Watershed Advisory Committee
Cuyahoga River North

October 15, 2019

Northeast Ohio
Regional Sewer District

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Agenda

- Sewer District Updates
- Stormwater Master Plan
- Stormwater Inspection and Maintenance
- Stormwater Design & Construction
- Stormwater Nomination Process
- Special Feature – Echo Lane Project

Program Highlights

Frank Greenland, Director of Watershed Programs

Matt Scharver, Deputy Director of Watershed Programs

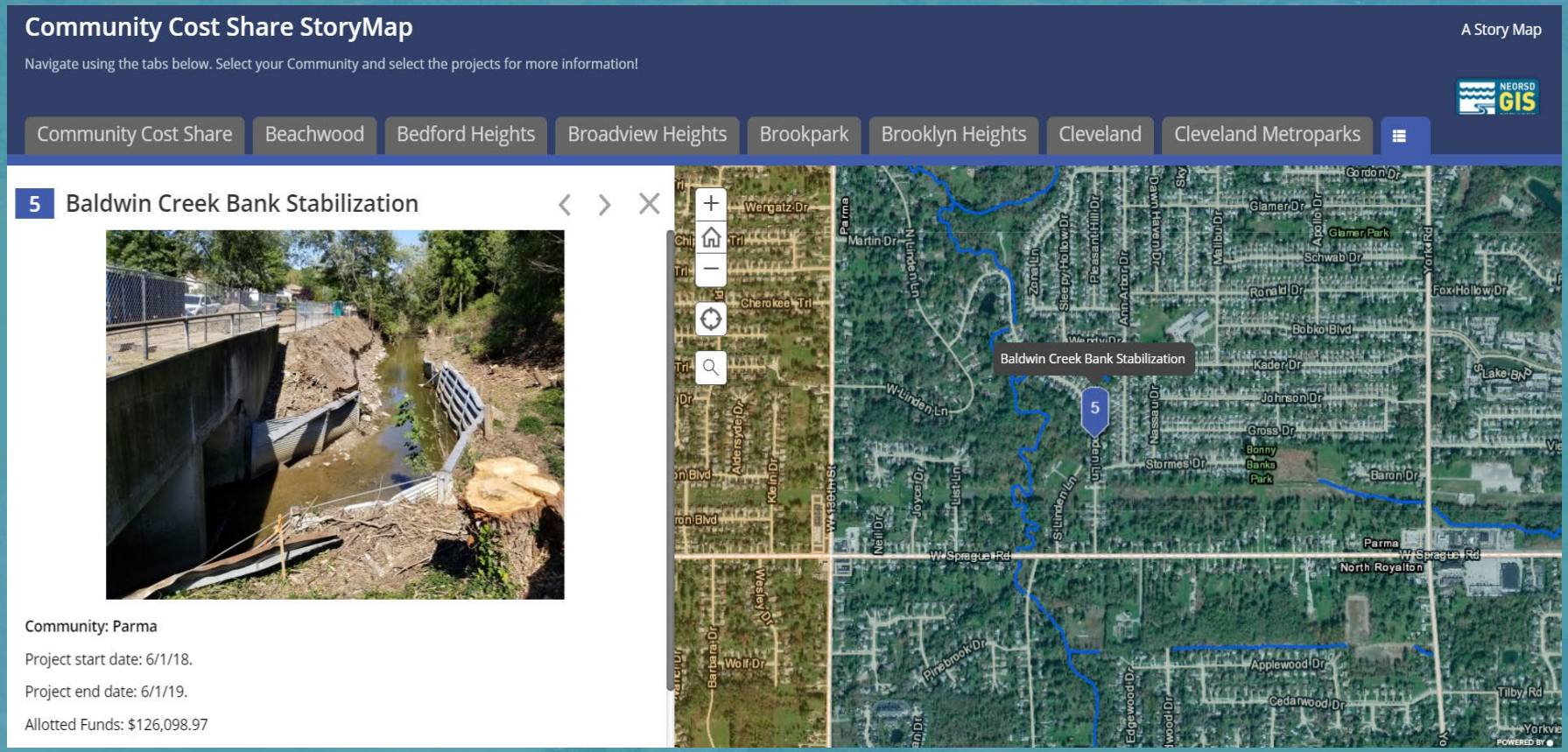
Community Cost-Share: 2019

• CCS Funds Balance (9/30/2019)	$25,180,562
• 53 projects w/ executed agreement	$ 8,728,844
• 12 projects w/ agreements in progress	$ 550,771
• 18 approved allocation agreements	$ 9,886,368
• CCS Funds available to Member Comm.	$ 6,014,579

35 of 55 Member Communities currently participating

50 of 55 Member Communities have participated

Community Cost-Share
Project Story Map



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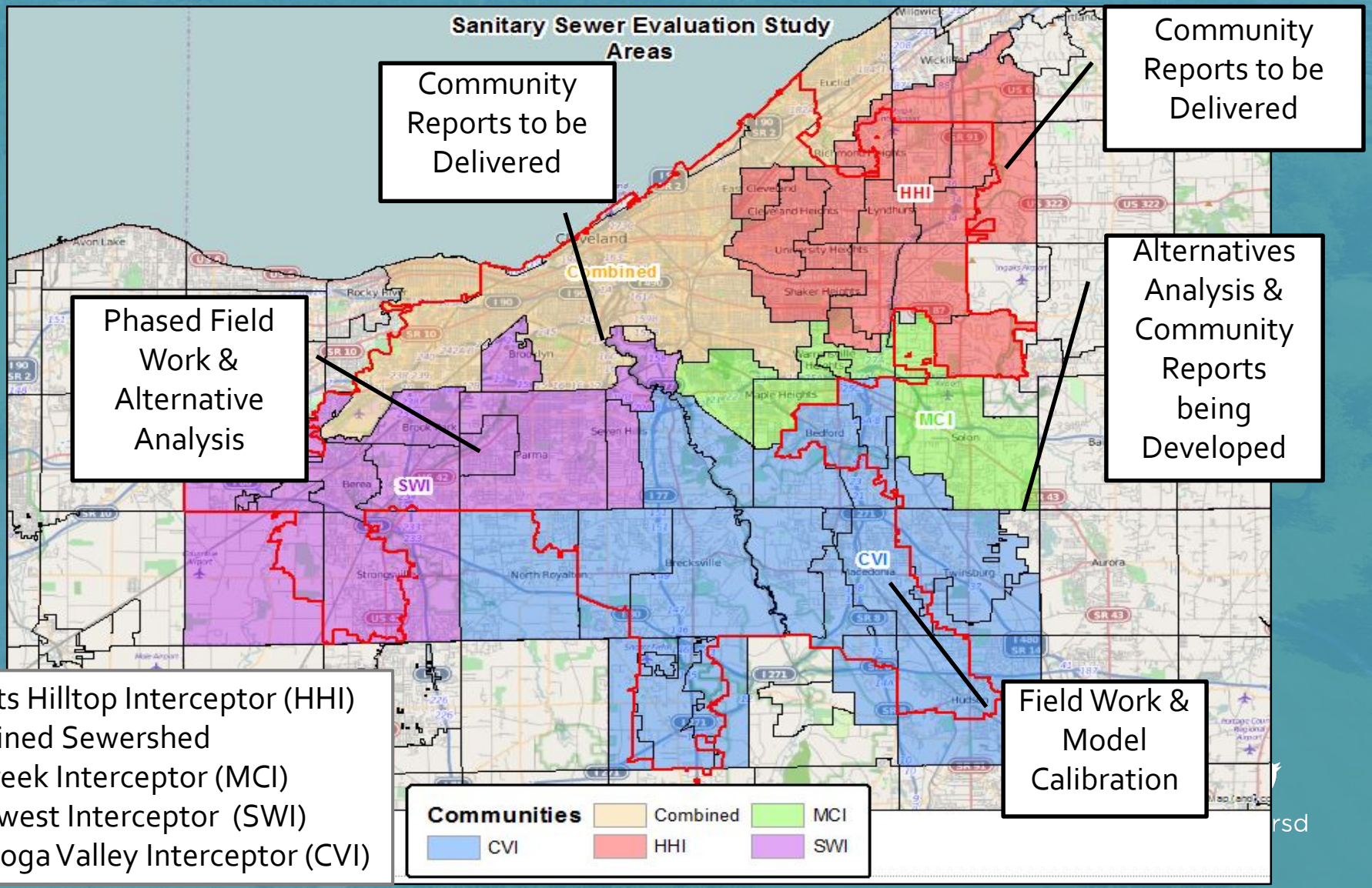
Local Sewer System Evaluation Studies



Heights Hilltop Interceptor (HHI)
Combined Sewershed
Mill Creek Interceptor (MCI)
Southwest Interceptor (SWI)
Cuyahoga Valley Interceptor (CVI)

Member Community Infrastructure Program

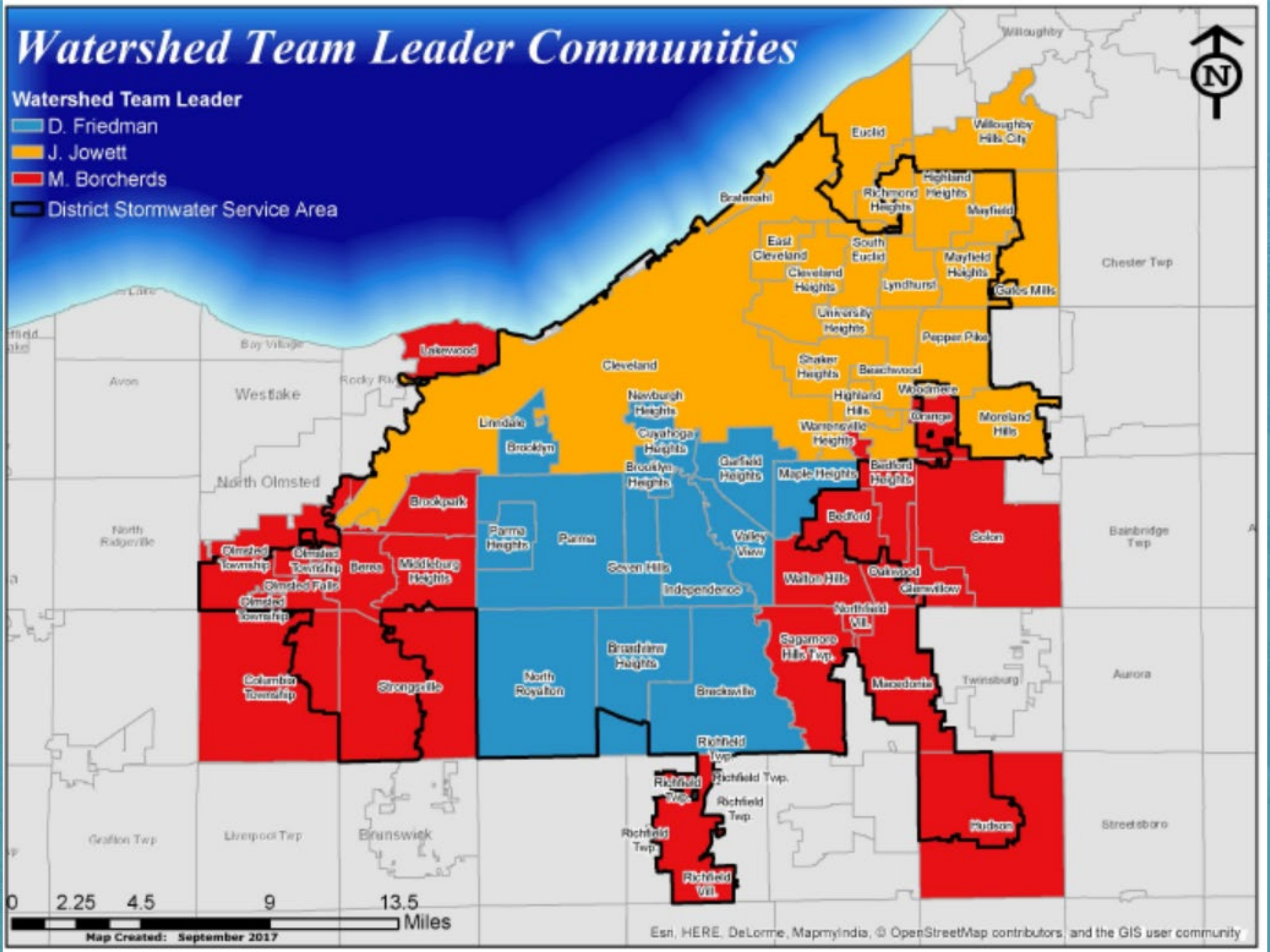
- Grant funding for local sanitary sewer rehabilitation targeted at reducing basement backups and human health issues
- LSSES early action project alternatives for the Southwest Interceptor area
- RFP will be released February 6, due on May 11
- MCIP Workshop March 13 (10am – noon) at the Watershed Stewardship Center

Cost-saving Programs

- *Summer Sprinkling*
  - *Average winter consumption*
- *Crisis Assistance*
  - *$300 sewer credit*
  - *Experienced financial hardship within last 6 months*

Cost-saving Programs

- *Homestead*
  - 65 and older *or* permanently disabled
  - Household income must not exceed $33,500
- *Affordability*
  - Annual income is at or below 200% of the poverty level


Watershed Team Leader Communities
Watershed Team Leader
D. Friedman
J. Jowett
M. Borcherds
District Stormwater Service Area
N
Willoughby
Euclid
Willoughby Hills City
Highland Heights
Richmond Heights
Mayfield
Bratenahl
East Cleveland
South Euclid
Mayfield Heights
Cleveland Heights
Lyndhurst
Gates Mills
Chester Twp
University Heights
Pepper Pike
Lakewood
Cleveland
Shaker Heights
Beachwood
Bay Village
Avon
Westlake
Rocky River
Newburgh Heights
Highland Hills
Woodmere
Lindale
Cuyahoga Heights
Warrensville Heights
Orange
Moreland Hills
Brooklyn
Garfield Heights
Brooklyn Heights
Maple Heights
Bedford Heights
North Olmsted
Brookpark
Bedford
Parma Heights
Parma
Valley View
Solon
North Ridgeville
Olmsted Township
Olmsted Township
Berea
Middleburg Heights
Seven Hills
Bainbridge Twp
Olmsted Falls
Olmsted Township
Walton Hills
Oakwood
Glenwillow
Independence
Northfield Vill.
Sagamore Hills Twp.
Broadview Heights
North Royalton
Brecksville
Twinsburg
Aurora
Columbia Township
Strongsville
Macedonia
Richfield Twp.
Richfield Twp.
Richfield Twp.
Richfield Twp.
Hudson
Streetsboro
Grafton Twp
Liverpool Twp
Brunswick
0
2.25
4.5
9
13.5
Miles
Map Created: September 2017
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Water Resource Project Property Acquisition

Program Goals

- Support Design and Construction project needs
- Mitigate the threat of erosion and flooding
- Protect functioning regional stormwater assets
- Leverage acquisition dollars through partnerships

Acquisition Process

Outreach

Appraisal

Appraisal Review

FMV Offer

Board Approval

Closing /Leasing

Maintenance/Inspection

Demolition

Water Resource Project

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Water Resource Project Property Acquisition

Success to date: Threat Mitigation/ Asset Protection

- Flood / Erosion Mitigation: 25 homes
- Stream / Riparian length protected: 1.5 Miles

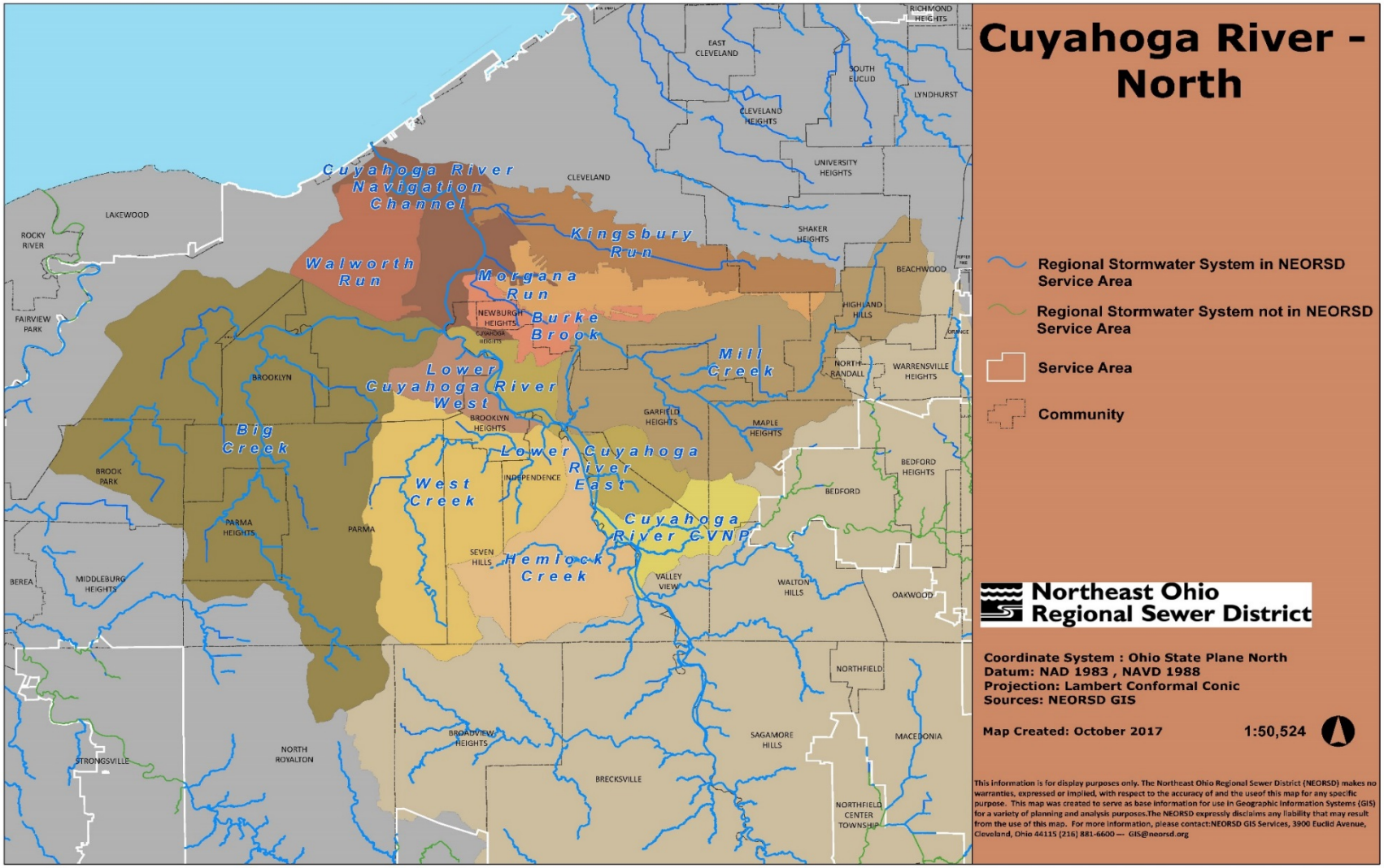
Success to date: Partnerships

- Flood / Erosion Mitigation: 17 homes
- District Dollars invested: $518,904.00
- Dollars Leveraged: $2,742,399.00

Looking forward

- 2020 and 2021
  - 52 Properties contributing to approx. 16 projects

Stormwater Master Plan



Stormwater Master Planning
(Status through 9/25/2019)

Cuyahoga River South

Completion Date: June 2019

100 % Complete

Cuyahoga River North

Completion Date: December 2019

89% Complete

Rocky River

Completion Date: April 2020

74.5% Complete

Chagrin River / Lake Erie Tributaries

Completion Date: May 2021

34% Complete

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Cuyahoga River North SWMP
(Status through 9/25/2019)

Task 1: Data Collection

100 % Complete

Task 2: Model Development

100 % Complete

Task 3: Alternative Development

89% Complete

Task 4: SWMP Recommendations

65% Complete

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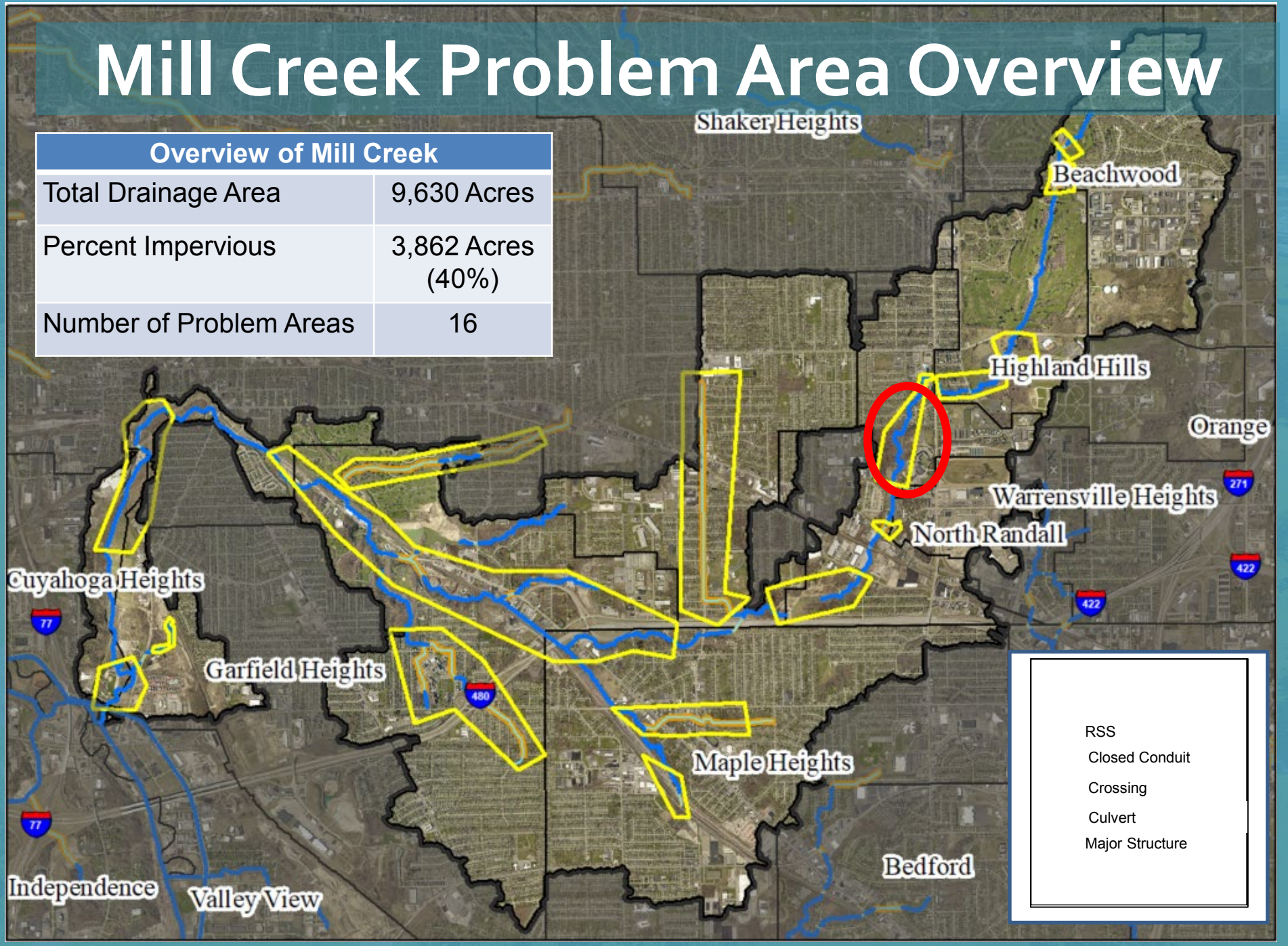
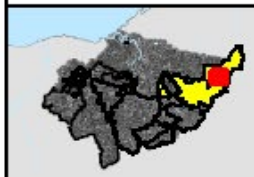
Mill Creek Problem Area Overview

Overview of Mill Creek	
Total Drainage Area	9,630 Acres
Percent Impervious	3,862 Acres (40%)
Number of Problem Areas	16



Problem Area MC-WH-05 BREs and Inundation

REGIONAL STORMWATER MANAGEMENT PROGRAM



Legend

Max BRE
- 6 - 11
- 12 - 19
- 20 - 33
- 34 - 45
- Problem Area

Regional Stormwater System
- Closed Conduit
- Stream
- Crossing
- Culverted Stream
- LSS Model Conduit
- 100-year
- Municipality

1 inch = 529 feet

0 140 280 560 Feet

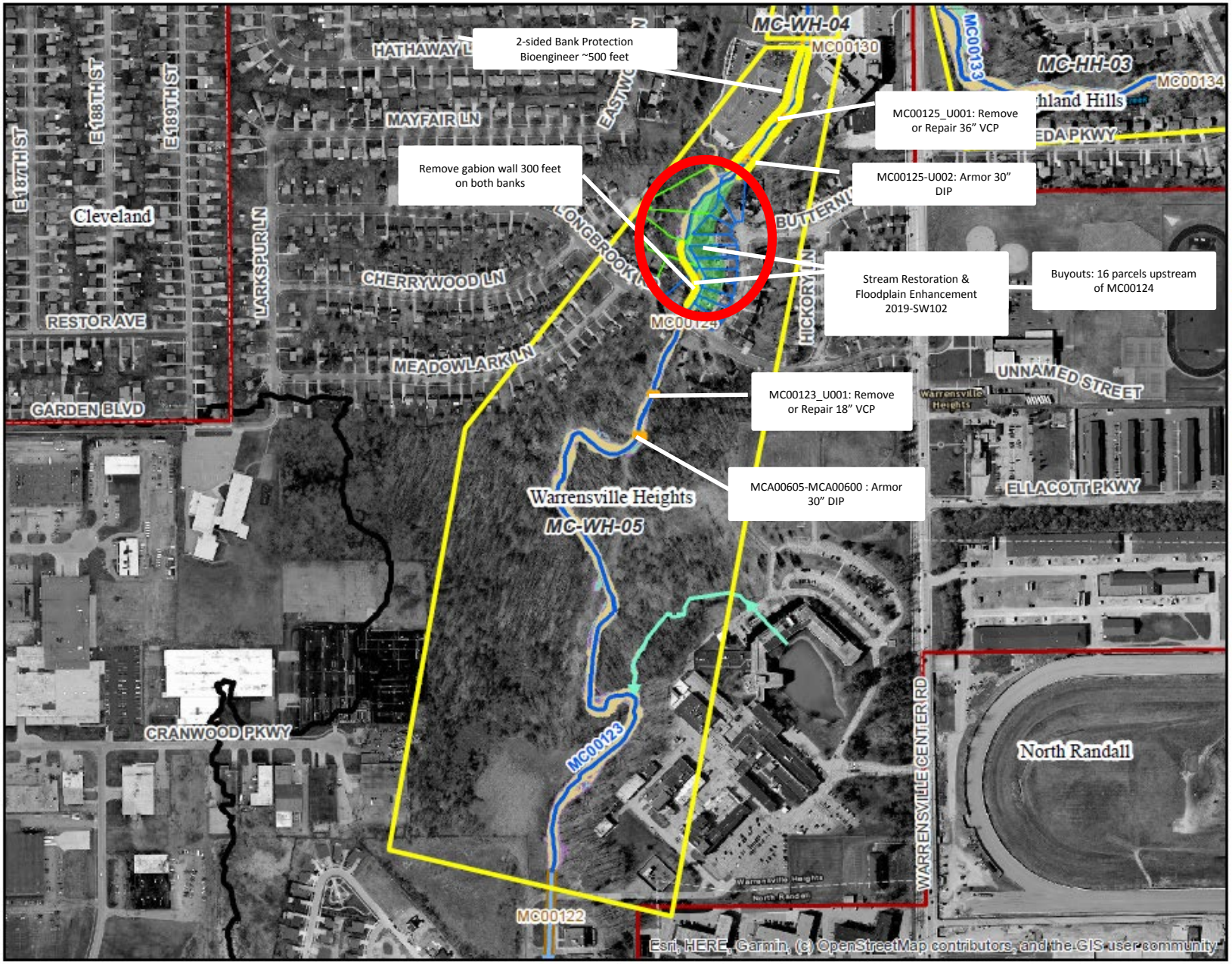
Disclaimer:
For Planning Purposes Only

Sources: NEORSD GIS
Ohio Department of Transportation, Cuyahoga County

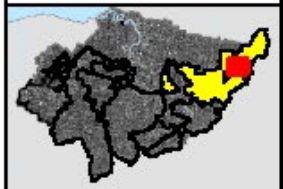
Map Created: 10/2/2019

NOTES

Problem Area MC-WH-05: Alternative 2



REGIONAL STORMWATER MANAGEMENT PROGRAM



Legend

- Problem Area
- Stream Restoration
- Buy-out
- Easement
- Floodplain
- Structural_Repair-Alt 2
- Inundation 1-year
- Inundation 2-year
- Inundation 5-year
- Inundation 10-year
- Inundation 25-year
- Inundation 50-year
- Inundation 100-year
- Municipality
- Subwatershed

Regional Stormwater System

- Closed Conduit
- Stream
- Crossing
- Culverted Stream
- LSS Model Conduit

1 inch = 529 feet

0 140 280 560 Feet

Disclaimer:
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Sources: NEORSD GIS
Ohio Department of Transportation, Cuyahoga County

Map Created: 10/2/2019

NOTES

Mill Creek - Existing Conditions

Mill Creek in Warrensville Heights

Mill Creek Bank Stabilization

Warrensville Heights

Project Objectives

- Removing the risk to structures – Purchase 16 homes
- Expand floodplain
- Stabilize streambanks
- Protect existing infrastructure – Utilities & Parking
- Improve stream function

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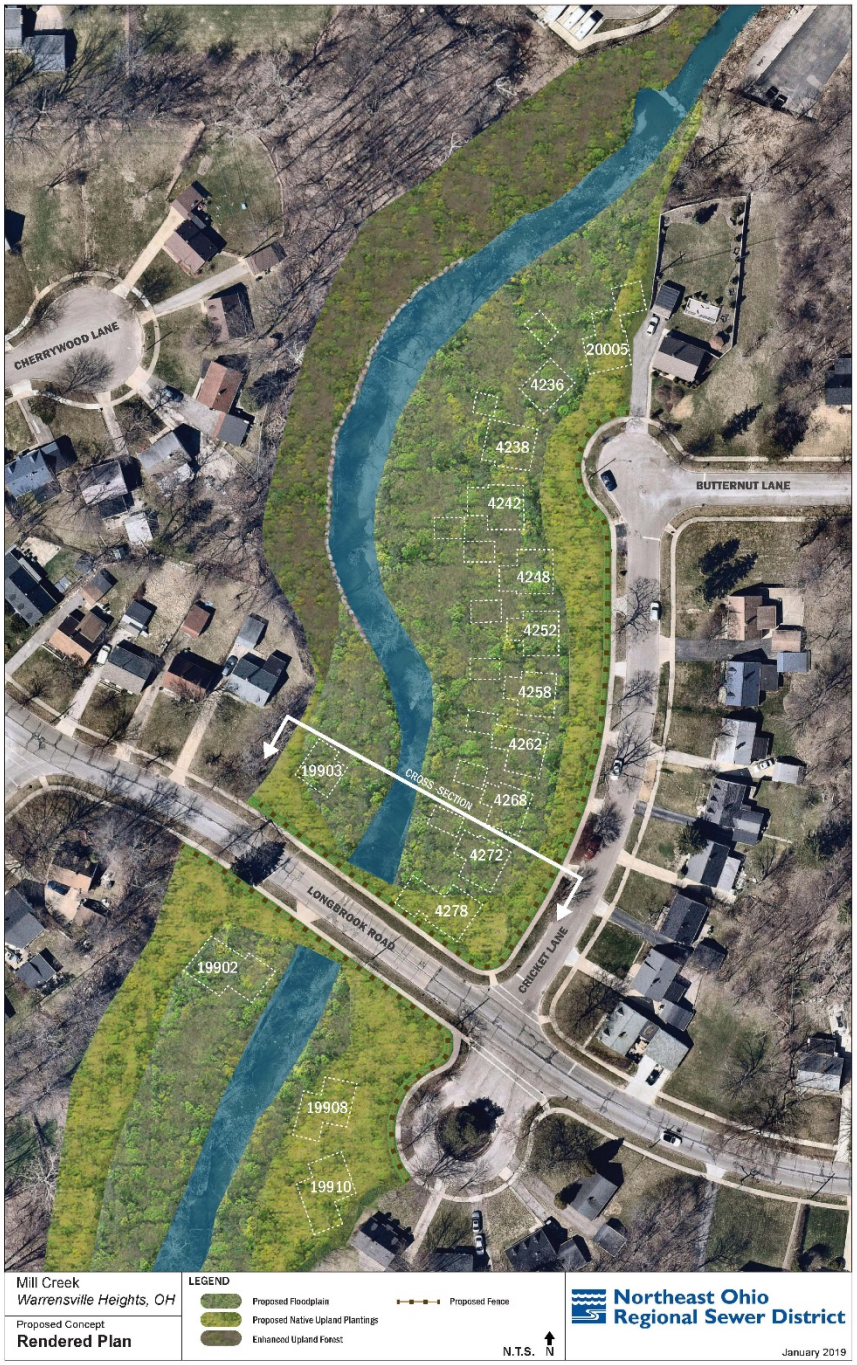
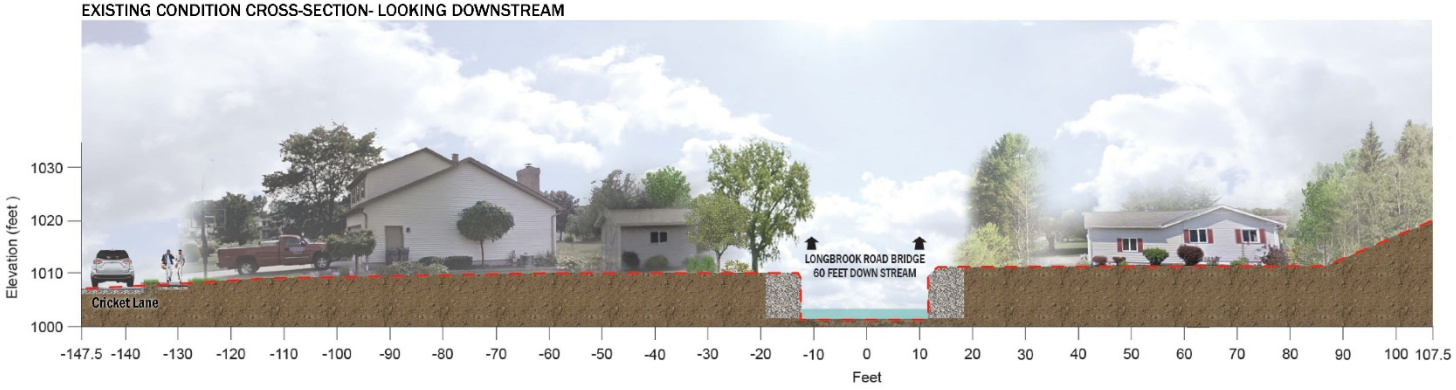
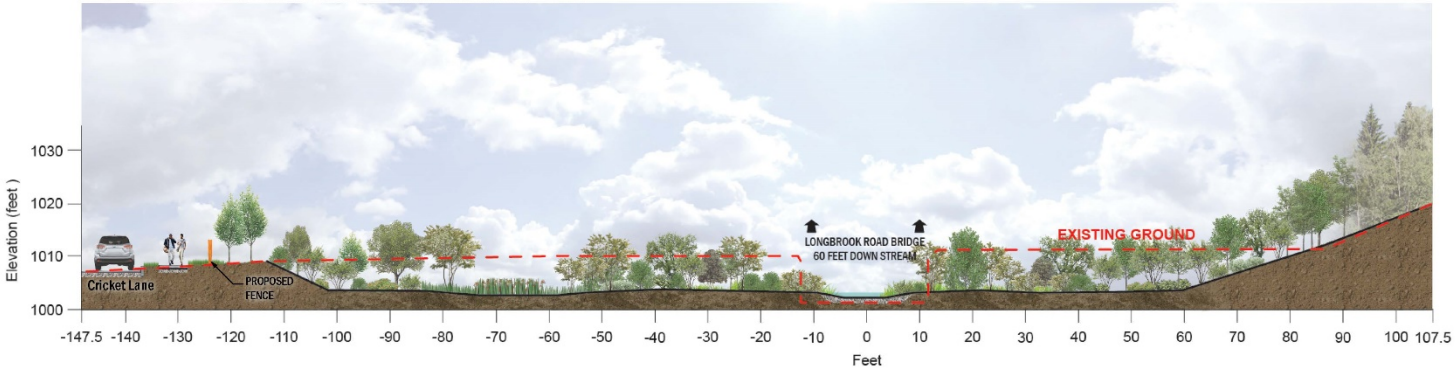


Proposed Project Plan

EXISTING CONDITION CROSS-SECTION- LOOKING DOWNSTREAM



PROPOSED CONDITION CROSS-SECTION - LOOKING DOWNSTREAM



Mill Creek
Warrensville Heights, OH

Proposed Concept
Cross-Section

Northeast Ohio Regional Sewer District

August 2018

Mill Creek Bank Stabilization

Warrensville Heights

Property Acquisition

- Planned acquisition of 16 residential properties
- West Creek Conservancy
- Close coordination / cooperation with City
- City letter and public meeting in Fall 2018 to impacted property owners
- 4 acquisitions completed

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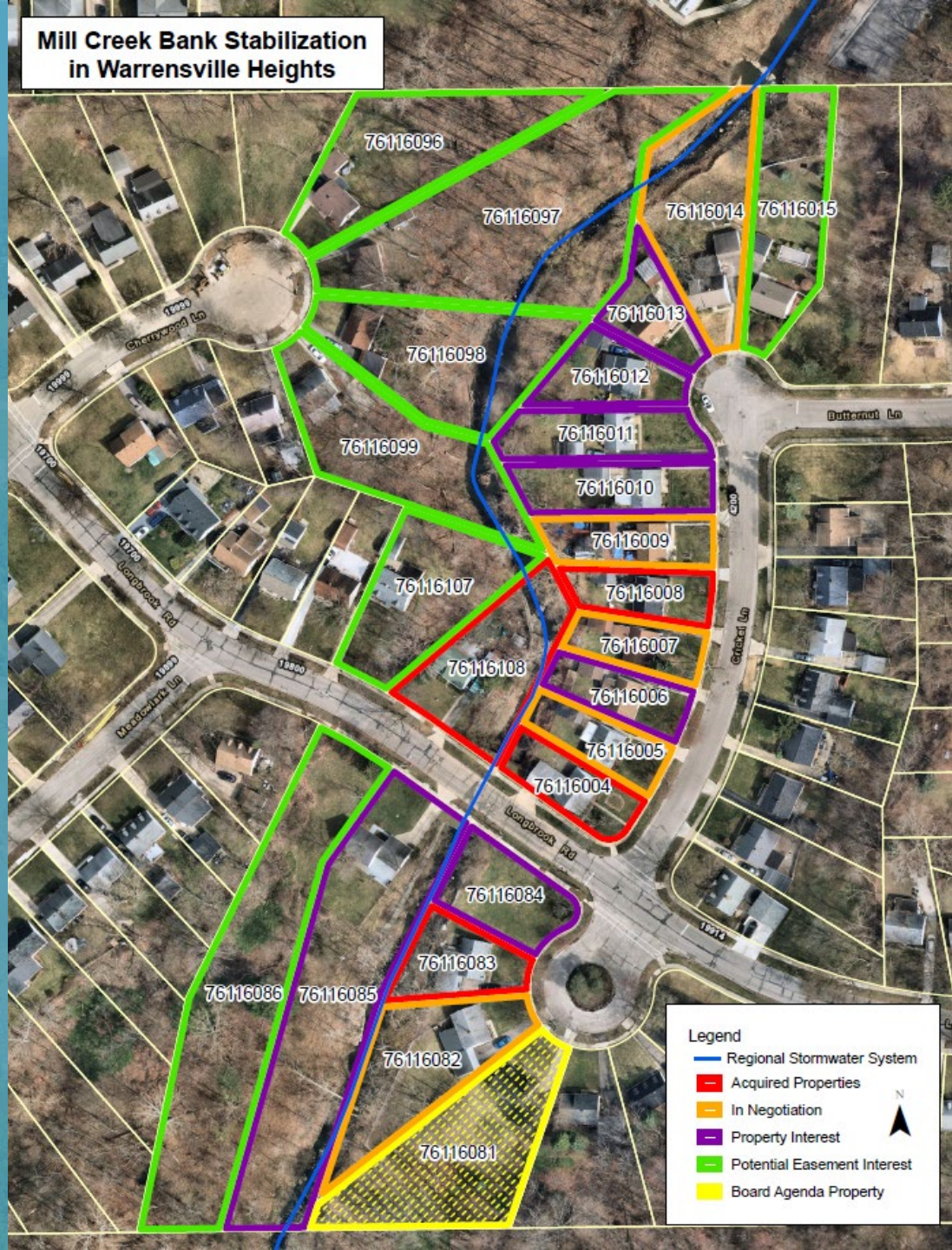

Stormwater Master Plan

Community Communication

- Recommendations and Community Reports – Anticipated in the 1st half 2020

Watershed Team Leaders serve as the point of contact between the communities and the District

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Questions

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Regional Sewer District

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SWIM Update

State of the Infrastructure: Crossing
Cuyahoga River North: Big Creek West Branch

Asset ID: WB00183
Brook Park: Commerce Park Drive
Structural BRE = 24 [Grade = D]

State of the Infrastructure: Crossing
Cuyahoga River North: West Creek

Asset ID: WC000067
Brooklyn Heights: Lancaster Drive
Structural BRE = 18 [Grade = B]

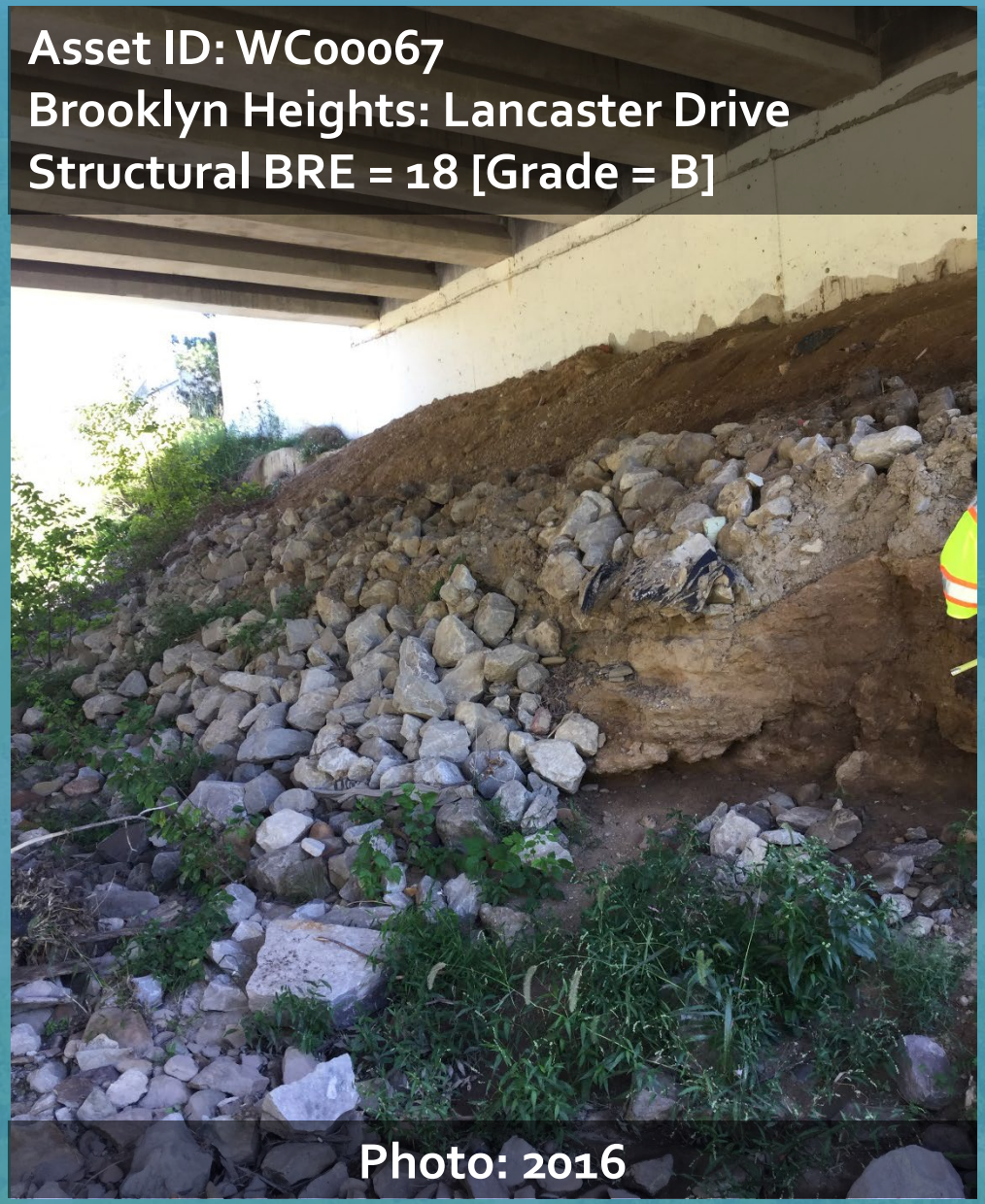

Photo: 2016

Photo: 2019

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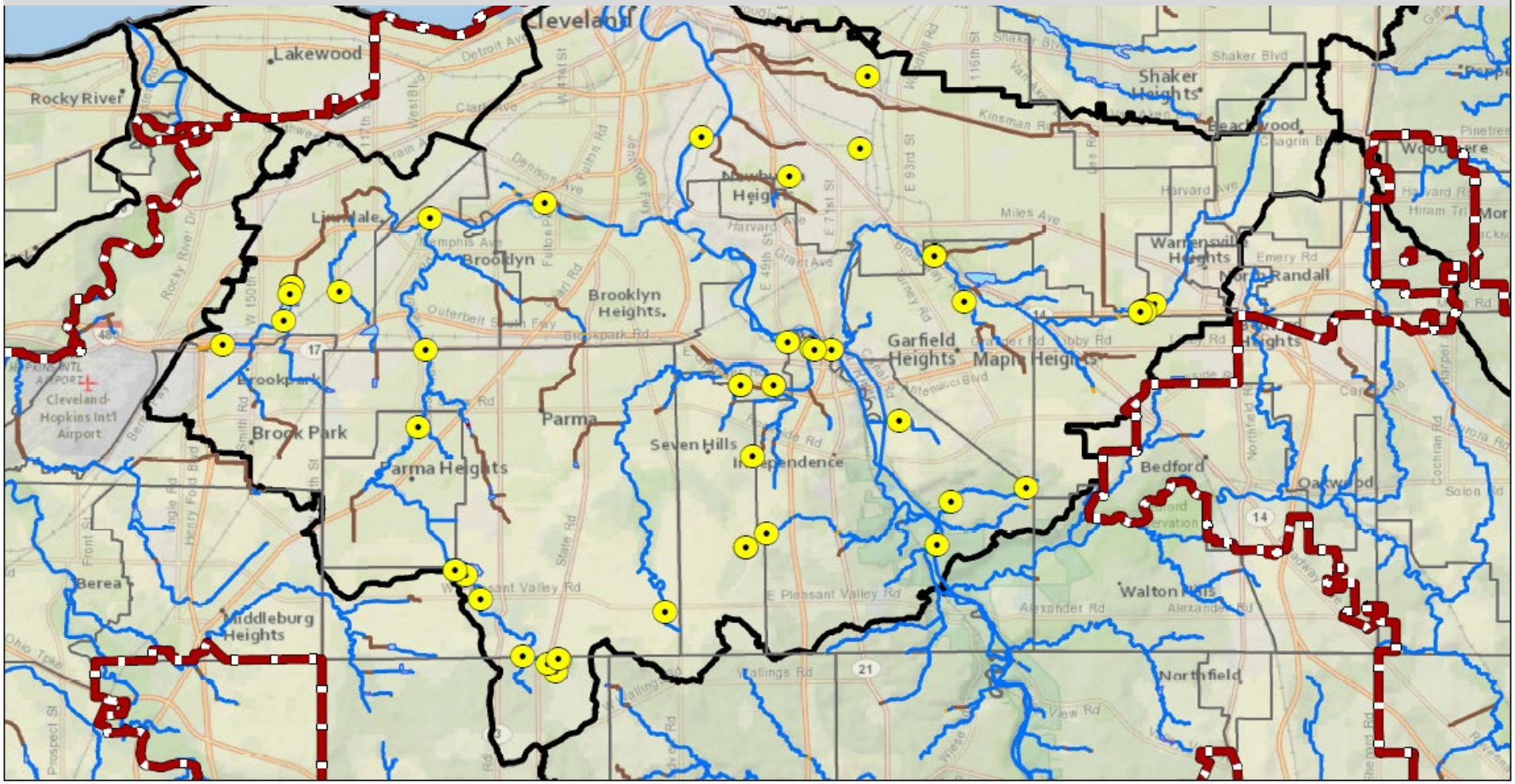
NORTHEAST OHIO REGIONAL SEWER DISTRICT
REGIONAL STORMWATER MANAGEMENT PROGRAM

50 Maint. Projects Completed: 1,782 CY LWD, 53 CY sediment



Cuyahoga River North Watershed

2019 Maintenance Projects

Map Created 09/27/2019

Debris/Sediment Removal Maintenance (50 Projects)

Debris Removed: 1,782 CY
Sediment Removed: 53 CY

- Stream
- Major Structure
- Basin
- Crossing
- Culverted Stream
- Community Boundary
- Watershed Boundary
- Stormwater Service Area

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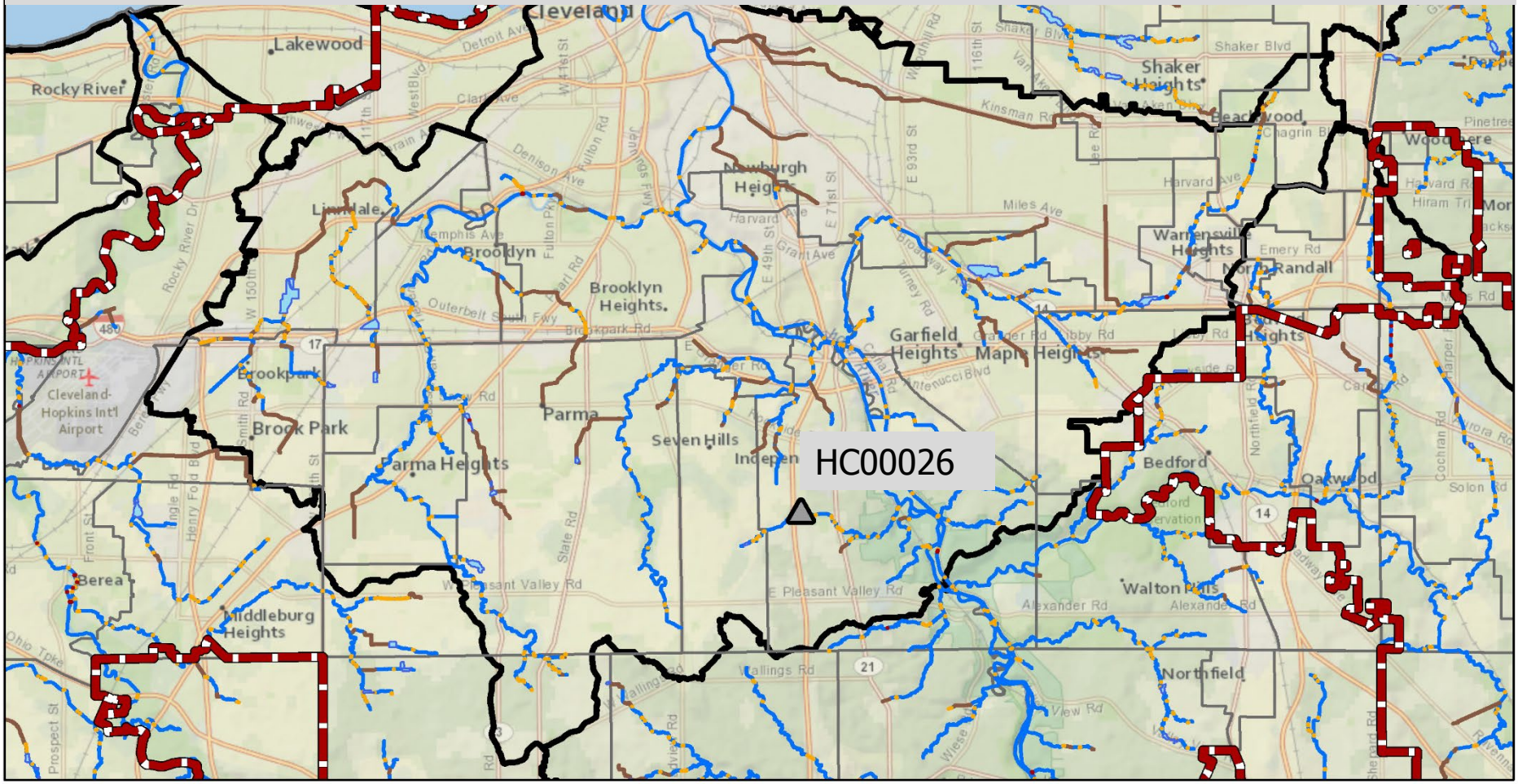
NORTHEAST OHIO REGIONAL SEWER DISTRICT
REGIONAL STORMWATER MANAGEMENT PROGRAM

Several Small-Scale Projects will be Nominated this Year



Cuyahoga River North Watershed

2019 Small-Scale Projects

Map Created 10/01/2019

	Project Type	Completed	Approved
○	Dredging	0	0
△	Streambank Stabilization	0	1
□	Structural	0	0
	Total	**0**	**1**

Stream
Major Structure
Basin
Crossing
Culverted Stream
Watershed Boundary
Community Boundary
Stormwater Service Area

Inspection and Maintenance: Debris Removal from Crossing
Cuyahoga River North: Big Creek

Asset #: BC00372
Parma: Sprague Road Crossing
Debris BRE = 16

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Inspection and Maintenance: Debris Removal
Cuyahoga River North: Big Creek

Asset #: BC00029
Cleveland: Brookside Park
Debris BRE = 6

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July 5th Storm Response Summary
Rainfall Stats

	Peak 5min	Peak 10min	Peak 15min	Peak 30-min	Peak 1-hr	Peak 2-hr		Peak 5min	Peak 10min	Peak 15min	Peak 30min	Peak 1-hr	Peak 2-hr
Rain Gage	in	in	in	in	in	in		in	in	in	in	in	in
SWI-RG03	0.18	0.28	0.33	0.54	0.98	1.04		4-mo	3-mo	2-mo	4-mo	1-yr	6-mo
SWI-RG06	0.16	0.25	0.31	0.45	0.47	0.51		3-mo	2-mo	2-mo	2-mo	<2-mo	
SWI-RG08	0.54	0.94	1.33	1.93	2.86	3.22		25-yr	25-yr	25-yr	50-yr	100-yr	50-yr
SWI-RG10	0.19	0.27	0.33	0.47	0.53	0.53		6-mo	2-mo	2-mo	2-mo	2-mo	
SWI-RG11	0.26	0.5	0.72	1.16	1.38	1.38		1-yr	1-yr	2-yr	5-yr	2-yr	1-yr
SWI-RG12	0.37	0.66	0.83	1.3	1.73	2.1		5-yr	5-yr	2-yr	5-yr	10-yr	10-yr
SWI-RG14	0.16	0.3	0.45	0.71	0.81	0.94		3-mo	4-mo	6-mo	9-mo	6-mo	4-mo
Brook Park	0.15	0.25	0.34	0.4	0.4	0.4		3-mo	2-mo	2-mo			
Mayfield Heights	0.13	0.21	0.28	0.35	0.44	0.44		2-mo					
Moreland Hills	0.16	0.29	0.35	0.39	0.41	0.41		3-mo	3-mo	3-mo			
North Royalton	0.36	0.68	0.99	1.55	1.72	2.29		2-yr	5-yr	10-yr	10-yr	10-yr	10-yr
Parma	0.35	0.59	0.79	1.34	1.63	1.64		2-yr	2-yr	2-yr	10-yr	5-yr	2-yr
Richfield	0.16	0.24	0.28	0.31	0.35	0.37		3-mo	2-mo				
Shaker Heights	0.2	0.28	0.31	0.56	0.79	0.8		6-mo	3-mo	2-mo	4-mo	6-mo	3-mo
South Euclid	0.23	0.43	0.48	0.56	0.57	0.57		9-mo	1-yr	6-mo	4-mo	2-mo	
Strongsville Foltz	0.17	0.31	0.4	0.51	0.58	0.58		4-mo	4-mo	4-mo	3-mo	2-mo	

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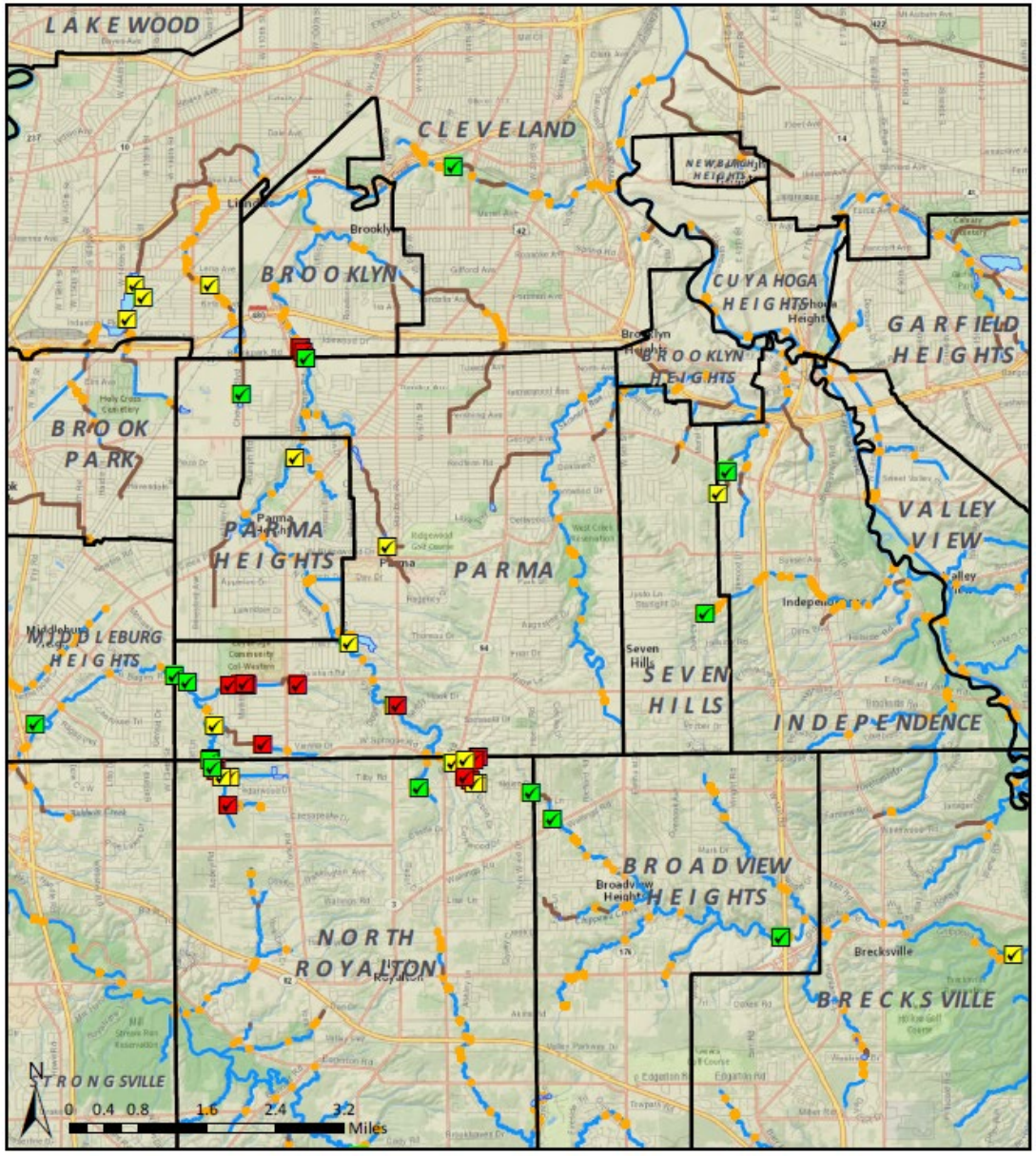
July 5th Storm Response Summary
Rainfall Figure

Resident's house looking east at Ridge Road

July 5th Storm Response Inspection Summary

- 51 Sites field visited
- 22 sites flooded
- Hardest hit areas were near RGs with peak rainfall



July 5, 2019 Rain Event
Regional SWIM Field Response
Map Created: September 25, 2019

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Estimated Peak Hydraulic Condition Score
- 1 or 2
- 3
- 4 or 5

Municipal Boundary
Basin
Culverted Stream
Crossing
Stream

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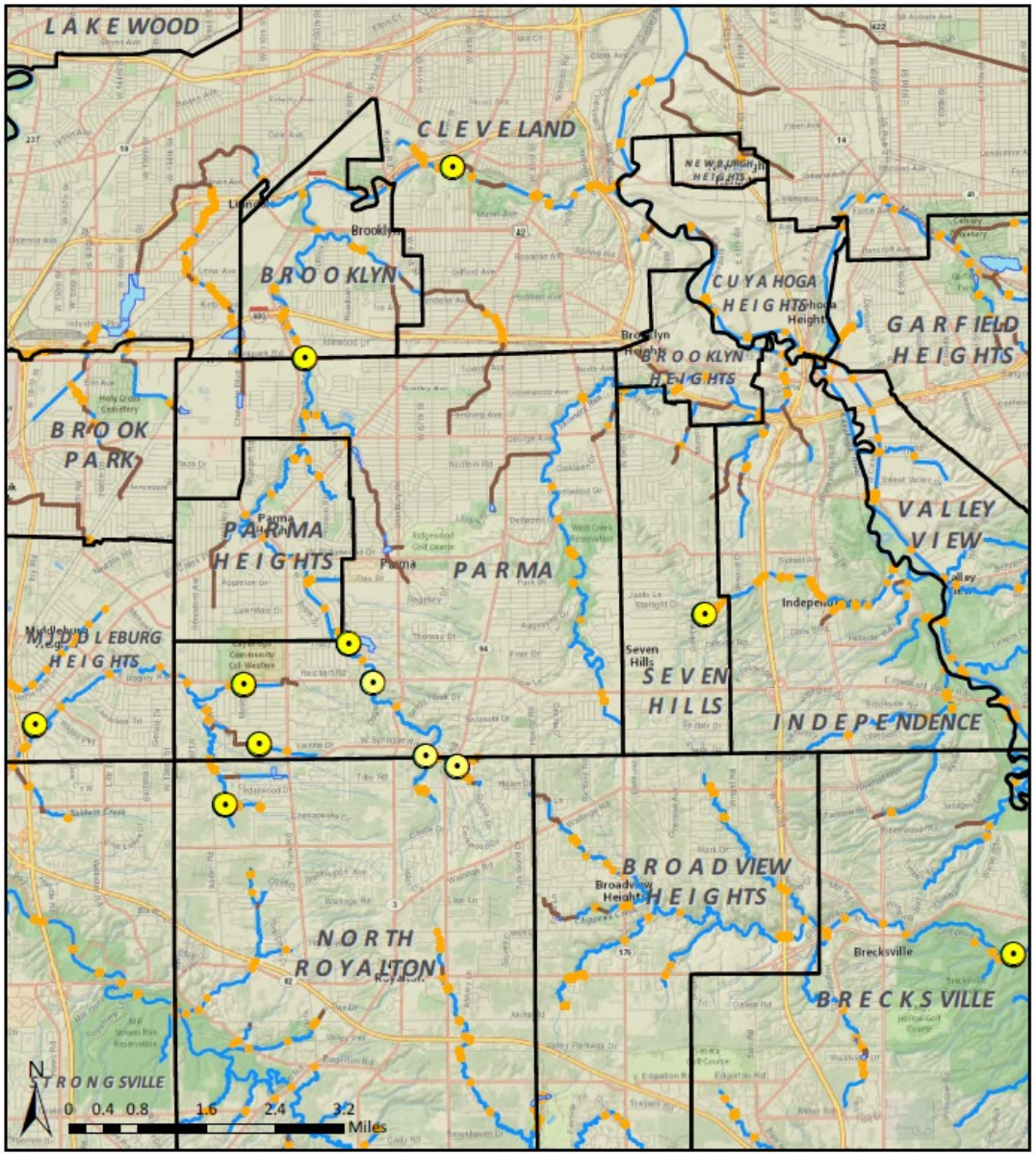
July 5th Storm Response Maintenance Summary



July 5, 2019 Rain Event
Regional SWIM Maintenance

Map Created: October 08, 2019

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Sediment & Debris Maintenance
Municipal Boundary
Basin
Culverted Stream
Crossing
Stream

- 12 sites with sediment or debris maintenance
- 362 CY removed

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State of the Infrastructure
Structural Integrity

SWSA	2,873	2,231	78%	B-	450	267
ASSET CLASS TYPE	**RSS COUNT**	**Condition Score Count**	**Percent Inspected**	**Report Card Grade (Avg Structural Condition)**	**Assets with Structural Condition 4 or 5**	**Assets with Structural BRE > 19**
Stream	1469	912	62%	B-	217	0
Crossing	1084	1062	98%	B-	143	168
Culverted Stream	208	151	73%	C	68	74
Basin	96	93	97%	B-	20	23
Major Structure	16	13	81%	B-	2	2

State of the Infrastructure
Structural Integrity

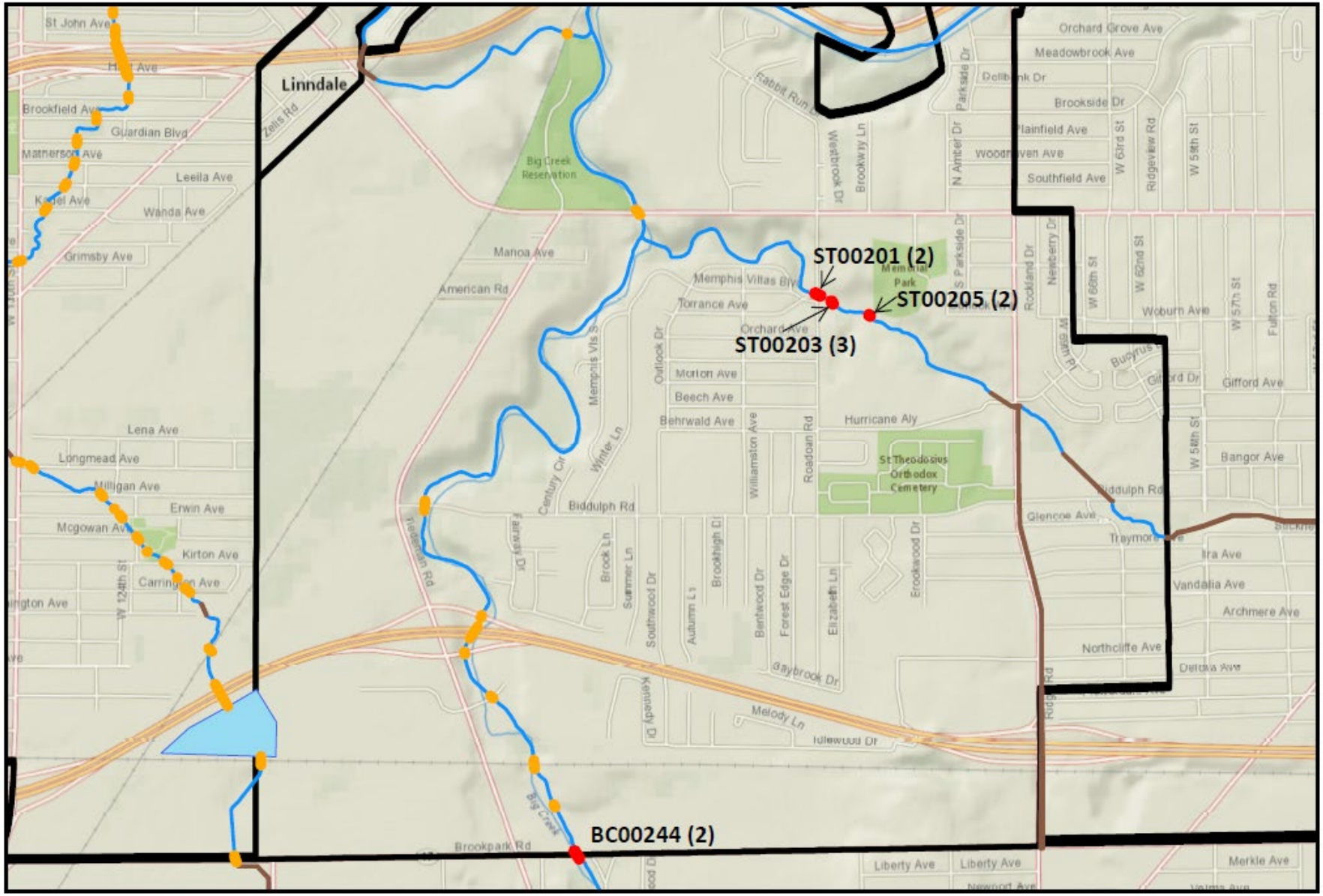
CRN	785	576	73%	C+	142	90
ASSET CLASS TYPE	**RSS COUNT**	**Condition Score Count**	**Percent Inspected**	**Report Card Grade (Avg Structural Condition)**	**Assets with Structural Condition 4 or 5**	**Assets with Structural BRE > 19**
Stream	389	198	51%	B-	53	0
Crossing	284	279	98%	B-	43	41
Culverted Stream	88	78	89%	C-	43	45
Basin	16	14	88%	B-	2	3
Major Structure	8	7	88%	B-	1	1

Community Crossing Meeting

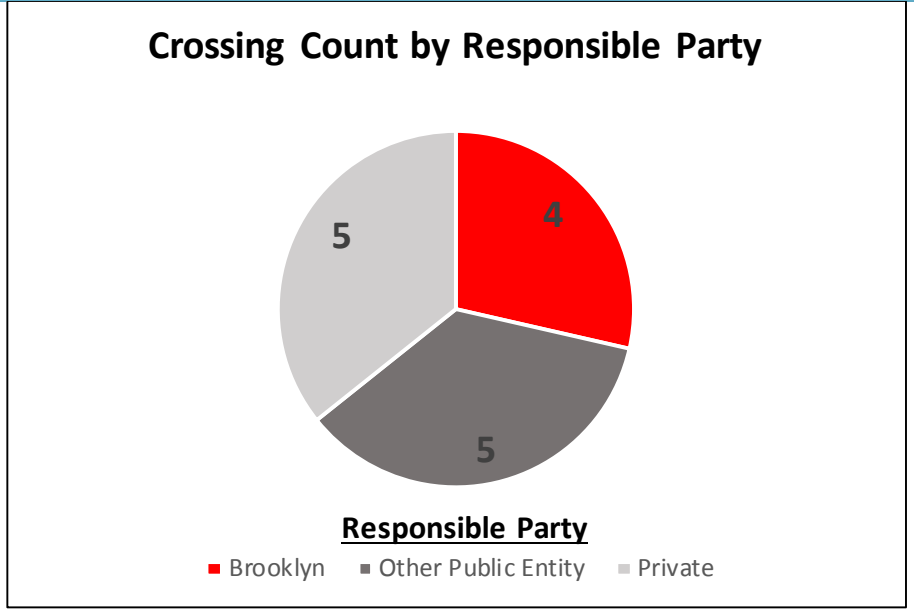
Meeting Objectives:

- Review SWIM's Structural Condition Assessment
- Confirm Community's Ownership or Maintenance Responsibilities
- Discuss Crossings and Recommended Repairs
- Understand Community's Schedule to Address Known Issues
- Discuss Potential Next Steps

Brooklyn Responsible Party Crossings: Structural Condition Scores

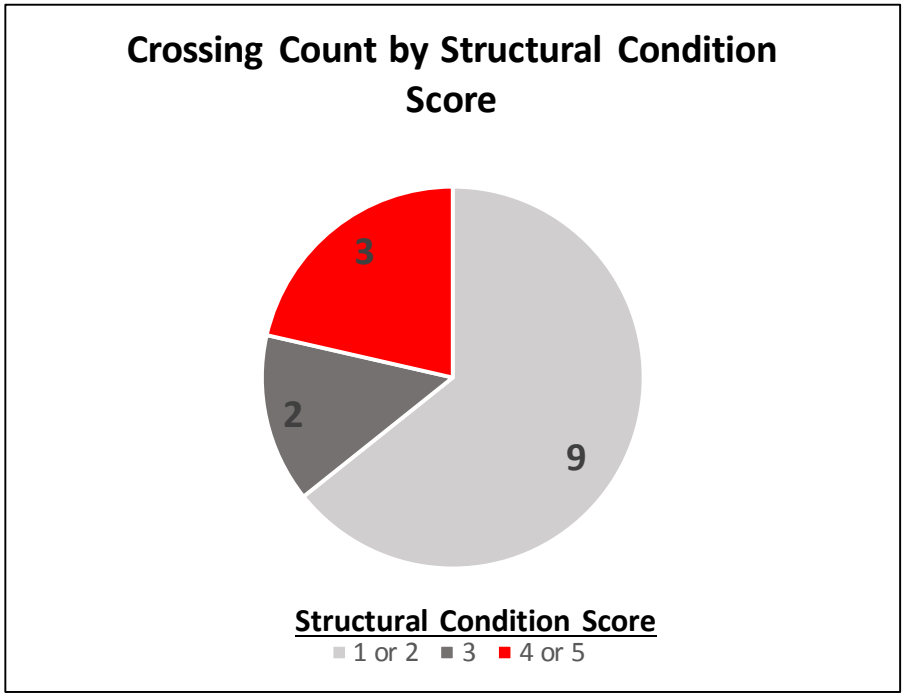


Responsible Party	Crossing Count
Brooklyn	4
ODOT	3
Public (Cuyahoga County)	2
Private (Railroad)	3
Private (Commercial)	2
Total	**14**



Structural Score	Crossing Count
1 or 2	9
3	2
4 or 5	3
Total	**14**

Brooklyn Crossings (4s & 5s)	
Asset ID	**Steet**
NONE	



Stormwater Design and Construction Program

Northeast Ohio Regional Sewer District

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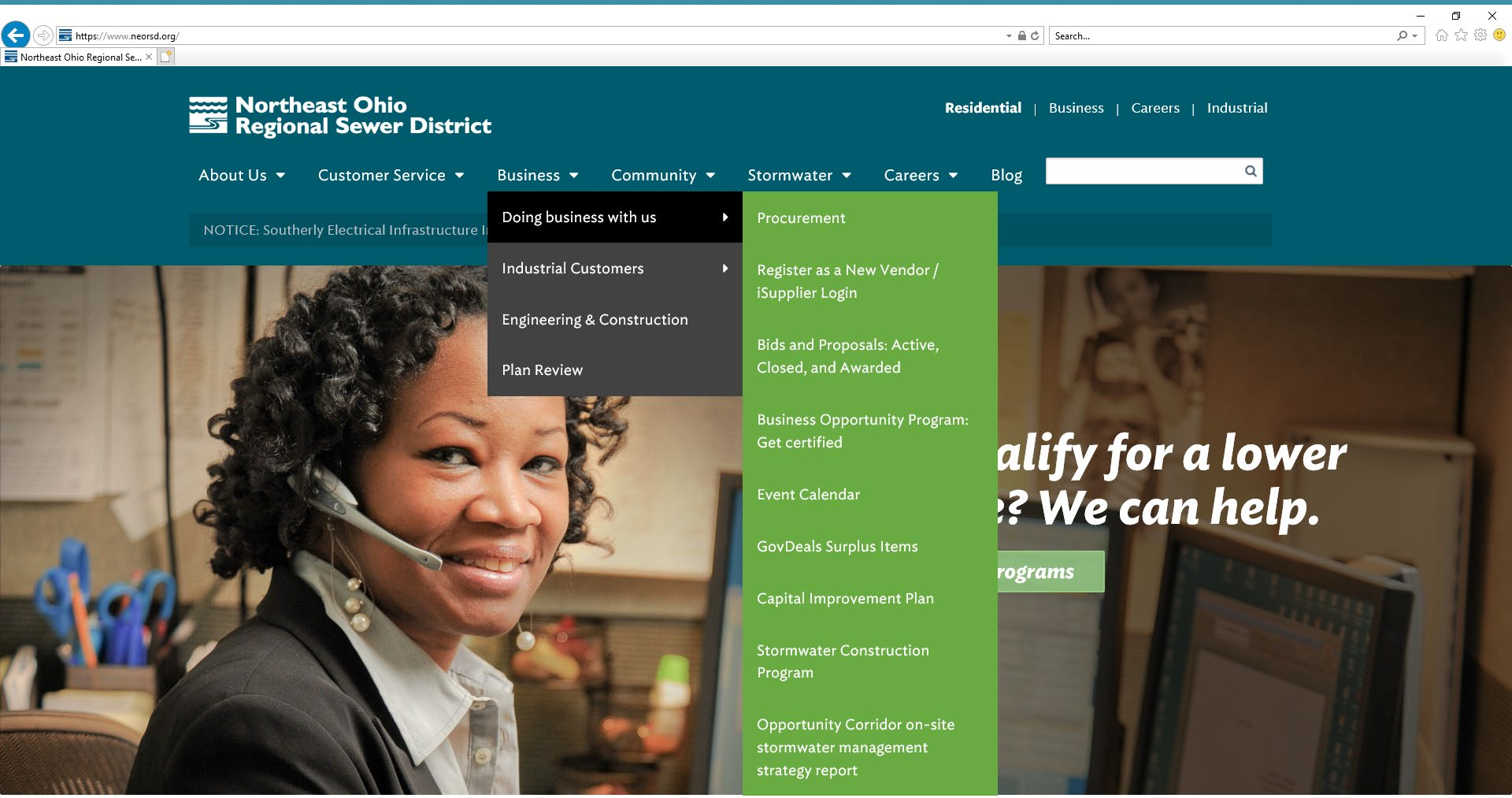
Stormwater Storymap



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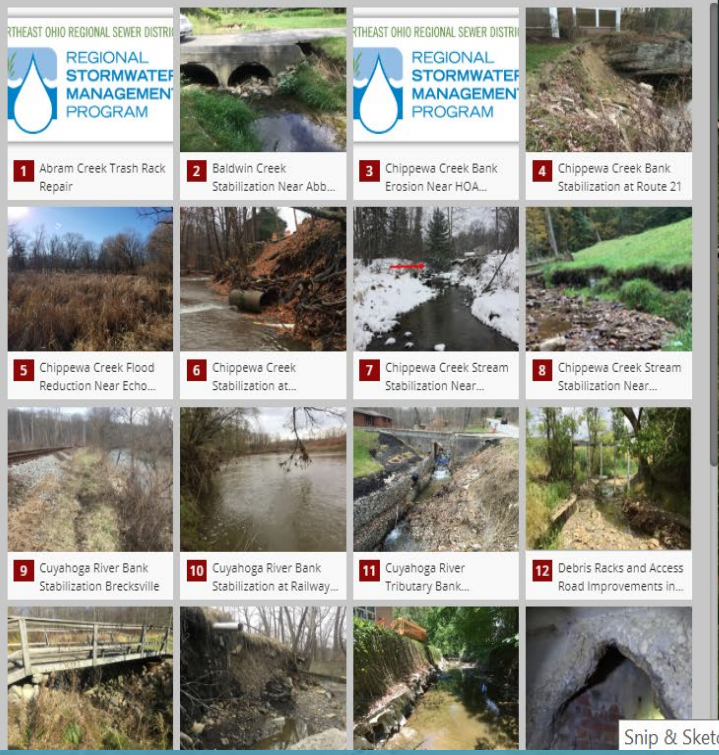
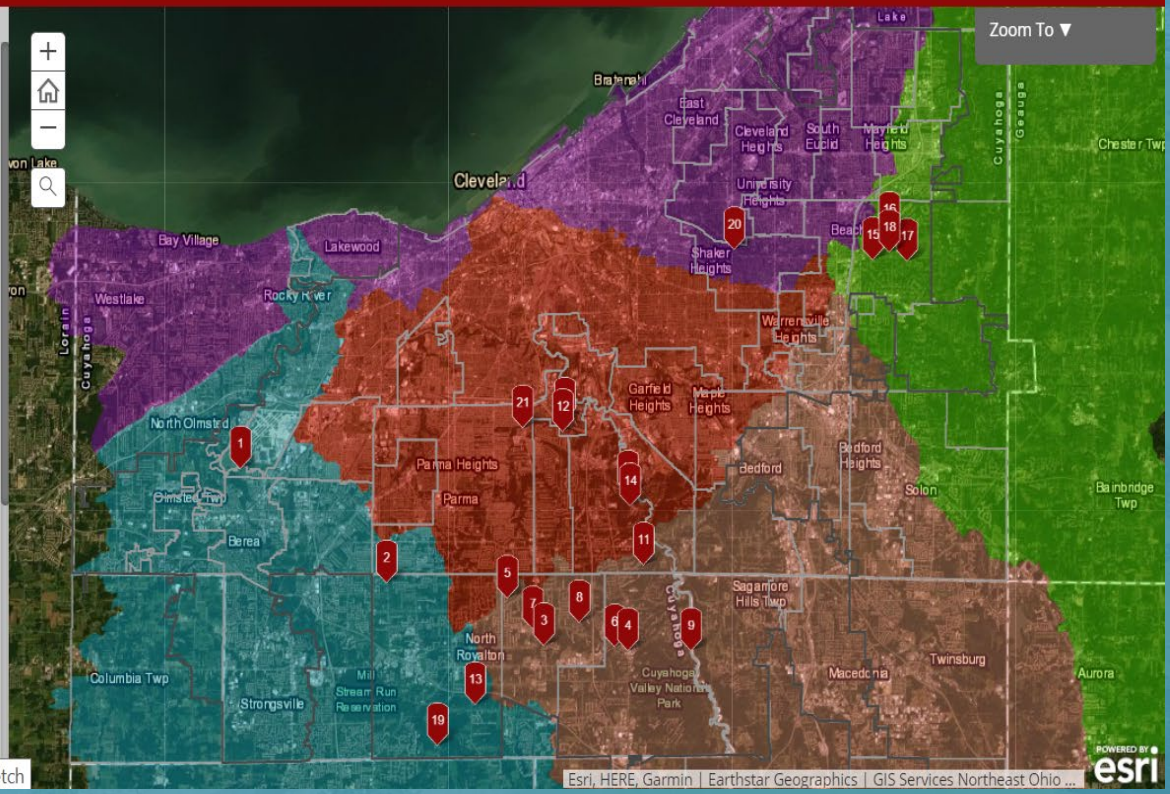
NEORSD Stormwater Design & Construction Program

Navigate using the tabs below and by clicking the images to view more details on our completed, current design, and current construction stormwater projects. Zoom in to view satellite imagery and Regional Stormwater System features (e.g. streams, culverts, conduits, etc). Use the "Zoom To" drop down menu to locate your watershed.

All Projects | Design | Construction | Complete





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NEORSD Stormwater Design & Construction Program

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All Projects | Design | **Construction** | Complete

1 Baldwin Creek Bank Stabilization at East...

2 Big Creek Stabilization

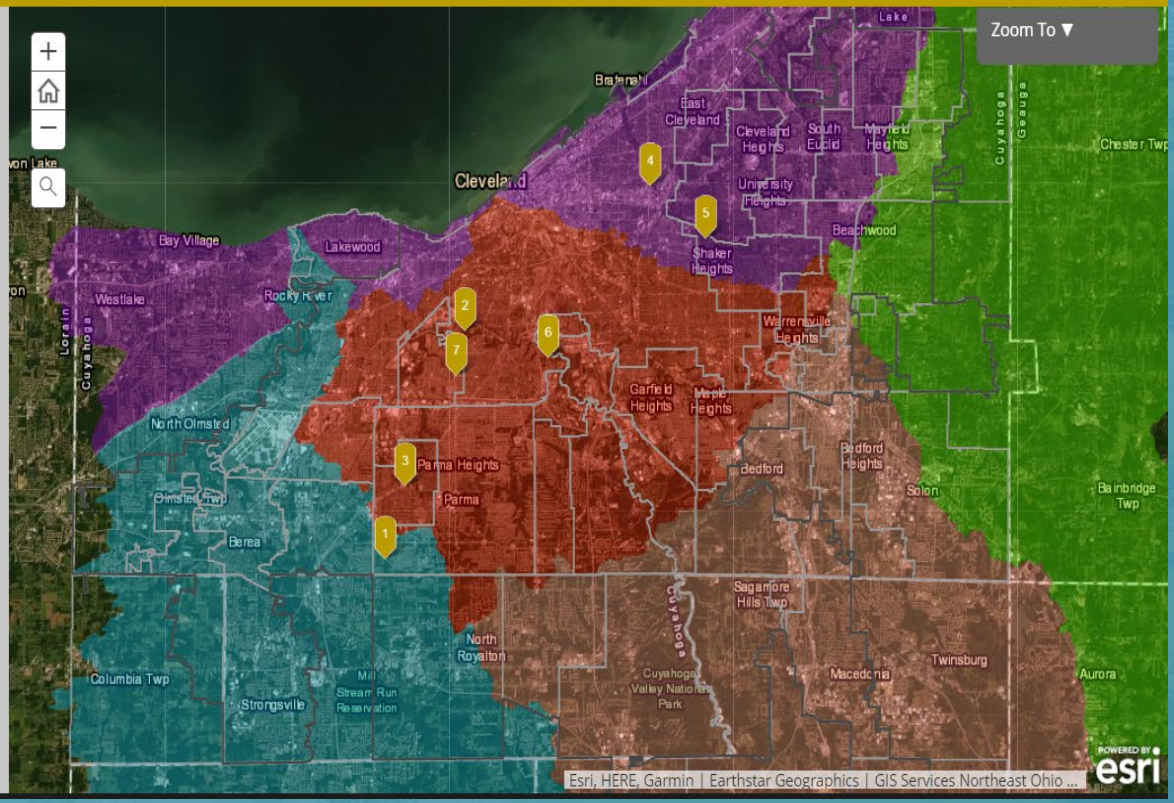
3 Colombo Park Stream Restoration

4 Doan Brook Stream Bank Stabilization

5 Shaker Lakes Dam Rehabilitation Phase I:...

6 Spring Creek Culvert Rehabilitation

7 Stickney Creek Restoration and Utility...



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Design

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Regional Sewer District

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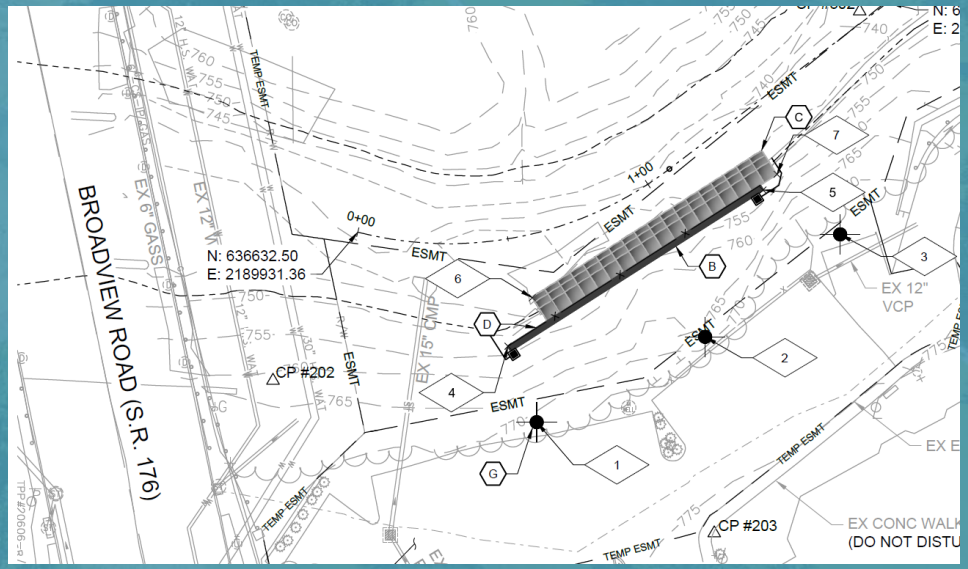
West Creek – Stabilization by Sandpiper Dr in Parma

Goals:

- Arrest bank erosion and re-align creek to protect assets
- Improve stream function

Current Design Phase:
90% Design
Est. Construction Cost:
$2,232,000



West Creek – Stabilization in Brooklyn Heights

Goals:

- Arrest bank erosion and re-align creek to protect assets
- Improve stream function
- Raise stream channel

Current Design Phase:
30% Design
Est. Construction Cost:
$18M

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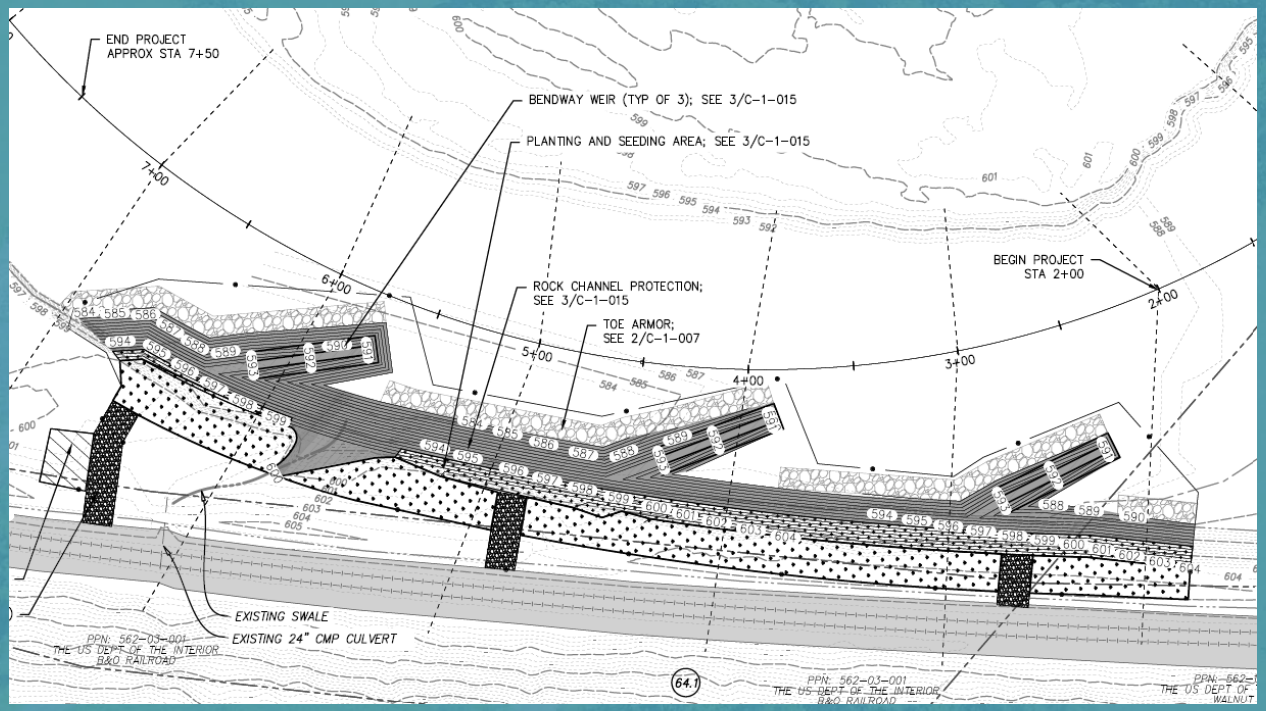
Cuyahoga River – Stabilization in Independence

Goals:

- Arrest bank erosion to protect assets, including CVSR
- Improve stream function

Current Design Phase:
50% Design
Est. Construction Cost:
$763,000



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Hemlock Creek – Stabilization in Independence

Goals:

- Arrest bank erosion to protect assets, incl. trails and sewer
- Improve stream function
- Remove Hemlock Rd Bridge

Current Design Phase:
Pre-Design
Est. Construction Cost:
$1,000,000

Pepper Luce at Shaker Blvd Culvert Deterioration

Goals:

- Alleviate flooding of Shaker Blvd and nearby homes
- Improve stream function

Current Design Phase:
Final Design

Total Project Cost: $750,000

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Pepper Luce at Shaker Blvd Culvert Deterioration

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Construction

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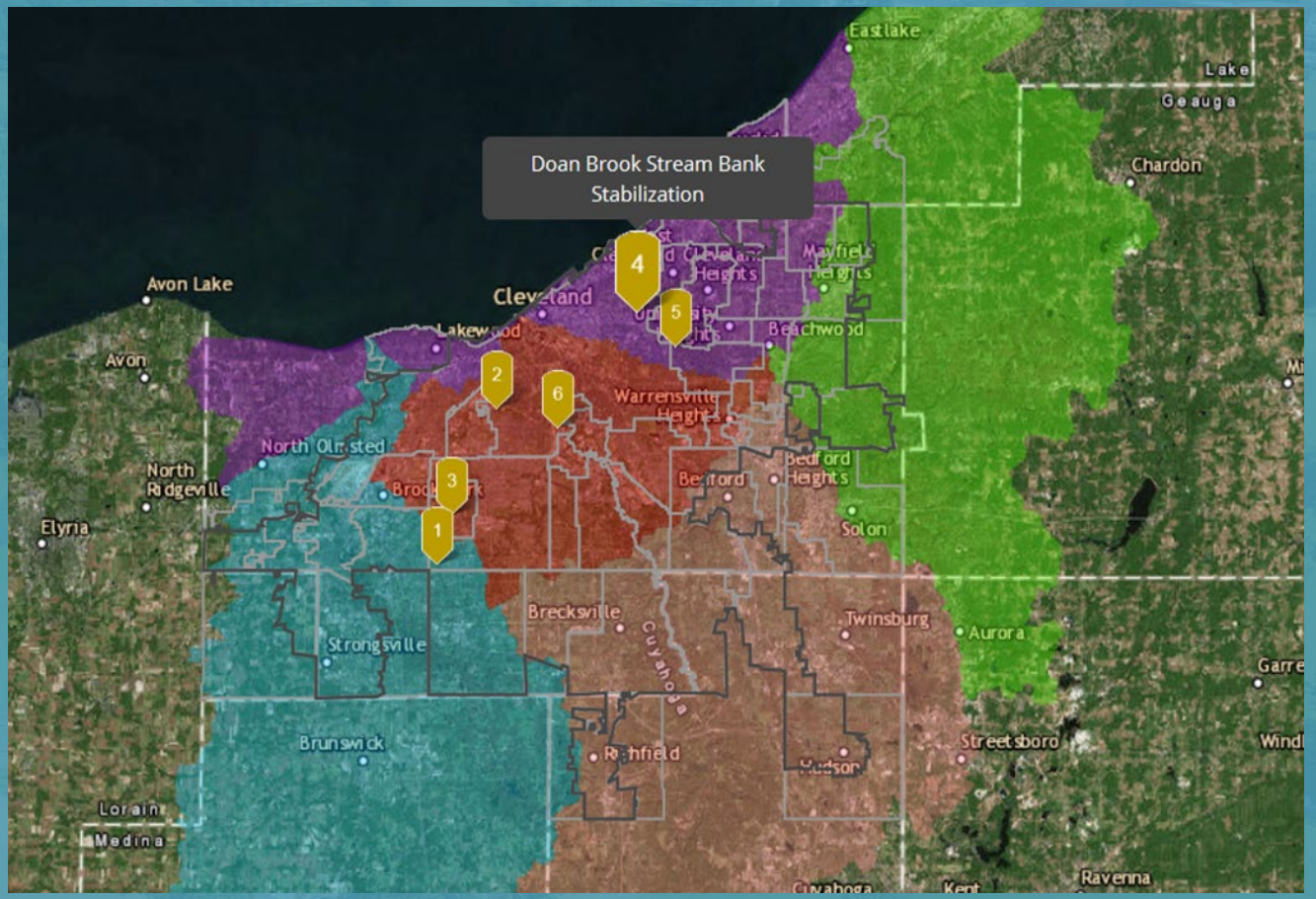
1410_Construction Update

Doan Brook Streambank Stabilization in Cleveland adjacent to MLK Blvd

Doan Brook is tributary directly to Lake Erie



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Doan Brook Streambank Stabilization

- *1000lf stream rehabilitation*
- *Tie in from Nord Family Greenway to MLK Culvert*
- *$2.4M Construction Cost*

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Doan Brook Streambank Stabilization

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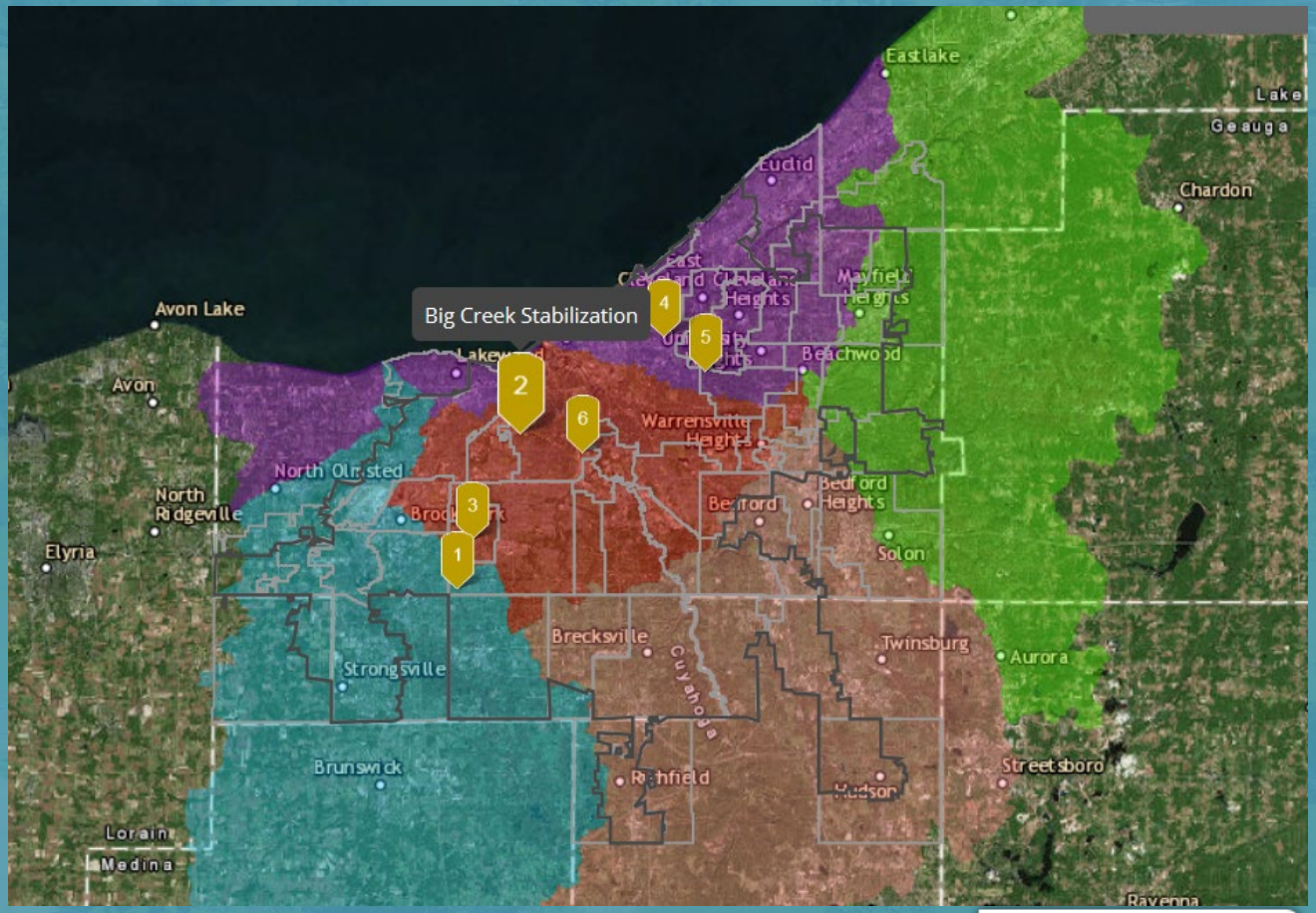
1411_Construction Update

Big Creek Stabilization in Cleveland; tributary to Cuyahoga River

When I-71 was constructed in 1966, Big Creek was straightened



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Big Creek Stabilization

- Remove 1200lf of concrete lined channel
- Remove 30ft tall drop structure and replace with rock channel design
- $6.5M Construction Cost

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Big Creek Stabilization

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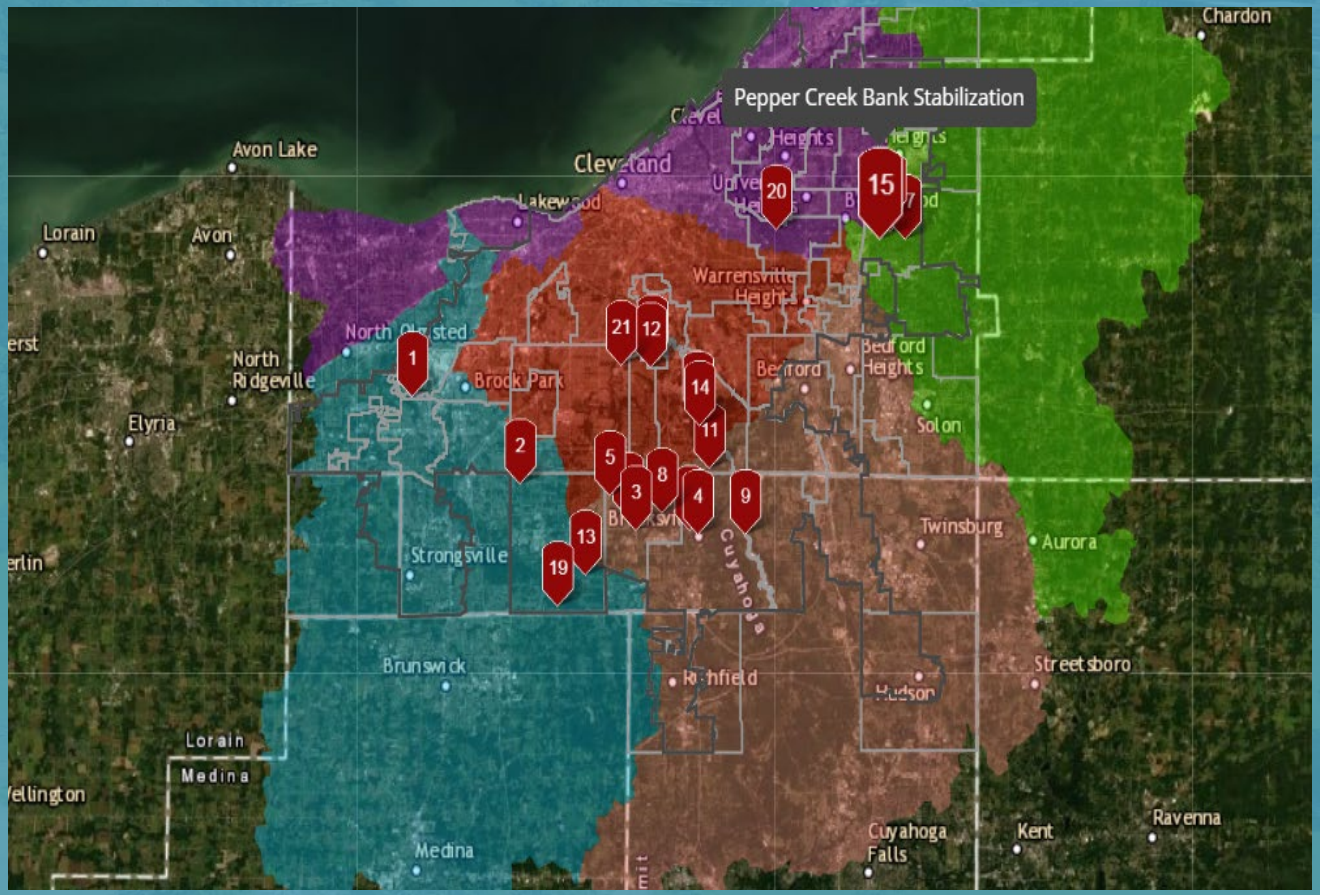
1369_Construction Update

Pepper Creek Bank Stabilization in Pepper Pike; tributary to Chagrin River

Severely eroding stream segment near Shaker Blvd.



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Pepper Creek Bank Stabilization

- Restore 850LF feet of stream
- Reestablish a more natural stream alignment
- $1.1M Construction Cost

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Pepper Creek Bank Stabilization

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Pepper Creek Bank Stabilization

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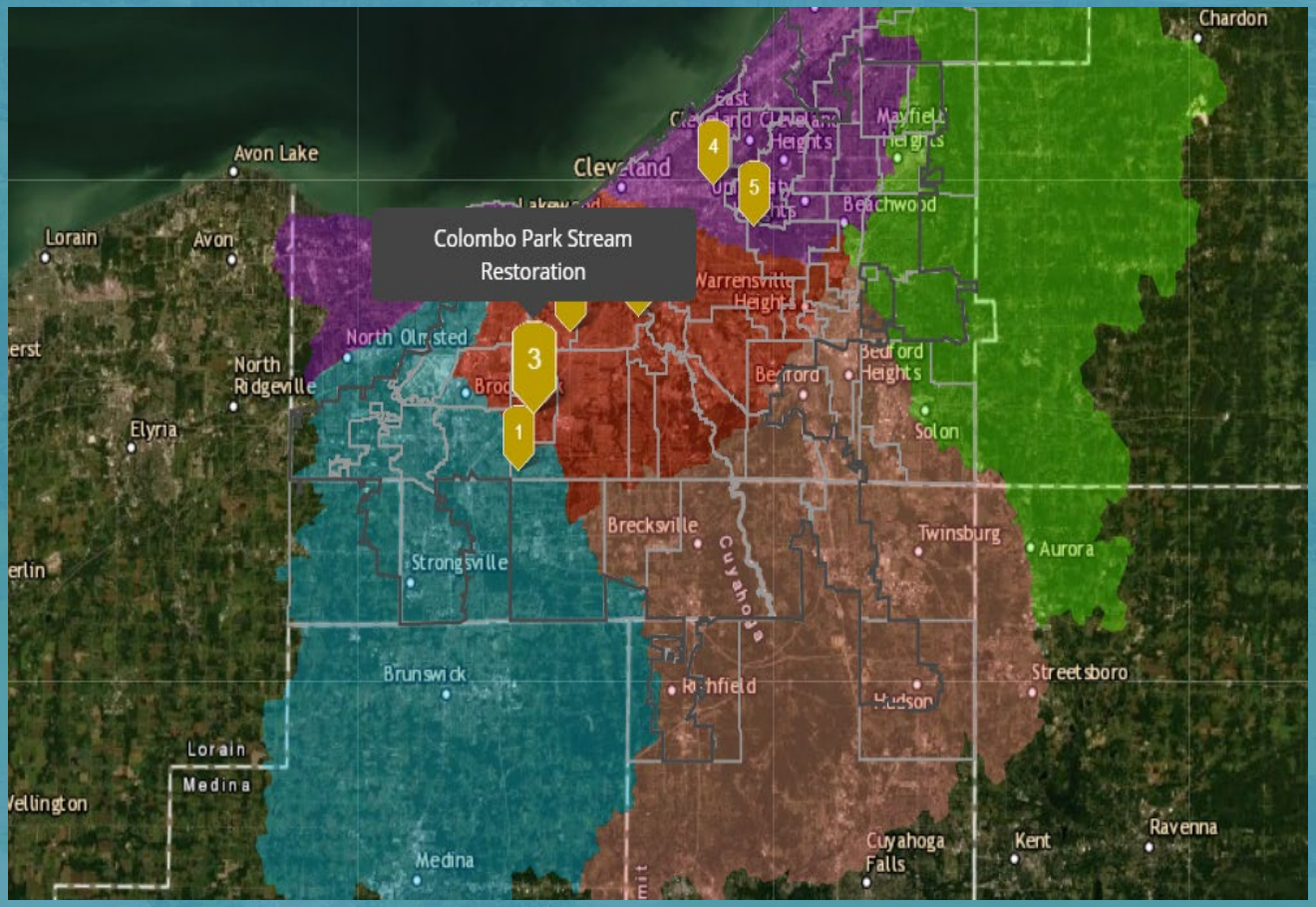
1409_Construction Update

Colombo Park Stream Restoration in Parma Heights; tributary to Cuyahoga River

Threatened Sanitary Sewer infrastructure



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Colombo Park Stream Restoration

- 400 lf of stream restoration
- New soldier pile wall to protect park and sanitary structure
- $1.5M Construction Cost

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Colombo Park Stream Restoration

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Colombo Park Stream Restoration

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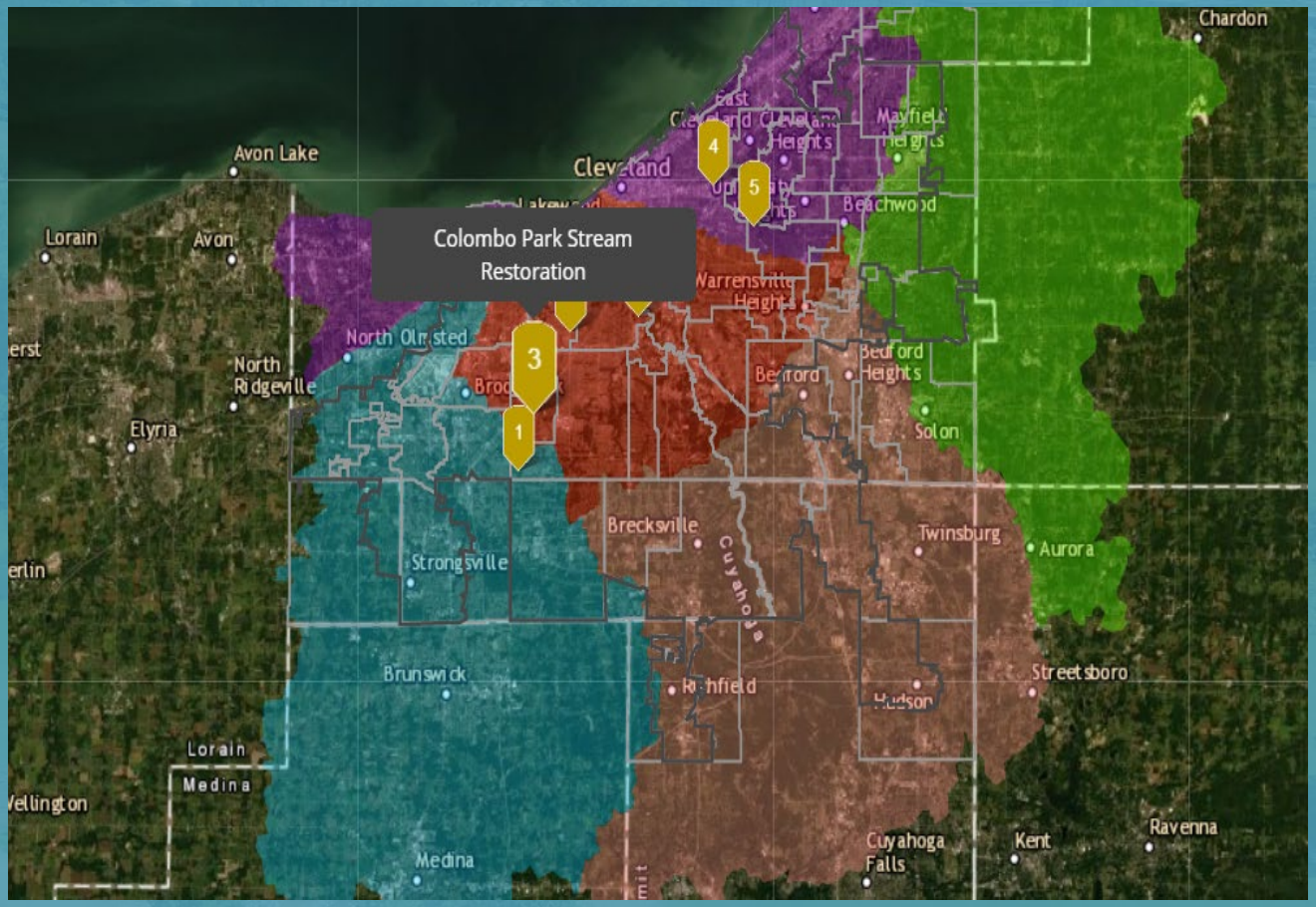
1502_Construction Update

Stickney Creek Restoration and Utility Relocation

Threatened Sanitary Sewer infrastructure



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Stickney Creek Restoration and Utility Relocation

- 430 LF of sewer replacement and realignment
- 900 LF of stream restoration
- $3.16 M Total Project Cost

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Stickney Creek Restoration and Utility Relocation

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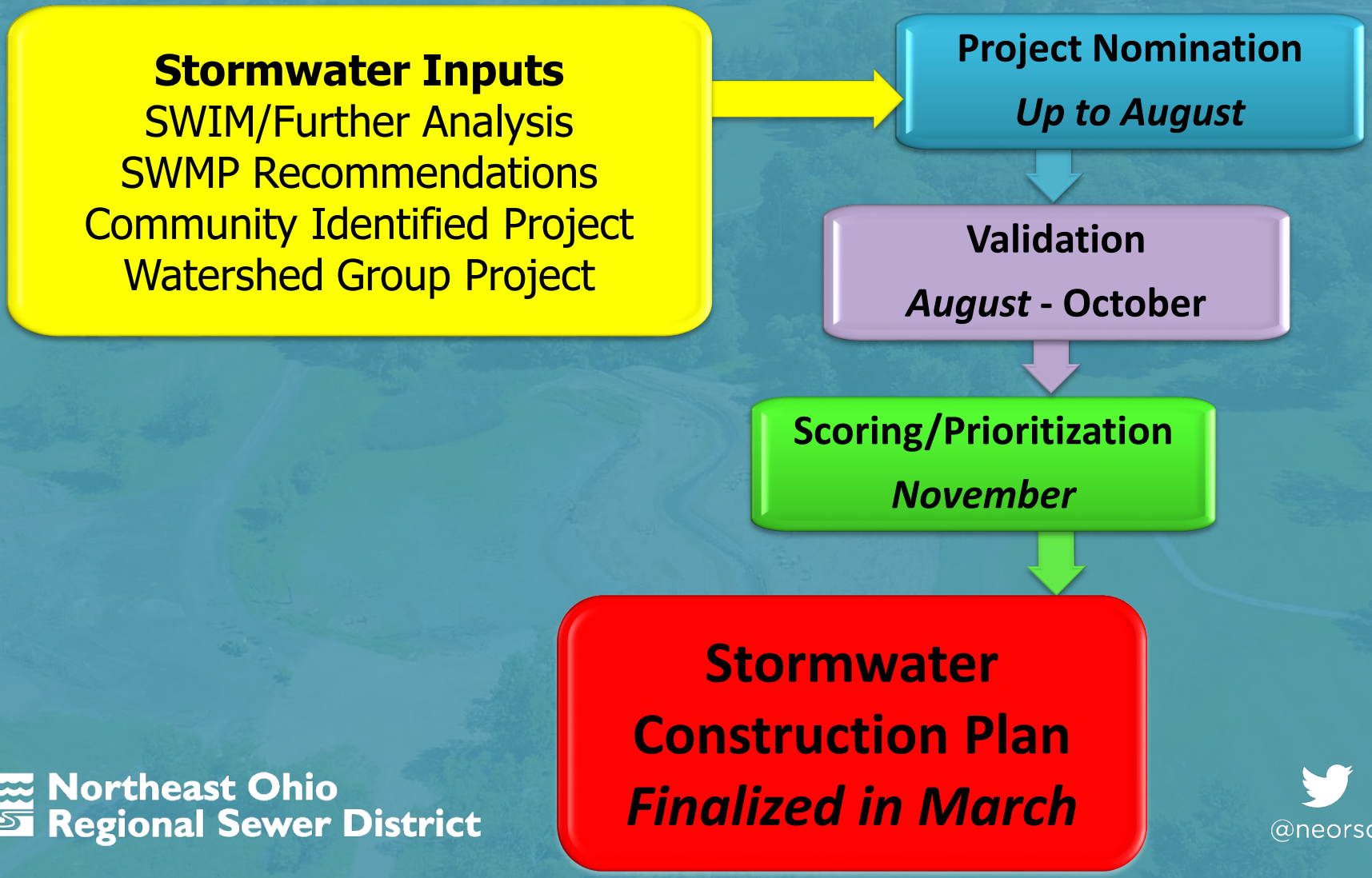
PROGRAM

Stormwater Nomination Process



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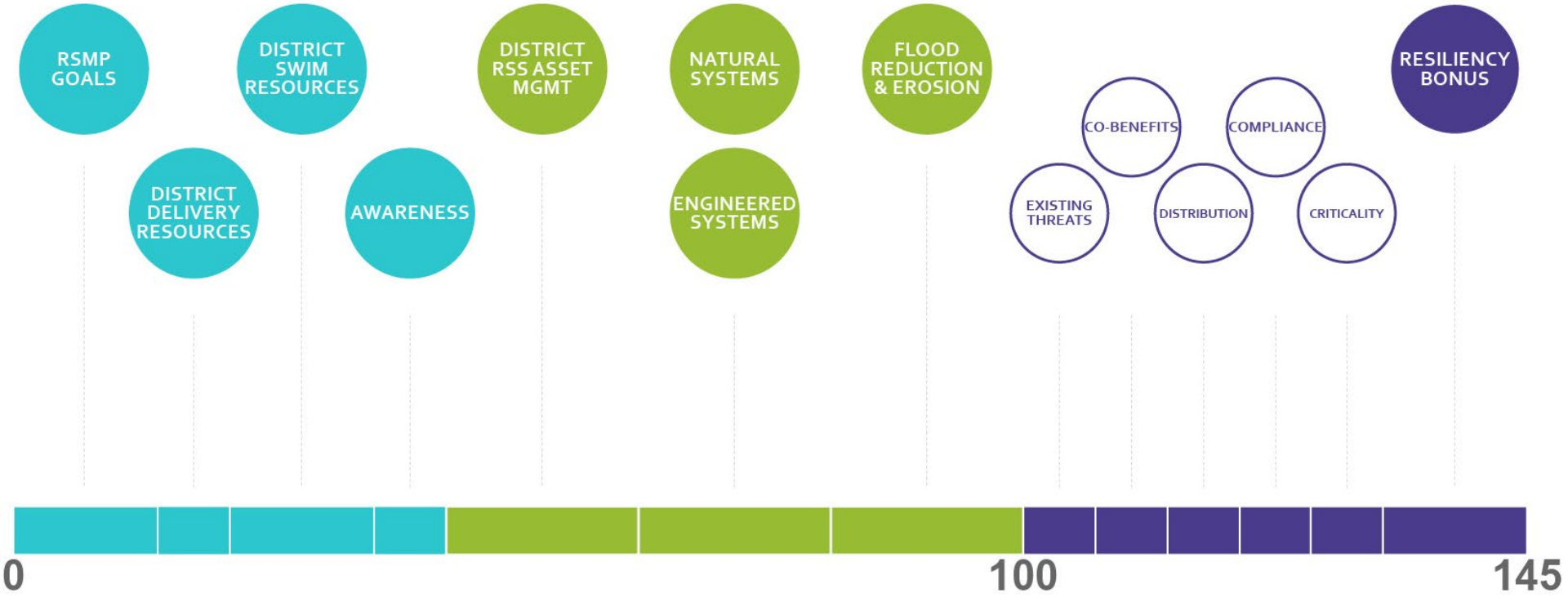
Nomination Process

- Previous risk-based system

Nomination Process

- Benefit-based system



Nomination Process

- Project Nomination Numbers
  - **80** new project nominations in 2019
    - Includes **73** from SWMPs
  - **20** reevaluated from previous years

Questions

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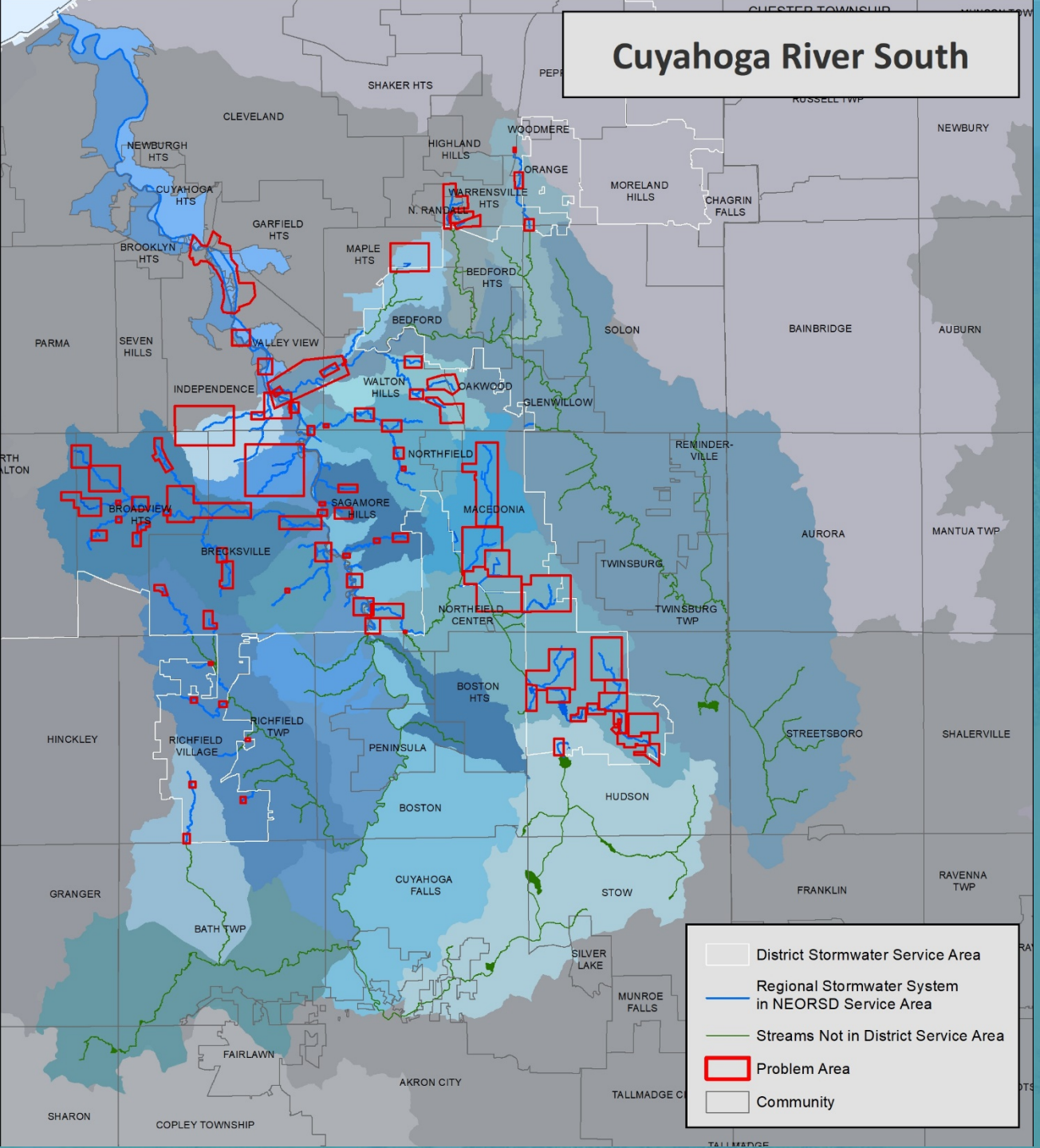

Cuyahoga River South Stormwater Master Plan

80+ Problem Areas with Planning Level Recommendations

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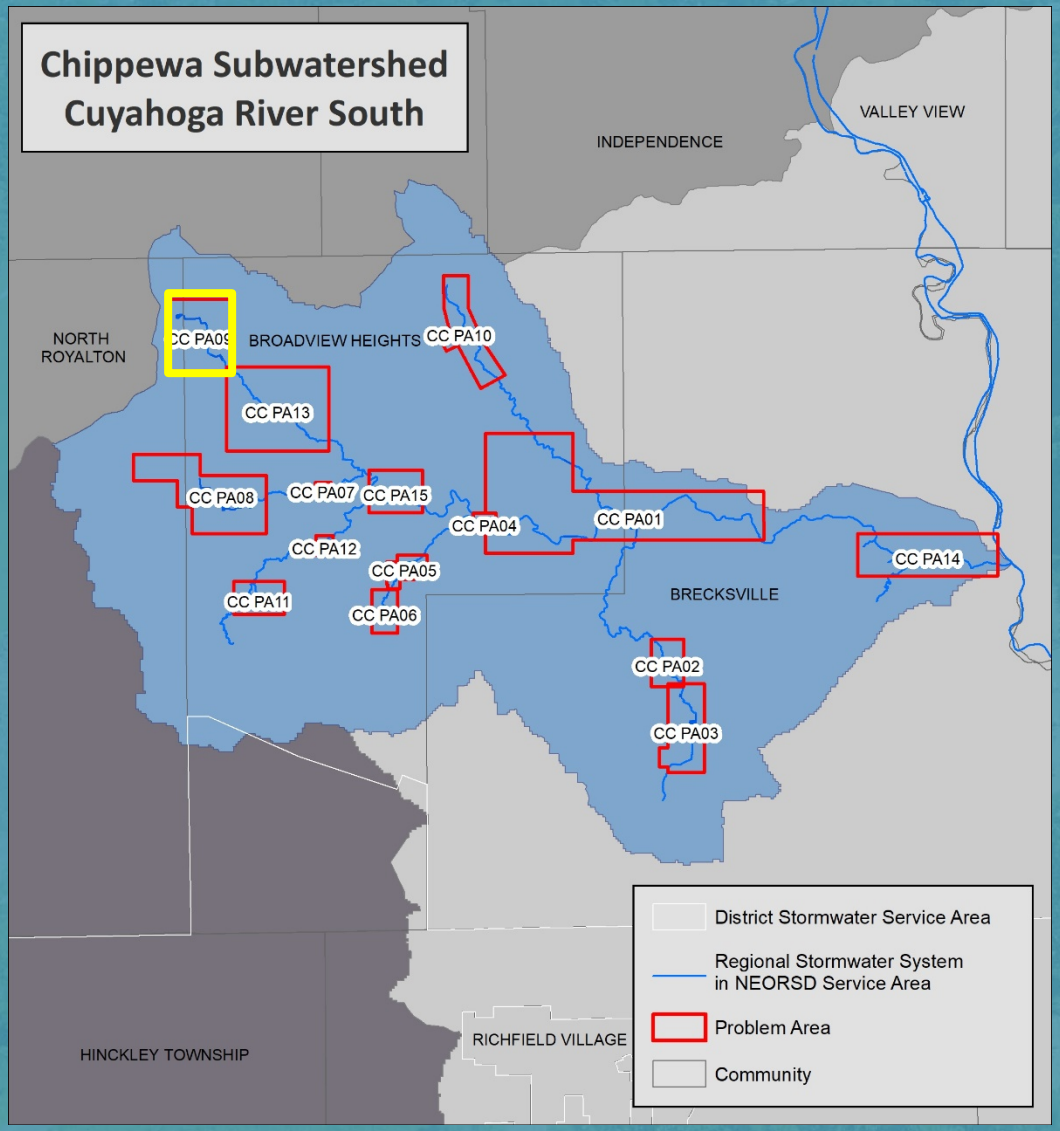
CRS SWMP - First Out Project



- Chippewa Creek Problem Area CC-PA09
- Echo Lane area on border between North Royalton and Broadview Heights

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Chippewa Creek - CC PA09

Broadview Heights/North Royalton

- Community request due to repeated flooding – November 2016
- SWIM inspection and recommendation – November 2016: *Determine if should be included in RSS. If yes, refer to SWMP.*

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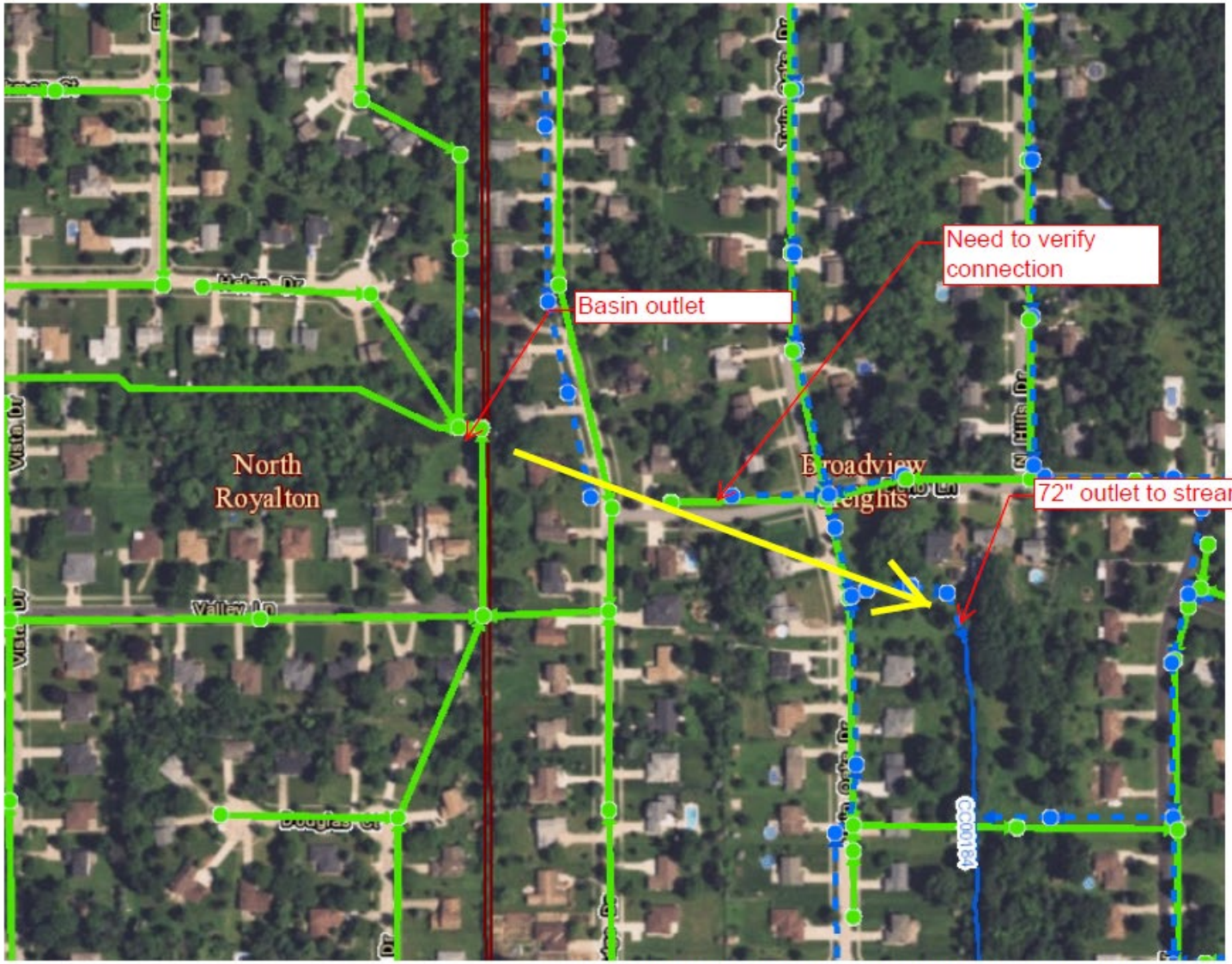
Protecting Your Health and Environment

Basin Inspection- Broadview Heights/North Royalton



Legend

- All Industrial Users
- RSS Artificial Flow Path
- RSS Closed Conduit
- RSS Stream
- RSS Basin
- Local Manhole
  - Sludge
  - OverUnder
  - Combined
  - CSO Overflow
  - Culverted Stream
  - Sanitary
  - STORM
- Local Sewer Pipe
  - COMBINED
  - CSO OVERFLOW
  - CULVERTED STREAM
  - FORCE
  - SANITARY
  - SANITARY OVERFLOW
  - STORM
- Municipal Boundary

1:4,513

Coordinate System: Ohio State Plane North Feet
Datum: NAD 1983 (NAVD 1988)
Projection: Lambert Conformal Conic
Sources: NEORSD Collection System GIS, Cleveland GIS, Cuyahoga County GIS, Summit County Auditor and DOES, Lorain County Auditor, Lake County GIS

Map Created: 11/14/2016

Notes

CC00184
1632029.01
ITL #224826

Problem Area
CC PA09

- CRS SWMP reviewed
  - RSS terminus extension - stream drainage area < 300 acres, but inter-community drainage causing flooding
- Problem Area includes:
  - Stormwater basin
  - Two Culverts through private property
  - Flooding impacts to 8 homes and 4 roads

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Problem Area

CC PA09

Preferred Alternative:

- A101- Enlarge and deepen the basin
- A102 - 1,200 lf of channel restoration w/connected floodplain
- A103 - Demolish existing culverted stream; create 630 linear feet of channel restoration with connected floodplain

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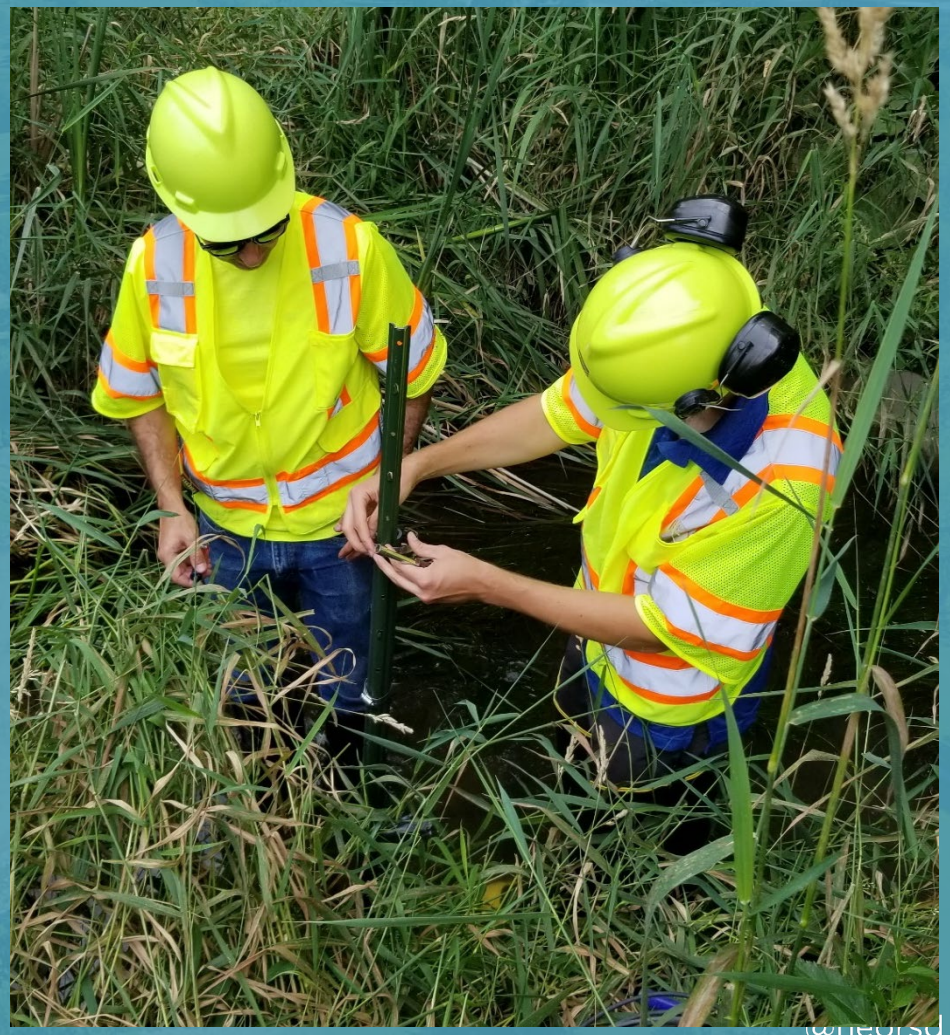
Problem to Project Timeline

- SW Construction Plan prioritization - *Fall 2018*
- RFP Preparation - *January to March 2019*
- Proposals due - *April 2019*
- Flow monitoring by District began - *July 2019*
- Consultant selected and design started - *September 2019*



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Problem Area Components

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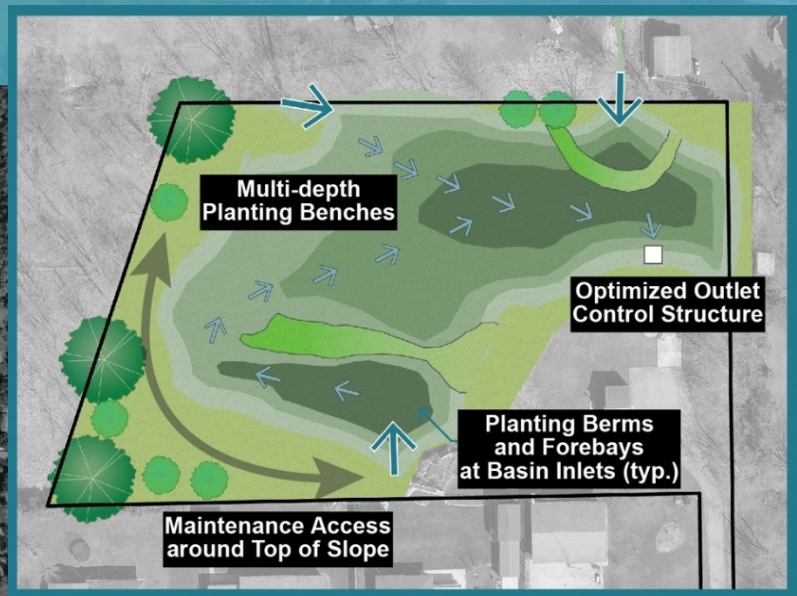
Proposed Project

Stream CC00184 Conceptual Cross Section Looking Downstream



Basin CC00231 Conceptual Plan

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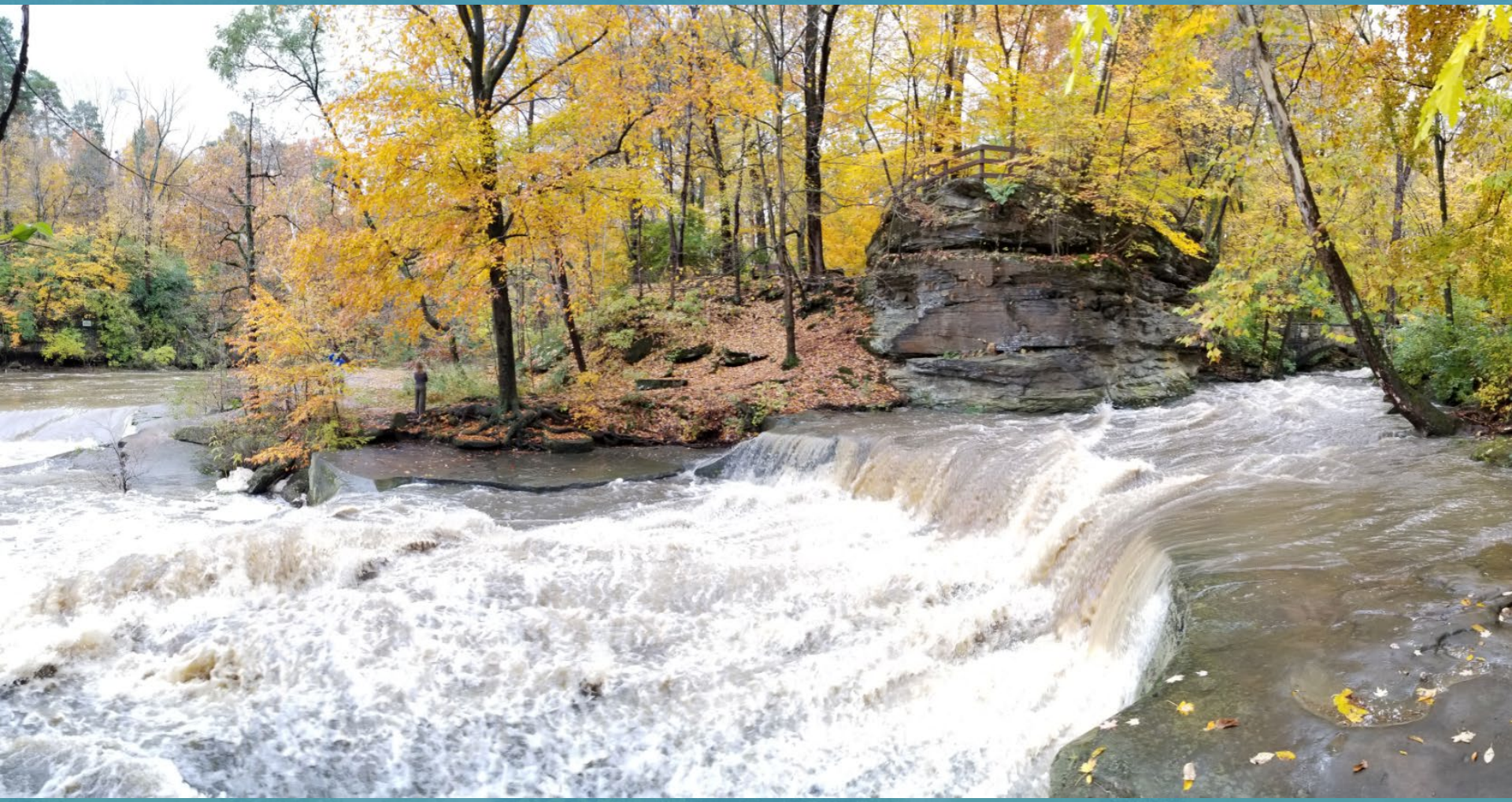
Project Goals

- Reduce flood risks to residential structures and roads
- Improve hydrology of basin by maintaining baseflow and regulating storm flow
- Increase channel roughness and sinuosity and reconnect channel to floodplain
- Biological and chemical water quality goals to be determined following collection of baseline data by WQIS

Anticipated Project Timeline

- Data collection phase: *September 2019 to February 2020*
- Complete design: *Summer 2021*
- Begin construction: *Late 2021/early 2022*
- Potential to accelerate construction of basin-related project elements

Questions



WTL Contact

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216.881.6600 Ext. 6768
friedmand@neorsd.org

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Stormwater Program: Community Resources
http://www.neorsd.org/communitystormwaterresources.php