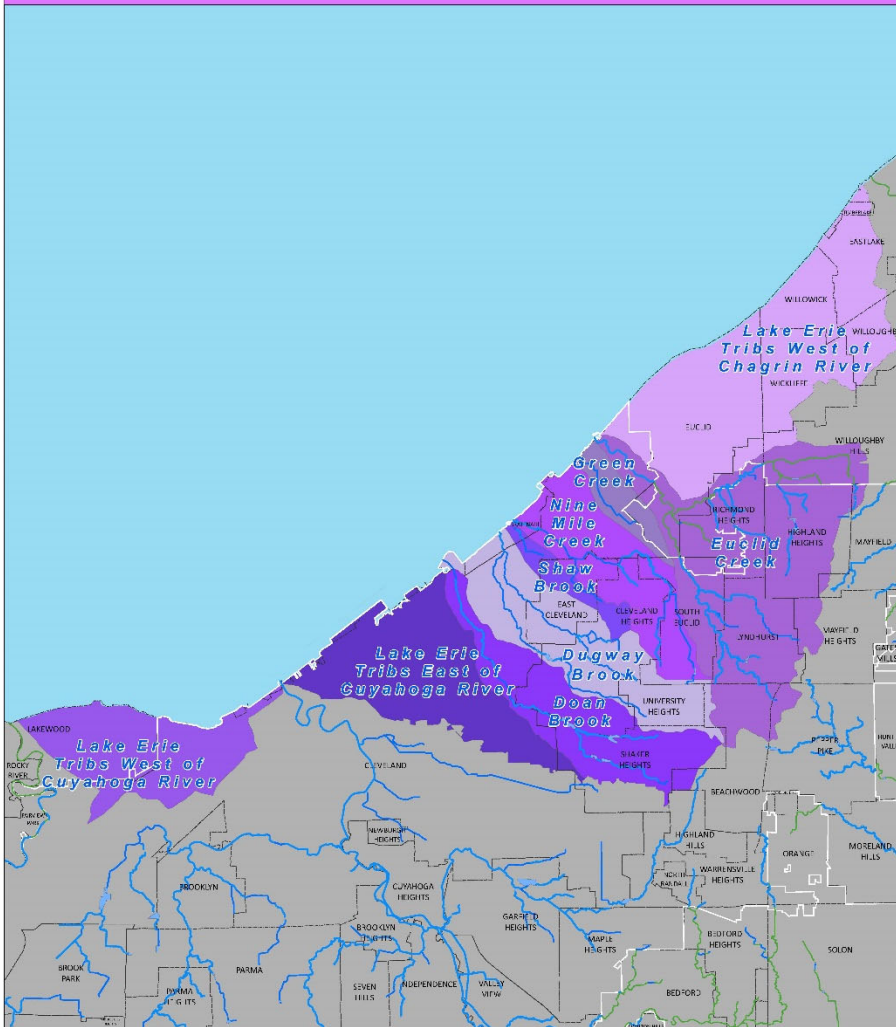


Lake Erie Direct Tributaries Watershed



Northeast Ohio Regional Sewer District

1:60,605



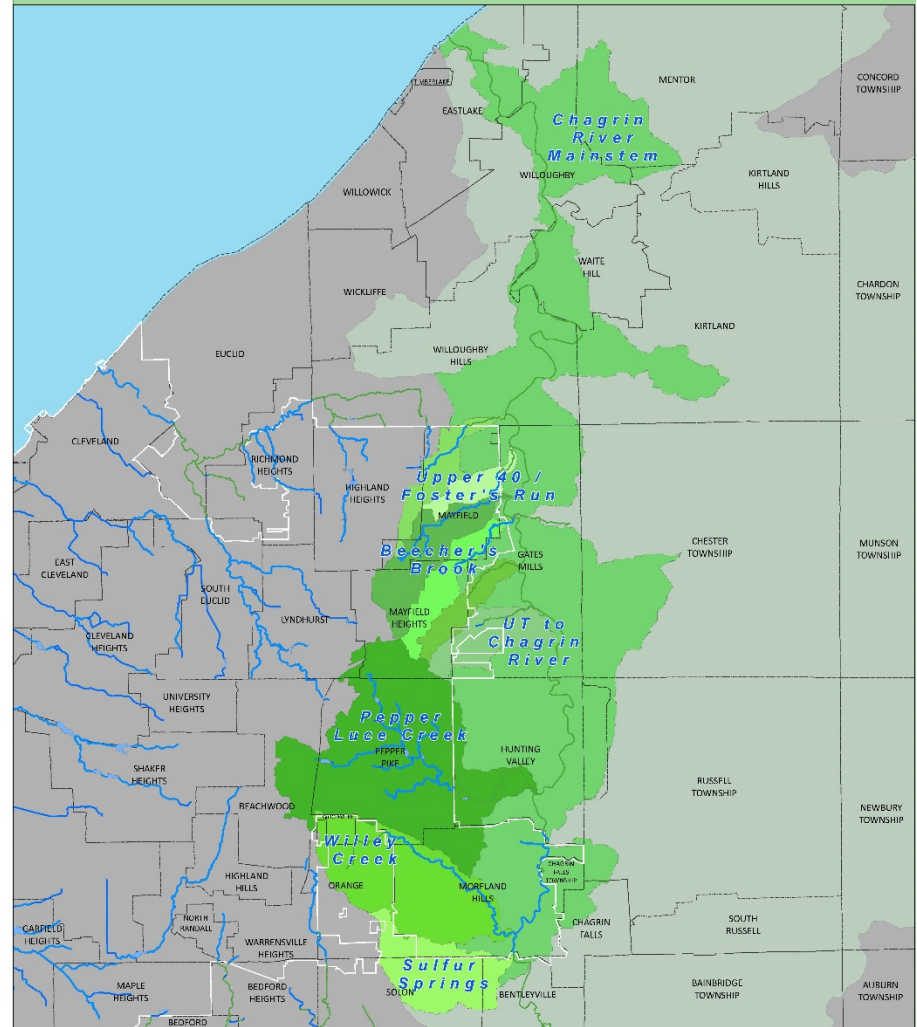
Coordinate System : Ohio State Plane North
Datum: NAD 1983 , NAVD 1988
Projection: Lambert Conformal Conic
Sources: NEORSR GIS

Map Created: October 2017

This information is for display purposes only. The Northeast Ohio Regional Sewer District (NEORSR) makes no warranties, expressed or implied, with respect to the accuracy of and the use of this map for any specific purpose. This map was created to serve as base information for use in Geographic Information Systems (GIS) for a variety of planning and analysis purposes. The NEORSR expressly disclaims any liability that may result from the use of this map. For more information, please contact: NEORSR GIS Services, 3900 Euclid Avenue, Cleveland, Ohio 44115 (216) 881-6600 — GIS@neorsr.org

- Regional Stormwater System in NEORSR Service Area
- Regional Stormwater System not in NEORSR Service Area
- Service Area
- Community

Chagrin River Watershed



Northeast Ohio Regional Sewer District

1:47,836



Coordinate System : Ohio State Plane North
Datum: NAD 1983 , NAVD 1988
Projection: Lambert Conformal Conic
Sources: NEORSR GIS

Map Created: October 2017

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- Regional Stormwater System in NEORSR Service Area
- Regional Stormwater System not in NEORSR Service Area
- Service Area
- Community

*Watershed Advisory Committee
Lake Erie Direct Tributaries
Chagrin River
October 2018*

NORTHEAST OHIO REGIONAL SEWER DISTRICT



REGIONAL
STORMWATER
MANAGEMENT
PROGRAM



Northeast Ohio
Regional Sewer District



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Agenda

- Sewer District Updates
 - Community Cost-Share
 - Local Sewer System Evaluation Studies
- Stormwater Master Plan
- Stormwater Inspection and Maintenance
 - Urgent Response Process
 - Problems to Projects
 - Community Meetings on Crossings and Culverts
- Stormwater Construction Plan
 - 2018 Project Updates
 - 2019 Annual SW Construction Plan Review
 - Construction Project Oversight



Community Cost-Share

- CCS Funds Balance (8/31/2018) \$ 22,039,931
- 67 approved projects \$ 9,150,615
- 17 approved allocation agreements \$ 7,539,502
- CCS Funds available to Member Comm. \$ 5,349,814

30 of 55 Member Communities currently participating

Community Cost-Share Project Ideas

Examples of the Community Cost-Share Program

- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

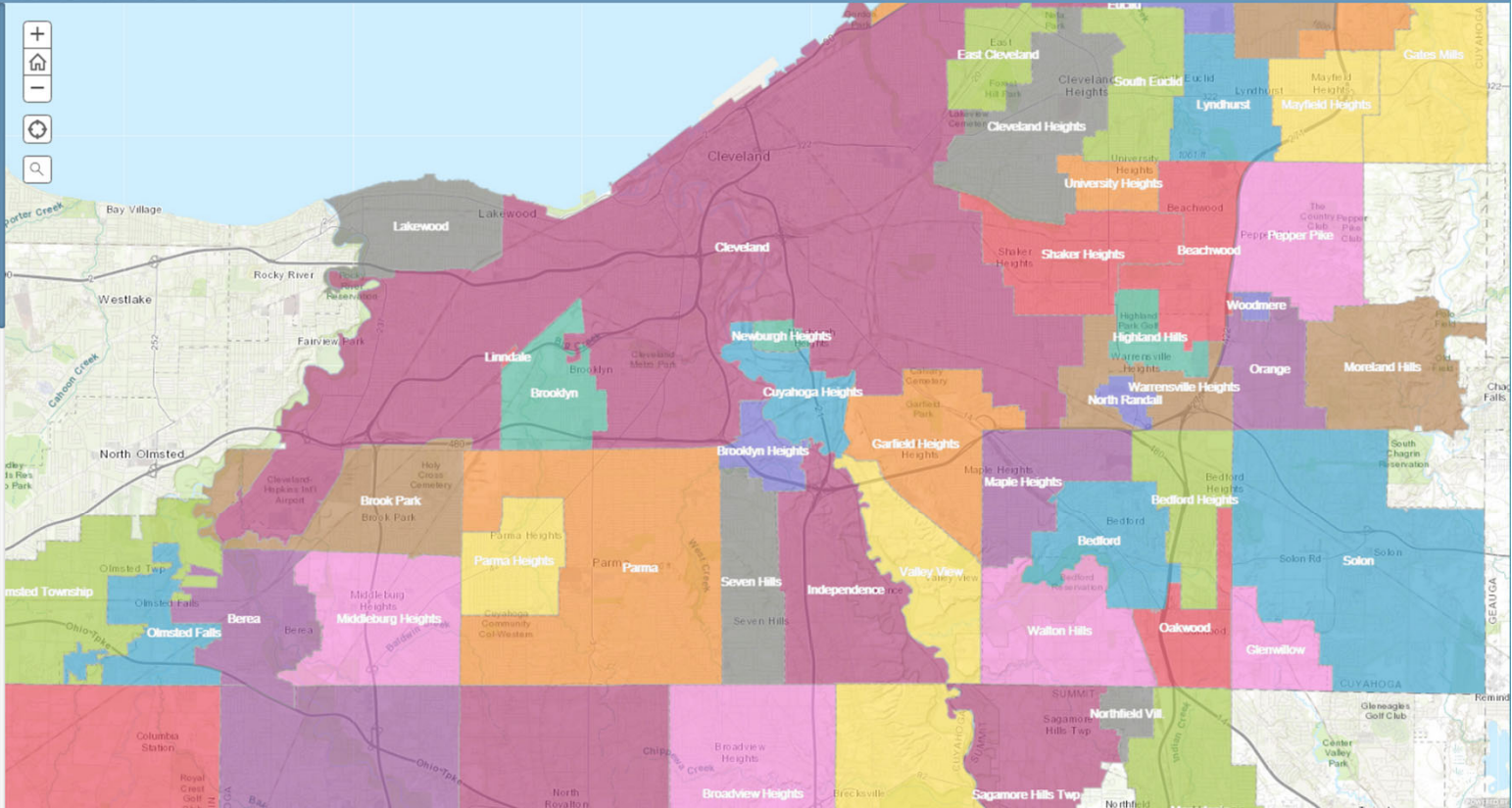


The Community Cost-Share Program provides funding to Member Communities for Community-specific stormwater management projects. To implement the Community Cost-Share Program, the Northeast Ohio Regional District (District) has formed a financial account termed "Community Cost-Share Account" for the aggregation and dissemination of funds derived from Stormwater Fee collected in each Member Community.

25% of the total annual Stormwater Fee collected in each Member Community is allocated to the Community Cost-Share Account for each Member Community. The Community Cost-Share Account is under the control of the District, with disbursement of funds to Member Communities through a grant application and reimbursement process. To access Community Cost-Share Program funds, Member Communities must maintain compliance with Title V Stormwater Management Code. A Community Cost-Share Program Project must clearly promote or implement the goals and objectives of the District set forth in Title V and must be intended to address current or minimize new, stormwater flooding, erosion, and water quality problems.

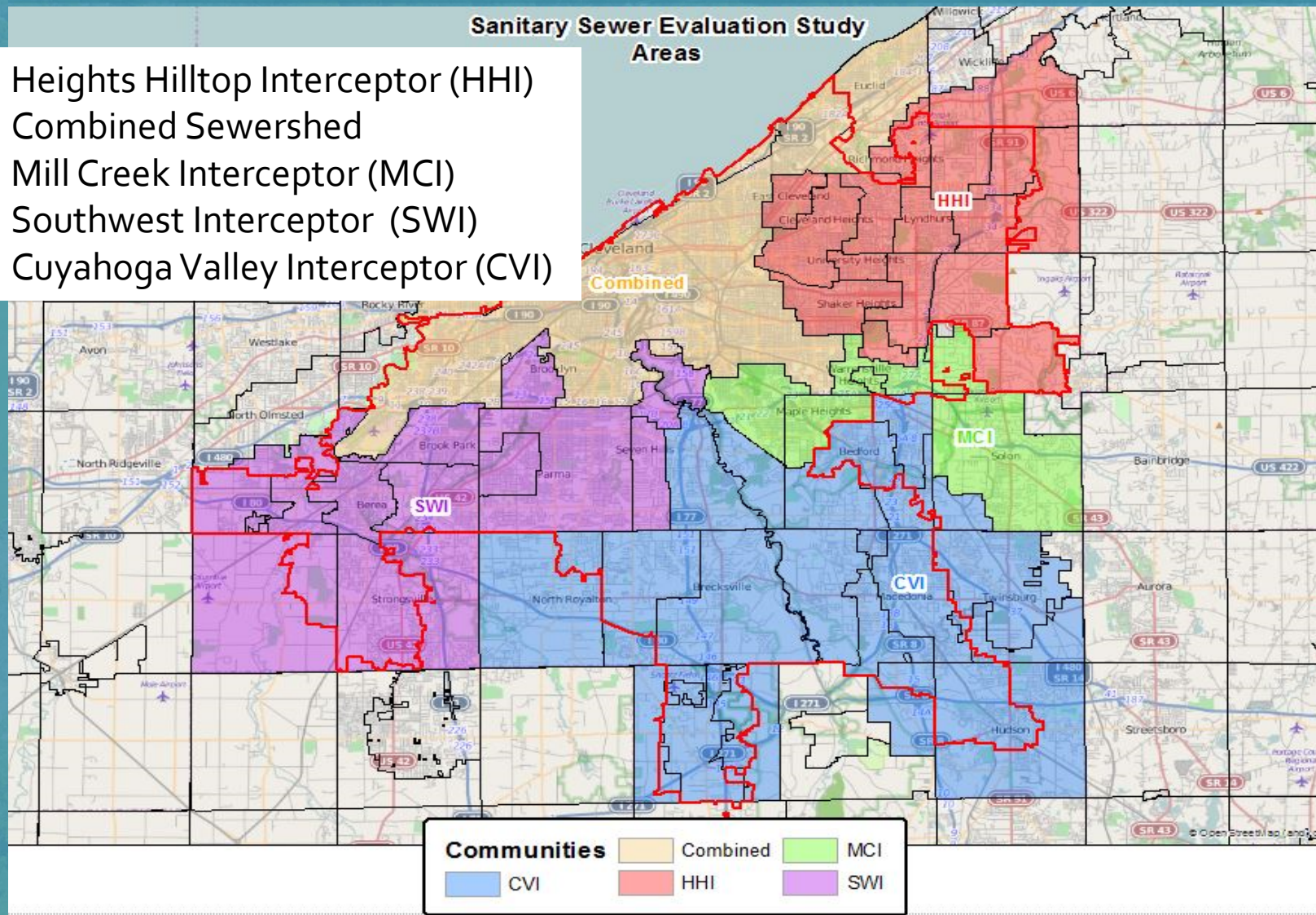
More Information

- WTL Communities
- Beachwood
 - Bedford
 - Bedford Heights
 - Berea
 - Bratenahl
 - Brecksville
 - Broadview Heights
 - Brook Park
 - Brooklyn
 - Brooklyn Heights
 - Cleveland
 - Cleveland Heights



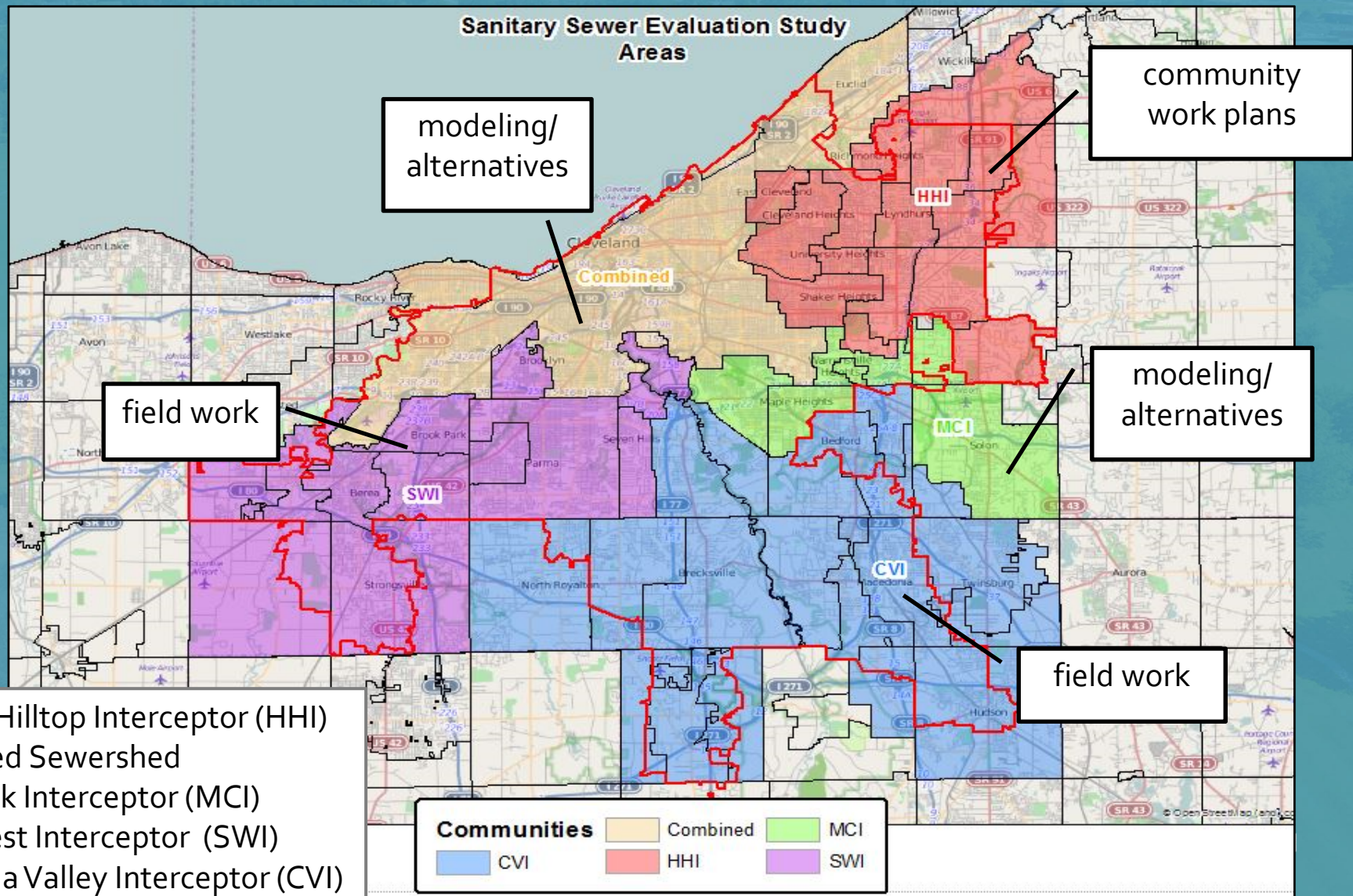
Sewer System Evaluation Studies

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



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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)

Questions

Johnston
TH AMERICA

This equipment was funded by the
 Northeast Ohio
Regional Sewer District
Regional Stormwater Management Program

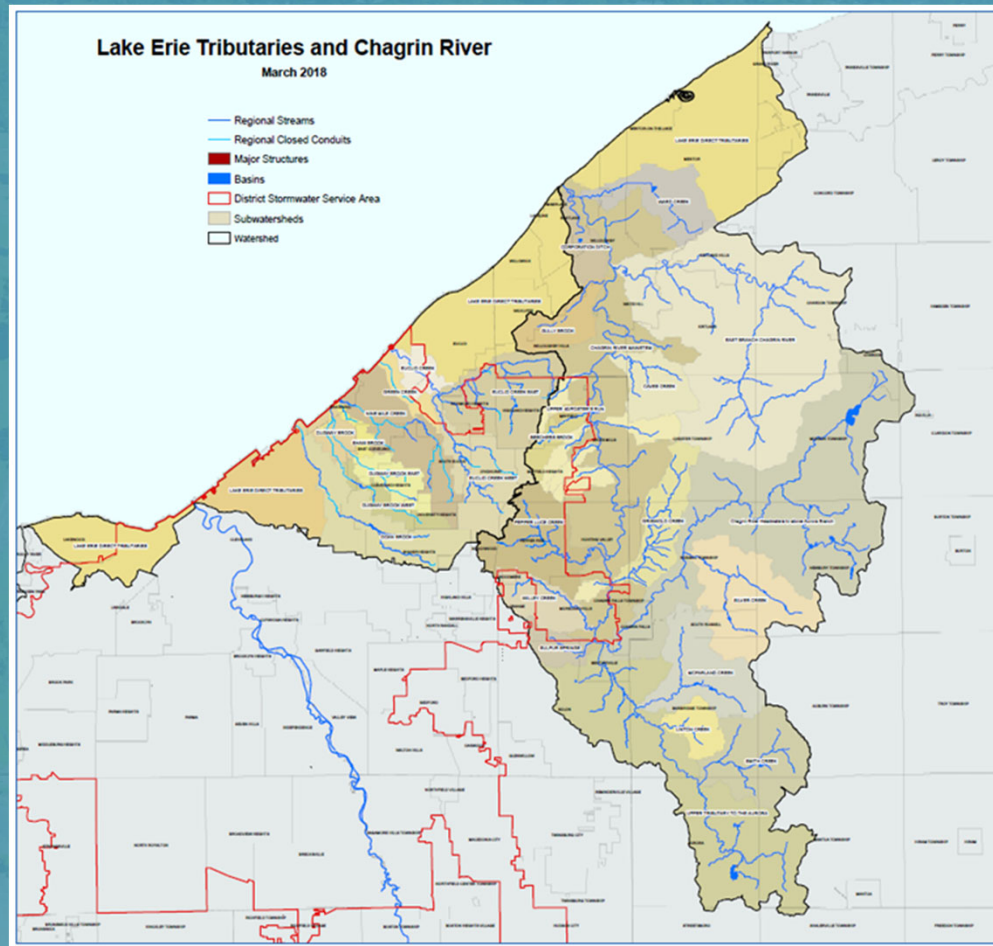
STAINLESS STEEL
BODY

south euclid
18

Johnston

South Euclid Community Cost Share – Equipment Purchase

Stormwater Master Plan

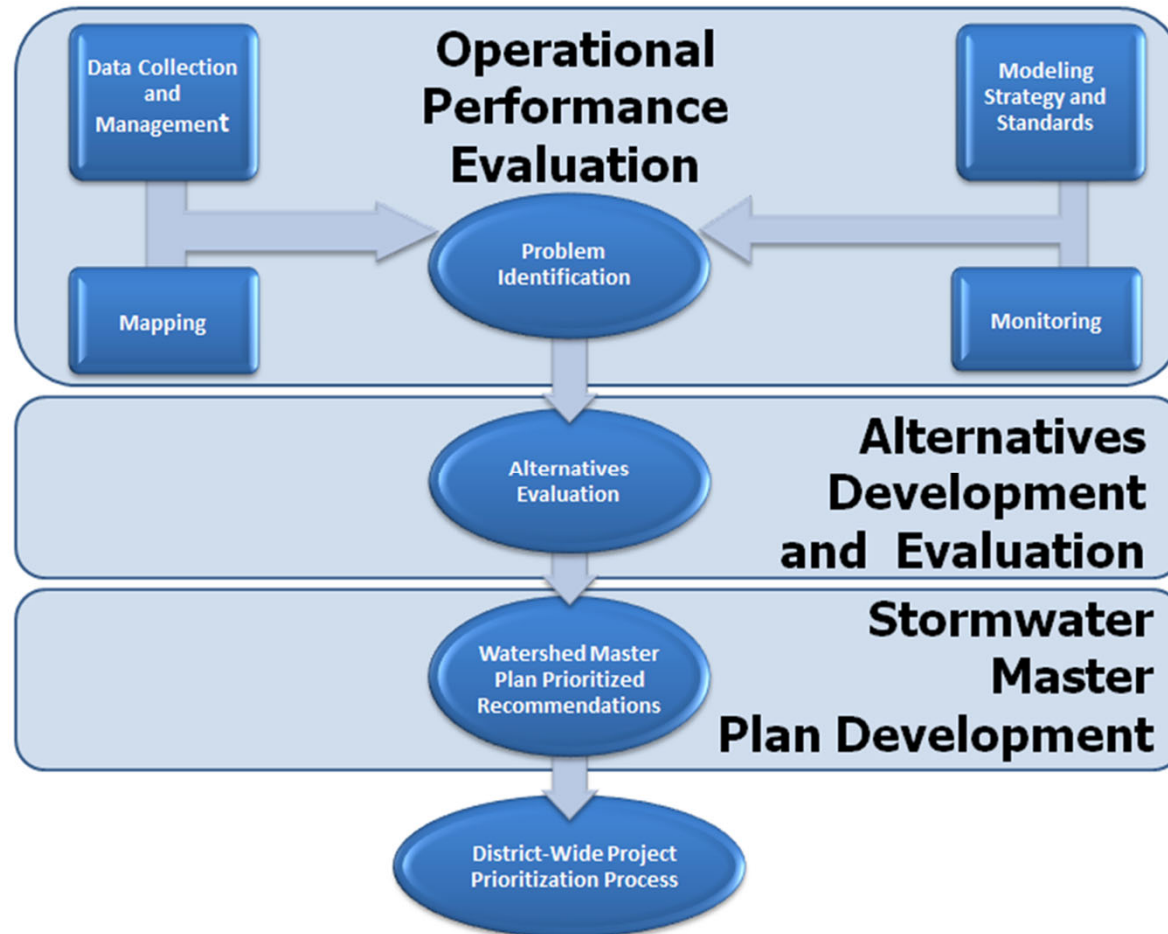


**Northeast Ohio
Regional Sewer District**



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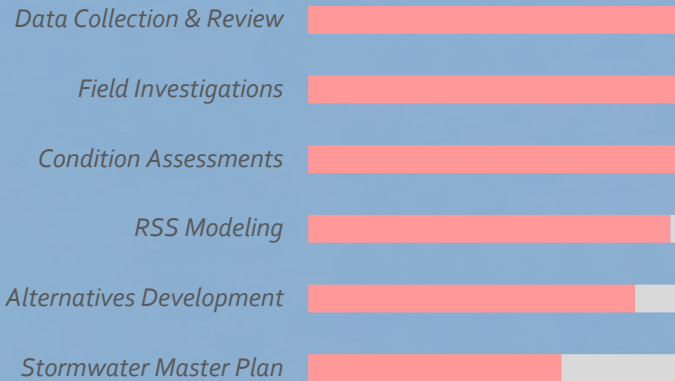
Stormwater Master Plan Study Process



Stormwater Master Planning (status through 9/30)

Cuyahoga River South

Completion Date: December 2018



Cuyahoga River North

Completion Date: 4th Quarter 2019



Rocky River

Completion Date: 4th Quarter 2019



Chagrin/Lake Erie

Completion Date: 4th Quarter 2020

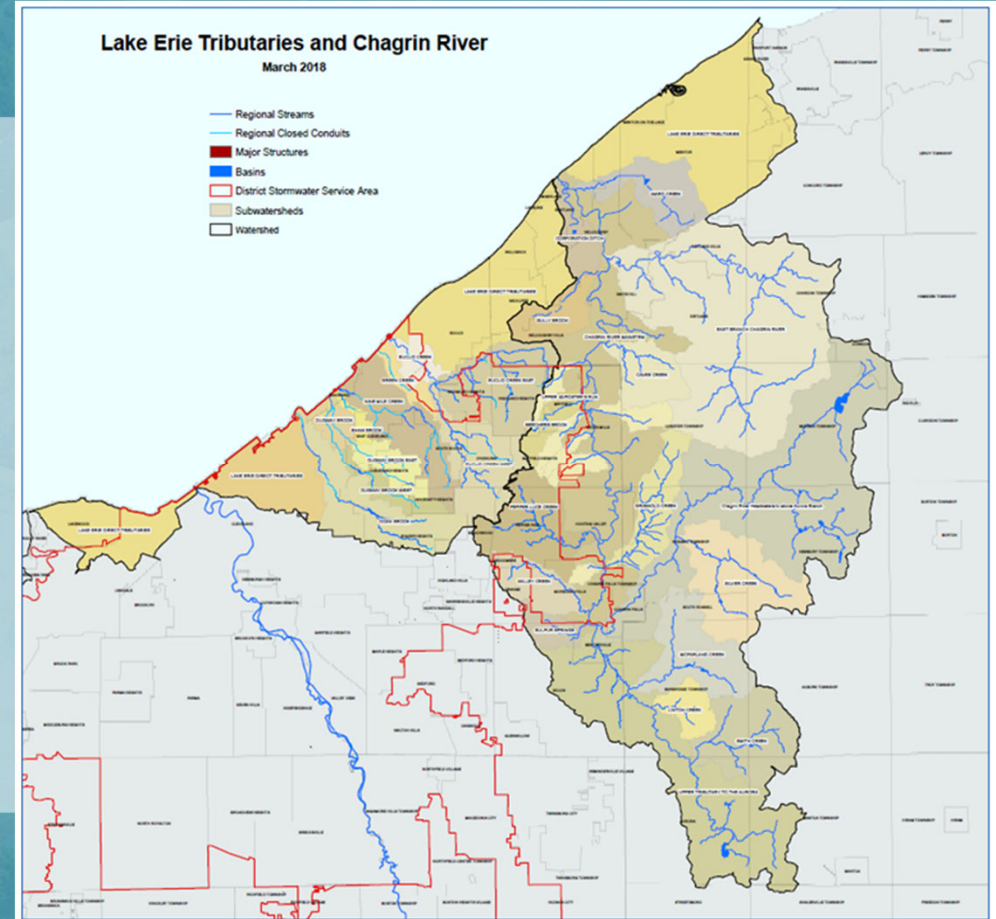


Stormwater Master Plan

Study Area

Total Study Area

- 217,318 acres (58,616 within SWSA)
- 25 Subwatersheds in the SWSA
- 21 WAC Member Communities



Stormwater Master Plan

Chagrin River Watershed

Chagrin River Watershed Study Area

- 169,520 acres in total
 - (15,090 acres in SWSA)
- 12 of 25 subwatersheds in SWSA
- 10 WAC Member Communities



**Northeast Ohio
Regional Sewer District**



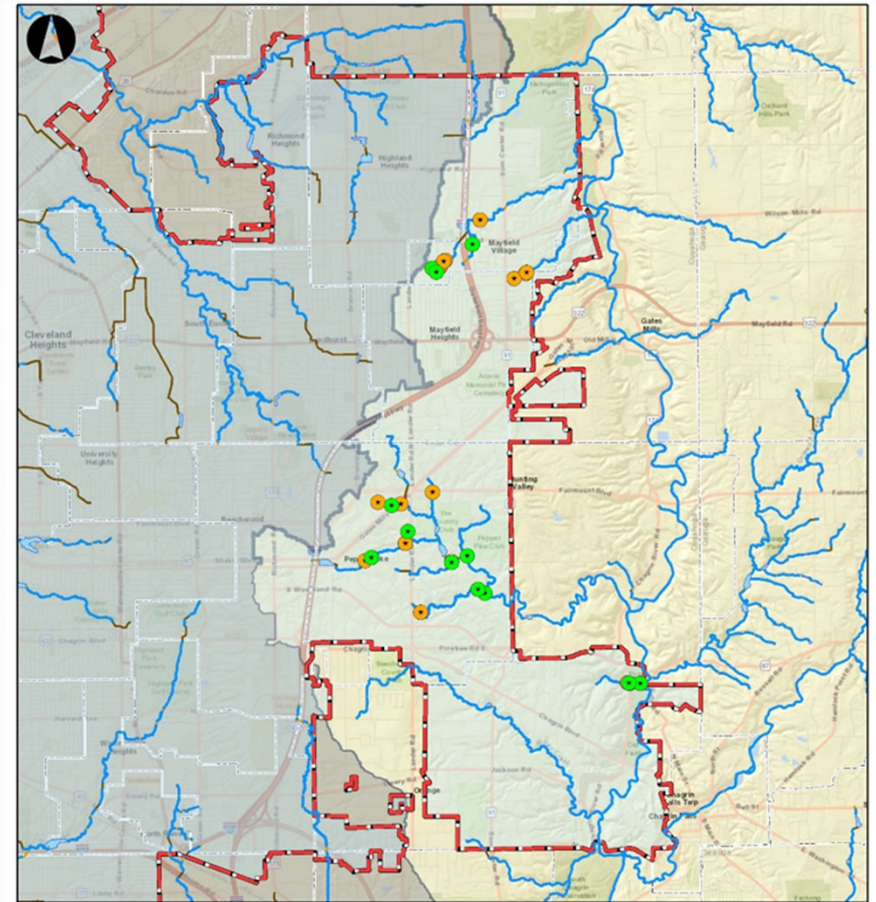
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Stormwater Master Plan

Chagrin River Watershed

Chagrin River SWMP Subwatersheds

- Beechers Brook
- Chagrin River Mainstem
- Chagrin River Small Tributaries (6)
- Pepper Luce Creek
- Sulfer Springs
- Upper 40/Foster's Run
- Willey Creek



Stormwater Master Plan

Lake Erie Direct Tributaries

LET Watershed Study Area

- 47,798 acres in total
 - (43,526 acres in SWSA)
- 13 subwatersheds in SWSA
- 17 WAC Community Members



Northeast Ohio
Regional Sewer District



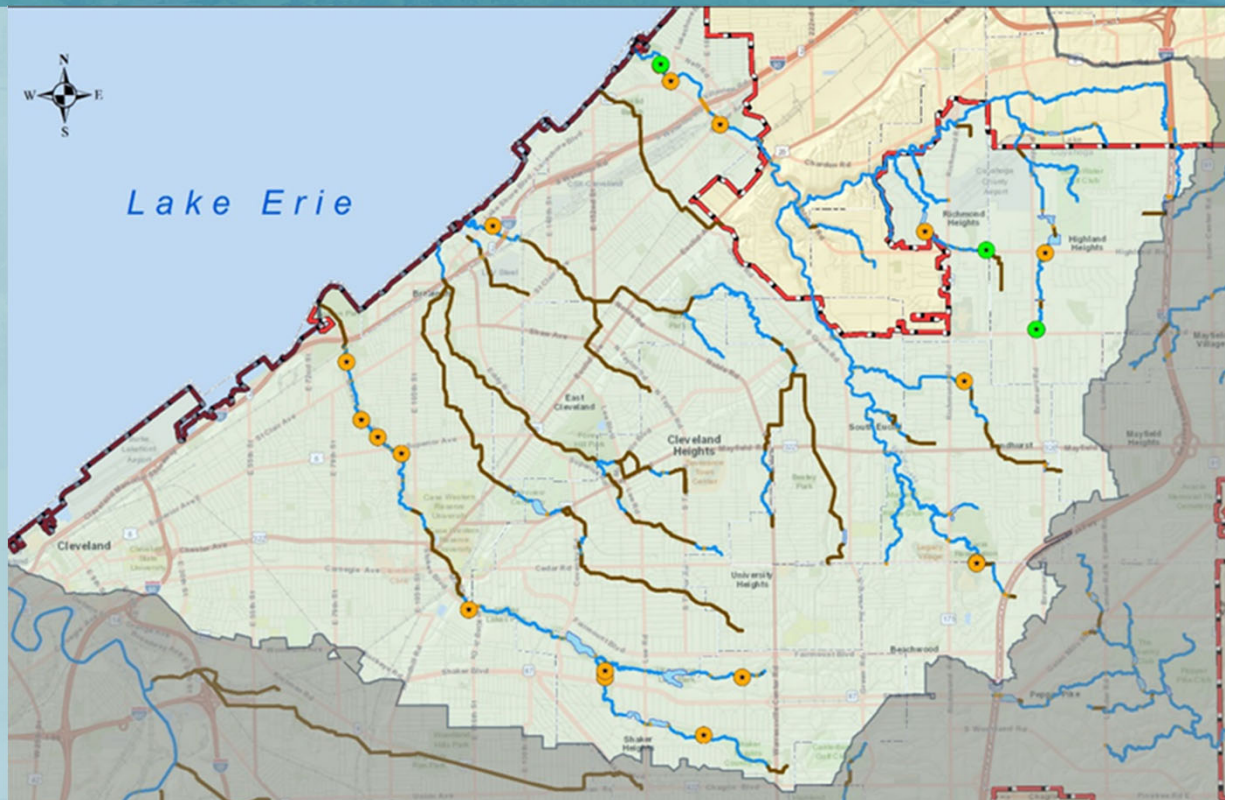
@neorsd

Stormwater Master Plan

Lake Erie Direct Tributaries

LET SWMP Subwatersheds

- Doan Brook
- Dugway Brook
- Euclid Creek
- Green Creek
- Nine Mile Creek
- Shaw Brook



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Regional Sewer District



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Stormwater Master Plan

Chagrin River / Lake Erie Direct Tributaries



Significant work: thru October 2018

- RFP Publication and Selection of Contractor
- Contract Award – Wade Trim, Inc.
- Board Resolution – October 18th
- Notice to Proceed – October 22nd

CHALET SWMP Project Budget: \$10M



**Northeast Ohio
Regional Sewer District**



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Stormwater Master Plan

Upcoming Milestones



- **SWMP Kickoff**
- **Data Collection Activities**
 - Member Community Work Plans
 - HWM Gauge Placement Notifications
- **SWMP Field Activities**
 - HWM Gauge installations & Monitoring
 - Geomorphological Surveys
 - Stream & Basin Surveys
 - Shaker Lake Nature Center Early Action Assessment
 - Spherical Imagery Collection
 - Culverted Stream CCTV Inspections
- **Model Development**
 - Watershed Delineation
 - RSS Terminus Extension Identification



Stormwater Master Plan

Level of Service Evaluation

Sam's Club – Brooklyn, Ohio – Big Creek Subwatershed

Problem:

- Stormwater inundation and impacts to Sam's Club, Brookpark Road & surrounding areas including fueling station
- Brookpark Road overtops around a 1-yr. storm
- Sam's Club parking lot begins to flood between the 2- and 5- yr storms
- Water enters the Sam's Club Building around the 10-yr storm

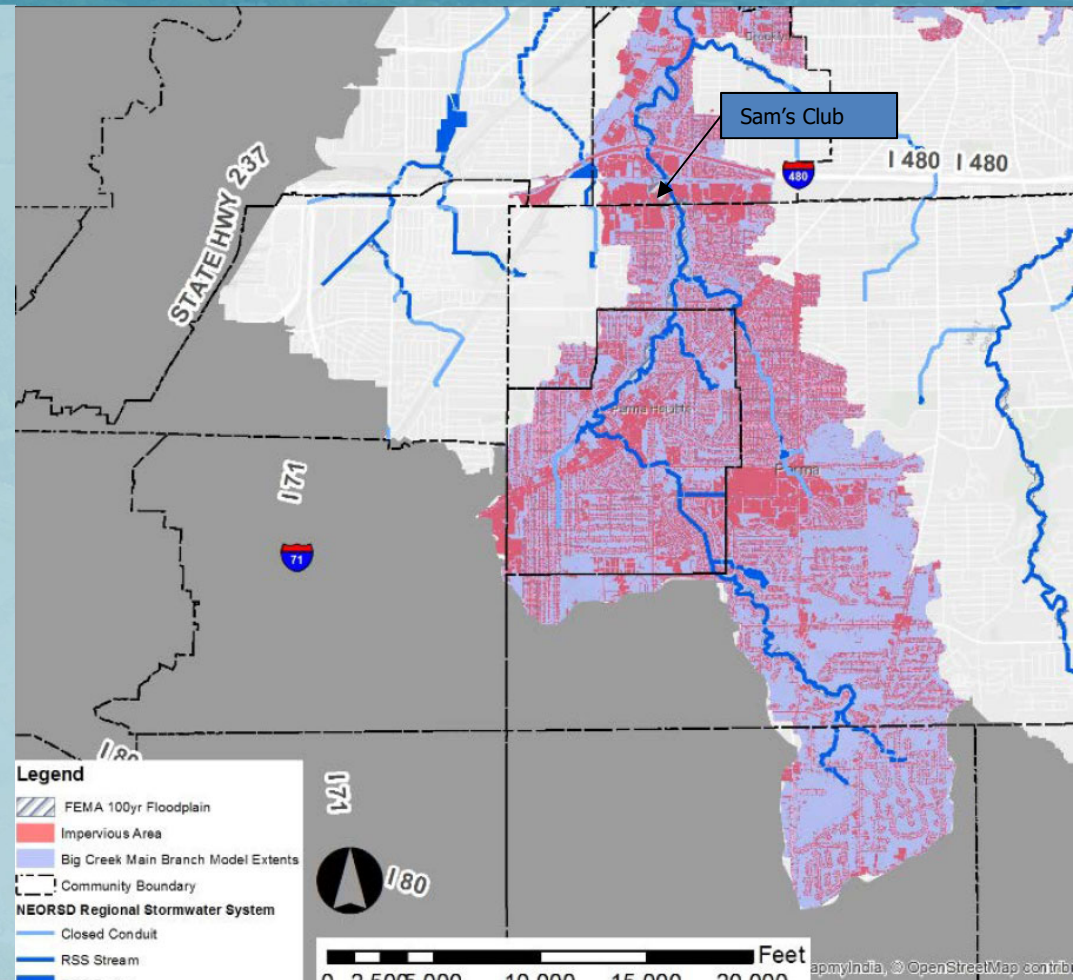


Stormwater Master Plan

Level of Service Evaluation

Problem Overview

- Sam's Club building & parcel site within both the 100-year FEMA & CRN SWMP model floodplains
- Total Drainage Area 8781 acres
- Percent Impervious 38% acres
- Problem Area Specific - Target volume to manage for 100-year LOS 1,800 acre-feet or $\approx 1,361$ football fields
- Watershed-wide: Target volume to manage for 100-yr LOS 3,300 acre-feet or 2,496 football fields



Stormwater Master Plan

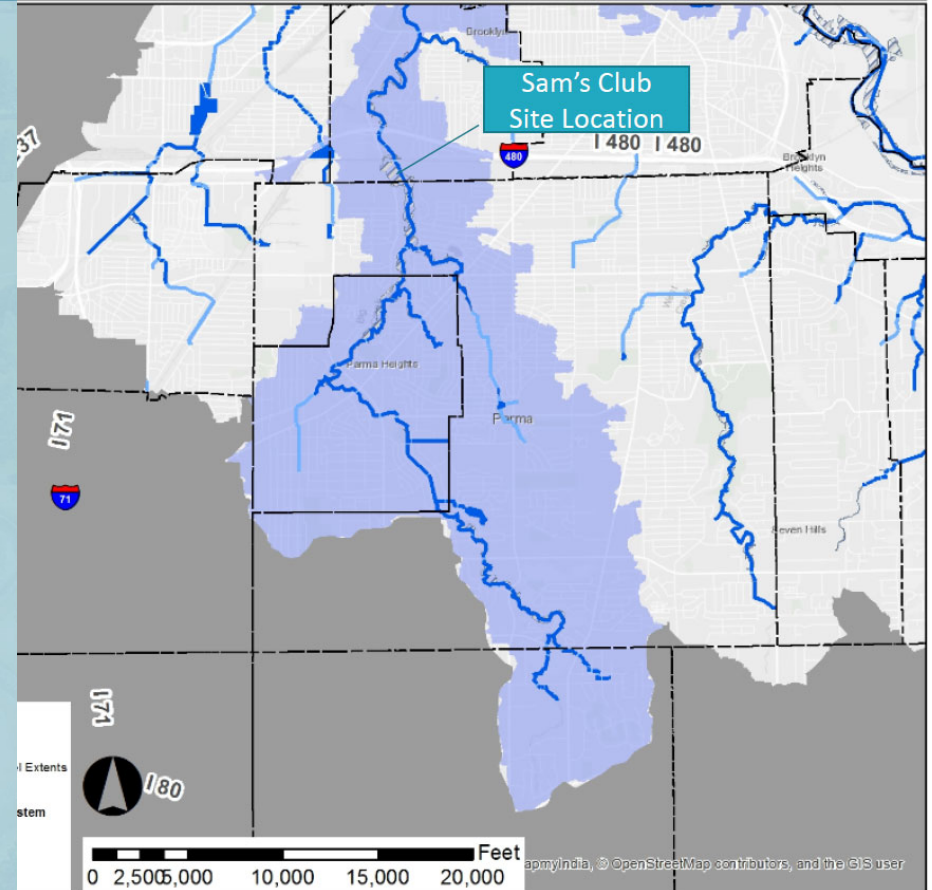
Level of Service Evaluation

No upstream development at all

- All impervious area (development) removed
- Review 100-yr design storm (CRN SWMP parameter)
- Review depth at Sam's Club entrance 767.3

Results

- Inundation depth 1 ft above Sam's Club entrance elevation



Stormwater Master Plan

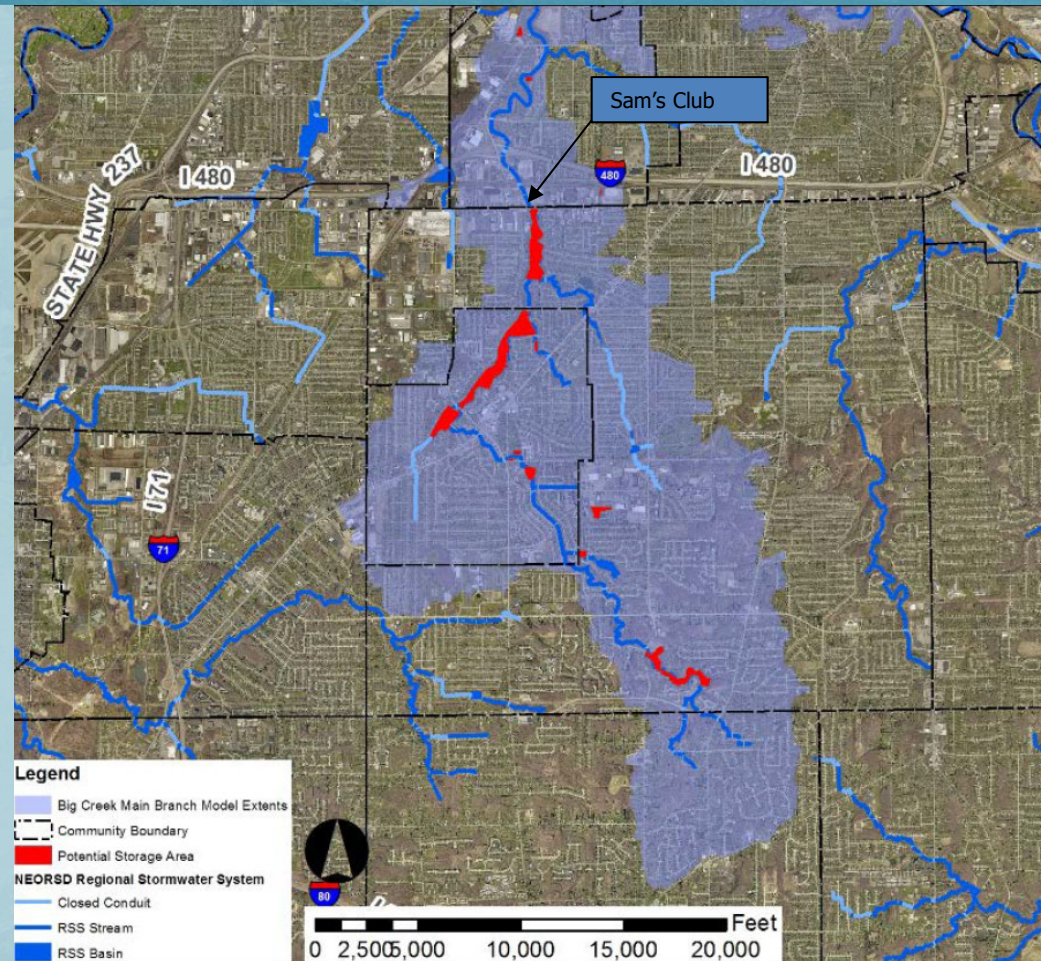
Level of Service Evaluation

Use open land areas –regardless of current ownership

- Review 100-yr design storm (CRN SWMP parameter)
- Review depth at Sam's Club entrance 767.3

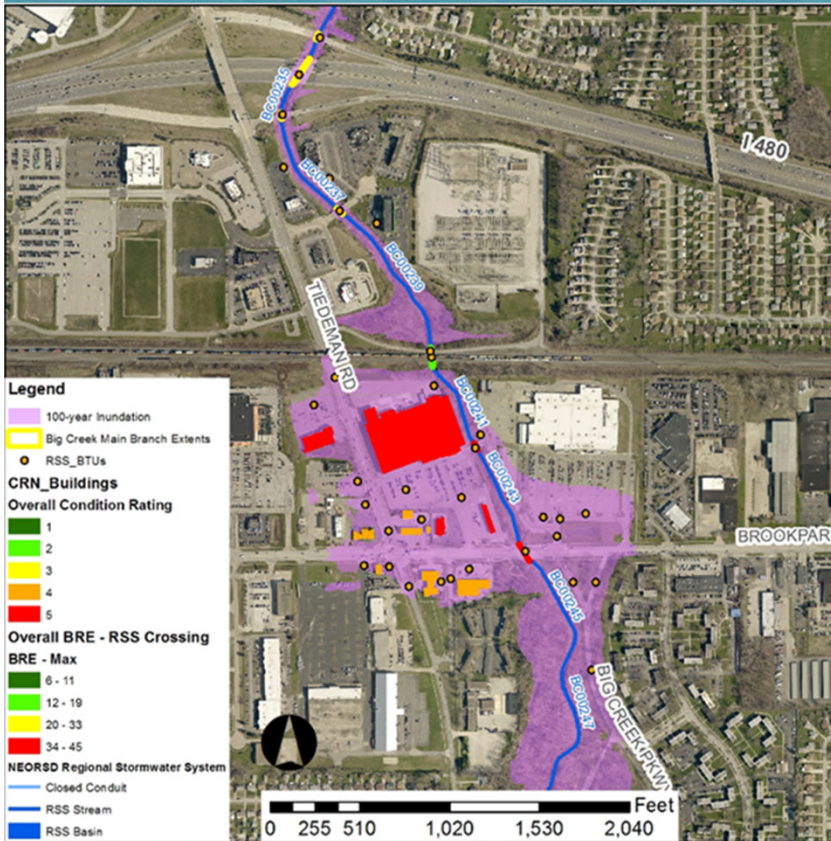
Results

- Potential open area is about 440 acres
- Needed storage of 1,800 acre-ft exceeds potential
- Current watershed does not have enough open areas to address levels of flooding
- Available open areas at Walmart locations for storage opportunities can not remedy issues



Stormwater Master Plan

Level of Service Evaluation – Mitigation Options



- **<2-year Scenarios**
 - Current conditions (Do Nothing)
 - Raise Brookpark Road
 - Channel re-alignment south of Brookpark Rd
 - Sam’s Club/Walmart bridge removal
- **<5-year Scenario (New)**
 - CSX crossing modification
- **<10-year Scenario**
 - Channel widening into Walmart parking lot
- **<25-year Scenario (New)**
 - Channel widening into Walmart parking, CSX crossing upsizing & width increase at Brookpark Rd
- **Results:**
 - Increased floodplain storage from <2-yr to <25-yr LOS (up to <10-yr with channel widening only)
 - Inundation depths reduced by about 1 inch at 100-yr
 - Downstream problem areas show increase inundation depths

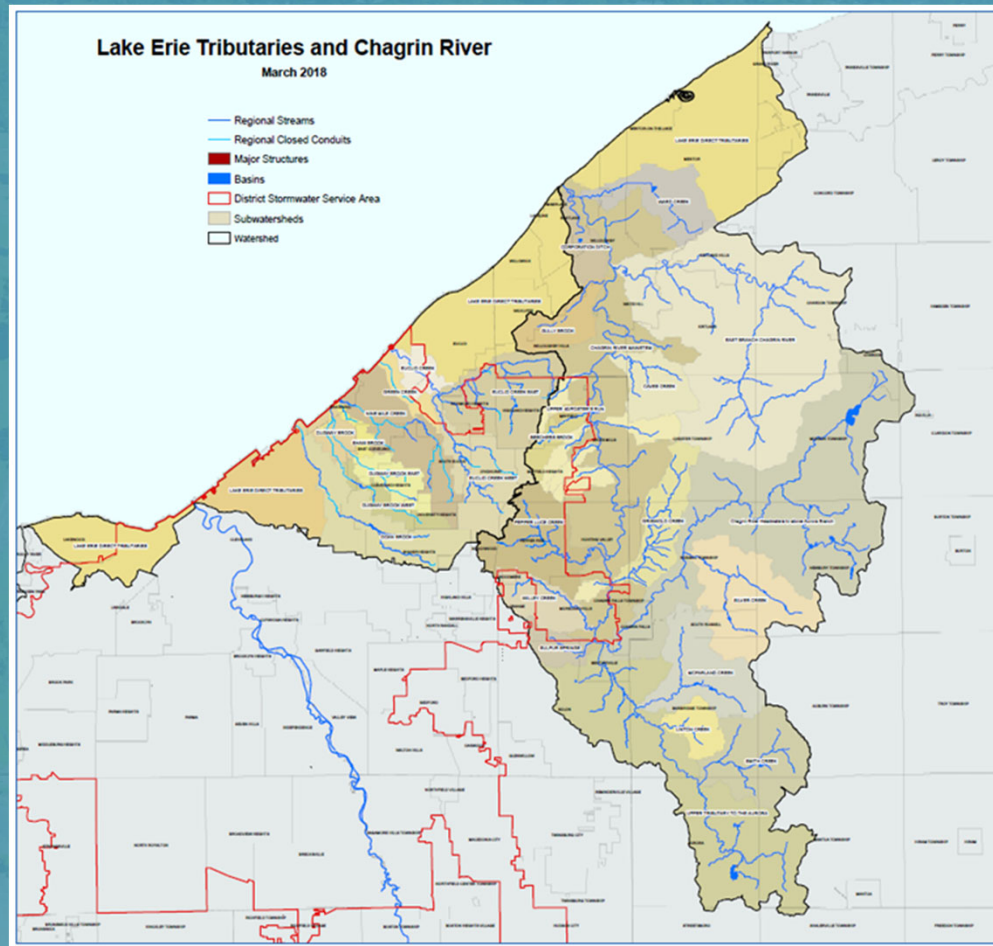
Stormwater Master Plan

Community Communication

- Member Community Work Plans
- Meet with communities
 - Problem Area Review
- Recommendations and Community Report
- Community Participant Option
 - Inform Watershed Team Leader by November 9, 2018

Your Watershed Team Leader serves as the point of contact between the communities and the District

Questions



**Northeast Ohio
Regional Sewer District**



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Stormwater Inspection and Maintenance (SWIM)



SWIM Agenda

- Introduce SWIM Team Members
- Urgent Storm Event Response Process
- Small Scale Maintenance Projects
- Upcoming Community Meetings on Crossings



Westside SWIM Team

- **Mark Link**
Supervisor
- **Christina Silea**
Inspector
- **Nikki Velez**
Inspector
- **Claire Posius**
Project Coordinator
- **Martina Jozanovic**
*Data Maintenance
Administrator*

Eastside SWIM Team

- **Keith McClintock**
Supervisor
- **Jon Brauer**
Inspector
- **Anne Roberto**
Inspector
- **Mark Hornyak**
Project Coordinator
- **Eric Baker**
*Data Maintenance
Administrator*

SWIM Agenda

- Introduce SWIM Team Members
- Urgent Storm Event Response Process
- Small Scale Maintenance Projects
- Upcoming Community Meetings on Crossings

SWIM Progress Status

Urgent Storm Response Case Study

April 15, 2018 Storm Event



**Northeast Ohio
Regional Sewer District**



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SWIM Urgent Storm Event Response Process

- Review Advanced Warning Notifications
 - e.g., National Weather Service
- Field Check and Clean Known Problem Assets Prior to Storm
- Track Rainfall for Size of Storm (e.g., 10-yr, 24-hr) & Monitor Live Field Data for Evidence of Flooding
- Analyze Media, Customer & Member Community reported flooding

SWIM Urgent Storm Event Response Process

- Immediately Field Inspect Problem Assets Upon Receded Flooding
- Mobilize Contractors for Post-Storm Event Response Maintenance

Urgent Storm Event Response Case Study

April 15-16, 2018

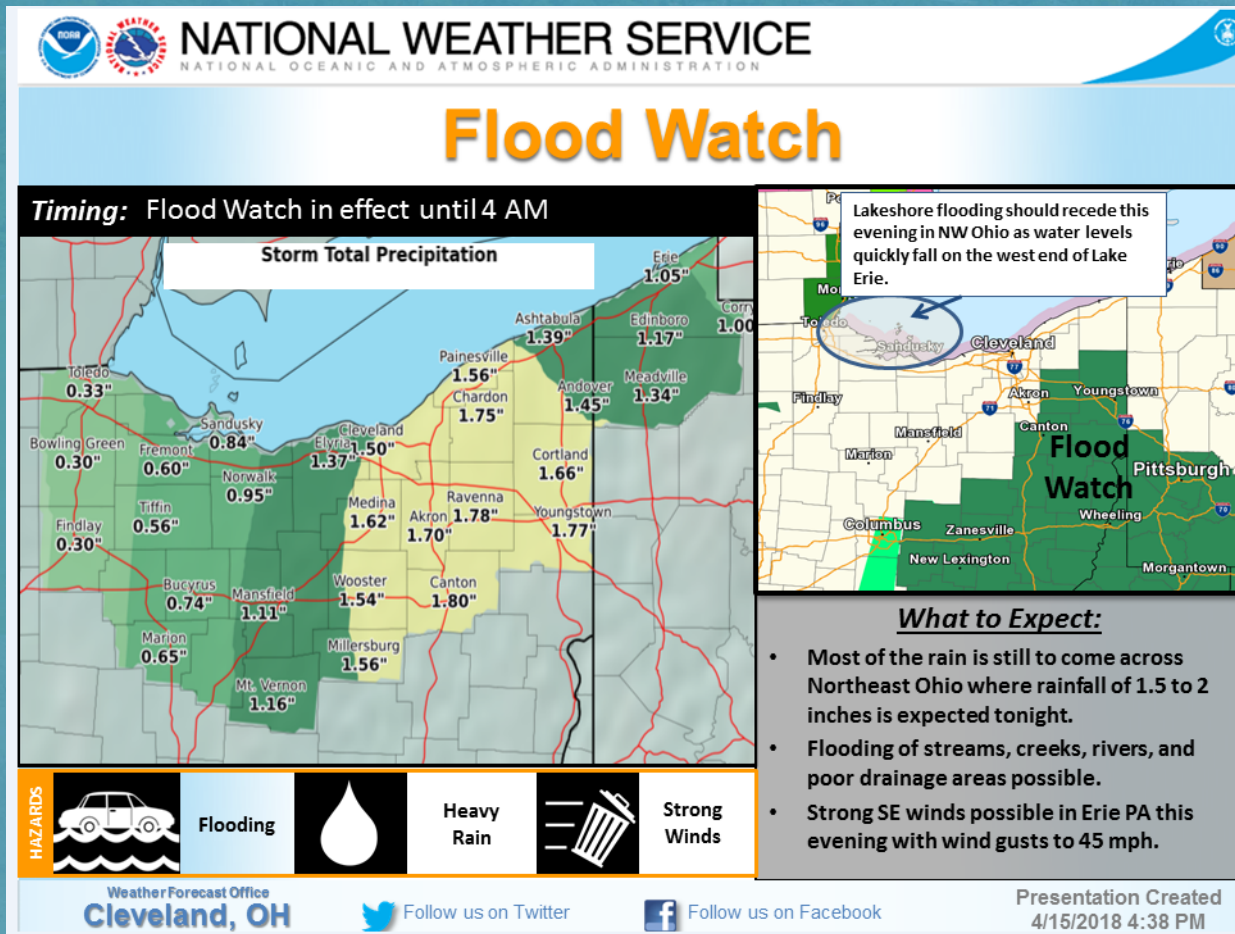


**Northeast Ohio
Regional Sewer District**



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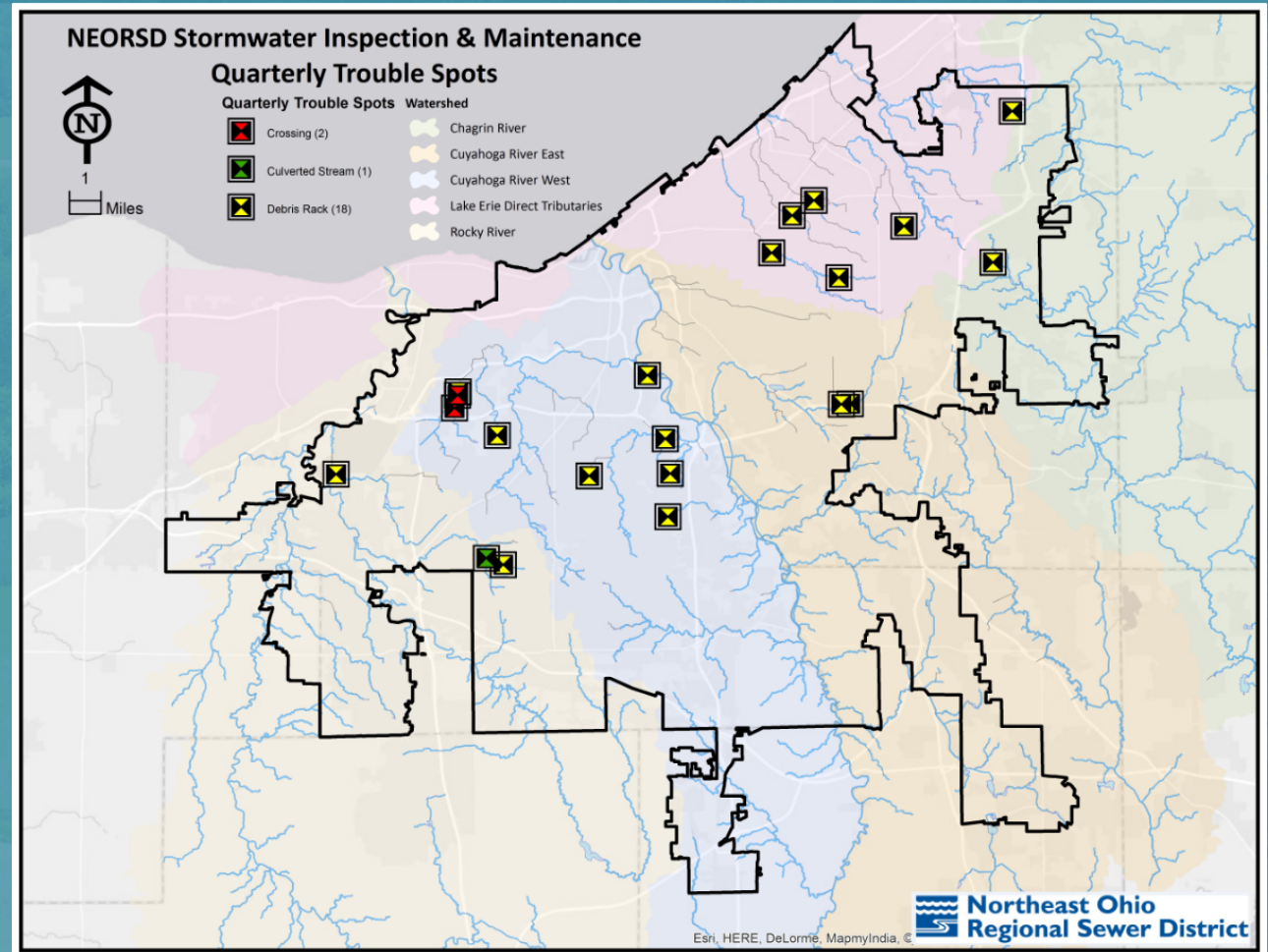
Review of Advanced Warning Notifications



4/15/18 NWS
Notifications
received at
5:02 PM
(Sunday)
immediately
prior to the
storm

Sites SWIM Routinely Checks for Debris and Prior to Large Storms with Advanced Warning

SWIM
routinely
visits 21 sites
for debris
maintenance



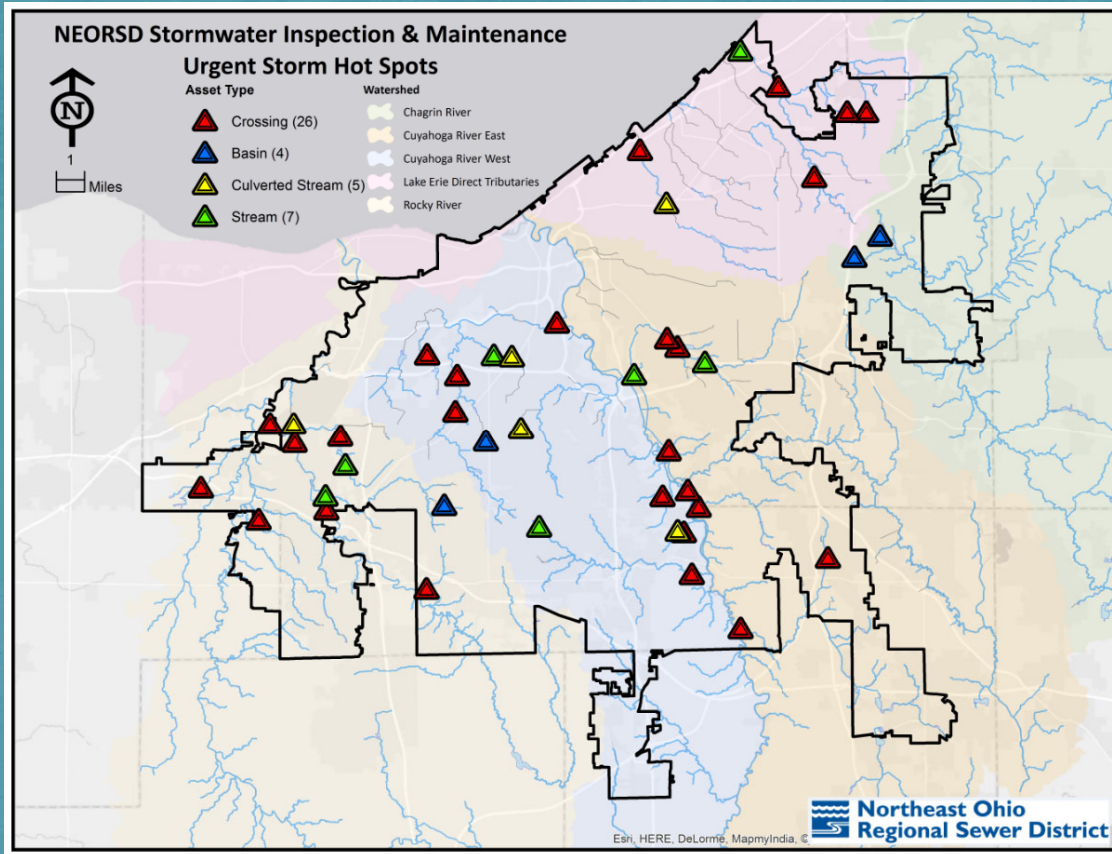
April 14, 2018: Debris Rack is Clear Before the Storm Event



April 16, 2018: Peak Storm and Debris Accumulated on Rack



Immediately Field Inspected Problem Assets Upon Receded Flooding

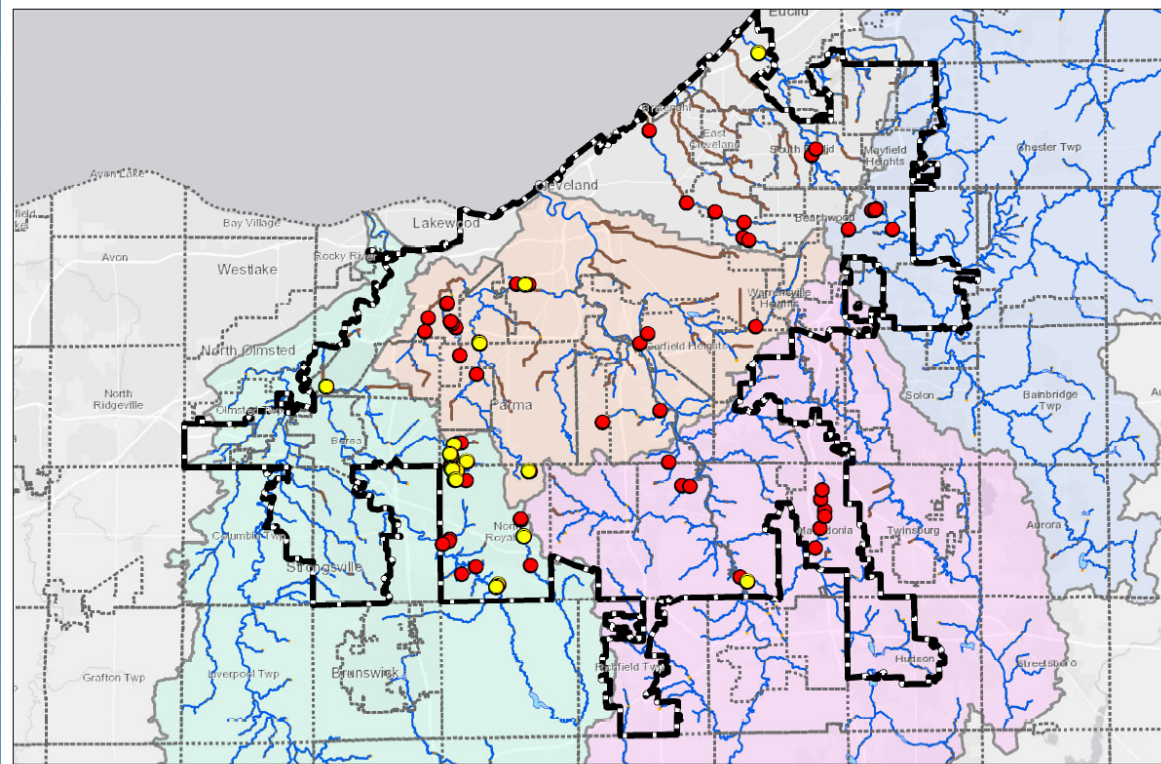


SWIM has a list of 42 known sites that are prone to flooding

Field inspected when reported heavy rainfall, high streams, or media reports of flooding in the area

Additional sites are added based on media reports or field observations

Mobilized Contractors to Perform Post-Storm Response Maintenance



Urgent Storm Event: April 15, 2018

**Storm Observations &
Post-Storm Maintenance Projects**

Map Created: 09/25/2018

79 site inspections

18 debris removal projects (many the same day as inspection)

Average yardage of debris was low compared to previous removals due to preventative maintenance

Rocky River: Rocky River East Branch
Member Community: North Royalton
Asset ID: RY00434
Maintenance Project: Debris Removal (10 CY)



Debris was removed the same day it was inspected

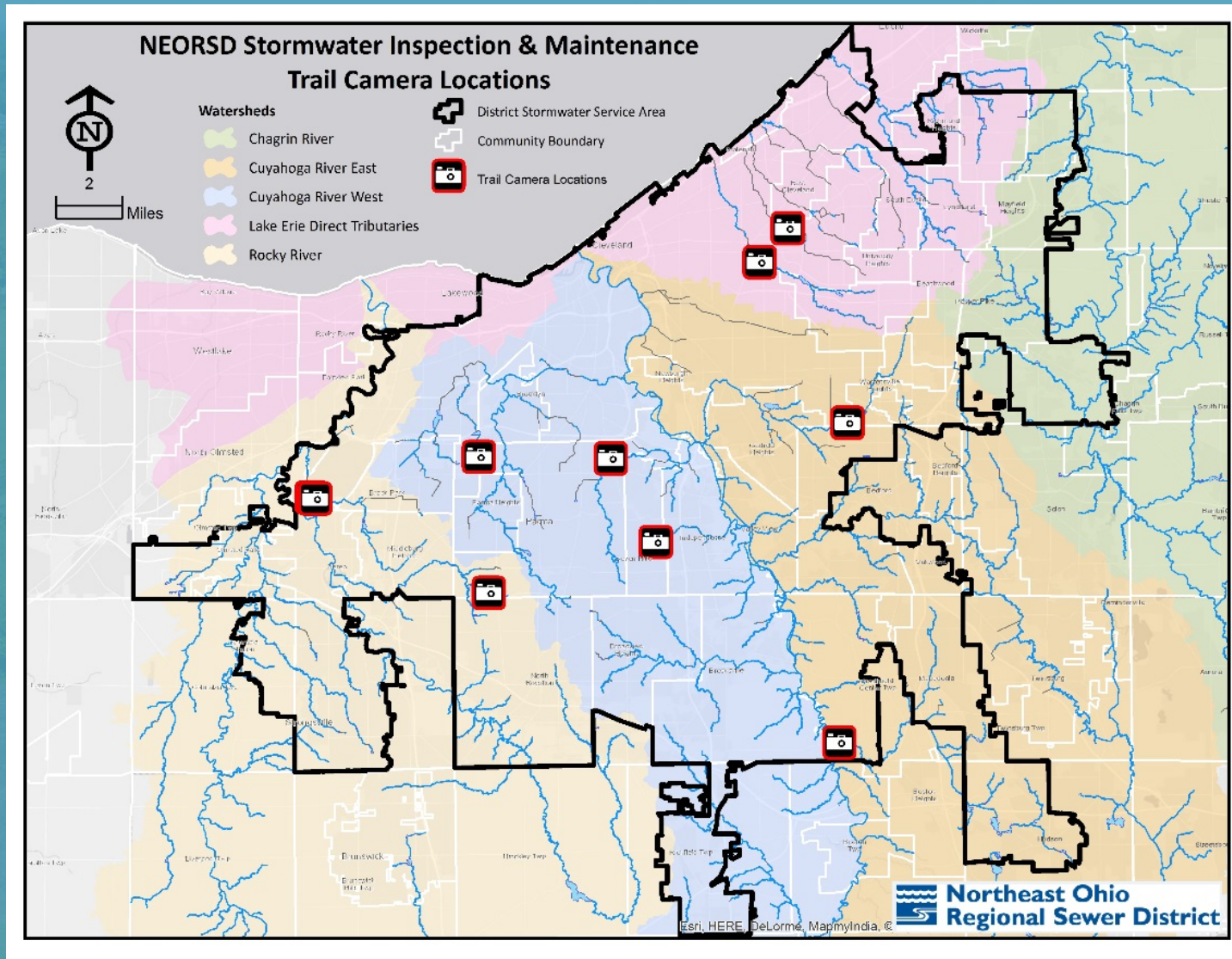


**Northeast Ohio
Regional Sewer District**



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Using Trail Cameras to Support the RSMP



Forest Overlook Basin
Hemlock Creek (Seven Hills)
Prior to Storm



Peak Storm Water Level (Rainfall was 1.62-inches)



SPARTAN

T

04/19/2017 20:15:26

061°F P3

Post Storm (80 Cubic Yards of Sediment & Debris)



Post Storm Event Response



Peak Storm Water Level (Rainfall was 1.52-inches)



T

05/28/2017 20:00:54

061°F P3

Post Storm



T

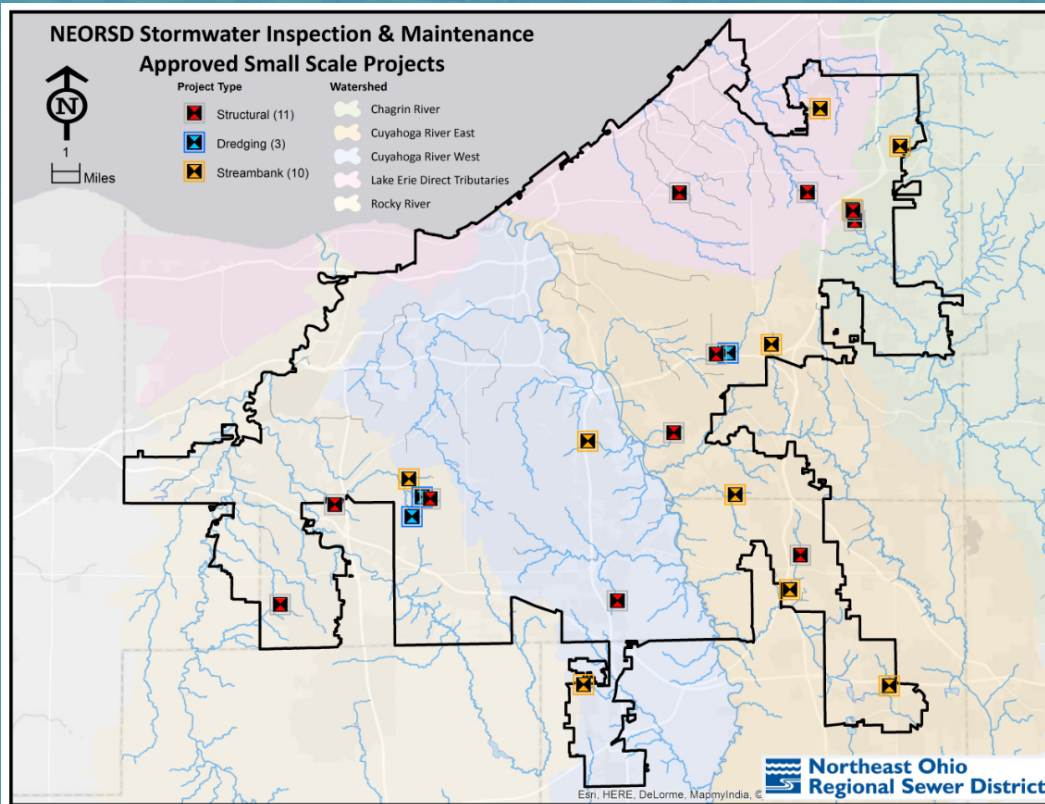
05/29/2017 06:00:03

SWIM Agenda

- Introduce SWIM Team Members
- Urgent Storm Event Response Process
- **Small Scale Maintenance Projects**
- Upcoming Community Meetings on Crossings



Small Scale Maintenance Projects



21 small scale maintenance projects are underway as a pilot preventative maintenance program

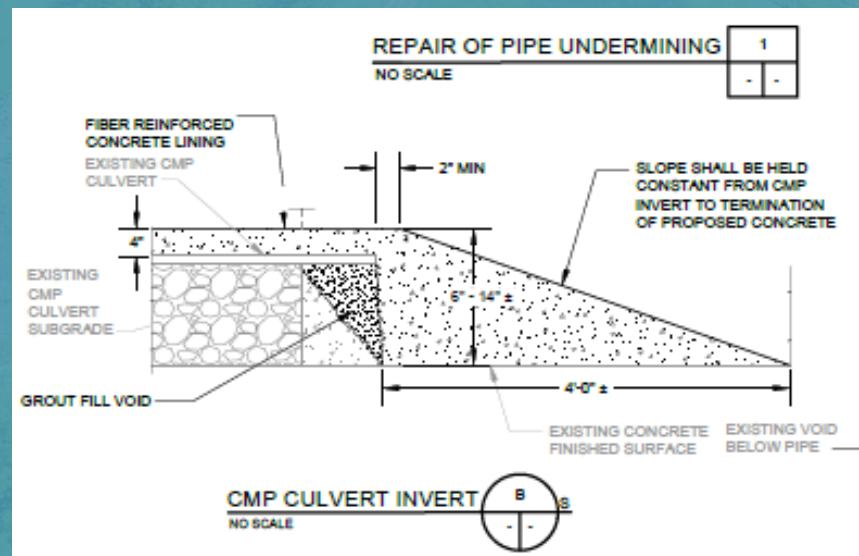
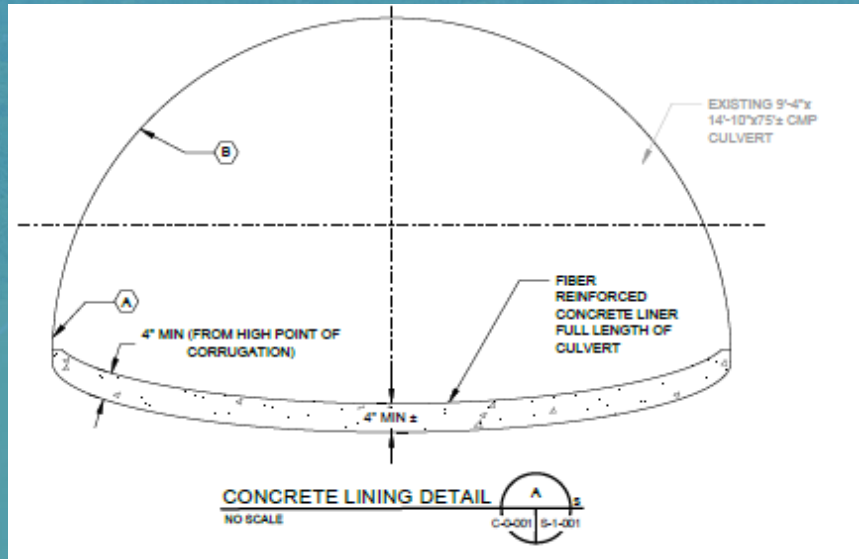
- 11 Structural Maintenance projects
- 10 Streambank Stabilization projects

Small Scale Maint Project: Structural Repairs Lake Erie Direct Tributary: Euclid Creek West

Asset #: EW00207: Lyndhurst
West of Richmond Road
Structural BRE = 32



Small Scale Maint Project: Structural Repair Lake Erie Direct Tributary: Euclid Creek West



- Patch reinforced concrete in areas with large loss from scaling and areas with exposed rebar
- Provide structural concrete support in undermined area at outlet

Small Scale Maint Project: Streambank Stabilization Chagrin River: Unnamed Tributary to the Chagrin

Asset #: CToo108

Mayfield Heights: Stonecreek Drive

Structural BRE= 15

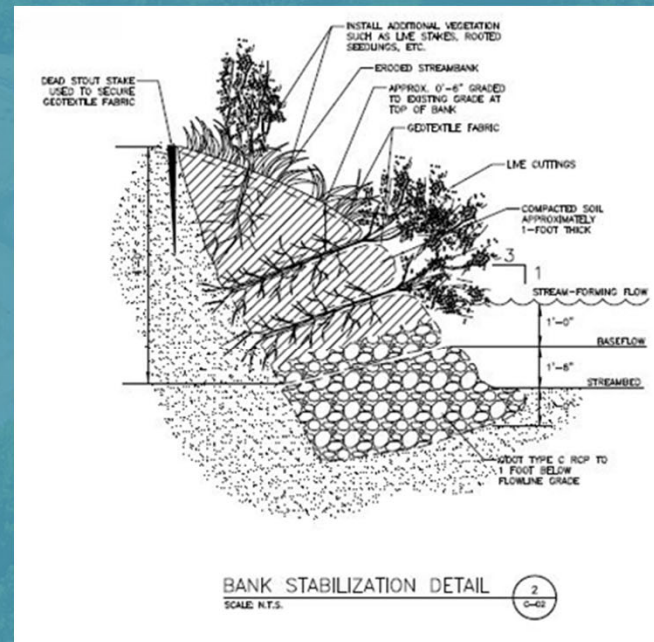


Small Scale Maint Project: Streambank Stabilization Chagrin River: Unnamed Tributary to the Chagrin



Baldwin Creek

- Lay banks to a stable slope
- Install live branch layering and rock toe protection
- Install rock vane



SWIM Agenda

- Introduce SWIM Team Members
- Urgent Storm Event Response Process
- Small Scale Maintenance Projects
- Upcoming Community Meetings on Crossings

Upcoming Community Meetings to Discuss State of RSS Crossings

District Stormwater Service Area

2018 SWSA Structural Integrity Report Card	SWSA Subwatersheds
A	12
B	38
C	5
D	1
F	0
Total	56

The District continues to inspect RSS assets (55%)

Almost all RSS crossings have been inspected

Meetings will review SWIM findings and next steps for implementation and financing

- 327 SWSA RSS assets with Condition Rating = 4 or 5
- 63 SWSA RSS Crossing assets Condition Rating = 4 or 5

Upcoming Community Meetings to Discuss State of RSS Crossings

2018 Chagrin River WAC Structural Integrity Report Card

RSS SUBTOTAL		289	264	✓	91%	B	▲	2.08	✓	8.48
ASSET CLASS TYPE	RSS COUNT	COND SCORE COUNT	Percent Inspected	Report Card Grade (per structural integrity condition)	Average Structural Integrity Condition	AVG BRE				
BASIN	8	8	✓	100%	A-	▲	1.6	✓	8.1	
CROSSING	113	112	✓	99%	B+	▲	1.9	✓	10.0	
CULVERTED_STREAM	8	4	▲	50%	D+	✘	3.8	✘	33.0	
Major Structure	-	-	○	0%						
STREAM	160	140	✓	88%	B	▲	2.2	✓	6.6	

- 39 CHA RSS assets with Condition Rating = 4 or 5
- 11 CHA RSS Crossing assets Condition Rating = 4 or 5

Upcoming Community Meetings to Discuss State of RSS Crossings

2018 Lake Erie Direct Trib WAC Structural Integrity Report Card

ASSET CLASS TYPE	RSS COUNT	COND SCORE COUNT	Percent Inspected	Report Card Grade (per structural integrity condition)	Average Structural Integrity Condition	AVG BRE
RSS SUBTOTAL	548	371 ✓	68%	B+ ✓	1.91 ✓	8.26
BASIN	25	25 ✓	100%	A-	▲ 1.6	✓ 9.8
CROSSING	200	198 ✓	99%	B+	▲ 1.8	✓ 9.1
CULVERTED_STREAM	30	7 ✗	23%	B+	▲ 1.9	▲ 15.9
Major Structure	1	- ○	0%			
STREAM	292	141 ▲	48%	B	▲ 2.2	✓ 6.5

- 41 LET RSS assets with Condition Rating = 4 or 5
- 9 LET RSS Crossing assets with Condition Rating = 4 or 5

Questions





Stormwater Design and Construction Program



**Northeast Ohio
Regional Sewer District**



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Chagrin River/Lake Erie Tributaries Design

NOTICE: London Road Relief Sewer Assessment

Doing business with us ▶

Industrial Customers ▶

Engineering & Construction

Plan Review

Procurement

Register as a New Vendor / iSupplier Login

Bids and Proposals: Active, Closed, and Awarded

Business Opportunity Program: Get certified

Event Calendar

GovDeals Surplus Items

Capital Improvement Plan

Stormwater Construction Program

Opportunity Corridor on-site stormwater management strategy report

[Home](#) > [Business Home](#) > [Stormwater Construction](#)

Stormwater Construction

Thank you for your interest in assisting the Sewer District with the implementation of the Stormwater Construction Program. The format of the five-year program is designed to provide more information to Small Business Enterprise (SBE), Minority Business Enterprise (MBE) and Woman Business Enterprise (WBE) participants in the District's [Business Opportunity Program](#), to allow you to better plan and participate in planned Regional Stormwater Management Program projects and provide you with information on the Stormwater Construction Award and Construction Award). It is our hope that you will find this succinct format helpful for your work over the next several years.

NEW: [Stormwater Design 2018 preview](#) | As presented at our Business Opportunity Program

If this page does not automatically redirect, [proceed to the latest Stormwater Construction Plan](#). This plan is updated monthly during the year to reflect the updated status of these projects.

Stormwater Construction Program Storymap

FEATURED POSTS

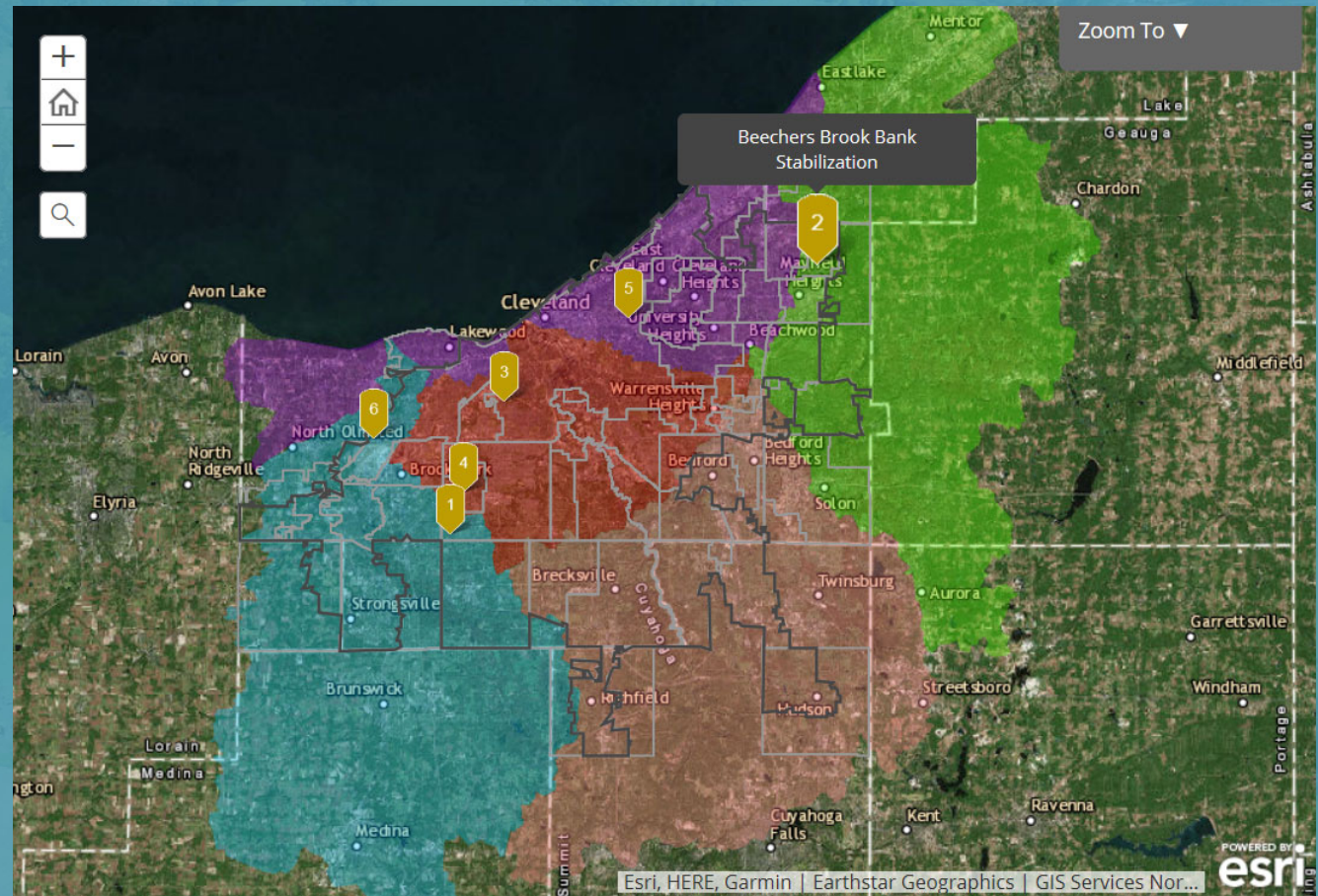
[Community Cost-Share Program](#)

[Stormwater Construction Table of Projects](#)

[Member Community Infrastructure Program \(MCIP\)](#)

Chagrin River Watershed Construction

Beecher's
Brook Bank
Stabilization
Project in
Mayfield
Village



https://neorsd.maps.arcgis.com/apps/Shortlist/index.html? NEORS Stormwater


Page Safety Tools

NEORS 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 projects. Use the "To" drop down menu to locate your watershed.

All Projects Design **Construction** Complete


2 Beechers Brook Bank Stabilization



Project Name: Beechers Brook Bank Stabilization
 Community: Mayfield Village
 Watershed Team Leader: [R. Webb](#)
 Watershed: Chagrin River
 Subwatershed: Beechers Brook

Summary: This project will stabilize approximately 595 linear feet of Beechers Brook in Mayfield Village by realigning the stream and connecting it to its floodplain to address significant erosion along its streambanks.

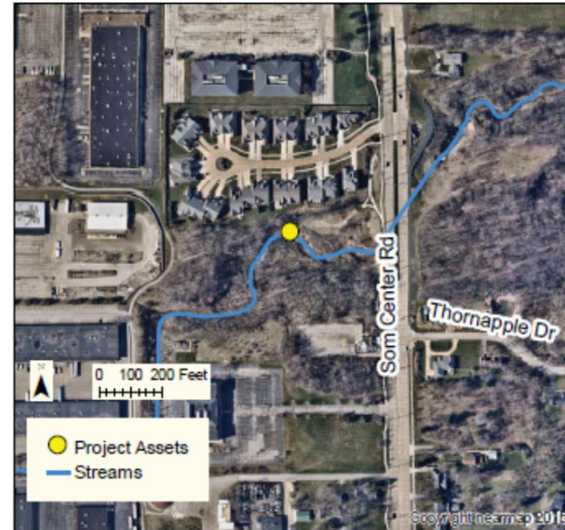
Asset Number: BE00021
 Contract Type: Design/Build
 Construction Cost: \$3,278,780
 Anticipated Substantial Completion: 4th QTR 2019
 Summary Sheet: [Click here](#)



Northeast Ohio Regional Sewer District

BEECHERS BROOK BANK STABILIZATION

Mayfield Village, Ohio



SUMMARY

This project will stabilize approximately 595 linear feet of Beechers Brook in Mayfield Village.

This project will realign the stream and connect it to its floodplain to address significant erosion along its streambanks.

CHAGRIN RIVER WATERSHED

BEECHERS BROOK SUBWATERSHED



Project Details

Asset Numbers:
 BE00021
 PC00146
 BD00257
 BD00259

Contract Type:
 Design/Build

Construction Cost:
 \$3,278,780

Anticipated Substantial Completion:
 4th QTR 2018

Watershed Team Leader:
WebbR@neorsd.org



https://neorsd.maps.arcgis.com/apps/Shortlist/index.html?&... NEORSD Stormwater


Page Safety Tools

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 projects. Use the "To" drop down menu to locate your watershed.

All Projects Design **Construction** Complete


5 Doan Brook Stream Bank Stabilization



Project Name: Doan Brook Stream Bank Stabilization
 Community: Cleveland
 Watershed Team Leader: [J. Jowett](#)
 Watershed: Lake Erie Tributary
 Subwatershed: Doan Brook

Summary: The project will stabilize and rehabilitate approximately 1,000-feet of Doan Brook stream channel and convert available contiguous land into hydraulically-connected and functioning floodplains. The proposed improvements will avert significant streambank

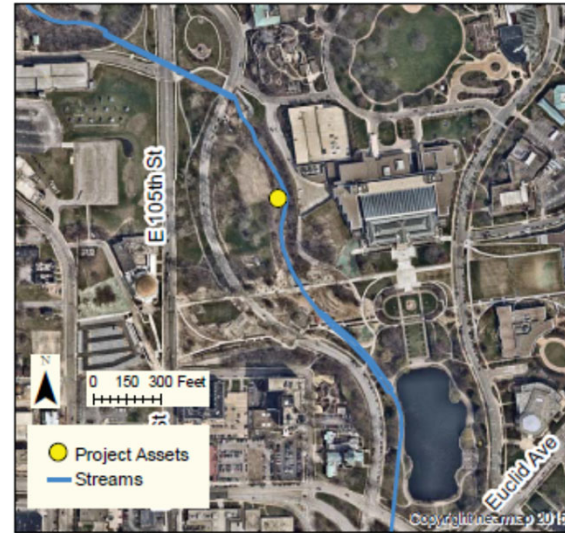
Vermilion
Erie
Cuyahoga Falls
New London



Northeast Ohio Regional Sewer District

DOAN BROOK STREAM BANK STABILIZATION

Cleveland, Ohio



SUMMARY

The project will stabilize and rehabilitate approximately 1,000-feet of Doan Brook stream channel and convert available contiguous land into hydraulically-connected and functioning floodplains.

The proposed improvements will avert significant streambank erosion within the project area as well as provide stormwater quality improvements for a portion of the Doan Brook watershed.

When completed, the project will provide streambank stabilization, protection of utilities and infrastructure, flooding relief, improved stream flow, enhanced streamside riparian areas, aesthetic improvements and improved public access to this section of Doan Brook.

LAKE ERIE DIRECT TRIBUTARIES WATERSHED

•
DOAN BROOK
SUBWATERSHED



Project Details

Asset Number:
DB00029

Contract Type:
GES/Bid/Build

Construction Cost:
\$2,458,853

**Anticipated Substantial
Completion:**
2nd QTR 2019

Watershed Team Leader:
JowettJ@neorsd.org



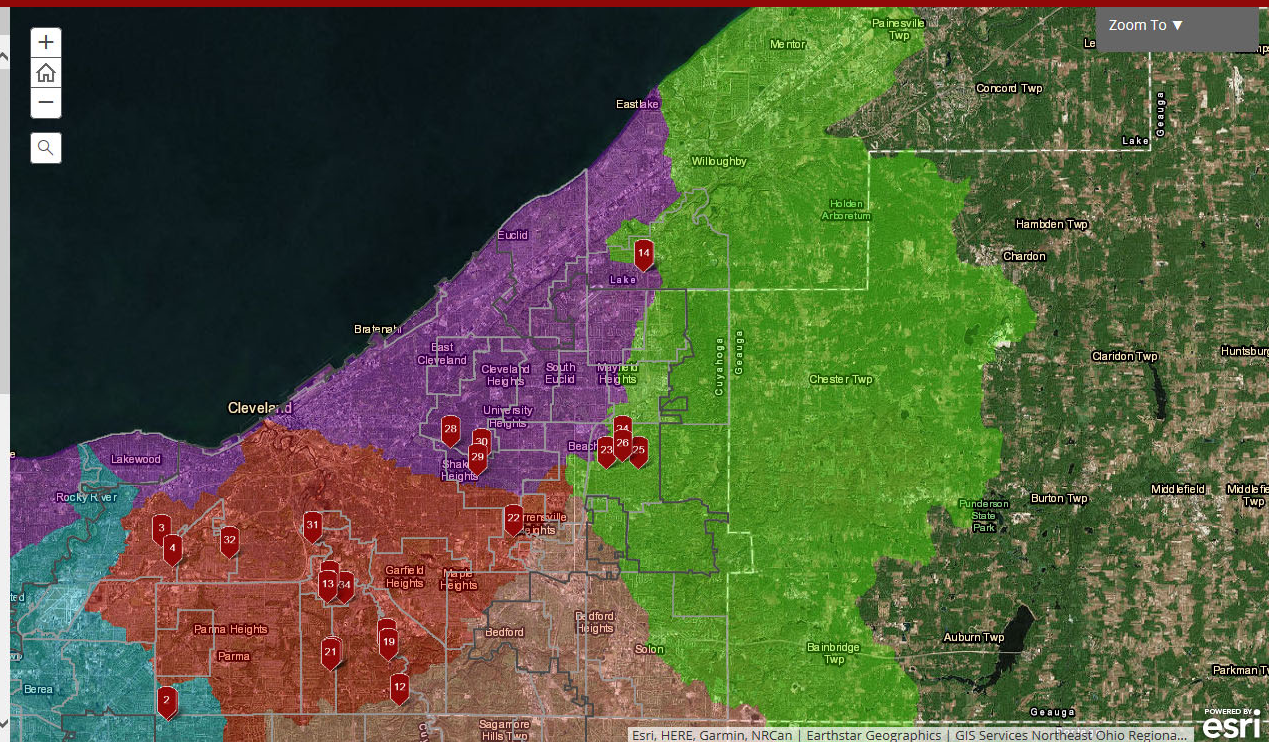
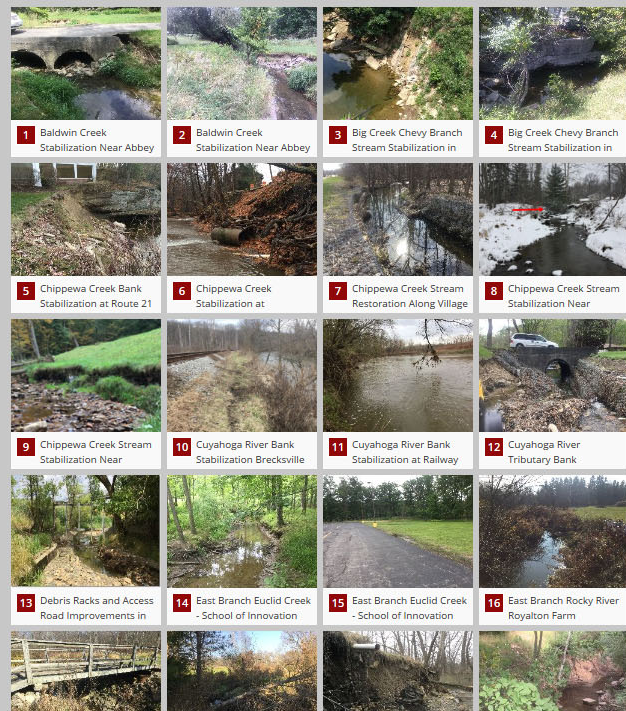
Chagrin River/Lake Erie Tributaries Design

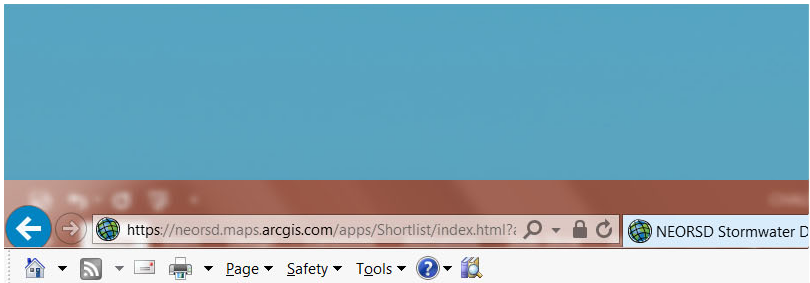


NEORS Stormwater Design & Construction Program

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





NEORS 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 projects. Use the "To" drop down menu to locate your watershed.

All Projects Design Construction Complete

26 Pepper Luce Creek Stabilization Near Lander Road



Project Name: Pepper Luce Creek Stabilization Near Lander Road

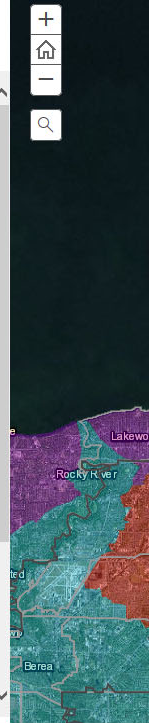
Community: Pepper Pike

Watershed Team Leader: [R. Webb](#)

Watershed: Chagrin River

Subwatershed: Pepper Luce Creek

Summary: A number of issues will be addressed along Pepper Luce Creek adjacent to this property, including: a) stormflows run behind the gabions that protect the yard and some



PEPPER LUCE CREEK CULVERT REPLACEMENT/REHABILITATION AT GATES MILLS BOULEVARD PEPPER PIKE, OHIO



SUMMARY

The District has developed numerous conceptual alternatives to address this failing private culvert southeast of Gates Mills Boulevard in the City of Pepper Pike.

The design engineer will evaluate these options and move forward with the best design to address this failing structure, providing safe conveyance under Gates Mills Boulevard.

CHAGRIN RIVER • PEPPER LUCE CREEK SUBWATERSHED



Project Details

Asset Number:
PC00218

Contract Type:
GES/Bid/Build

Construction Cost:
\$750,000

Anticipated Construction NTP:
1st QTR 2020

Watershed Team Leader:
WebbR@neorsd.org



https://neorsd.maps.arcgis.com/apps/Shortlist/index.html? NEORS Stormwater D

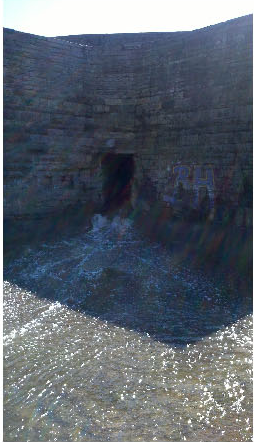
Page Safety Tools

NEORS 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. To " drop down menu to locate your watershed.

All Projects **Design** Construction Complete


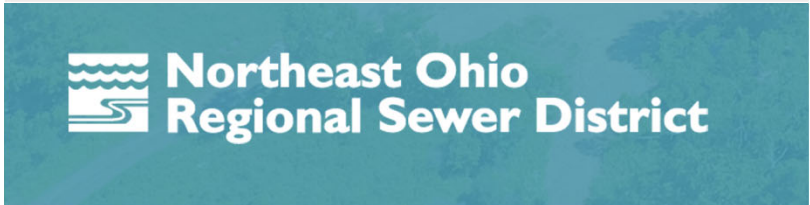
29 Shaker Lakes Dam Modifications



Project Name: Shaker Lakes Dam Modifications
 Community: Shaker Heights
 Watershed Team Leader: [J. Jowett](#)
 Watershed: Lake Erie Tributary
 Subwatershed: Doan Brook

Summary: This project will make improvements to the dam embankments and structures at Horseshoe and Green Lakes to meet ODNR Dam Safety Program compliance requirements.

Asset Number: DB00046 DB00056 DB00101

SHAKER LAKES DAM MODIFICATIONS

Shaker Heights, Ohio



SUMMARY

This project will make improvements to the dam embankments and structures at Horseshoe and Green Lakes to meet ODNR Dam Safety Program compliance requirements.



LAKE ERIE TRIBUTARY WATERSHED

DOAN BROOK SUBWATERSHED



Project Details

Asset Numbers:
 DB00046
 DB00056
 DB00101

Contract Type:
 Design/Bid/Build

Construction Cost:
 \$5,540,000

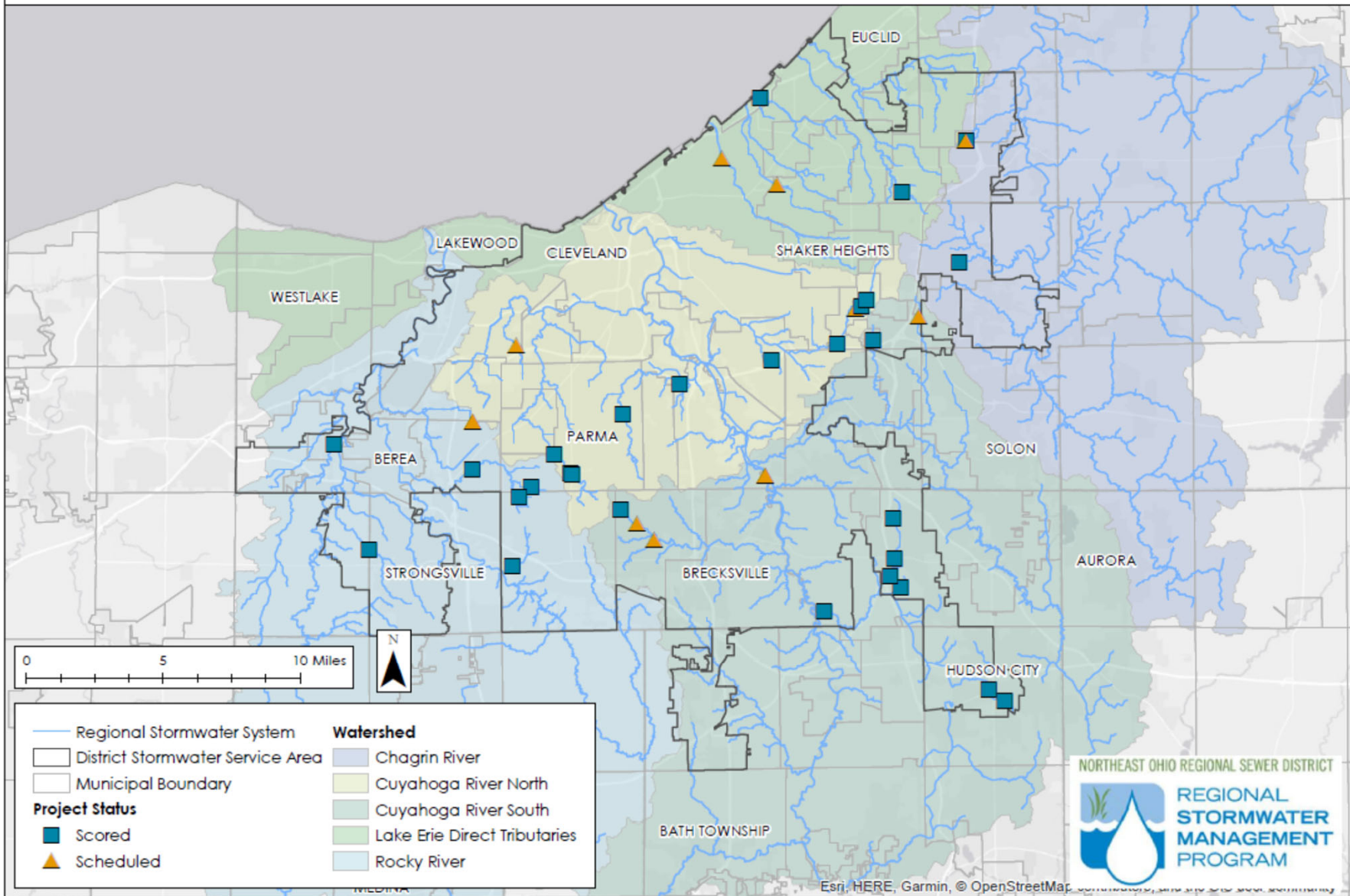
Anticipated Construction NTP:
 2nd QTR 2018

Watershed Team Leader:
JowettJ@neorsd.org



Northeast Ohio Regional Sewer District

Stormwater Design & Construction Program

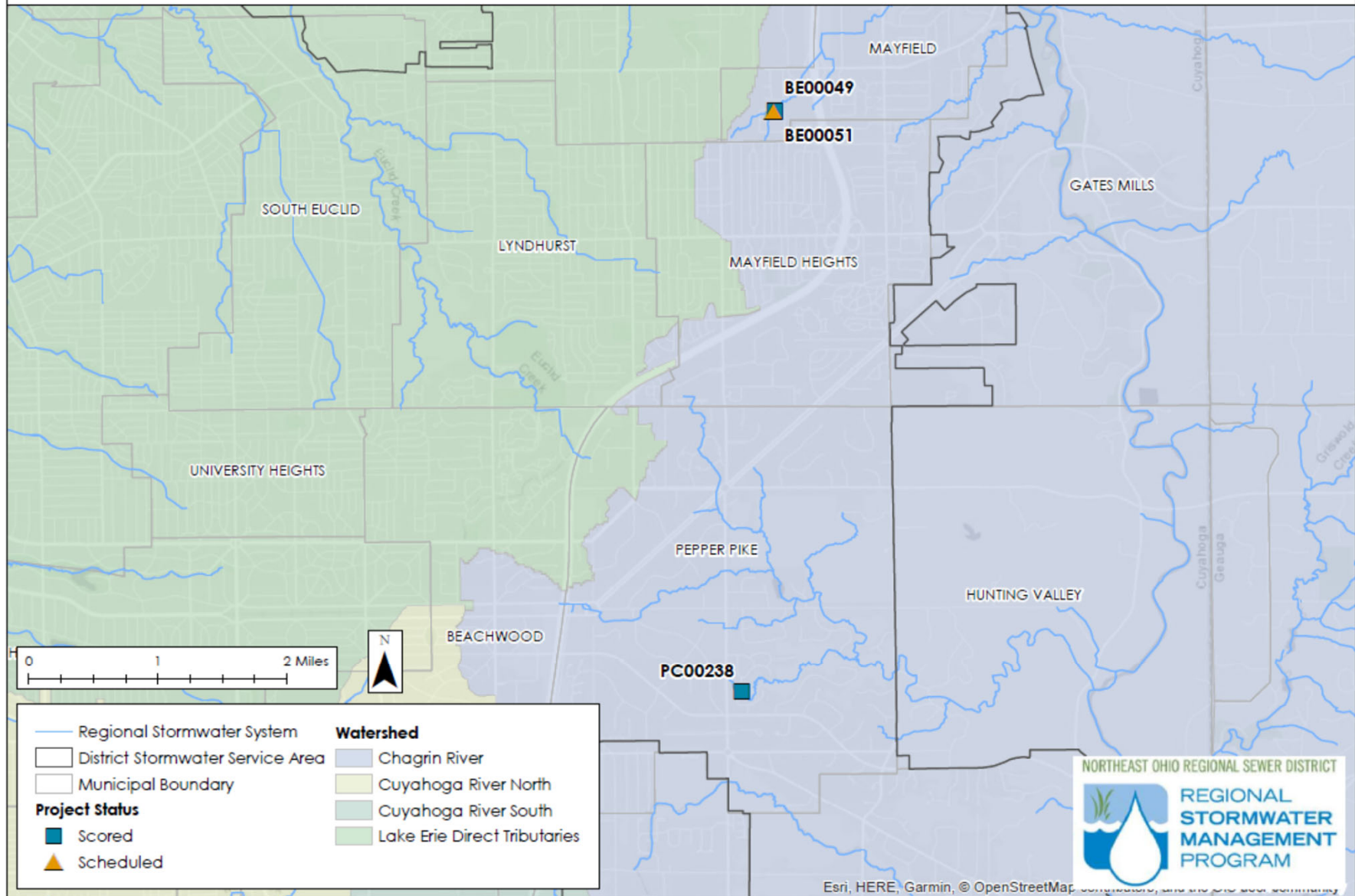


New Design and Construction Projects Chagrin River

	Proposed Project Name	RSS Asset ID(s)	Subwatershed	Project Community	Total BRE
1	Pepper Luce Stream Stabilization near Oak Knoll Dr Pepper Pike	PC00276, PC00238, PC00090	Pepper Luce Creek	Pepper Pike	72
2	Beechers Brook Stabilization and Restoration, Several Segments in Mayfield Village	BE00041, BE00064, BE00043, BE00042, BE00045, BE00047, BE00049, BE00051, BE00053, BE00075	Beechers Brook	Mayfield	72

NEORSD Stormwater Design & Construction Program

Chagrin River Watershed

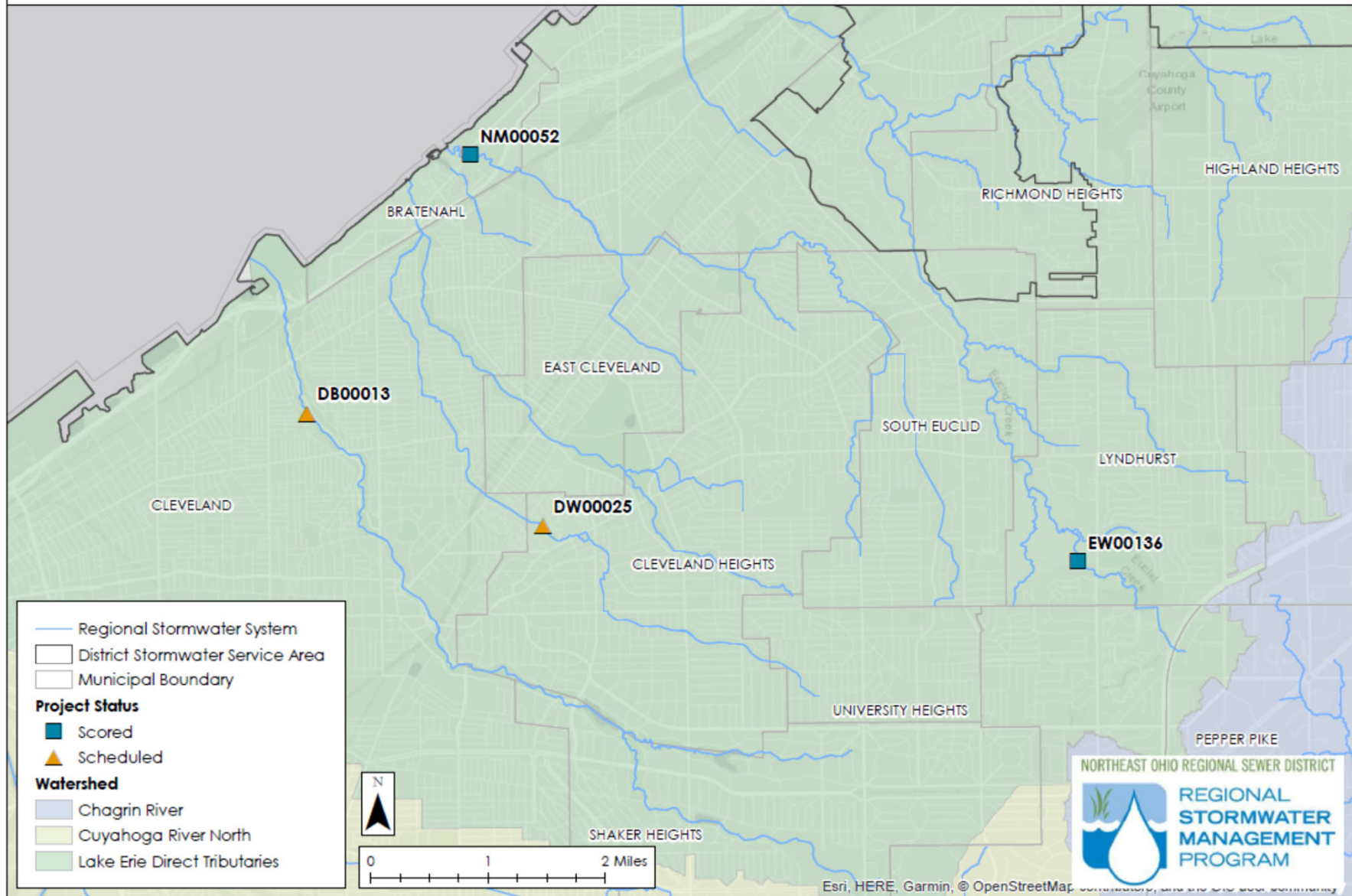


New Design and Construction Projects Lake Erie Tributaries

	Proposed Project Name	RSS Asset ID(s)	Subwatershed	Project Community	Total BRE
1	Nine Mile Creek_Bank Stabilization and Headwall Replacement - NM00052	NM00052	Nine Mile Creek	Bratenahl	52
2	West Branch of Euclid Creek, Cleveland Clinic Lyndhurst Campus Stream Restoration Project	EW00136	Euclid Creek West	Lyndhurst	2

NEORS D Stormwater Design & Construction Program

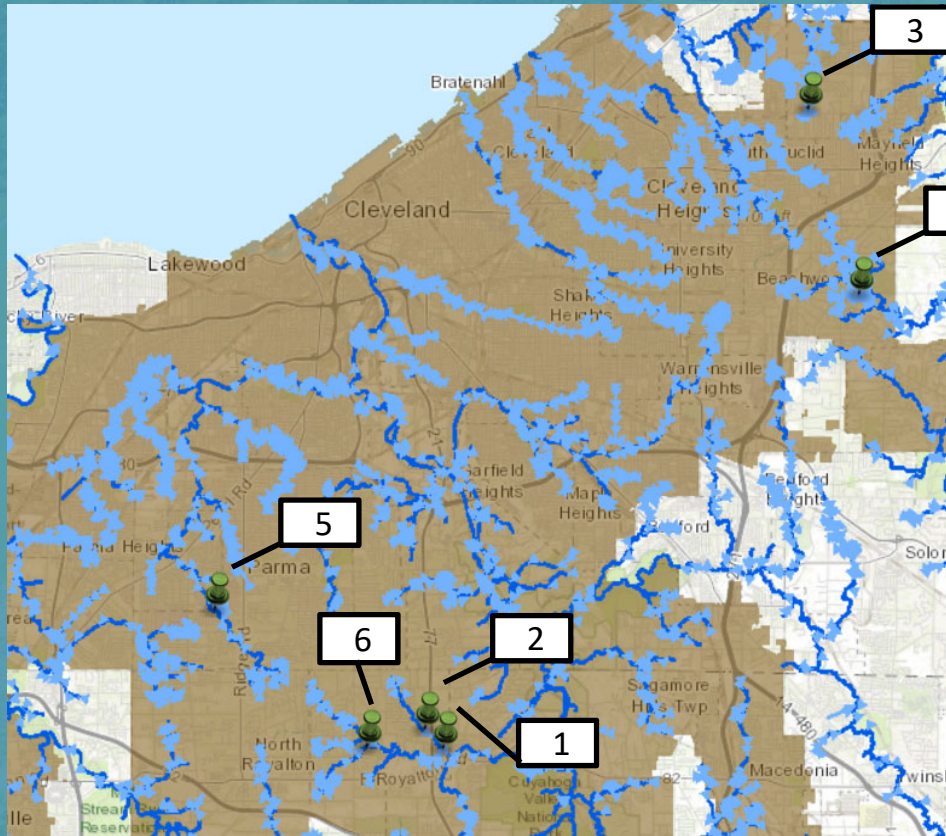
Lake Erie Direct Tributaries Watershed



Project Delivery Methods

- GES-Bid-Build
- Design-Bid-Build
- Design-Build
- Small Scale Projects
 - Under \$50K
 - \$50K-\$250K

Multi-Site Streambank Stabilization



Metrics of Success

- **9,336 LF** of Stream Restored/Stabilized
- **23,725 Tons** of Sediment Removed
- **6.6 Acres** of Floodplain Reconnected
- **575 LF** of Culverts Repaired/Replaced
- Property Interests Obtained
 - **2** Fee Simple Acquisitions (18 acres)
 - **17** Permanent Easements Acquired



Beecher's Brook Bank Stabilization



Stream Focused Solutions

- Flooding
- Erosion
- Water Quality

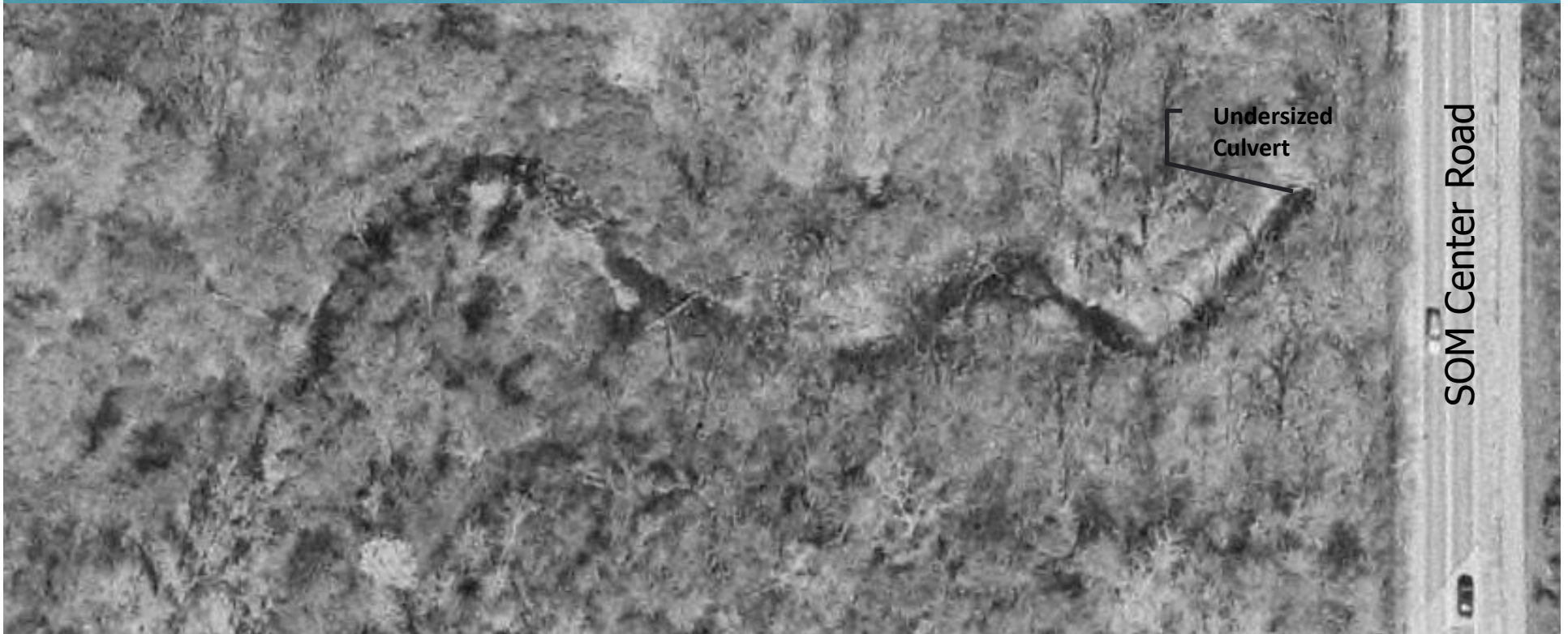


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Beecher's Brook Culvert 2002



Northeast Ohio
Regional Sewer District

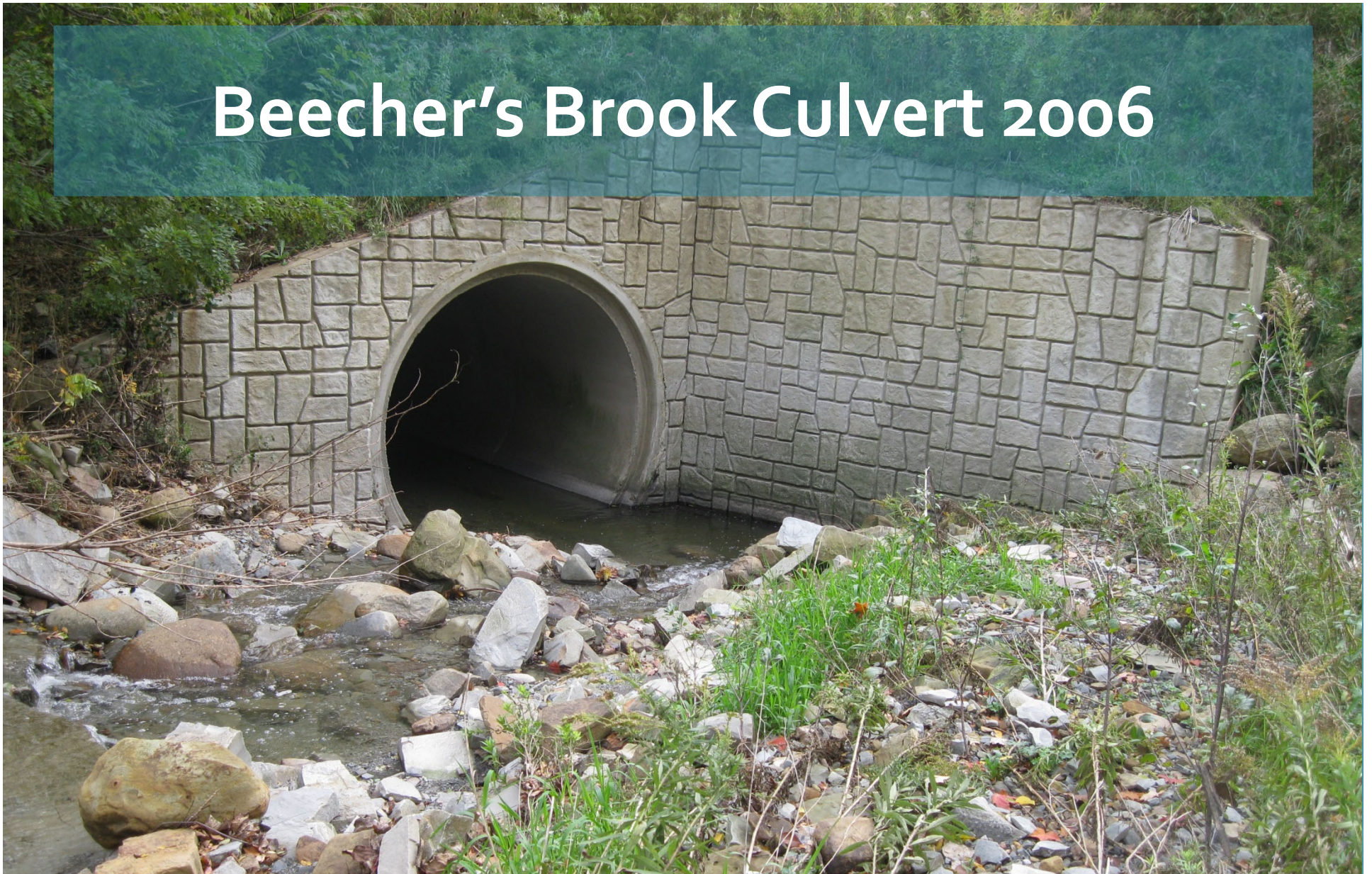


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Beecher's Brook Culvert 2002



Beecher's Brook Culvert 2006



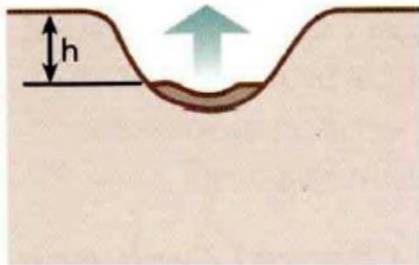
**Northeast Ohio
Regional Sewer District**



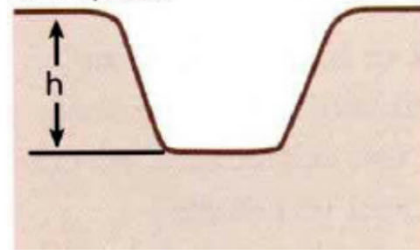
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CHANNEL EVOLUTION MODEL (SIX STAGES)
Simon and Hupp, 1986

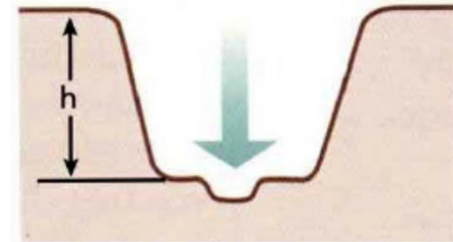
Class I. Sinuous, Premodified
 $h < h_c$



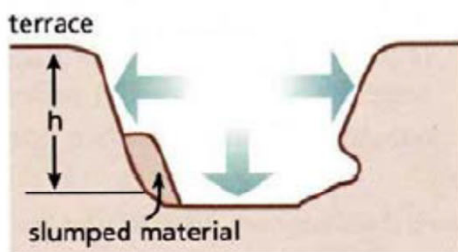
Class II. Channelized*
 $h < h_c$
floodplain



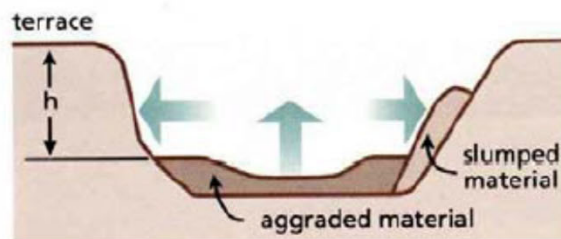
Class III. Degradation
 $h < h_c$



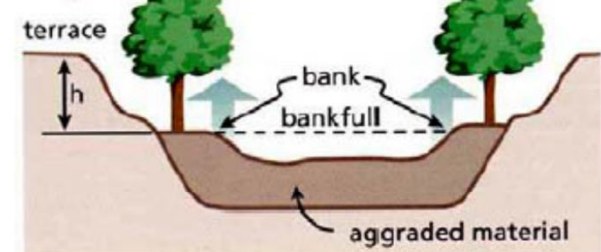
Class IV. Degradation and Widening
 $h > h_c$



Class V. Aggradation and Widening
 $h > h_c$



Class VI. Quasi Equilibrium
 $h < h_c$



*Anthropogenic



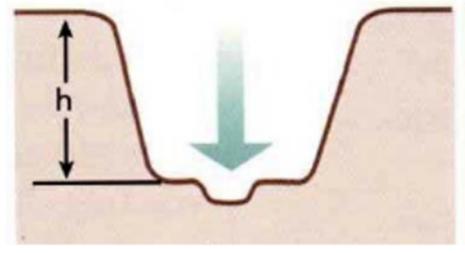
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Class III. Degradation
 $h < h_c$

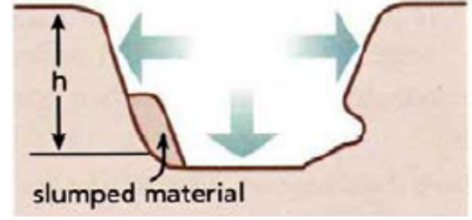




Class IV. Degradation and Widening

$h > h_c$

terrace



slumped material

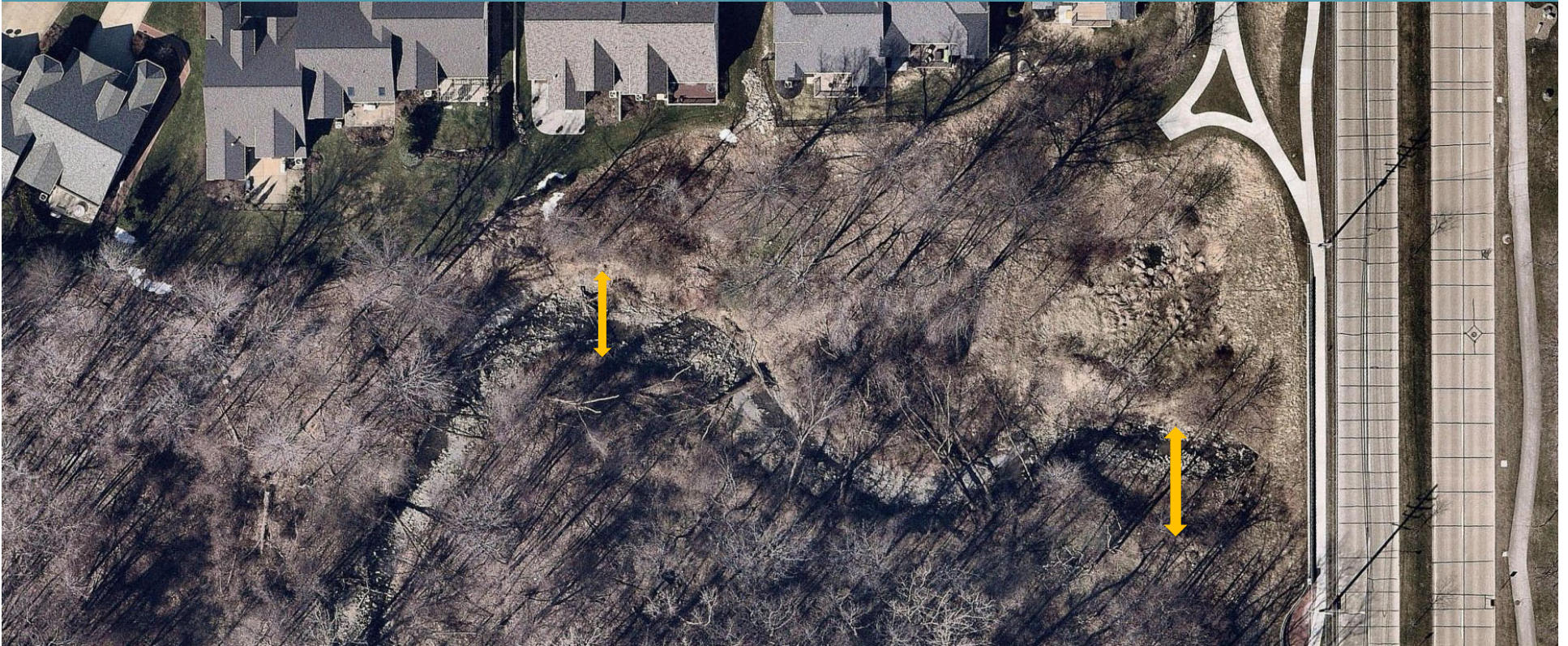


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Beecher's Brook Culvert 2017



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Questions



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What's Next

- Annual WAC Representative Designation – January 2019
- Next WAC Meeting – March 2019

Questions

Jeff Jowett

216-881-6600 Ext. 6881

jowettj@neorsd.org

Rachel Webb

216-881-6600 Ext. 6645

webbr@neorsd.org

Stormwater Program: Community Resources

<http://www.neorsd.org/communitystormwaterresources.php>



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