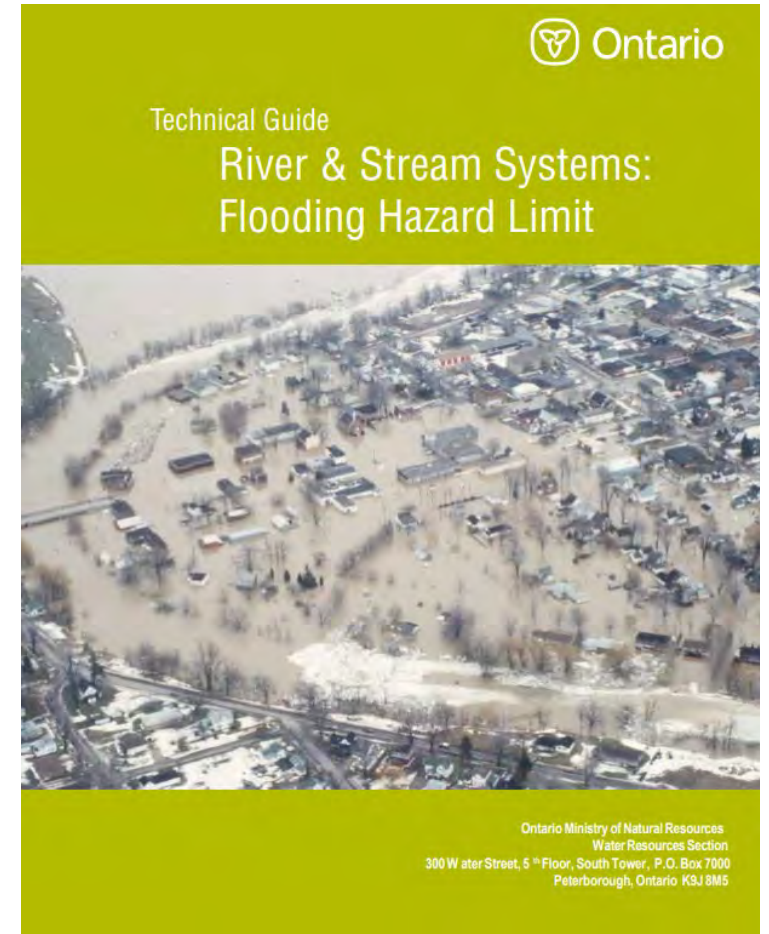
Floodplain Map: 1:2 year, 1:100 year; 1:200 year



Oswego Creek Floodplain Mapping

Guidelines for Creating Floodplain Maps

- Floodplain mapping must be undertaken in a manner consistent with the Provincial Technical Guide for River and Stream Systems.
- This guide is used by all Conservation Authorities undertaking floodplain mapping projects.



Oswego Creek Floodplain Mapping

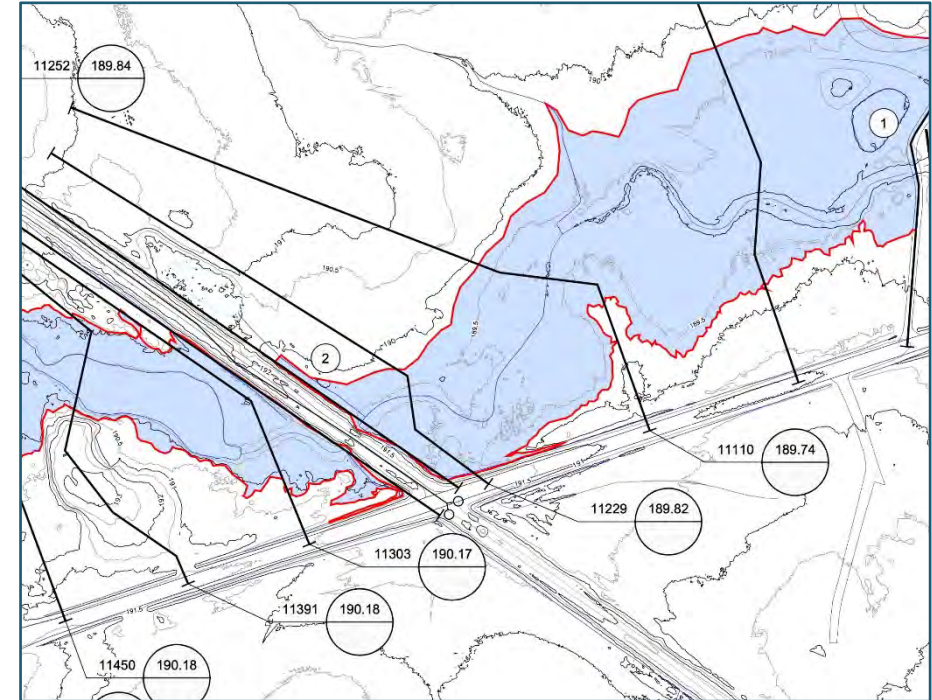
What are the key steps in preparing a floodplain map?

- Base Mapping
- Survey bridges and culverts
- Calculate the 1:100 year flow rate

PIC No. 2

- Develop a computer model that combines all of the above to estimate flood elevations
- **Prepare the floodplain maps**

PIC No. 3



Greck and Associates Limited (GRECK)- Who We Are



**SENIOR DESIGN REVIEW
ENGINEER**

BRIAN GRECK, P.ENG
Greck and Associates Limited



**WATER RESOURCES
ENGINEER (HYDRAULICS
LEAD & FIELD SURVEYING)**

JENNIFER CHAN, P.ENG.
Greck and Associates Limited



**TECHNICAL SUPPORT, CAD,
MAPPING AND FIELD
SURVEYING**

PAUL GRECK, B.E.S., CAN-
CIESC
Greck and Associates Limited



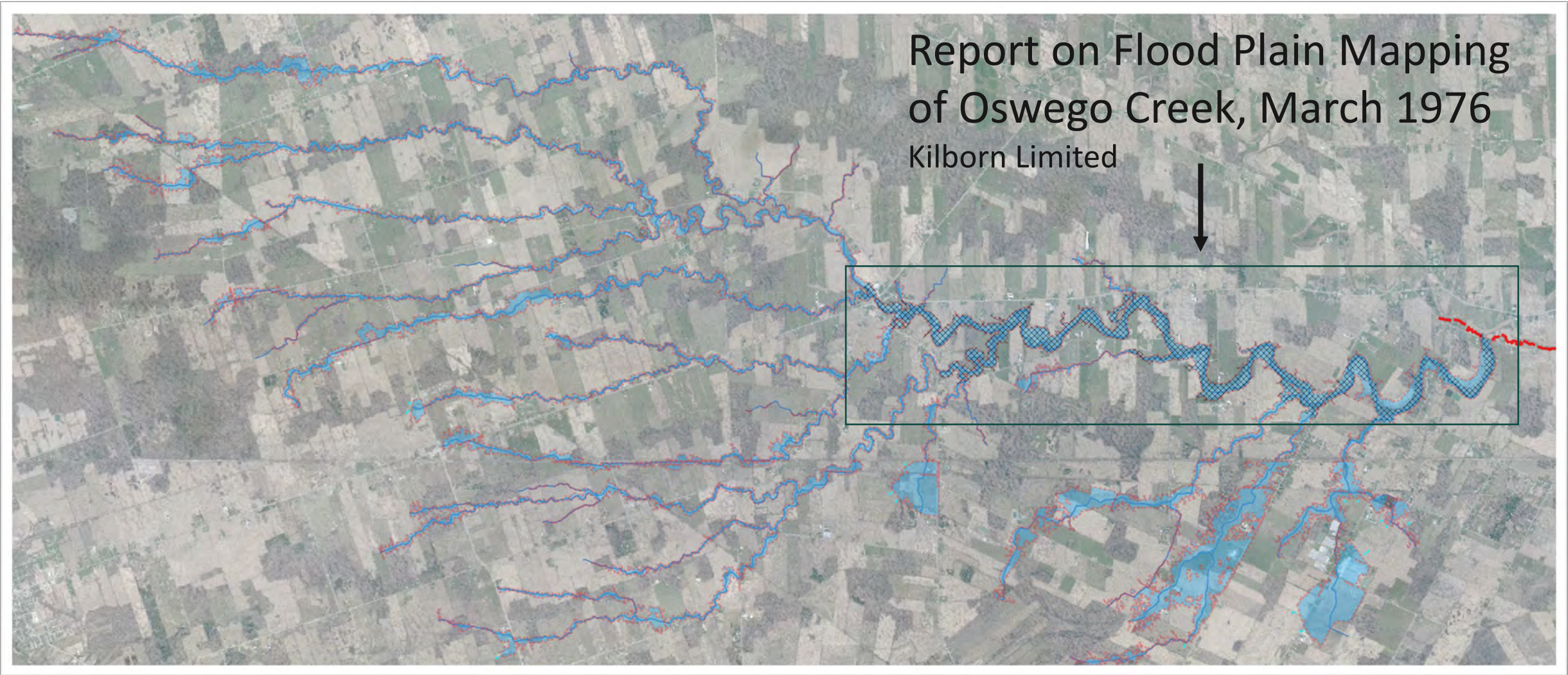
**WATER RESOURCES
ENGINEER (HYDROLOGY
LEAD & FIELD SURVEYING)**

ELLIOT PAI, P.ENG.
Greck and Associates Limited

Tasks Completed

- Review Background Studies (100%)
- Public Consultation (80%)
- Data Collection (100%)
- Field Surveys (100%)
- Hydrologic Model setup (100%)
- Hydraulic Model setup (90%)
- Floodplain Mapping (90%)
- Reporting
 - Hydrology Report 100%
 - Hydraulics Report 80%

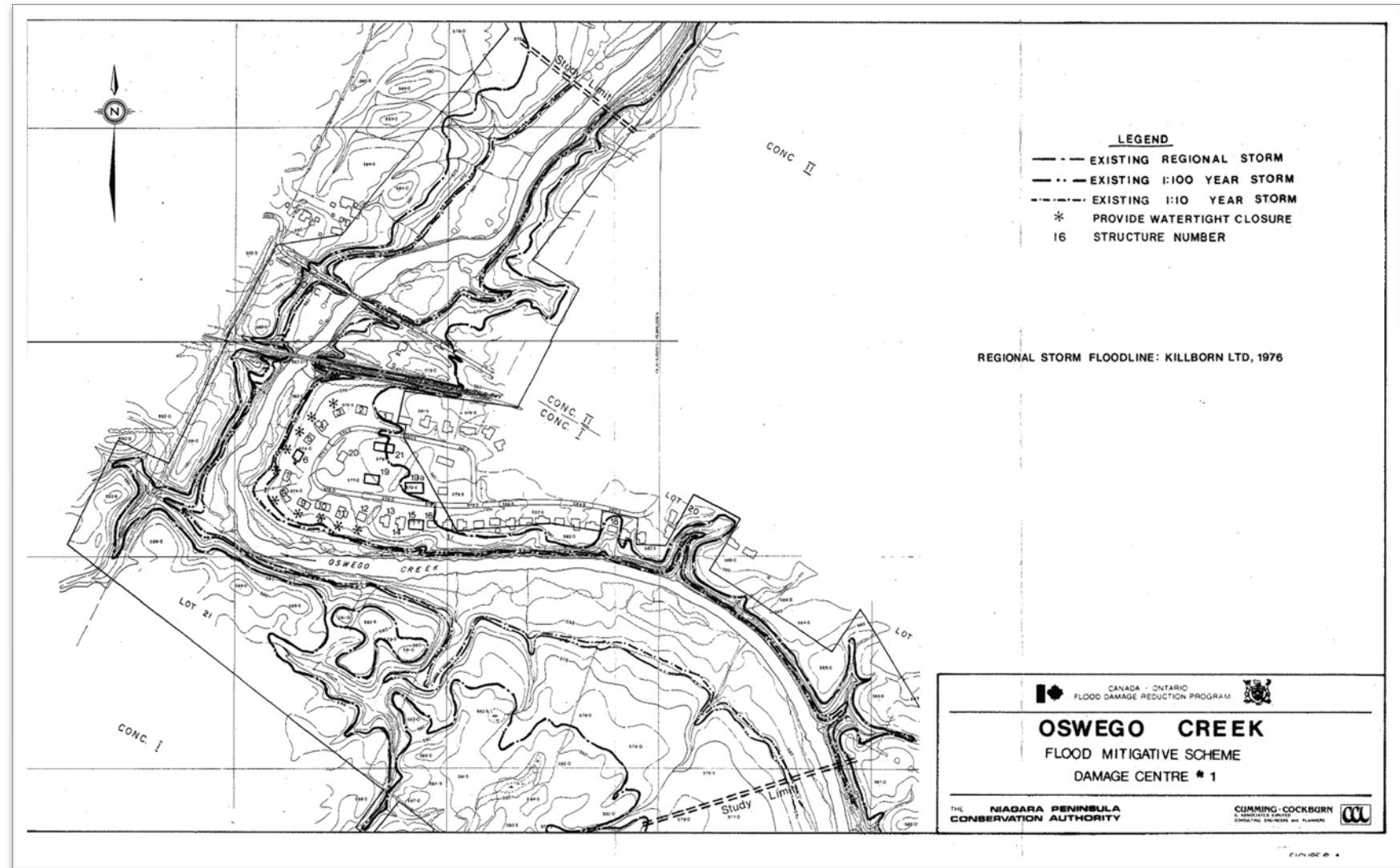
Review Background Studies



Review Background Studies

Watershed Flood Damage Assessment Study 1988, Cumming Cockburn Limited

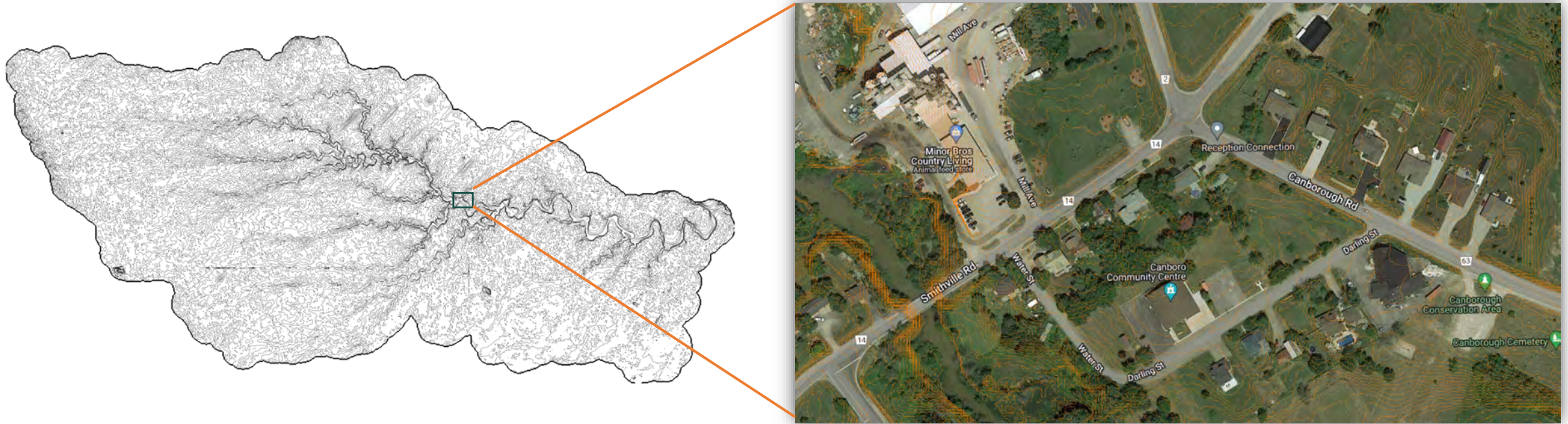
“Downstream starting elevations for each reach were, where available, taken from previous studies....Where such information was not available, or models began at confluences, starting elevations were estimated by starting the model assuming critical depth.” pg. 4-6



Data Collection

- NPCA - Aerial Photography, SWOOP 2020
- NPCA - Digital Terrain Model (DTM)/ Topography - Hamilton – Niagara 2021 Package F
- Greck – Field Survey of Crossing Structures

Aerial Photography With Lidar Topography



Field Surveys

110 Structures surveyed including 90 culverts and bridges and 20 Railway crossings (all abandoned structures).

77 other watercourse crossing were identified in aerial photographs, all on private land either in field or driveways. Most of the culverts are small diameter pipes. These structures were not surveyed or add to the hydraulic model.

The limited capacity of these structure is likely to cause nuisance flood for frequent storm flow events and minimal additional flood hazard during the 100-year storm. The effect of these additional culverts may be examined in the future.

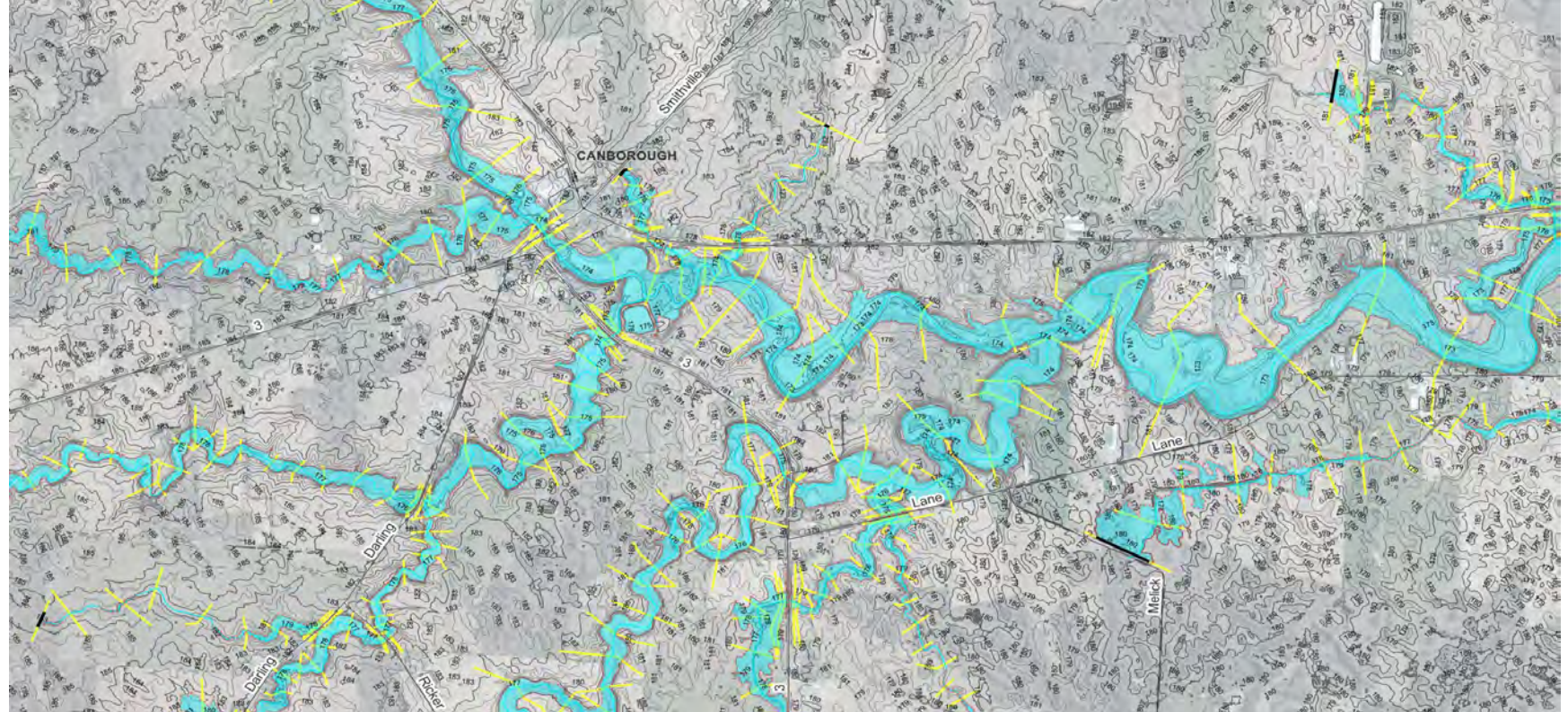


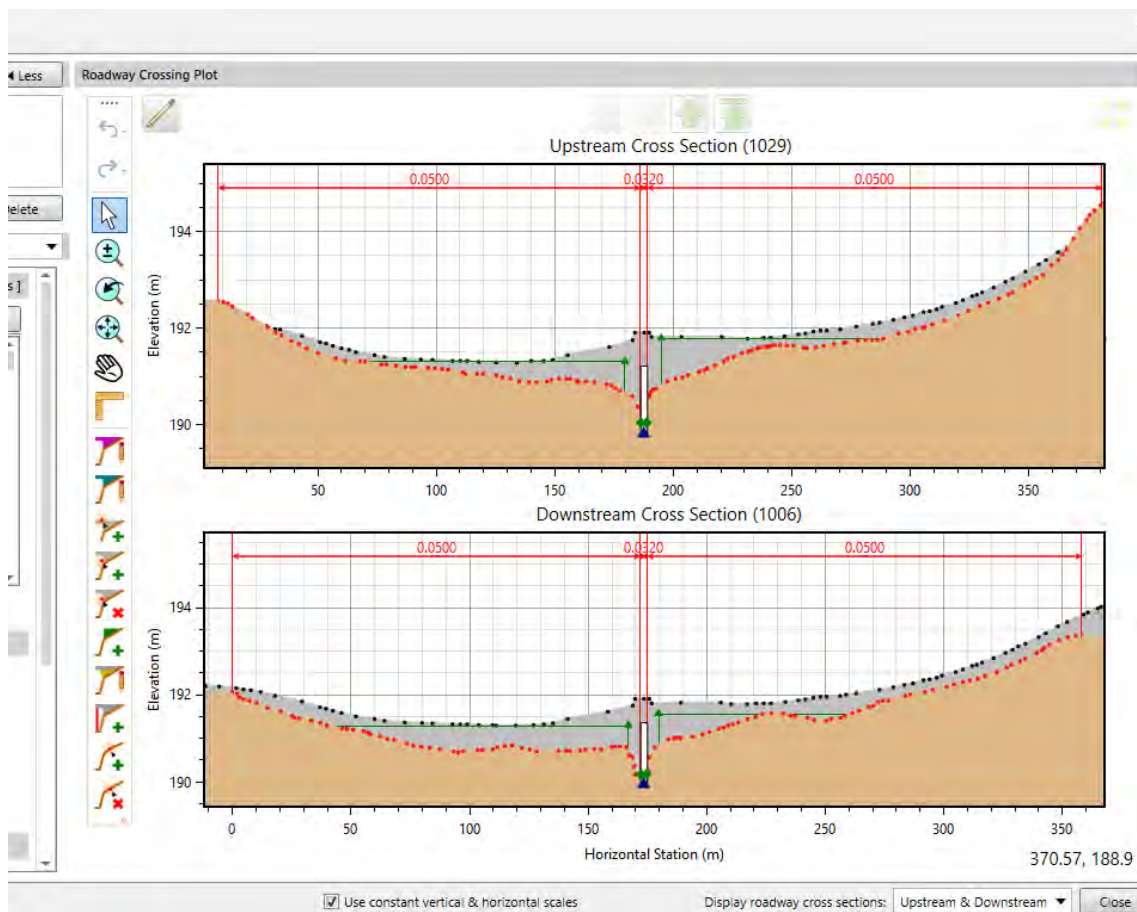
Niagara Peninsula CONSERVATION		Stream Crossing Field Inventory Sheet Oswego Creek		Greck	
Location:	Concession 1 Rd	Inspected By:	Paul Greck & Keiran Doak		
Northing:	4763361.14 N	Date:	26-Jul-23		
Easting:	602413.89 E	Weather:	23°C, Cloudy		
Inlet Type:	Box Culvert	Crossing ID:	81		
# of Spans:	1	Material:	Concrete		
Span or Diameter (m):	6.0	Open Footing:	Yes		
Rise (m):	2.68	Slope Angle:	No		
Length (m):	23.3	Sediment Depth (mm):	N/A		
US Invert Elevation (m):	180.16	Road Barrier:	No		
DS Invert Elevation (m):	180.28	US Obvert Elevation (m):	182.84		
Inlet/Outlet Type:	Projecting from Slope	DS Obvert Elevation (m):	182.78		
High Water Mark Depth (m):	Not Observed	Low Point in Road Elevation (m):	183.5		
Number of Piers:	No	Water Depth (m):	0.71		
Pier Width:	N/A	Thickness of concrete is 0.38m			
Additional Notes/Notable Obstructions:					
Upstream Photo:					
Downstream Photo:					

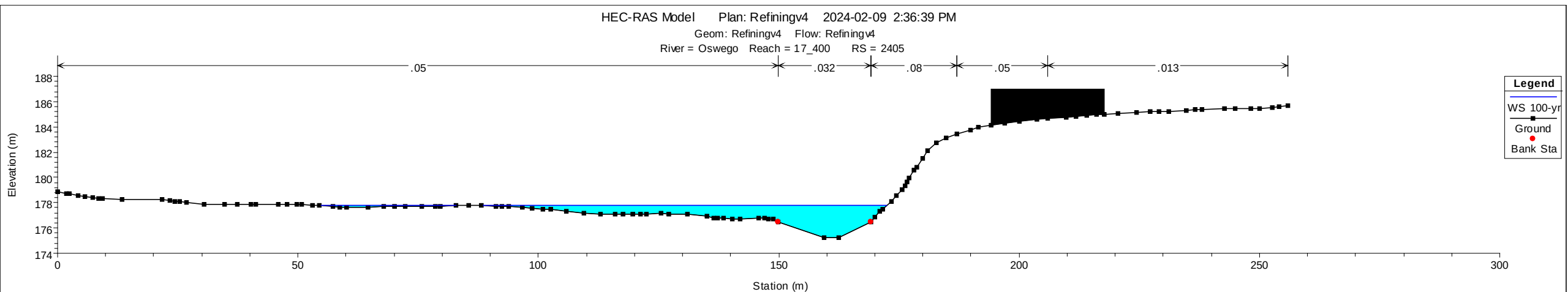


Hydraulic Model Setup

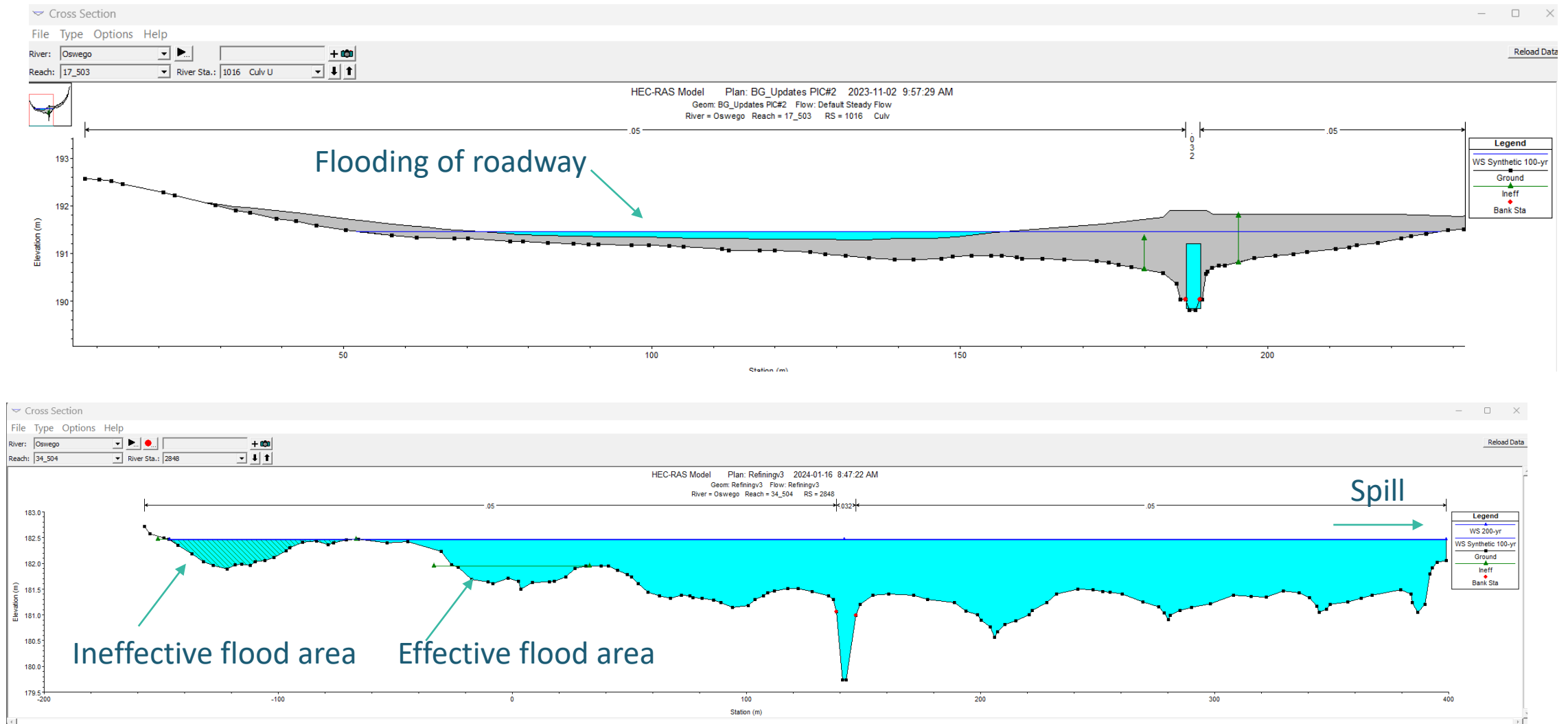
- Generate topography from LiDAR
- Add and adjust watercourse alignment
- Cut and adjust cross sections
- Add data for bridge and culverts
- Add flow date and Welland River starting water elevation
- Add hydraulic parameter
- Set modelling analytical procedures
- Review results and make model adjustments as needed.



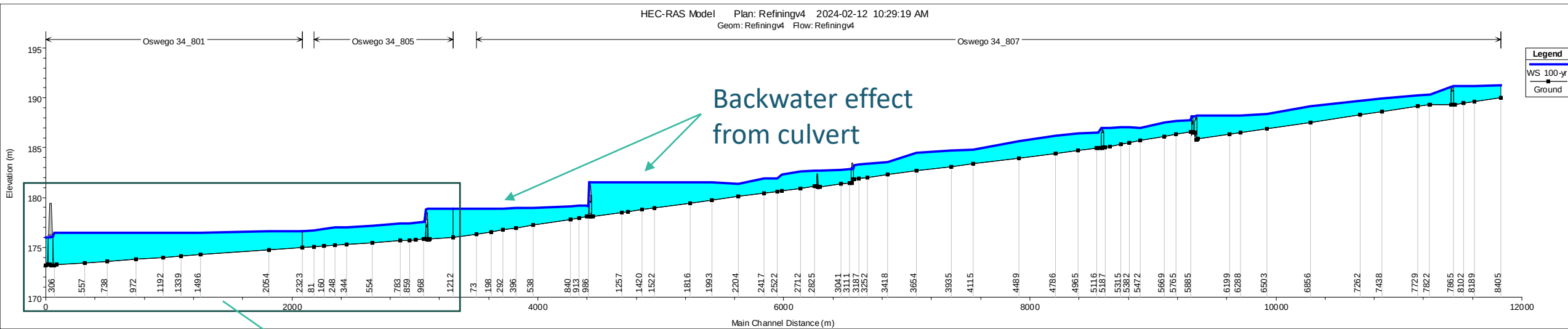




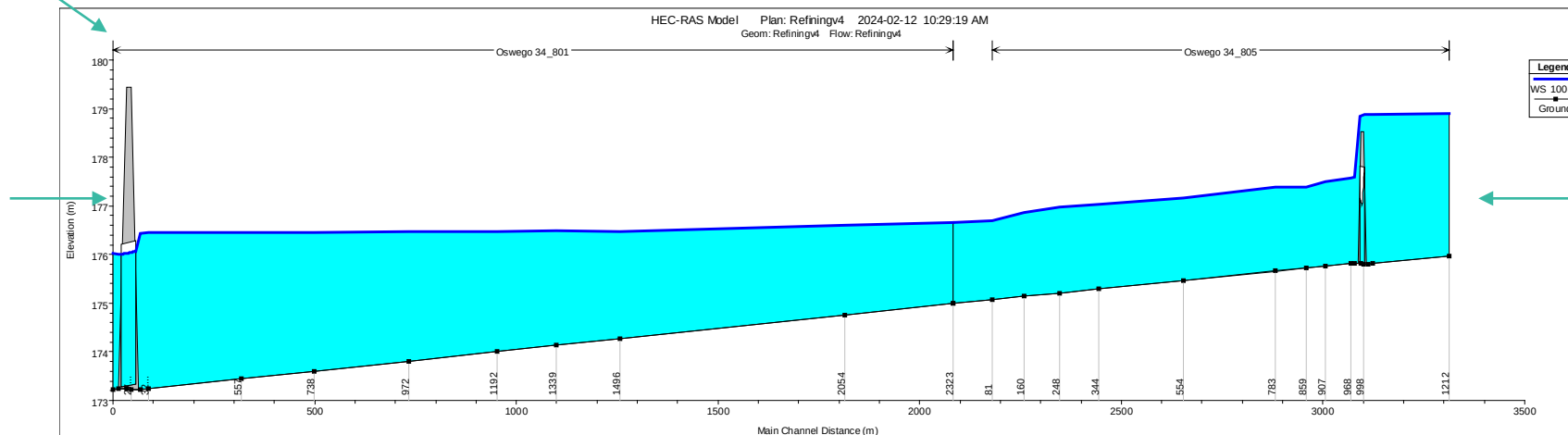
Example Model Results at a Culvert and Spill



Example Flood Flow Profiles

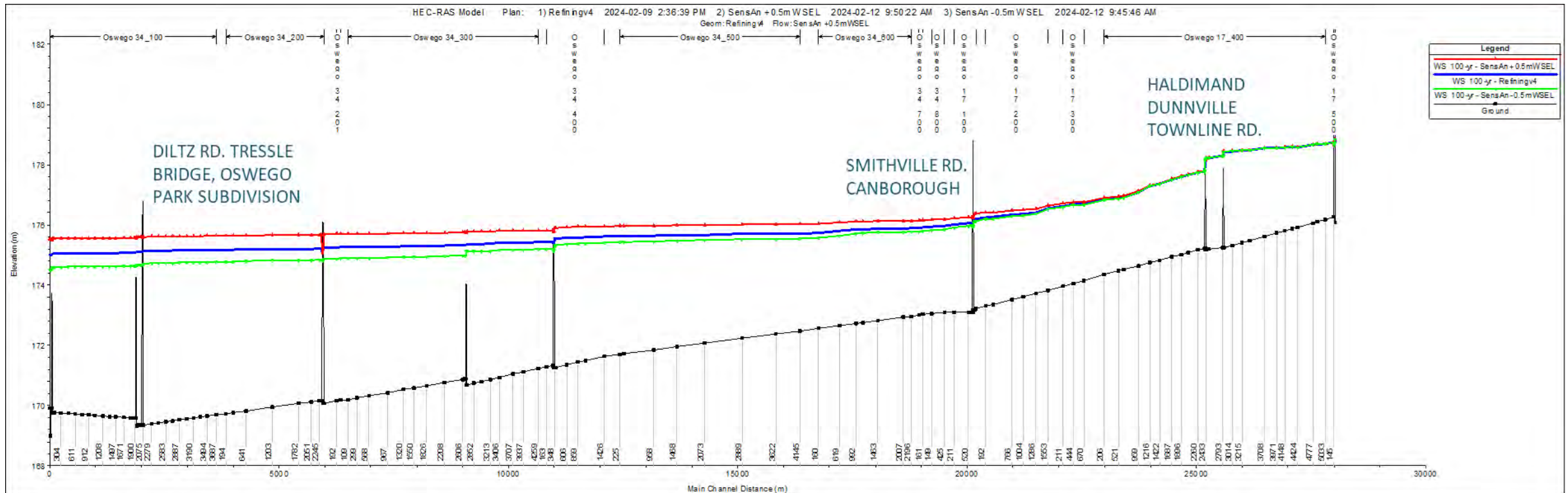


Bridge conveys
100-year storm
flow

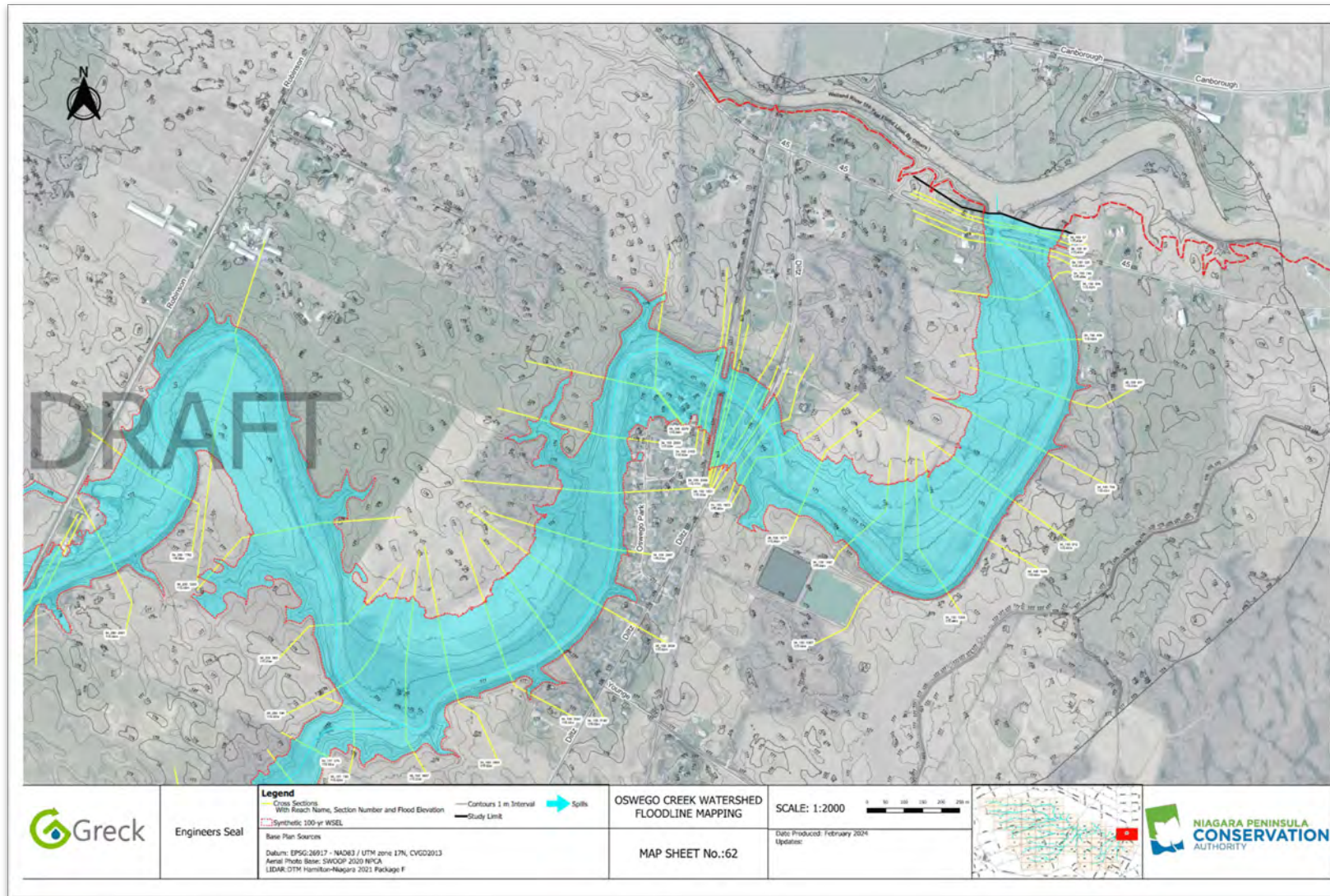


Culvert cannot
convey 100-year
storm flow and
overtops roadway

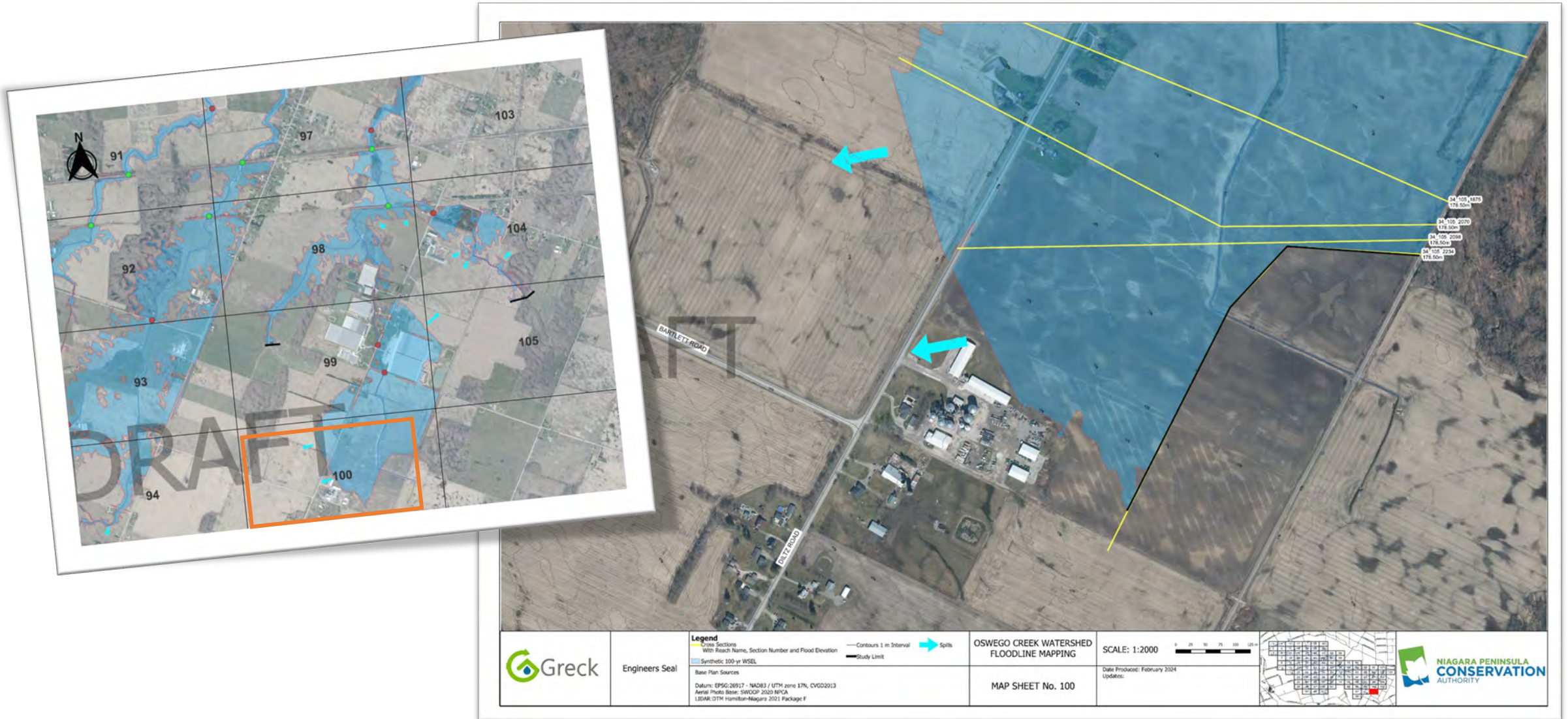
Flood Sensitivity to Welland River Flood Elevation



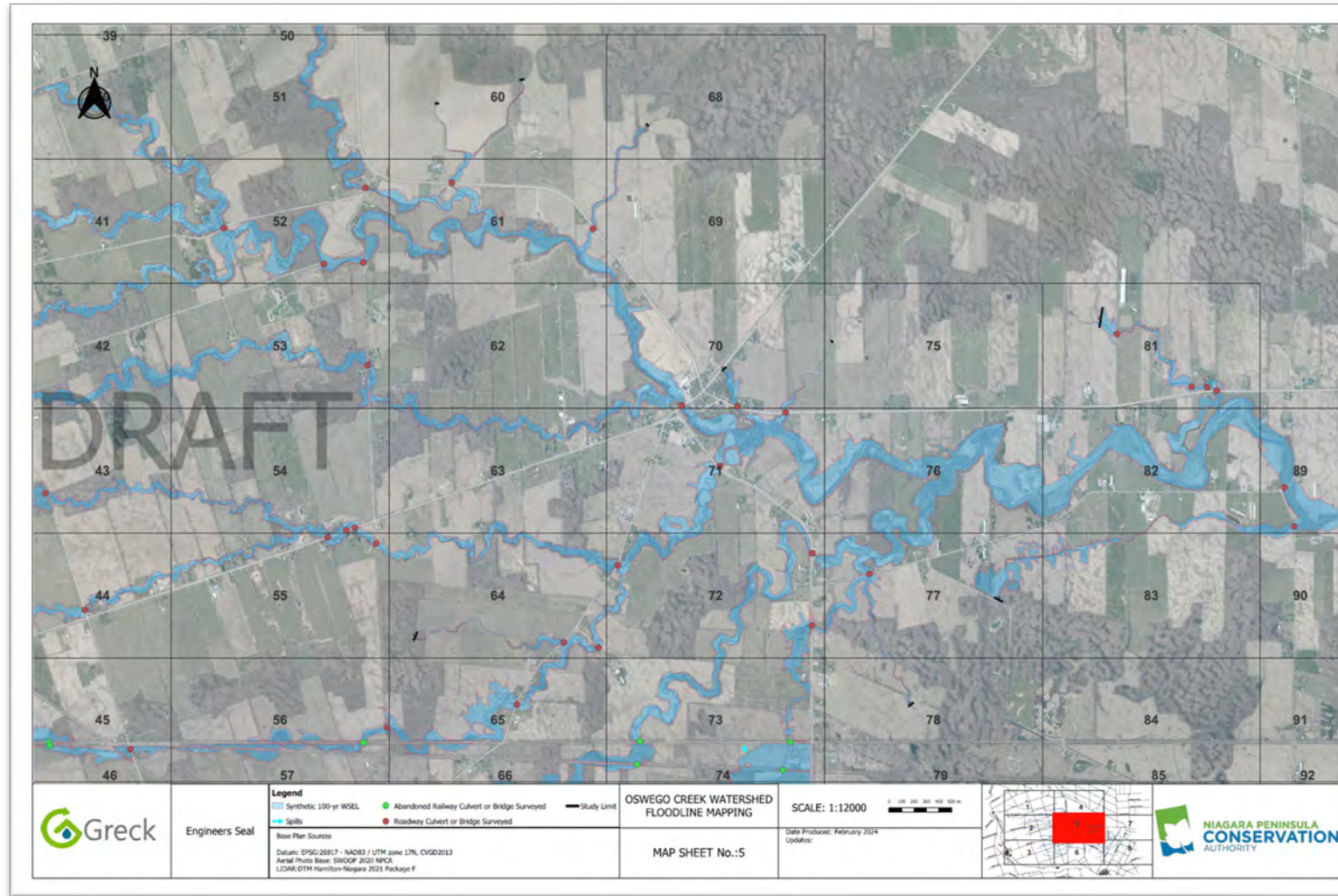
Example Floodplain Map Sheet



Example Floodplain Map Sheet With Spill Area



Find Your Property





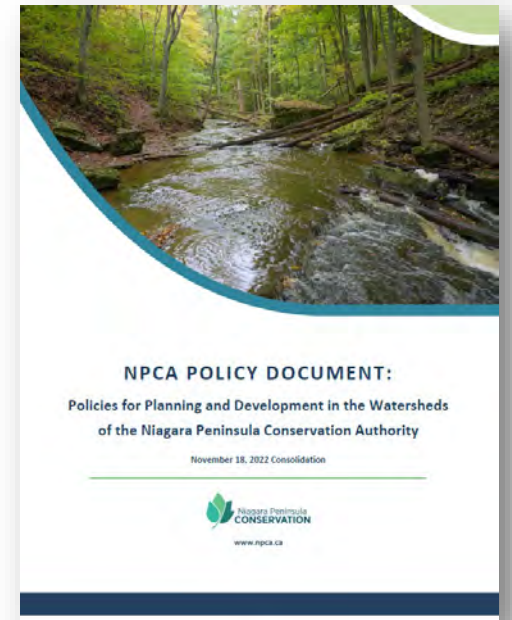
Niagara Peninsula
CONSERVATION

nature for all

NPCA FLOODPLAIN POLICIES

February 2024

David Deluce, MCIP, RPP
Senior Manager, Environmental Planning and Policy



What is Allowed?

- Passive open space uses
- Accessory structures (subject to criteria)
- Additions to existing buildings (up to 46.5 square metres)
- New agricultural buildings (subject to criteria)
- Up to 50 cubic metres of clean fill
- Balanced cut and fill
- Other uses not likely to incur damage from floodwaters



What is Not Allowed?

- Sensitive uses, such as hospitals, nursing homes, day-cares/pre-schools and schools
- Emergency services facilities
- Uses associated with the disposal, treatment, manufacturing/processing or storage of hazardous substances
- Any other use or development deemed to be inappropriate based on the following objectives:
 - Prevent loss of life;
 - Minimize property damage and social disruption;
 - Reduce the potential for incurring public costs associated with the impacts of flooding hazards;
 - Manage existing risks and reduce the potential for future risks;
 - Promote the conservation of land and a coordinated approach to the management of water.



NPCA Policies for Spill Areas

- The NPCA treats spill areas differently than areas within the 100 Year Flood Plain
- The NPCA would review Planning Act applications, Environmental Assessments, Building Permit applications where known spill areas exist
- No prohibitions but encourage mitigation measures

Stay Informed and Have Your Say

www.npca.ca



GET INVOLVED, NPCA

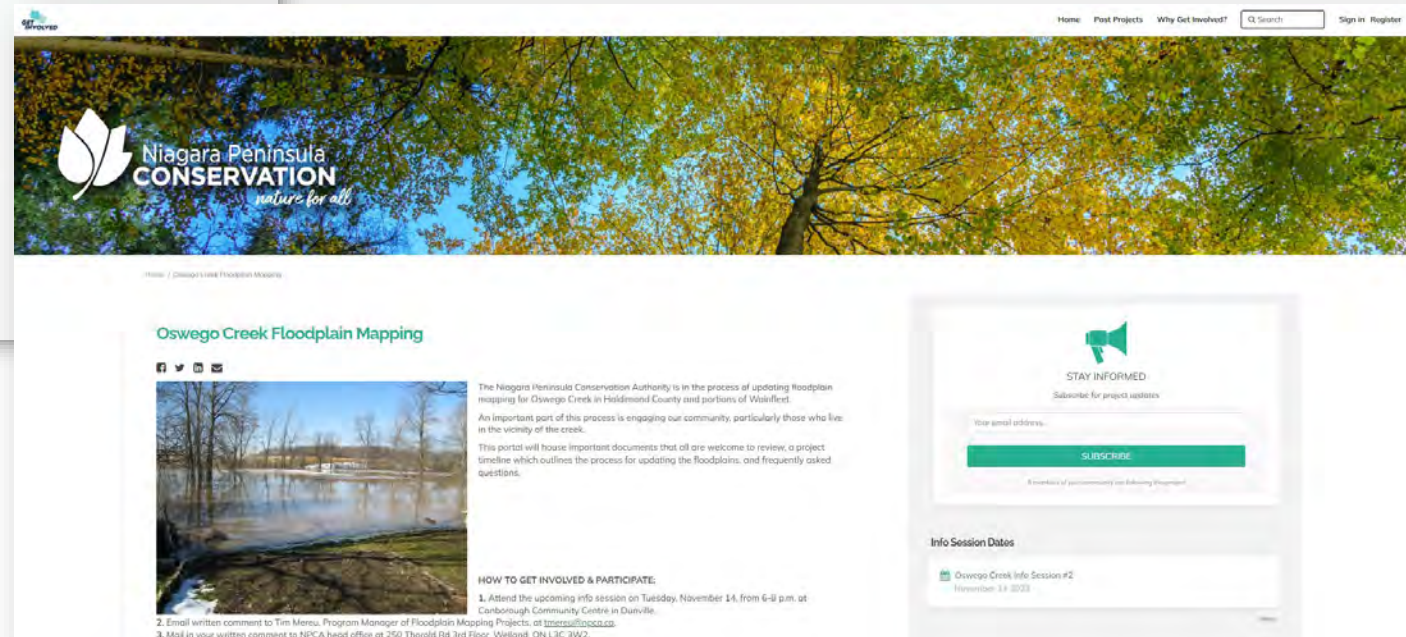
Welcome to Get Involved, the Niagara Peninsula Conservation Authority's online engagement platform, where you can contribute your feedback and ideas on issues and projects that are important to you.

We want to empower you, the people of our watershed, to be more active in shaping your community and future.

We will listen to what you say, take your opinions into account, and report back on how community input contributes to NPCA projects.

We invite you to join the conversation and share your thoughts.

[Register / Follow the Projects](#)



Home / Oswego Creek Floodplain Mapping

Oswego Creek Floodplain Mapping

The Niagara Peninsula Conservation Authority is in the process of updating floodplain mapping for Oswego Creek in Hamilton County and portions of Windsor. An important part of this process is engaging our community, particularly those who live in the vicinity of the creek. This portal will house important documents that all are welcome to review, a project timeline which outlines the process for updating the floodplains, and frequently asked questions.

HOW TO GET INVOLVED & PARTICIPATE:

1. Attend the upcoming info session on Tuesday, November 14, from 6-8 p.m. at Carleton Place Community Centre in Carleton Place.
2. Email written comment to Tim Morris, Program Manager of Floodplain Mapping Projects, at tmorris@npca.ca.
3. Mail in your written comment to NPCA head office at 250 Thorold Rd 3rd Floor, Welland, ON L3C 2W2.

STAY INFORMED
Subscribe for project updates

Your email address:

[SUBSCRIBE](#)

8 members of our community are following this project

Info Session Dates

Oswego Creek Info Session #2
November 14, 2023



Thank you!

Questions?

Leilani Lee-Yates, Director, Planning and Development, NPCA

Tim Mereu, Project Manager, Floodplain Mapping, NPCA

Brian Greck, Project Director, Greck and Associates Limited

David Deluce, Senior Manager, Environmental Planning & Policy, NPCA