Shaker Lakes: Review and recommendations

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Today's discussion

- NEORSD and regional stormwater management
- Shaker Lakes: History and current conditions
- Roles and responsibilities
- NEORSD Regional Stormwater Management recommendations
- Discussion





Floocing. Erosion. Water quality.

Environment and safety.



Lower Lake Old Stone Grist Mill, North Union Shaker Settlement



History of Lower and Horseshoe Lakes

- Doan Brook dammed in 1826 to power a mill, forming Lower Shaker Lake in the process
- Doan Brook dammed again 1852 for new mill, forming Horseshoe Lake
- North Union Shakers disbanded in 1889







LOWER LAKE DAM

HORSESHOE LAKE DAM

North Park Rd., Cleveland Hts.

University Circle, March 28-29, 2020

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University Circle, March 28-29, 2020

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STOP



FLOODING TURNS MLK DR. INTO A RIVER

History and current conditions

- Both dams out of Ohio Department of Natural Resources (ODNR) compliance
- Horseshoe Lake Dam is failing
- Water seeping through the dam has caused sinkholes and cracks in the concrete
- ODNR ordered the draining of Horseshoe Lake



History and current conditions





Stormwater Master Plan

University Circle Inundation Overview Legend 1:3,748 0 bedrates. Injustation 5-year Inundation 10-year ----- Cleased Conduit **Municipalities** May Greatest 8/17/2030 Inundation 25-year - Dopan Inuncialed Sublines Inundation 50-year 📒 Crossing Inumbers 1 year and this may and its scather one specific parpoon. The thirty's Inundation 100-year Culverted Steam inundation 2-year in, phone contact, gladi workd, and Basin





What a stormwater master plan includes

- Extensive field investigations
- Stakeholder discussion and problem identification
- Stream flow and rainfall data
- Computer modeling for wet weather
- Alternatives evaluation
- Recommendations







Environment and safety.





Roles and responsibilities

- ODNR: Assess, enforce dam compliance
- Cities: Compliance with ODNR orders
- NEORSD: Regional stormwater management



Alternatives evaluation

CRITICAL DAM PROBLEMS TO BE RESOLVED

- ODNR compliance
- Eliminate risk of total failure
- Address flooding



Master plan findings

LOWER SHAKER LAKE AND DAM

- Flood control benefits downstream: NOTABLE
 - ODNR Class 1 designation
 - Probable loss of life during total failure
 - Larger area, significant available storage
- Dam considerations:
 - ODNR requirements
 - Regional stormwater management program goals
 - Sediment

- Costs
- Maintenance requirements
- Alternative design time
- Stakeholder expectations



Master plan findings

HORSESHOE LAKE AND DAM

- Flood control benefits downstream: INSIGNIFICANT
 - ODNR Class 1 designation
 - Probable loss of life during total failure
 - Small drainage area, Lower Lake downstream
- Dam considerations:
 - ODNR requirements
 - Regional stormwater management program goals
 - Sediment

- Costs
- Maintenance requirements
- Alternative design time
- Stakeholder expectations



Recommendation

SCENARIO	СОЅТ
No dams, no lakes at both Horseshoe and Lower	\$22.7 million
Remove dam, no lake at Horseshoe Upgrade dam, maintain lake at Lower	\$28.3 million*
Class 1 dam, maintain lake at Horseshoe No dam or lake at Lower	\$28.7 million
Class 1 dams, lakes at both Horseshoe and Lower	\$34.3 million



*NEORSD funded

Remove dam, no lake at Horseshoe Upgrade dam, maintain lake at Lower

Environment

- Improves stream function
- Maintains size of Lower Lake

Safety

- ODNR compliant
- Assets protected

- Sediment handling
- Stakeholder expectations

- Flood control > Stream function
- Stakeholder expectations





CHALLENGES





Stickney Creek BEFORE

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Doan Brook Streambank Stabilization BEFORE

Doan Brook Streambank Stabilization DURING

This land

Doan Brook Streambank Stabilization AFTER



Conserve. Connect. Inspire.

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Why invest in Lower Lake dam?

- Lower Lake active storage reduces downstream flooding (a regional stormwater management benefit)
- Horseshoe dam: Insignificant downstream flood control
- Horseshoe dam: Significant non-compliance
- Lower Lake dam still functions, but also non-compliant



Lakes and flood control





NEORSD regional dollars invested to date

- Annual Stormwater construction budget: \$20 million
- Estimated cost of Shaker Lakes project: \$28.3 million
- NEORSD (Stormwater and Wastewater) Investment in Doan Brook Watershed:

>\$160 million over last 6 years







Next steps: Horseshoe Lake

• Release a Request for Proposals for the following services

- Engineering services
- Landscape architecture/planning services
- Historic resource consultation and mitigation
- Public engagement



Estimated Schedule

- Release Request for Proposal/Initial (Pre)Design: July 2021
- Complete Initial (Pre)Design & select alternative to move to detailed design: July 2022
 - Initial (Pre) Design will include Public Process
- Detailed Design Complete: August 2023
 - Detailed Design will continue Public Process



Estimated Schedule

- Publicly Bid Project for Construction: October 2023
- Construction Notice to Proceed: January 2024
 - Pre-construction Public Meetings included prior to Construction Notice to Proceed
- Lower Lake will follow a similar schedule staggered approximately 1 year forward



Environment and safety.

