

NORTHEAST OHIO REGIONAL SEWER DISTRICT

REGIONAL STORMWATER MANAGEMENT PROGRAM

Highland Park Golf Course Stream Restoration
Mill Creek Watershed in Highland Heights

Watershed Advisory Committee
October 2017

Your Sewer District Keeping our Great Lake great.

Agenda

- Stormwater Construction
 - On-going projects
 - 2018 Stormwater Construction Plan
- Stormwater Master Plan
- Stormwater Inspection and Maintenance
- GIS Resources
- Community Cost-Share Update



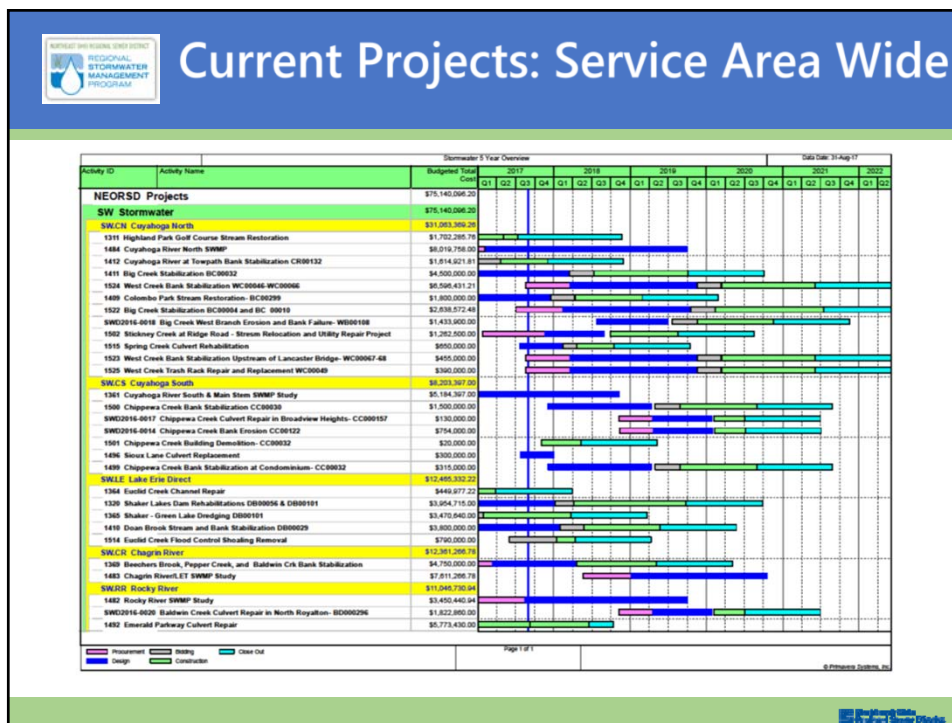
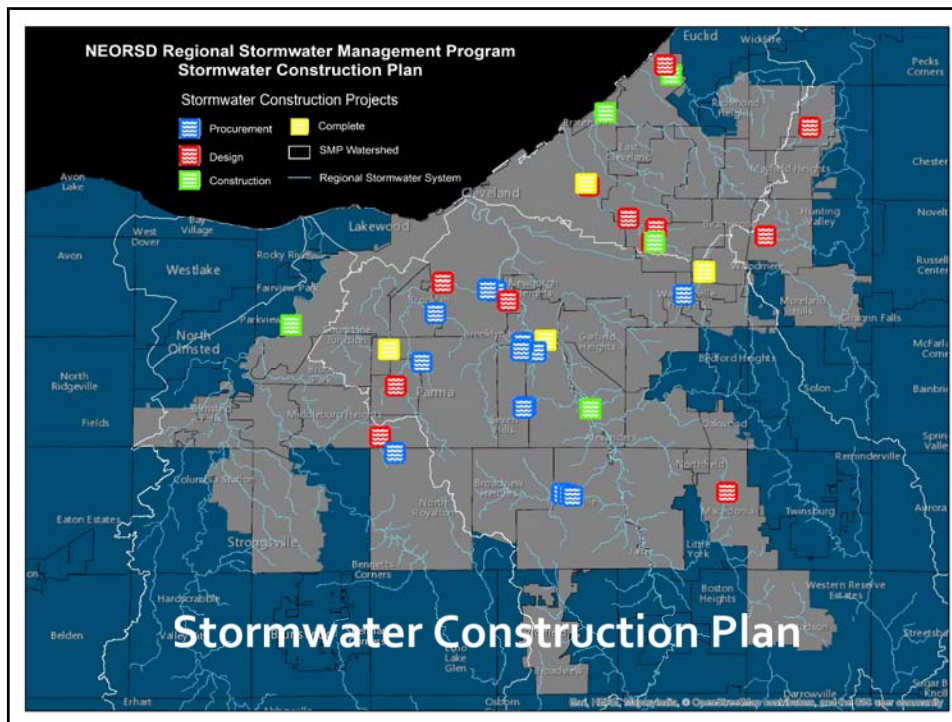
Cuyahoga River Towpath Stabilization
Cuyahoga Valley NP in Valley View

Stormwater Design and Construction Program 2017-2018



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Current Projects: Lake Erie Directs

Stormwater 5 Year Overview			Total Date: 10-Aug-17											
Activity ID	Activity Name	Budgeted Total Cost	2017	2018	2019	2020	2021							
			Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
NEORS D Projects														
SW Stormwater														
SWLE Lake Erie Direct														
1364	Euclid Creek Channel Repair	\$449,977.22												
1320	Shaker Lakes Dam Rehabilitations DB00056 & DB00101	\$3,954,715.00												
1365	Shaker - Green Lake Dredging DB00101	\$3,470,640.00												
1410	Doan Brook Stream and Bank Stabilization DB00029	\$3,800,000.00												
1514	Euclid Creek Flood Control Shoaling Removal	\$790,000.00												

Procurement Design Bidding Construction Close Out

Page 1 of 1

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Shaker Lakes
Highway Stormwater



Current Projects: Chagrin Watershed

Stormwater 5 Year Overview			Total Date: 10-Aug-17											
Activity ID	Activity Name	Budgeted Total Cost	2017	2018	2019	2020	2021							
			Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
NEORS D Projects														
SW Stormwater														
SWCR Chagrin River														
1369	Beechers Brook, Pepper Creek, and Baldwin Crk Bank Stabilization	\$4,750,000.00												
1483	Chagrin River/LET SWMP Study	\$7,611,266.78												

Procurement Design Bidding Construction Close Out

Page 1 of 1

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Shaker Lakes
Highway Stormwater



Euclid Creek Concrete Channel Repair



Completion Date: June 23, 2017

Construction Cost: \$335,187.46

BOP: 98.37%

Project Elements

Replacement/rehabilitation of sections of concrete lined channel sides and bottoms that have failed along the river-right immediately downstream of the Euclid Creek spillway



Euclid and Parma Ohio District
Regional Stormwater Management Program



Shaw Brook Culvert Rehabilitation



Est. Completion Date: November 2017

Construction Cost: \$945,200

Project Elements

Replacement and rehabilitation of 525 linear ft. of 10 ft. diameter corrugated steel culvert.



Euclid and Parma Ohio District
Regional Stormwater Management Program



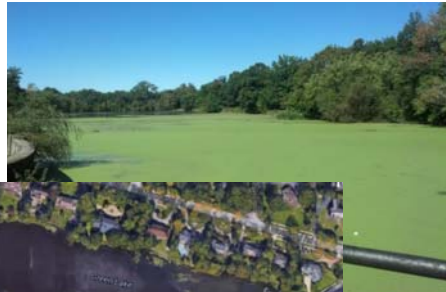
Green Lake Dredging



Completion Date: December 2017

Construction Cost: \$3.2 M

Project Elements: 25,000 CY sediment removal



Shirley M. White
Regional Stormwater Office



Euclid Creek Flood Control Channel Shoaling Removal



Est. Completion Date: January 2018

Construction Cost: \$540,000

Project Elements

- Remove sediment, vegetation, debris etc. to a depth of 24 inches
- Project length approximately 1,500 LF



Shirley M. White
Regional Stormwater Office



Shaker Lakes Dam Rehabilitation



DAM SAFETY INSPECTION REPORT

City Of Shaker Heights Dam
File Number: 1314-006
Class I



Cuyahoga County, City Of Shaker Heights
Inspection Date: September 30, 2014



In accordance with Ohio Revised Code Section 6101.06, the owners of dams must monitor, maintain, and operate their dams safely. Negligence of owners in fulfilling these responsibilities can lead to the development of extremely hazardous conditions to downstream residents and properties. In the event of a dam failure, owners can be subject to liability claims.

The Chief of the Division of Soil and Water Resources has the responsibility to ensure that human life, health, and property are protected from the failure of dams. Conducting periodic safety inspections and working with dam owners to maintain and improve the overall condition of Ohio dams are vital aspects of fulfilling this purpose.

Representatives of the Chief conducted this inspection to evaluate the condition of the dam and its appurtenances under authority of Ohio Revised Code Section 6101.06, in accordance with Ohio Administrative Code Rule 1507.01-1-01. The owners of dams must implement all essential measures listed in the inspection report.

Division of Soil and Water Resources - 10900 Office Plaza, NW, #2 - Columbus, Ohio 43229-9800
In July 2010, the Ohio Department of Natural Resources, Division of Soil and Water Resources was merged with the Division of Soil and Water Resources to become the Division of Soil and Water Resources.

Anticipated Construction NTP- April 2018

Estimated Construction Cost: \$3.6 M

Project Elements:

Bring two dams into ODNR Compliance and perform maintenance repairs to a third dam



Doan Brook Bank Stabilization

Construction commencing: Summer 2018

Est. Construction Cost: \$2.4 M

Project Elements:

- 850 LF Stream Restoration
- Bank Stabilization
- Reconnection to Floodplain



City of Cleveland
MLK over Doan Bk
Bridge Restoration



Cleveland Museum of Art



Nord Family
Greenway
Project



Beechers Brook Bank Stabilization

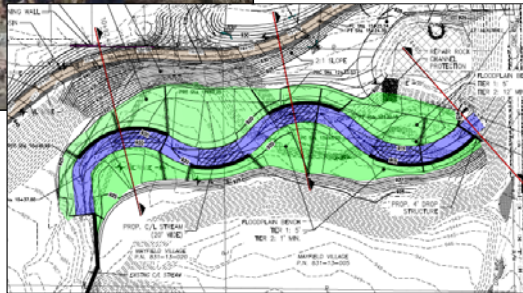


Construction Commencing: Spring 2018

Est Construction Cost: \$1,500,000

Project Elements:

- Stabilization of eroded hillside slope
- Stabilization of stream bed for protection of infrastructure
- Coordination with Mayfield Village on trail connection



Northwest Ohio
Regional Stormwater
Management Program



Pepper Creek Bank Stabilization



Construction Commencing: Summer 2018

Est Construction Cost: \$1,400,000

Project Elements:

- Floodplain and riparian enhancement



Potential Floodplain
Expansion Area

Northwest Ohio
Regional Stormwater
Management Program



Sioux Lane Culvert Replacement, Macedonia

Stormwater Construction Plan Annual Review Process



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Stormwater Construction Plan Process

Project Nomination
Up to August

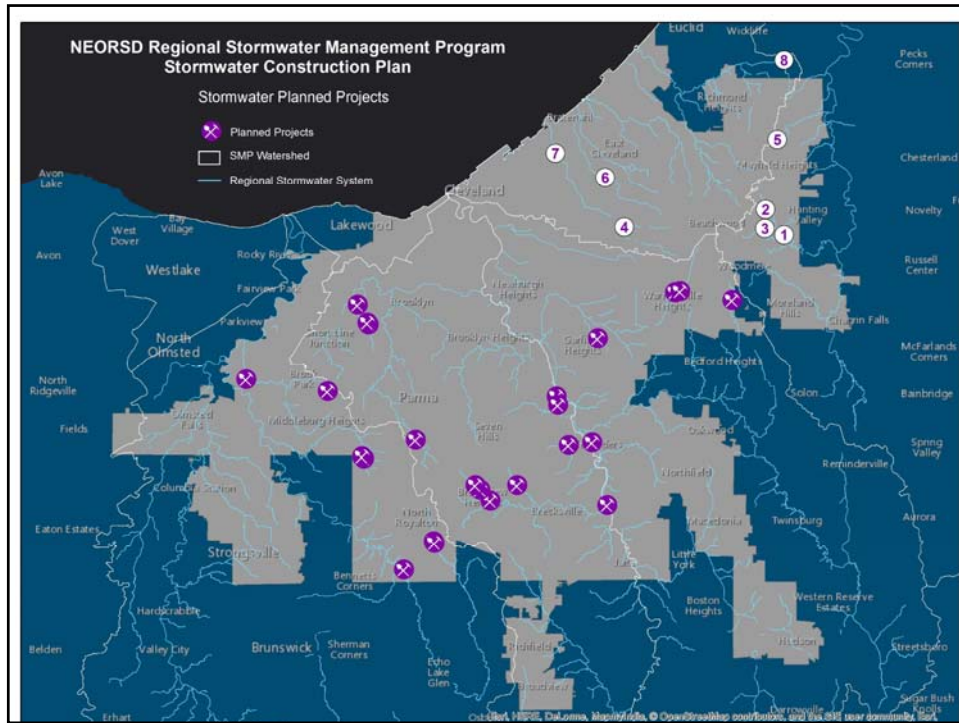
Validation
August

**Business Risk Exposure
Scoring**
November

**Stormwater
Construction Plan**
Finalized in March

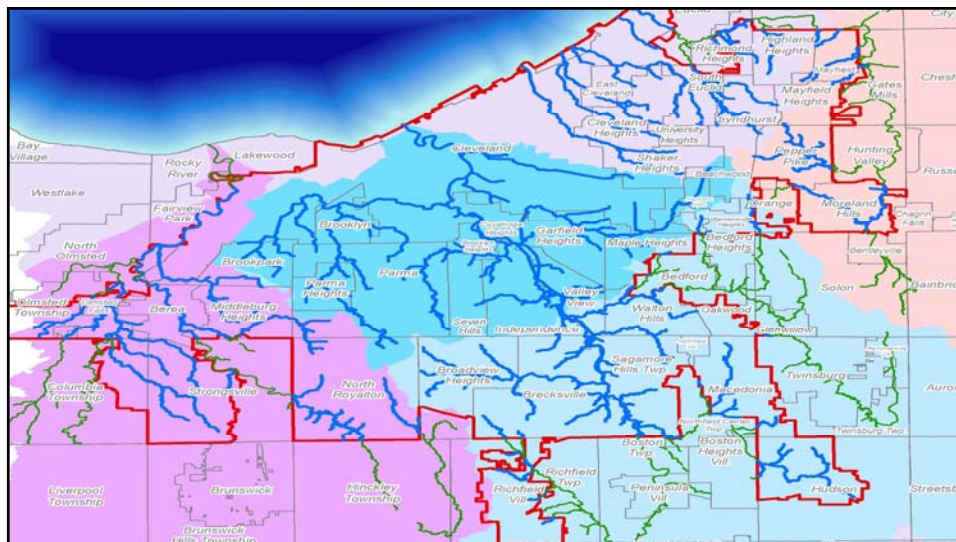
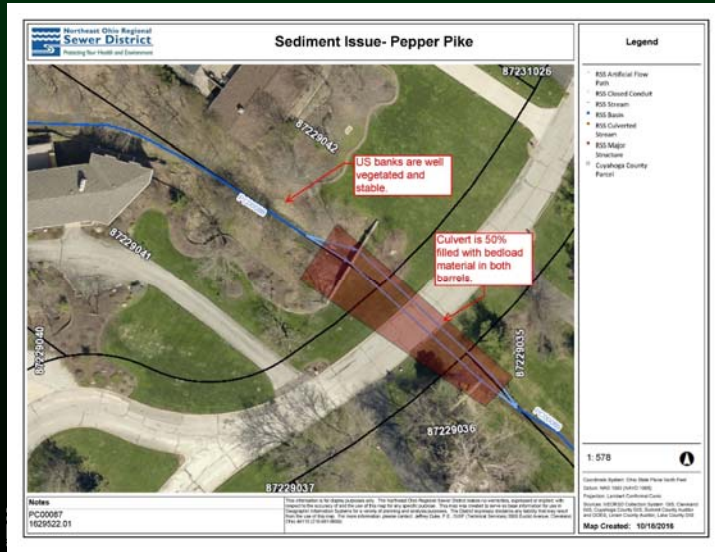
Stormwater Inputs
Further Analysis Projects
SW Master Plan Recommendations
Community Identified Project
Watershed Group Project





<div>  <h2>New Projects Approved for Construction Plan</h2> </div>						
Map Number	Proposed Project Name	RSS Asset ID(s)	WAC Watershed	Subwatershed	Project Community	Total BRE
1	Pepper Luce_Shaker Blvd Culvert Deterioration PC00111/PC00113	PC00111 and PC00113	Chagrin River	Pepper Luce Creek	Pepper Pike	70
2	Pepper Luce_Gates Mills Blvd Culvert Deterioration PC00218	PC00218	Chagrin River	Pepper Luce Creek	Pepper Pike	69
3	Pepper Luce_Erosion and Deterioration - PC00145	PC00144, PC00145, PC00146	Chagrin River	Pepper Luce Creek	Pepper Pike	37
4	Doan Brook_Erosion at Footbridge DB00161	DB00161	Lake Erie Direct Tributaries	Doan Brook	Shaker Heights	35
5	Beechers Brook_Slowly Eroding toward Home BE00053_B001	BE00053, BE00051, BE00049	Lake Erie Direct Tributaries	Beechers Brook	Cleveland	30
6	Dugway Brook_Lakeview Dam Regulatory Compliance - DW00025	DW00025	Lake Erie Direct Tributaries	Dugway Brook	Cleveland Heights	24
7	Doan Brook_Sowinski Park Floodplain Connection DB00013	DB00013	Lake Erie Direct Tributaries	Doan Brook	Cleveland	18
8	E. Br. Euclid Creek_School of Innovation Restoration EE00376	EE00375 and EE00376	Lake Erie Direct Tributaries	Euclid Creek East	Willoughby Hills	2

Conveyance Responsibility

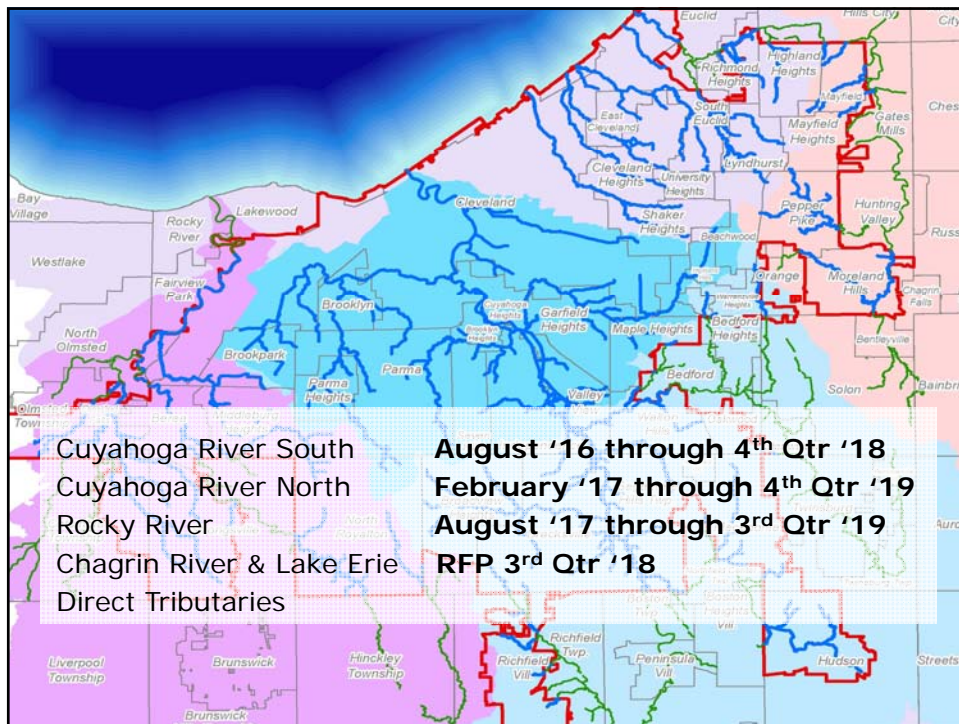


Stormwater Master Plan



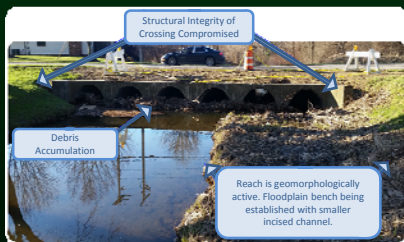
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Stormwater Master Plans Goals and Objectives

Operational Performance Evaluation



Modeling & Alternatives

Alternatives Evaluation (Chapter 8)

Screen SCMs	Evaluate Alternatives
<ul style="list-style-type: none"> • ID Opportunities/Constraints • Protect Existing Function • Increase Function <ul style="list-style-type: none"> ✓ Reduce Runoff/ Restore Stream Floodplain ✓ Enhance Storage – Conveyance • Buyout/Reduce ALR • Formulate 2 Alternatives 	<ul style="list-style-type: none"> • Size to achieve ALR • Estimate cost • Define multiple benefits • ID Business Case (TBL) • Select Alternative • Check watershedwide performance

Recommendations and Report



Results: Prioritized list of construction and maintenance projects at the Watershed-level and Program-level



Preparation for Master Plans Stream Gages

<https://maps.waterdata.usgs.gov/mapper/index.html>



Stormwater Master Plans Community Work Plans

- Requests for data/plans of stormwater assets in 2018
- Continue to communicate problem areas or assets...Flooding areas and stream erosion



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Stormwater Inspection and Maintenance

Lake Erie Tributaries and Chagrin River Fall 2017

SW Inspection and Maintenance Quick Review

- Asset Management Approach:
 - Condition – Probability of failure (sediment/debris, Structural Integrity), Hydraulic Performance
 - Criticality – Consequence of failure
 - Business Risk Exposure (BRE) = Condition x Criticality

Condition Rating	Criticality						
	3	4	5	6	7	8	9
1	3	4	5	6	7	8	9
2	6	8	10	12	14	16	18
3	9	12	15	18	21	24	27
4	12	16	20	24	28	32	36
5	15	20	25	30	35	40	45

- BRE scores are generally organized into four tiers:
 - BRE < 12 = Low Risk ← Action As-needed
 - BRE = 12 and < 20 = Moderately Low Risk ← Action As-needed
 - BRE = 20 and < 34 = Moderately High Risk ← Action Required
 - BRE = 34 – 45 = High Risk ← Action Required

SW Inspection and Maintenance Quick Review

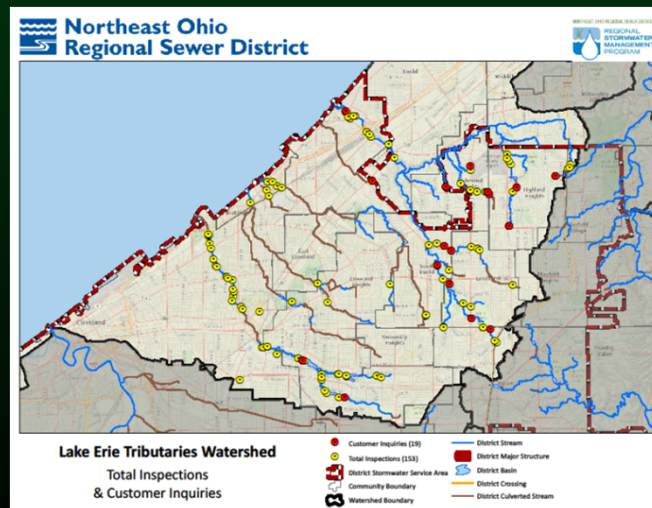
- Asset Class Types:
 - Streams (Open)
 - Crossings (Bridges/Culverts)
 - Culverted Streams (Long Reaches of Buried Pipe)
 - Basins (Dry/Wet, Regulated/Unregulated)
 - Major Structures (Low Head Dams/Drop Structures/Locks)
- Acronyms:
 - ALR – Acceptable Level of Risk
 - RSS – Regional Stormwater System
 - BTU – Building, Transportation, Utility Assets along the RSS
 - BEHI/NBS – Bank Erosion Hazard Index/Near Bank Stress
 - SWSA – Stormwater Service Area



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SWIM Inspections Lake Erie Tributaries: 2017 Summary



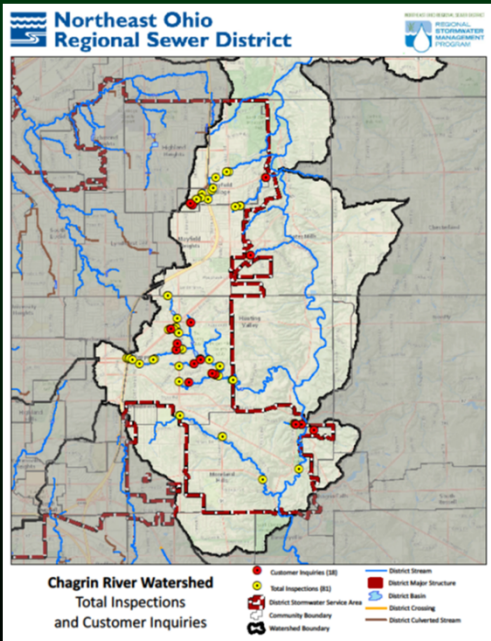
153 Total Inspections
(**911** in SWSA)

19 Customer Inquiries
(**157** in SWSA)



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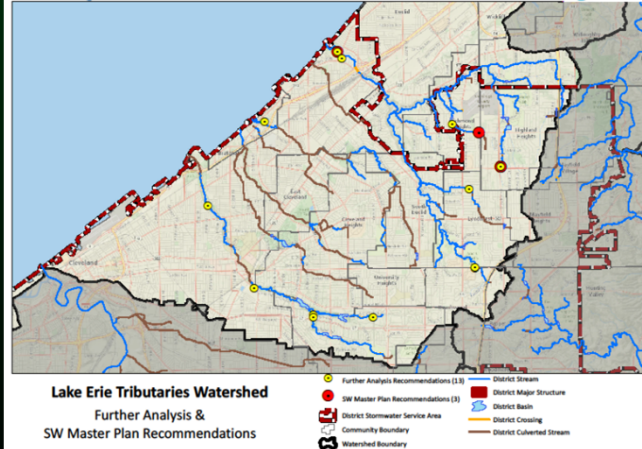
SWIM Inspections Chagrin River: 2017 Summary

81 Total Inspections
(**911** in SWSA)

18 Customer Inquiries
(**157** in SWSA)



**Northeast Ohio
Regional Sewer District**

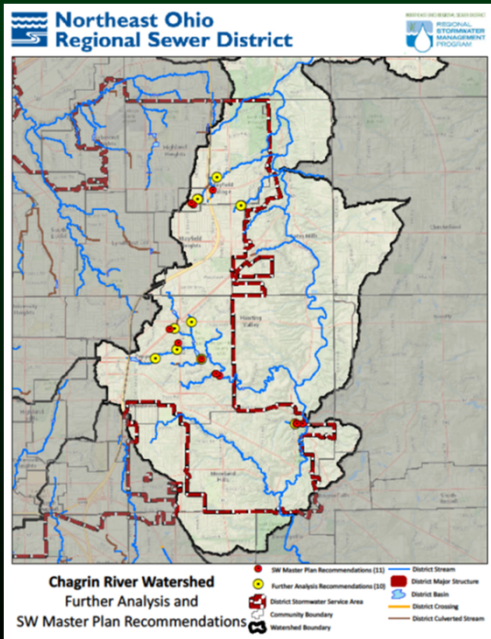


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3 Assets
recommended
for Stormwater
Master Planning
(**84** in SWSA)

13 Assets
recommended
for Further
Analysis
(**131** in SWSA)





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SWIM Recommendations:

Chagrin River
2017 Summary

11 Assets recommended for
SW Master Plan
(**84** in SWSA)

10 Assets recommended for
Further Analysis
(**131** in SWSA)



SWIM Recommendations: Further Analysis

Lake Erie Tributaries: Euclid Creek
Cleveland: Downstream of I-90 and Villaview Road
Asset ID: EC00006

NEORSRD Condition Rating	Criticality	BRE Score
4	3	12



Structural Integrity:

- Failing concrete bank protection

Recommendation:

- ✓ Monitoring
- ✓ Further Analysis



SWIM Recommendation: Further Analysis

Lake Erie Tributaries: Euclid Creek West Branch

Lyndhurst: Richmond Road

Asset ID: EW00207

NEORS Condition Rating	Criticality	BRE Score
4	8	32



Structural Integrity:
Spalling and exposed reinforcement

Recommendation:

- ✓Monitoring
- ✓Notify Owner



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SWIM Recommendations: Further Analysis

Chagrin River: Small Tributary

Mayfield Heights: Stonecreek Dr

Asset ID: CT00108

BEHI	NBS	NEORS Condition Rating	BTU Criticality	BRE Score
High	Moderate	3	6	18



Structural Integrity:

- o 19 feet to BTU (Residence)
- o Erosion on RR where bank is mostly composed of fill material
- o Exposed geotextile fabric
- o 8 CY LWD in channel diverts flow to eroding bank

Recommendation:

- ✓Remove debris
- ✓Further Analysis
- ✓Monitor annually



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SWIM Recommendations: Further Analysis

Chagrin River: Pepper Luce Creek
Pepper Pike: Lander Road
Asset ID: PC00213

BEHI	NBS	NEORS Condition Rating	BTU Criticality	BRE Score
High	Moderate	4	4	16



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Structural Integrity:

- o Gabions rotating toward stream
- o Erosion has scoured behind gabions
- o Exposed manhole shaft and utility

Recommendation:

- ✓ Notify community and utilities
- ✓ Monitor annually

SWIM Recommendations: Further Analysis

Chagrin River: Beechers Brook
Asset ID: BE00042
Mayfield: Worton Park Dr

ODOT Culvert Score	NEORS Condition Rating	Criticality	BRE Score
3A	4	6	24



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Structural Integrity:

- o Double barrel CMP, both barrels exhibit heavy rust with section loss at the invert
- o Minor vertical compression
- o Stream able to pass under barrels during elevated flow

Recommendation:

- ✓ Notify responsible party
- ✓ Further Analysis
- ✓ Monitor annually

SWIM Recommendations: Stormwater Master Planning & Further Analysis

Chagrin River: Pepper Luce Creek
Pepper Pike: Shaker Boulevard
Asset ID: PC00113

ODOT Culvert Score	NEORS Condition Rating	Criticality	BRE Score
4A	4	6	24



Structural Integrity:

- Heavy rust and perforations along invert, stream passing under pipe
- Section loss and exposed backfill/voids
- Flow constriction due to pipe size has led to roadway flooding on May 30 and August 10, 2017

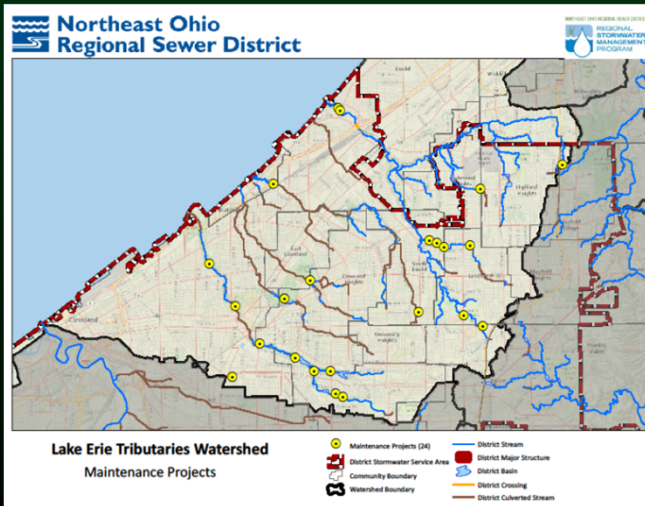
Recommendation:

- ✓ Remove 3 CY LWD
- ✓ Further Analysis
- ✓ Stormwater Master Planning
- ✓ Nominate to CIP
- ✓ Monitor annually



SWIM Maintenance

Lake Erie Tributaries: 2017 Summary



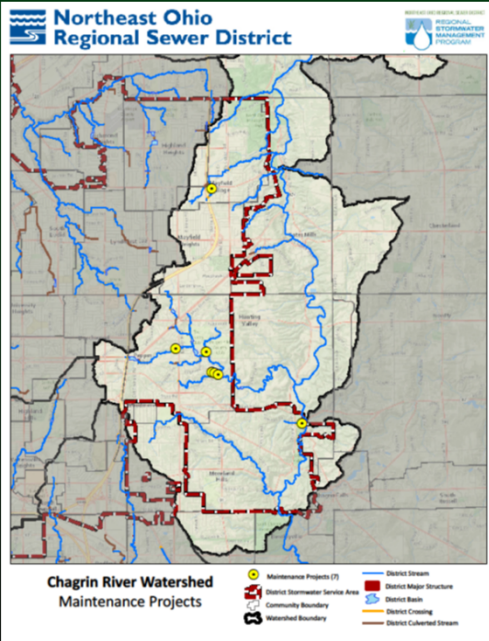
24 Maintenance Projects
(**154** in SWSA)

892 CY sediment and debris removed
(5,241 in SWSA)



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SWIM Maintenance

Chagrin River
2017 Summary

7 Maintenance projects
(**154** in Service Area)

146 CY sediment and
debris removed
(**5,241** CY in Service Area)



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Stormwater Maintenance

Lake Erie Tributaries: Euclid Creek West

South Euclid: Liberty Road

Asset ID: EW00092

Maintenance Project: Tree Removal Project (125 CY)

Pre-Maintenance



During Maintenance



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Stormwater Maintenance: Debris Removal

Chagrin River: Pepper Creek

Pepper Pike: 2860 Lander Road

Asset ID: PC00146

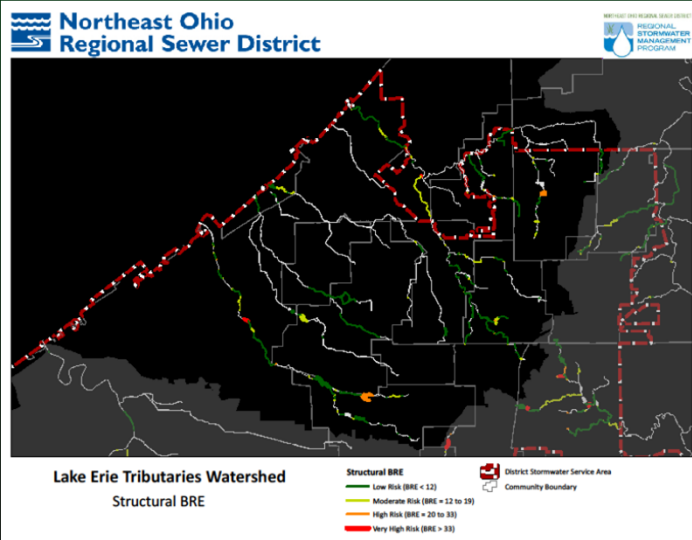
Maintenance Project: Tree Removal (35 CY)



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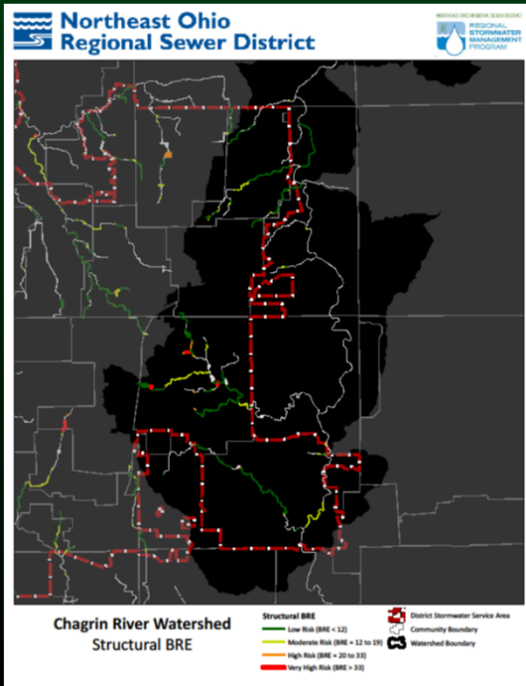


Structural BRE Update Lake Erie Tributaries



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Structural BRE Update: Chagrin River

Structural BRE Update cont. Lake Erie Tributaries

Lake Erie
Tributaries
Only

Asset Class Type	Total Assets	Low Risk	Moderate Risk	High Risk	Very High Risk	No Condition Scores
Streams	295	68	13	0	0	214
Basins	21	7	3	2	0	9
Crossings	208	35	44	7	0	122
Culverted Streams	61	8	3	0	1	49
Major Structures	1	0	0	0	0	1
Total Inspected (Count)	586	118	63	9	1	395
Total Inspected (Percent)		20%	11%	2%	0%	67%
Projected BRE (Percent)		62%	33%	5%	1%	0%
Projected BRE (Count)	586	362	193	28	3	0

Service
Area

Asset Class Type	Total Assets	Low Risk	Moderate Risk	High Risk	Very High Risk	No Condition Scores
Streams	2,071	472	116	0	0	1,483
Basins	79	27	8	3	0	41
Crossings	1,277	198	373	73	3	630
Culverted Streams	192	29	18	3	11	131
Major Structures	21	0	0	0	1	20
Total Inspected (Count)	3640	726	515	79	15	2,305
Total Inspected (Percent)		20%	14%	2%	0%	63%
Projected BRE (Percent)		54%	39%	6%	1%	0%
Projected BRE (Count)	3,640	1,980	1,404	215	41	0

Structural BRE Update cont. Chagrin River

Chagrin
River
Only

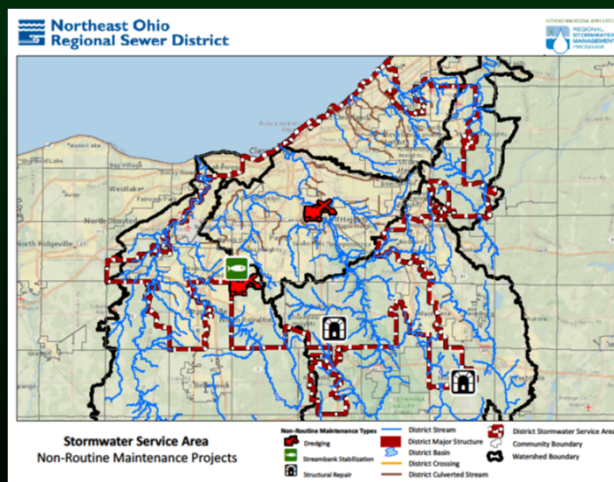
Asset Class Type	Total Assets	Low Risk	Moderate Risk	High Risk	Very High Risk	No Condition Scores
Streams	164	45	9	0	0	110
Basins	7	3	0	0	0	4
Crossings	118	17	23	8	0	70
Culverted Streams	8	0	0	1	3	4
Major Structures	0	0	0	0	0	0
Total Inspected (Count)	297	65	32	9	3	188
Total Inspected (Percent)		22%	11%	3%	1%	63%
Projected BRE (Percent)		60%	29%	8%	3%	0%
Projected BRE (Count)	297	177	87	25	8	0

Service
Area

Asset Class Type	Total Assets	Low Risk	Moderate Risk	High Risk	Very High Risk	No Condition Scores
Streams	2,071	472	116	0	0	1,483
Basins	79	27	8	3	0	41
Crossings	1,277	198	373	73	3	630
Culverted Streams	192	29	18	3	11	131
Major Structures	21	0	0	0	1	20
Total Inspected (Count)	3640	726	515	79	15	2,305
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Projected BRE (Percent)		54%	39%	6%	1%	0%
Projected BRE (Count)	3,640	1,980	1,404	215	41	0

SW Maintenance

Non-Routine Maintenance Projects: Pilot Update



Currently Piloting:

- Streambank Maintenance
- Basin Maintenance (e.g., Dredging)
- Structural Maintenance

Contact SWIM or WTL to discuss other potential locations



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SW Inspection and Maintenance Planned Activities 2018

- Implement Recommended Maintenance Projects from SWMPs
- Continue Piloting Non-Routine Maintenance Projects
- Inspect RSS assets and BTUs without condition scores
- Request Record Drawings from Member Communities



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NEORSD ArcGIS Online Home Page

Home Gallery Map Scene Groups Content Organization

NEORSD GIS SERVICES

WebGIS Platform

FEATURED MAPS

NEORSD Collection System Viewer

NEORSD Stream Photo Viewer

2014 NEORSD Sewer Pipe Condition Rating

2017 NEORSD Sewer Outflow

2016 NEORSD Stream Photo Viewer

neorsd.maps.arcgis.com

Username: WAC Member

Password: wacneoh2017

Mission: Provide the highest quality spatial information.

Vision: Create an environment of high quality spatial information.

Mantra: "Clean" water through "Clean" information....

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STORMWATER MANAGEMENT

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Search the website or visit the ArcGIS Marketplace

NEORSD GIS SERVICES

Cleveland Historical Map Viewer

Subwatershed Viewer

Soil Boring Web Application

Bikeway Projects - 2016

2014 NEORSD Sewer Pipe Condition Rating

SWMP Map

SWIM Map

NEORSD Gallery Maps

- SWMP
- SSES
- SWIM

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STORMWATER MANAGEMENT



Community Cost-Share



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Community Cost-Share

- CCS Funds Balance (9/30/2017): **\$16,303,570**
- 45 approved projects: **\$ 4,629,622**
- CCS Funds available to Member Communities: **\$11,673,948**
- 9 approved allocation agreements: **\$ 4,607,183**
- 31 Member Communities currently participating

CCS Workshop – November 2017



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What's Next...

- Community designation of WAC representative – January 2018
- Phase II Services: PIPE and IDDE
 - Submit for reimbursement for 2017 PIPE services from SWCD
 - No change in services for 2018
 - SWCD will invoice 1st Quarter for services
- Next WAC meeting - March 2018



Your Sewer District

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Questions

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Rachel Webb

216-881-6600 Ext. 6645

webbr@neorsd.org

Stormwater Program: Community Resources

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

