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Treatment and Reclamation Planning in Rehobeth, Rush Creek, Ohio

Natalie Kruse Daniels, Jen Bowman, Guy Riefler
Ohio University

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Rush Creek Watershed Perry County, Ohio

Extensive Coal Mining Legacy

Pre Law and Post Law

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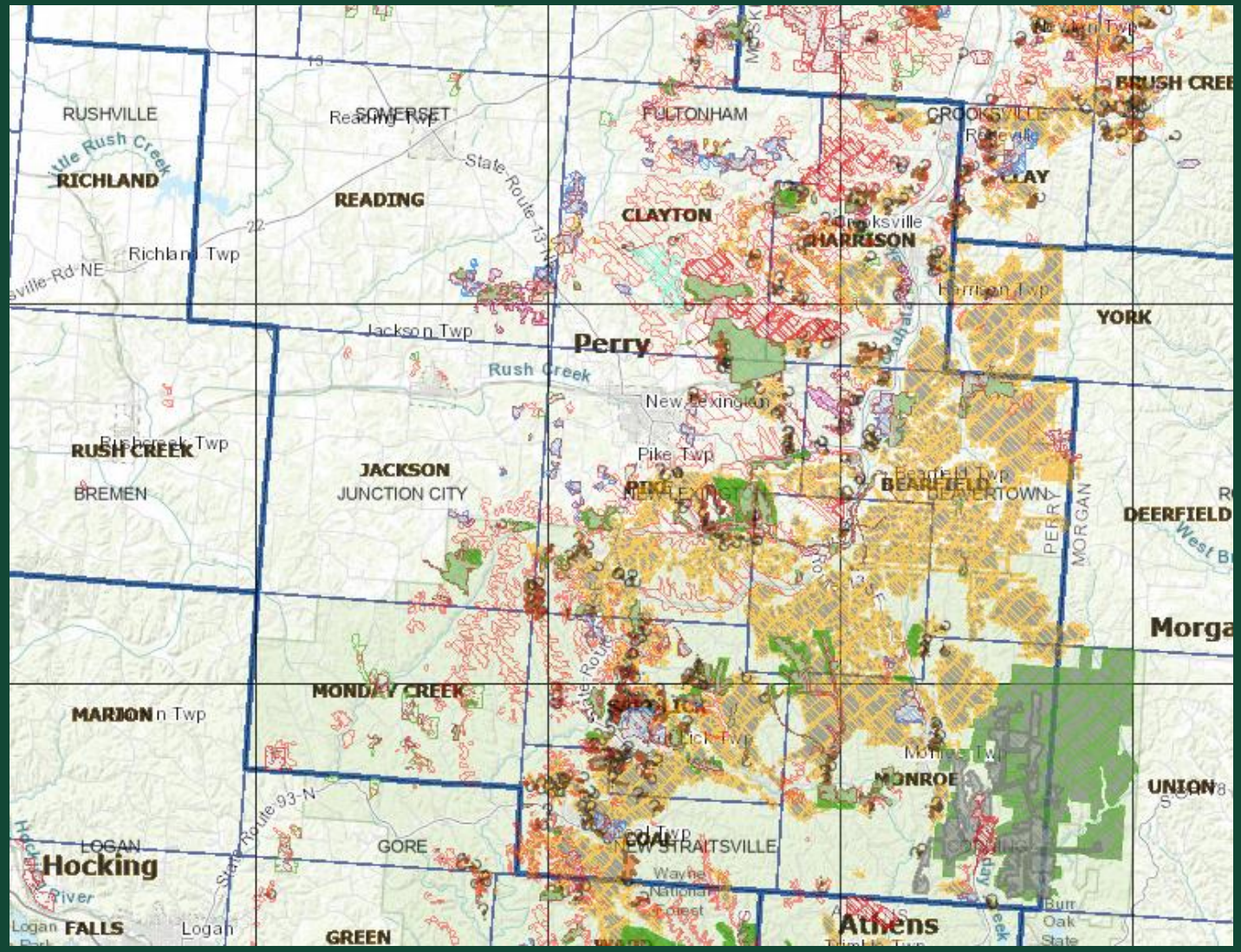
Mines in Perry County, Ohio



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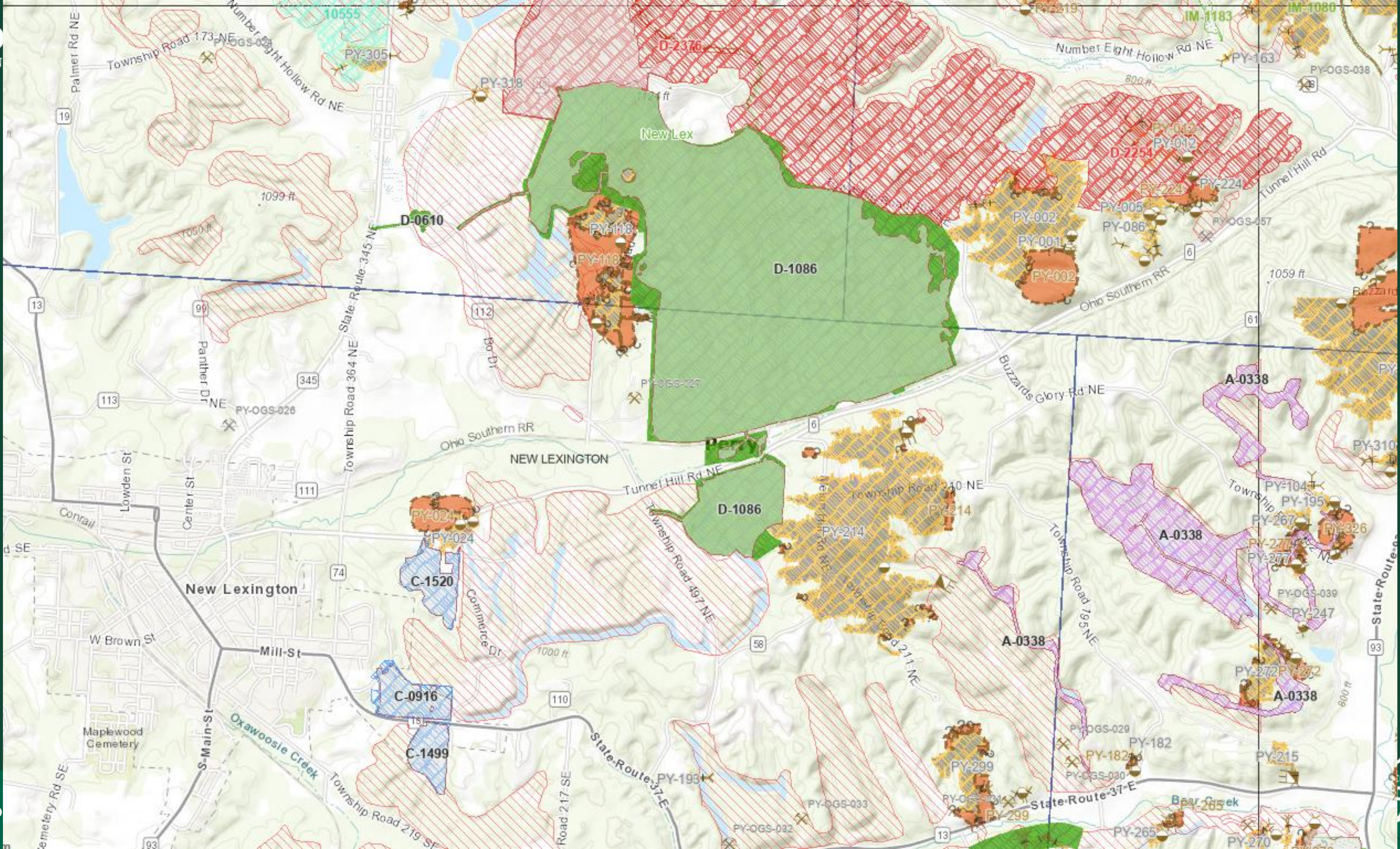
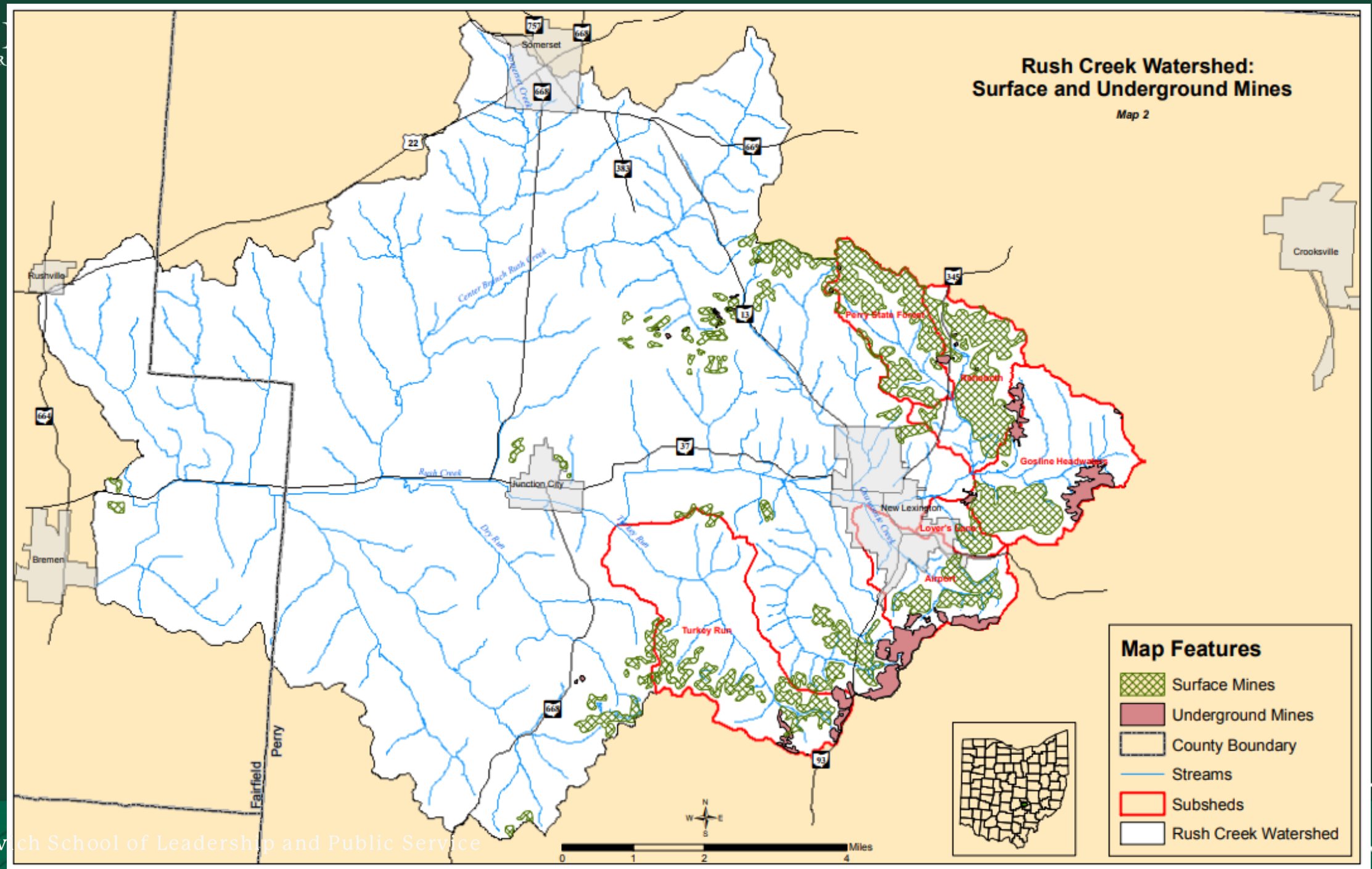


D-2376
D-2254
D-1086
D-1086
D-0610
New Lex
Perry
NEW LEXINGTON
New Lexington
C-1520
C-0916
C-1499
A-0338
A-0338
A-0338
A-0338
PY-118
PY-118
PY-318
PY-305
PY-024
PY-024
PY-214
PY-214
PY-002
PY-002
PY-001
PY-005
PY-086
PY-012
PY-224
PY-224
PY-163
PY-219
PY-104
PY-195
PY-267
PY-326
PY-247
PY-272
PY-272
PY-182
PY-182
PY-215
PY-299
PY-299
PY-265
PY-265
PY-270
PY-193
PY-310
PY-OGS-026
PY-OGS-027
PY-OGS-029
PY-OGS-030
PY-OGS-032
PY-OGS-033
PY-OGS-038
PY-OGS-039
PY-OGS-057
IM-1183
IM-1080
10555
Township Road 173 NE
Number Eight Hollow Rd NE
Palmer Rd NE
State Route 345 NE
Township Road 364 NE
Bo Dr
Panther Dr NE
Ohio Southern RR
Tunnel Hill Rd NE
Tunnel Hill Rd
Buzzards Glory Rd NE
Township Road 210 NE
Township Road 211 NE
Township Road 497 NE
Township Road 195 NE
Township Road 219 SE
Commerce Dr
Lowden St
Center St
Conrail
W Brown St
Mill St
S Main St
Oxawoosie Creek
Maplewood Cemetery
Cemetery Rd SE
Road 217 SE
State Route 37 E
State Route 37 E
State Route 93
Bear Creek
1099 ft
1090 ft
1124 ft
1059 ft
1000 ft
800 ft

Vo


Rush Creek Watershed:
Surface and Underground Mines
Map 2
Somerset
Rushville
Junction City
Bremen
New Lexington
Crooksville
Fairfield
Perry
Center Branch Rush Creek
Rush Creek
Dry Run
Turkey Run
Perry State Forest
Roosboch
Gosline Headwaters
Lover's Lane
Airport
Turkey Run
Map Features
Surface Mines
Underground Mines
County Boundary
Streams
Subsheds
Rush Creek Watershed
N
W
E
S
0
1
2
4
Miles

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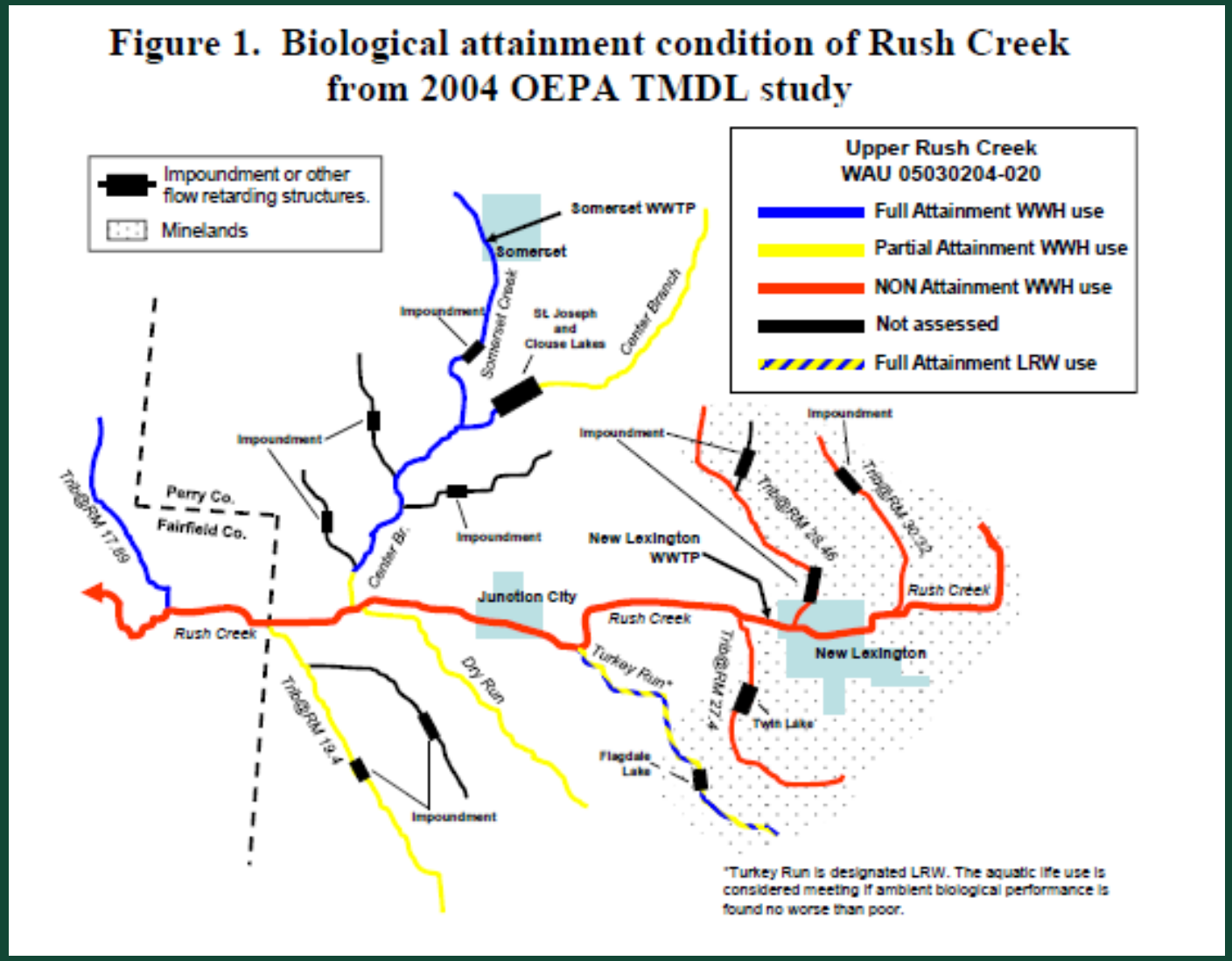
Rush Creek Data

From AMDAT (Bowman 2009) and update (Voinovich School 2021)



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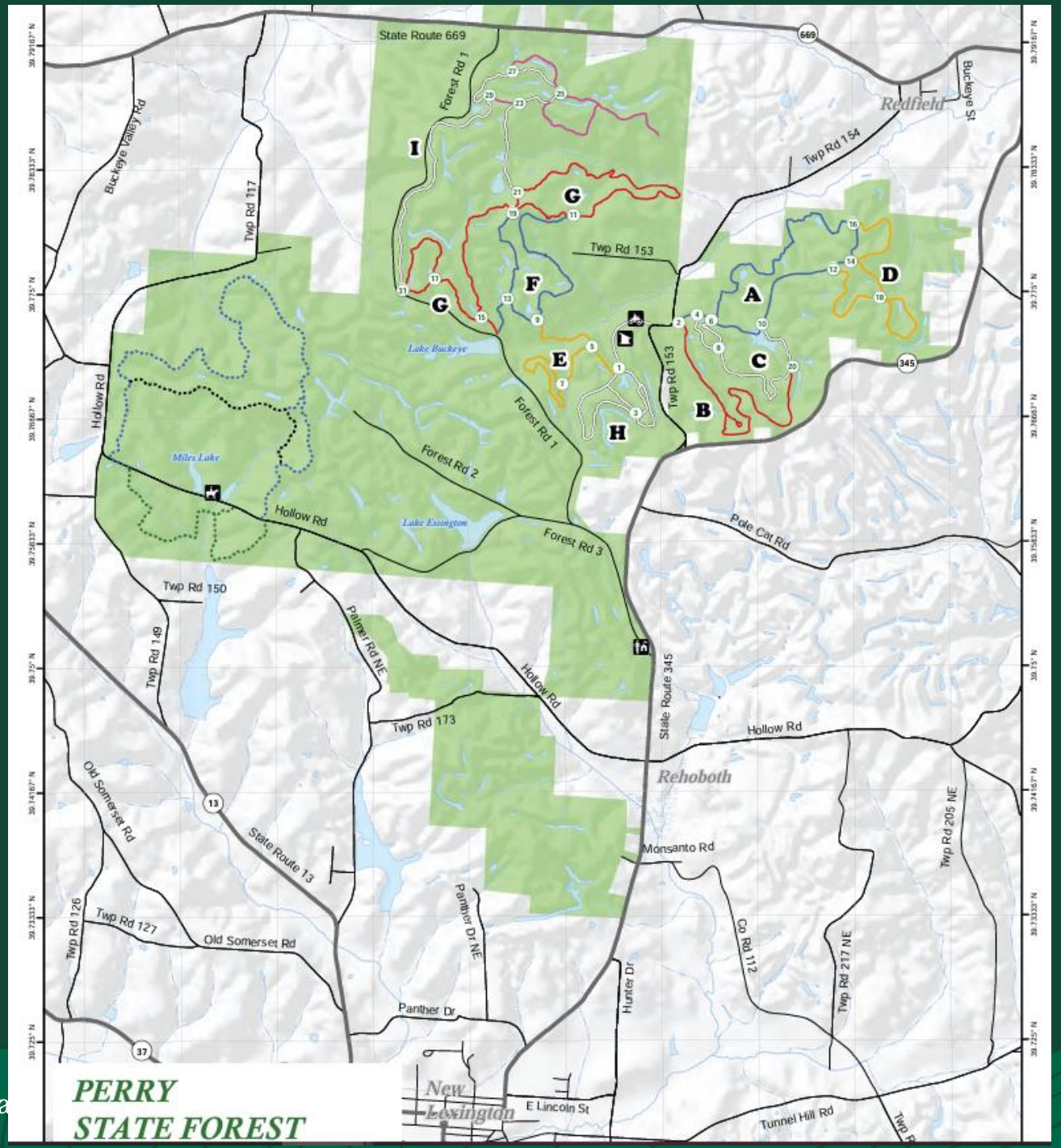

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Perry State Forest

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Confluence with Perry State Forest

Confluence with Rush Creek

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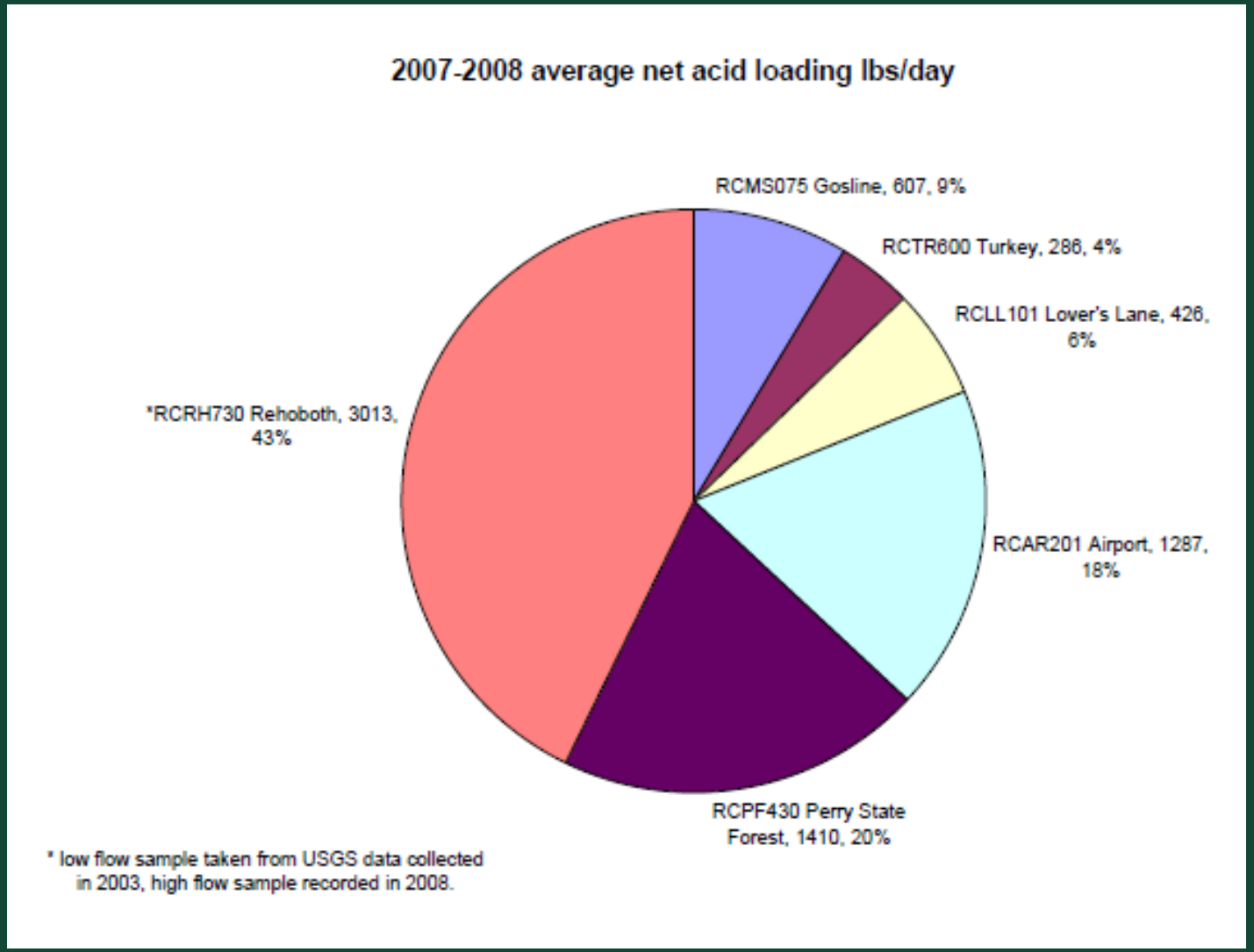
2007-2008 Acid Loadings



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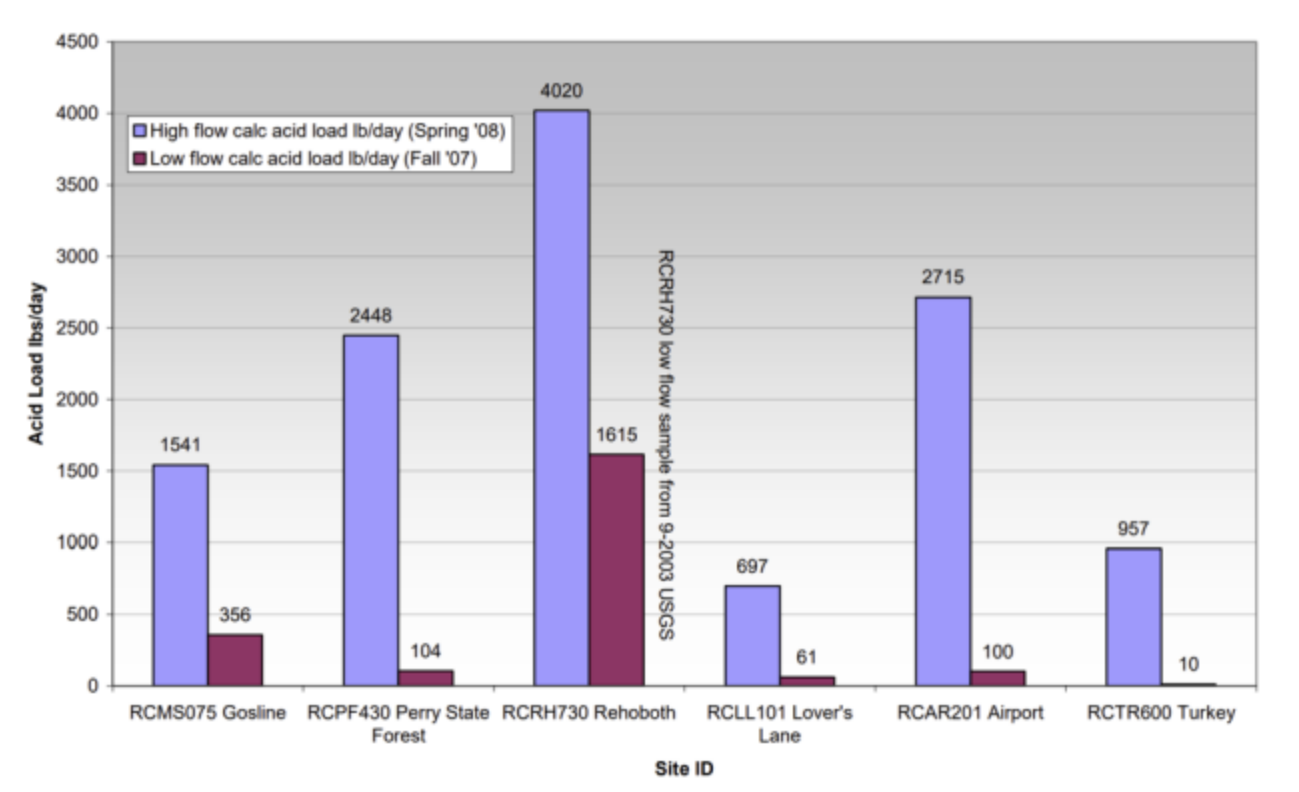
Acidity Loading from Tributaries



Timeline of Planning & Funding

AMDAT Development – Complete in 2009	• No Action Planned – too great a cost
Community Member Interest and Investment	• Updated Upper Rush Creek Planning
Brownfields Phase II Grant	• Additional Sampling and Conceptual Treatment/Reclamation Design
BIL	• Land Reclamation & AMD Treatment Planning
H2Ohio – State Water Quality Improvement Program	• Short turnaround time dollars – must show a measurable and visible improvement

Current Efforts

- Brownfields Grant Ends Q3 2024 – includes treatment/reclamation planning
- BIL Funds – Perry State Forest focus, then downstream Rehobeth
- H2Ohio Funds with a rapid turnaround – design this summer in Gosline

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Rehobeth Treatment Planning

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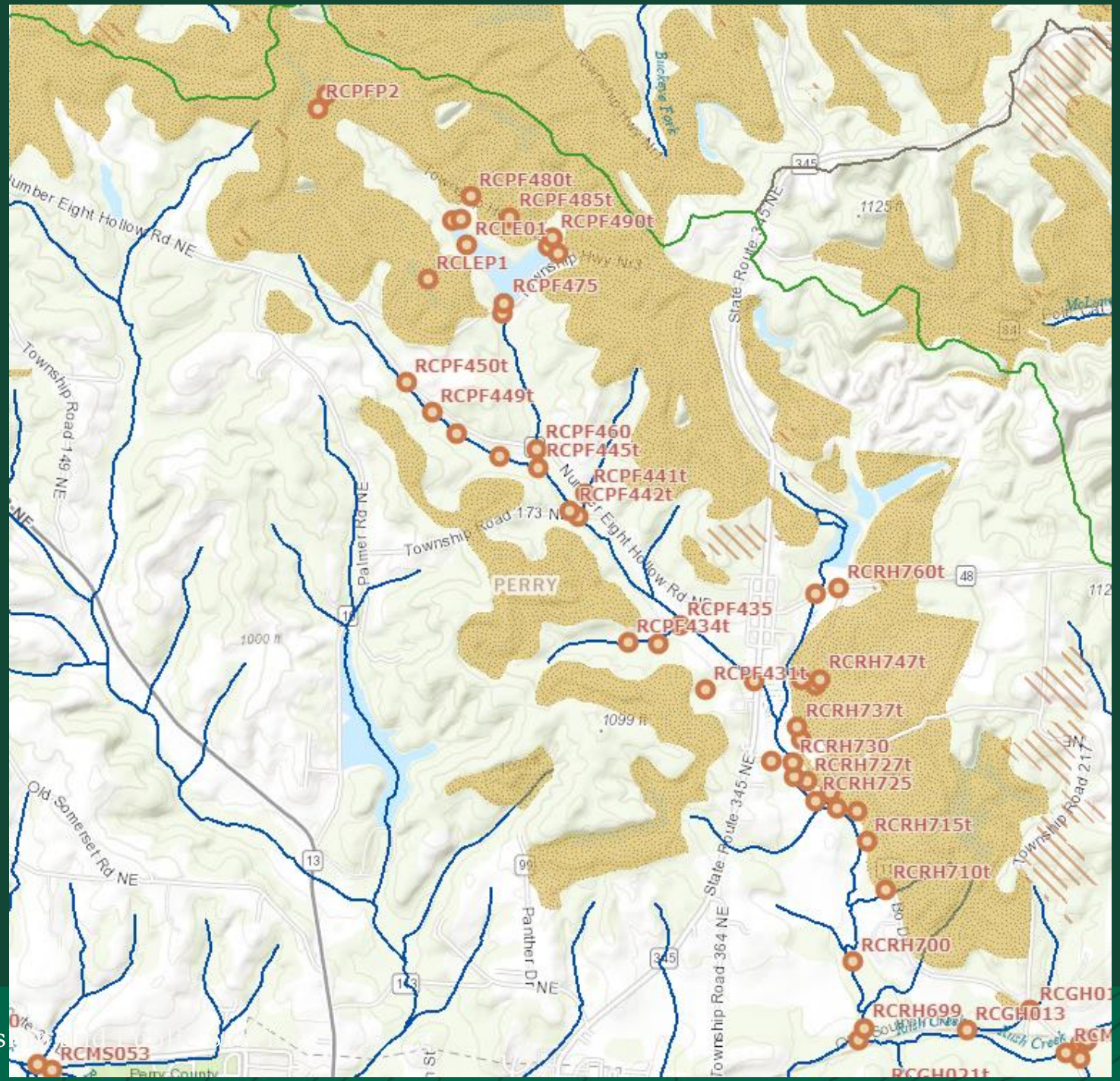

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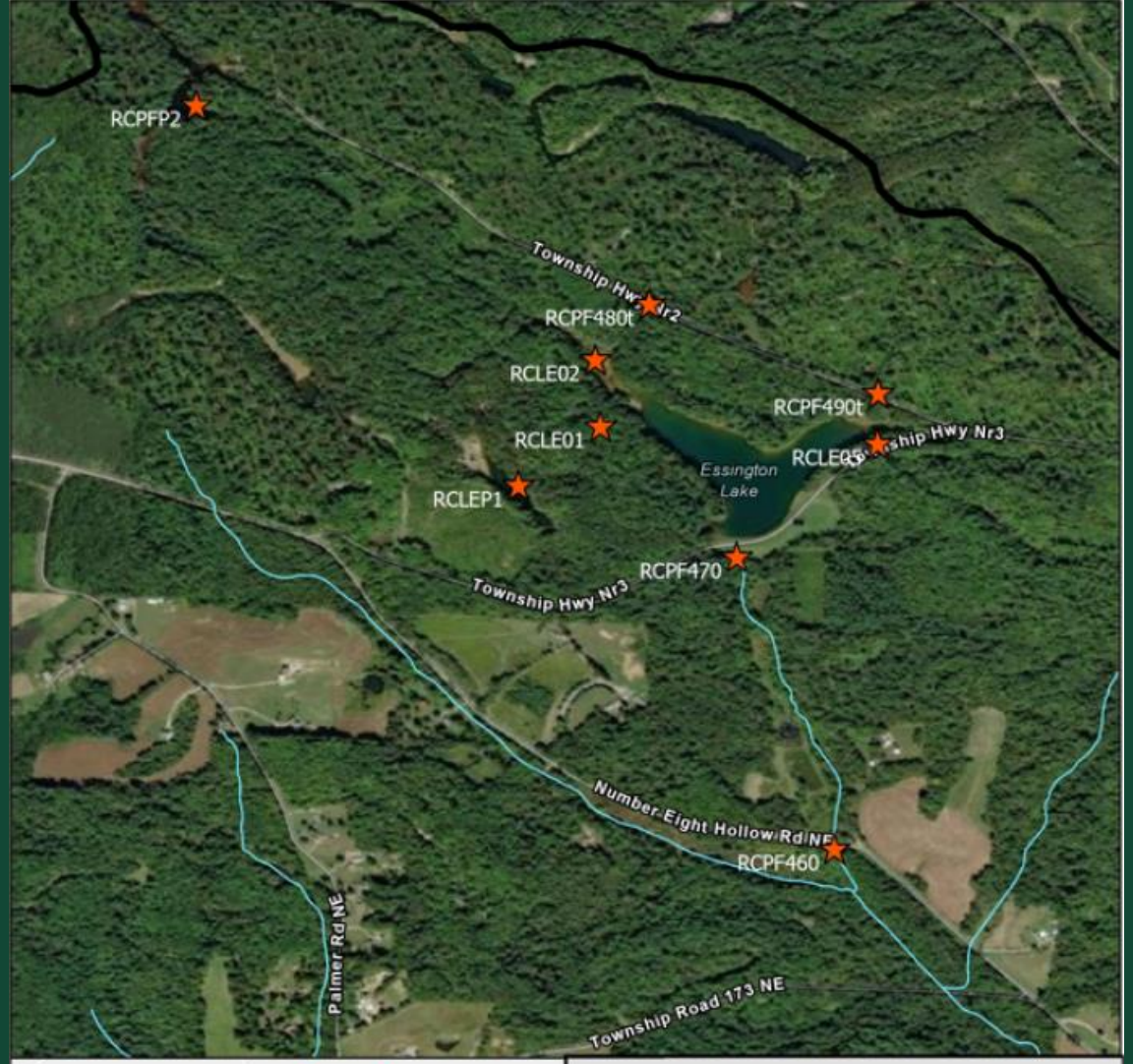
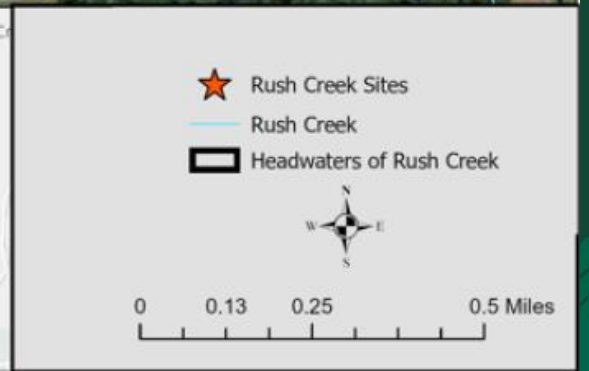
Perry State Forest & Essington Lake





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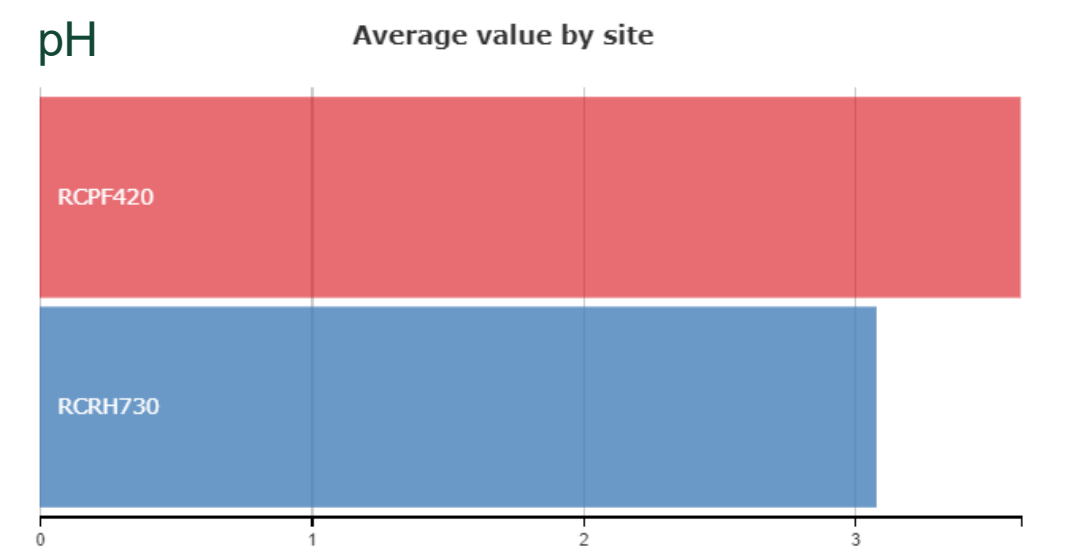
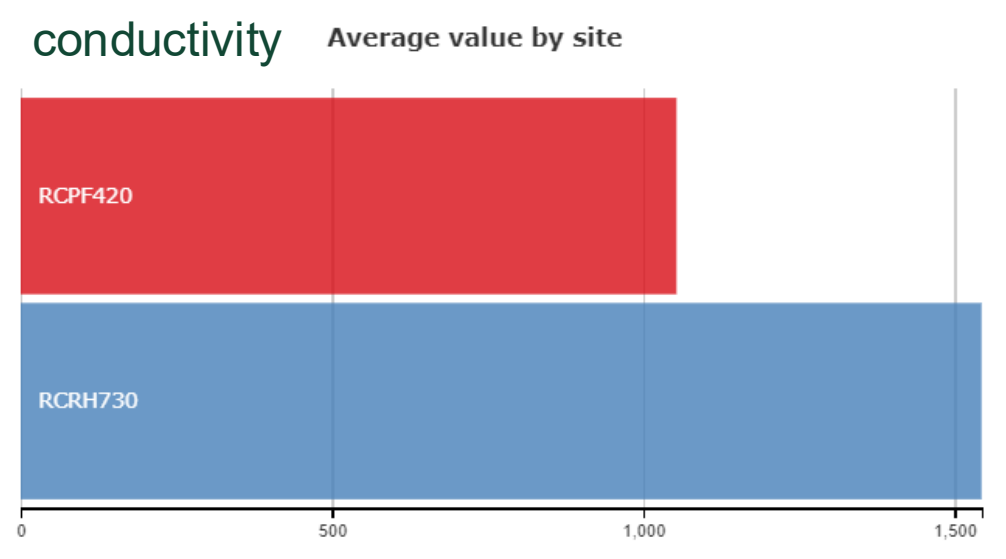
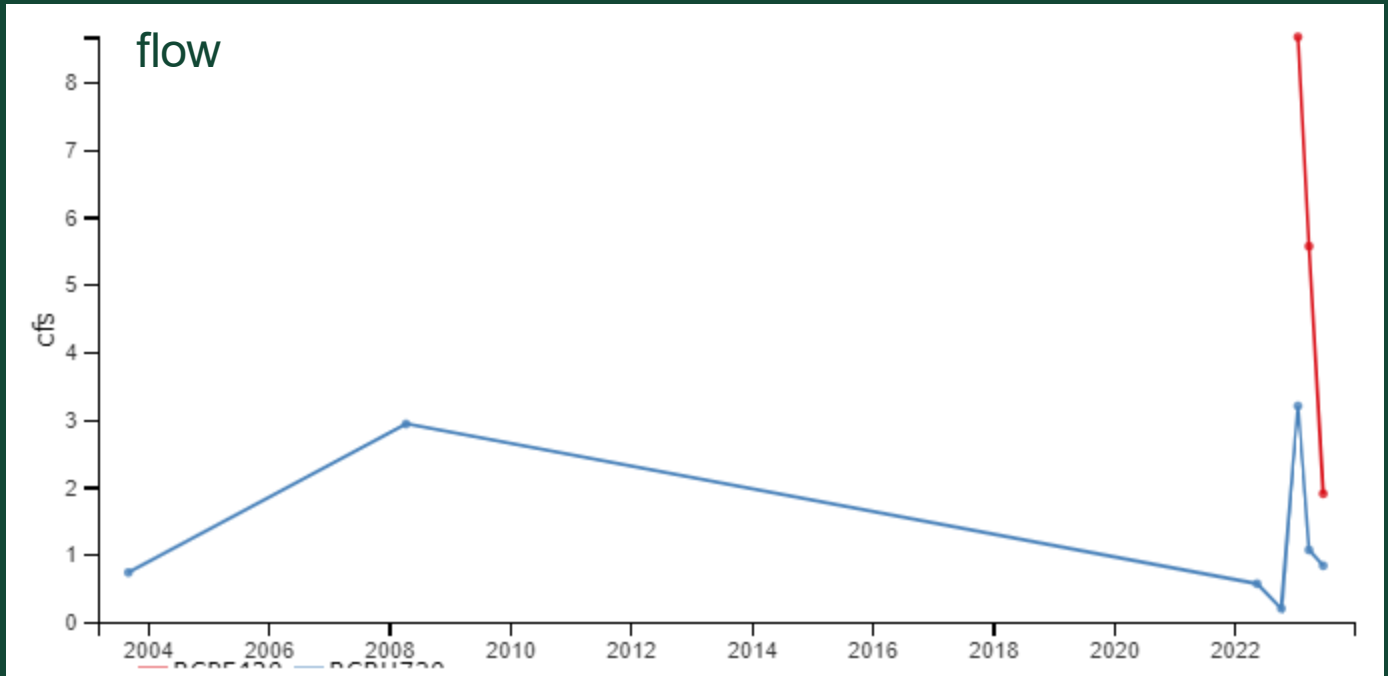

pH
Average value by site
RCPF420
RCRH730
0
1
2
3


conductivity
Average value by site
RCPF420
RCRH730
0
500
1,000
1,500


flow
cfs
0
1
2
3
4
5
6
7
8
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022

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Voinovich School of Leadership and Public Service

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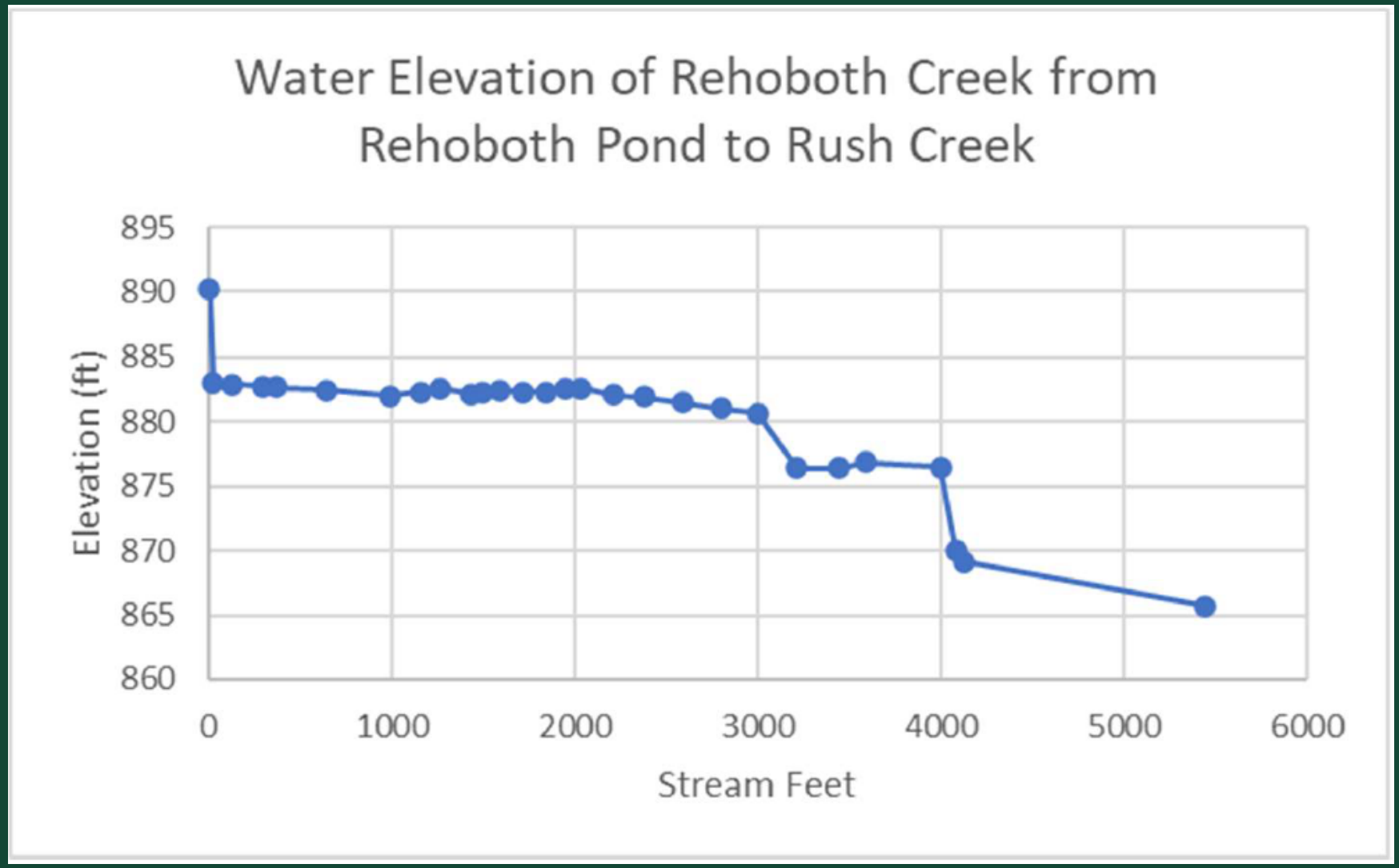
Water Elevation of Rehoboth Creek from Rehoboth Pond to Rush Creek
Elevation (ft)
895
890
885
880
875
870
865
860
0
1000
2000
3000
4000
5000
6000
Stream Feet

Wetland/pond at downstream end of Rehobeth Tributary

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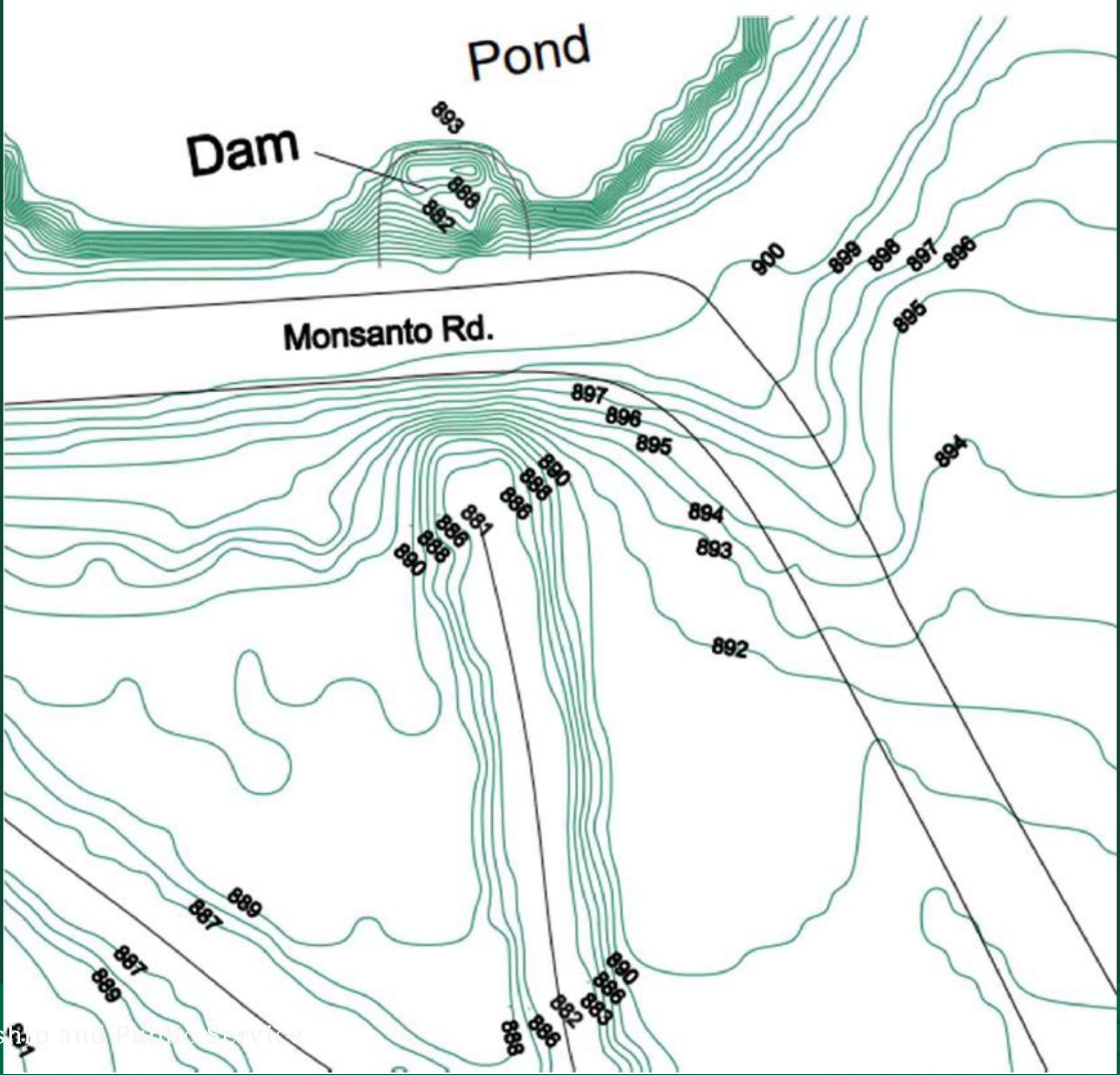

Key Conceptual Design Questions

- Metal collection?
- Dosing plus mixing or liming + clarifier?
- Most effective mixing?
- Conveyance across the road

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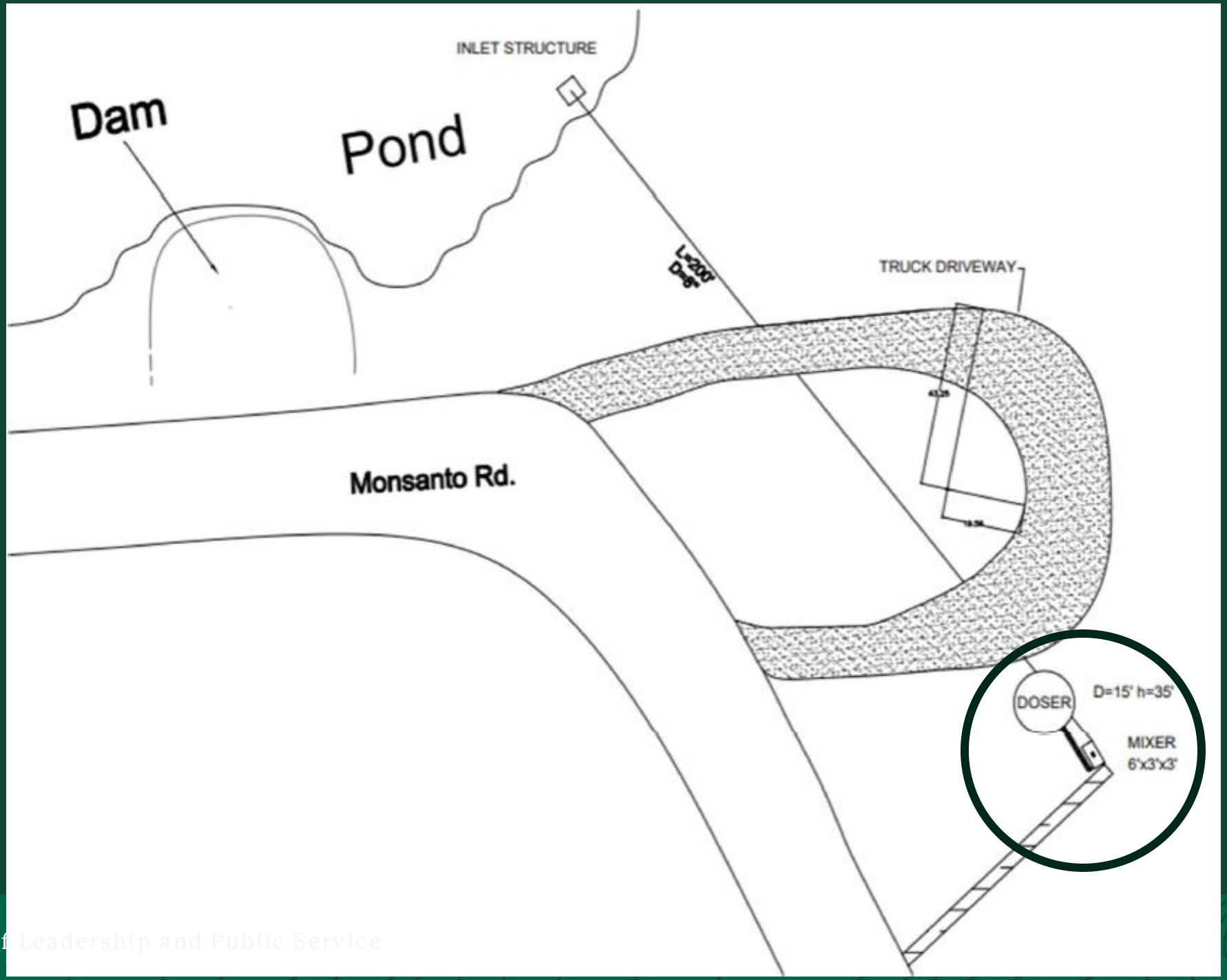

Dosing with shear mixing

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Thank you:

Ohio Department of Natural Resources DMRM
Rural Action
Ohio University Civil and Environmental Engineering Senior Design Class
Upper Rush Creek Revitalization Project

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