

SD1's Updated Watershed Plan

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2023

INDIANAPOLIS

FIVE CITIES PLUS

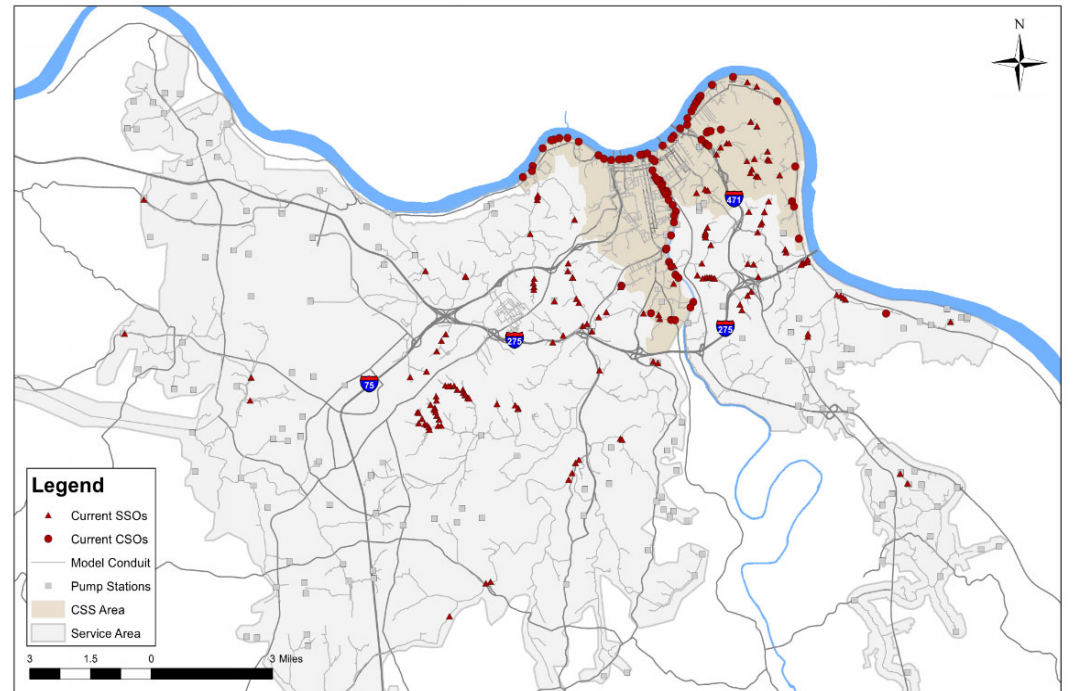
Agenda

- SD1 Overview
- History and Need for an Updated Plan
- Modeling Approach
- Revising Future Growth Projections
- Revised CSO Plan
- Revised SSO Plan
- Current Implementation Status
- Conclusions



SD1 Overview

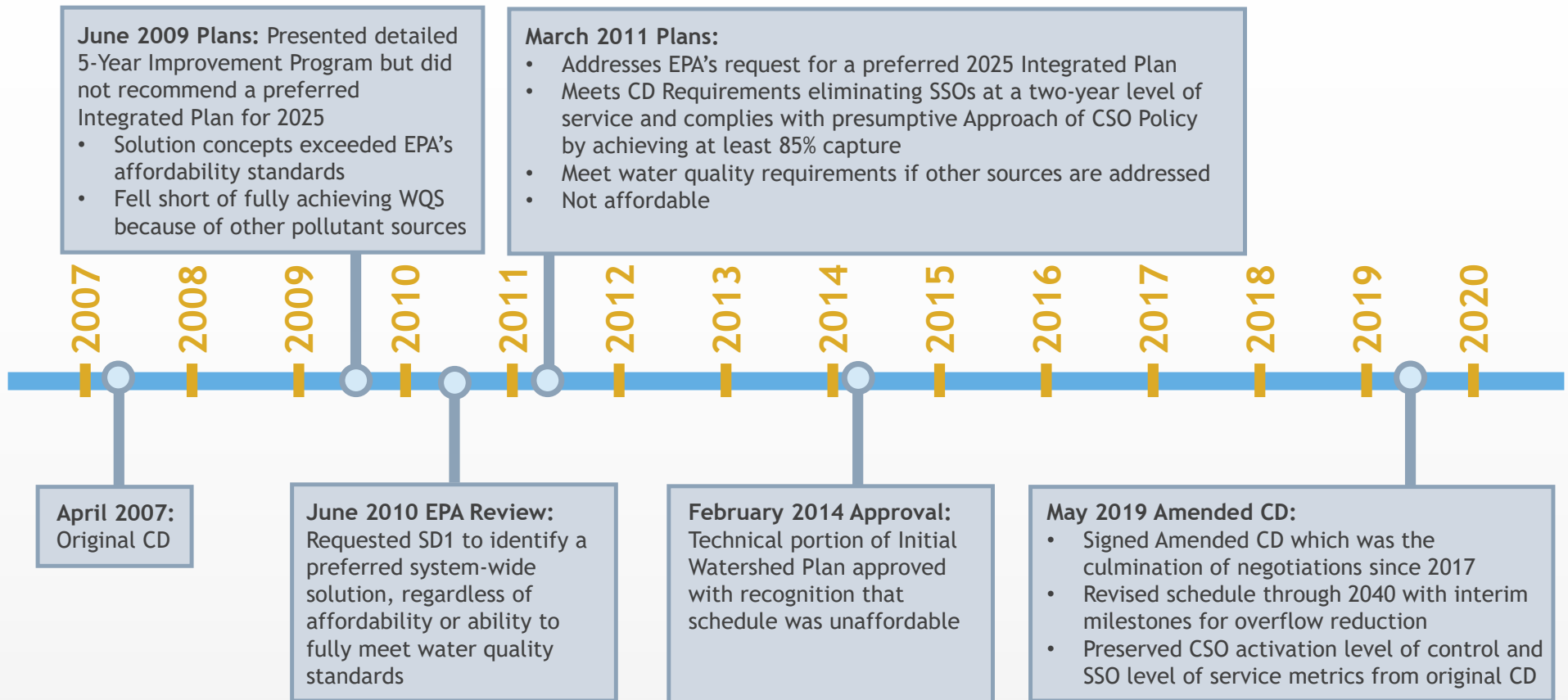
- Total Service Area ~ 200 sq miles
- Population ~ 380,000
- > 1,600 miles of sewers
- > 42,000 manholes
- 3 regional WWTP
- 95 CSOs
- 134 SSOs



History and Need for an Updated Plan



Historical Timeline



Opportunities for Cost Savings in Original Plan

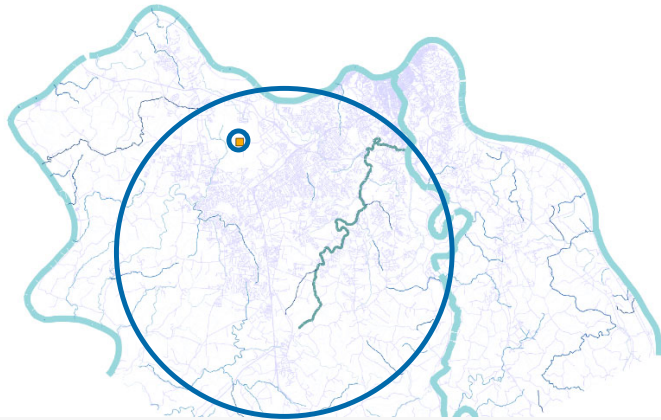
- CSO percent capture of 94% significantly over performed required 85%
- Revise level of service approach based on more realistic rainfall patterns
- Adjust future growth projections
- Reduce reliance on I/I removal and green infrastructure projects
- Leverage strategically placed equalization storage
- Maximize existing infrastructure utilization through coordinated controls
 - Existing sewer and pump stations
 - Existing stormwater detention basins

Modeling Approach



Areal Reduction Factors

- Use 1970 typical year rainfall as basis for CSO Percent Capture and SSO Volume reduction.
- Use areal reduction factors to account for spatial and temporal variability of rainfall across SD1's system.



Model	Areal Reduction	Area (square miles)
Bromley	0.93	40.0
Dry Creek	0.91	73.4
Eastern Regional	0.97	7.0
Taylorsport	0.96	14.0
Western Regional	0.93	40.5

Revising Future Growth Projections



Summary of Key Assumptions

Net effect is that future condition flows will decrease relative to original WP

Metric	Original WP	Recommendation for Updated Plan	Impact on System-Wide New Development Flows
2040 Population	468,200 (original WP) 466,078 (OKI 2008)	433,234	Reduction
Taps/Year	1,830	1,200	
Residential DWF	270 gpd/home	200 gpd/home	Reduction
Residential area	17,179 acres	15,416 acres	
Non-residential DWF	500 gpd/acre	400 gpd/acre	Increase
Non-residential area	4,840 acres	6,273 acres	
Combined System	10 acres/year, <i>uncontrolled</i> runoff	10 acres/year, <i>controlled</i> runoff	Reduction

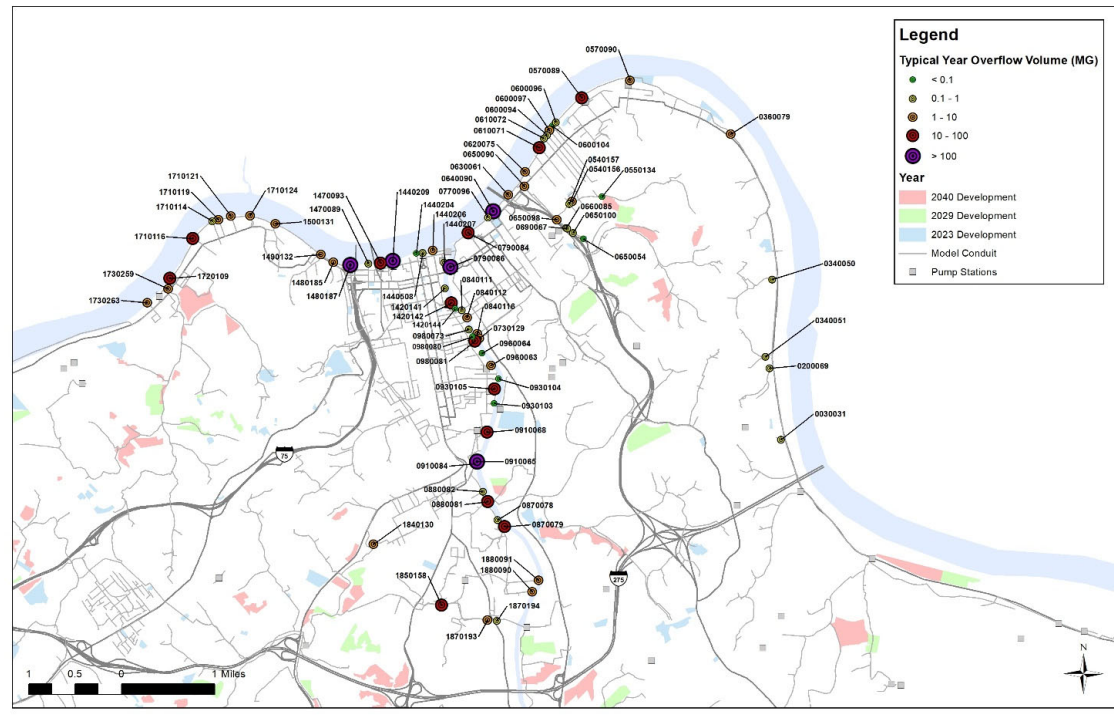
Revised CSO Plan



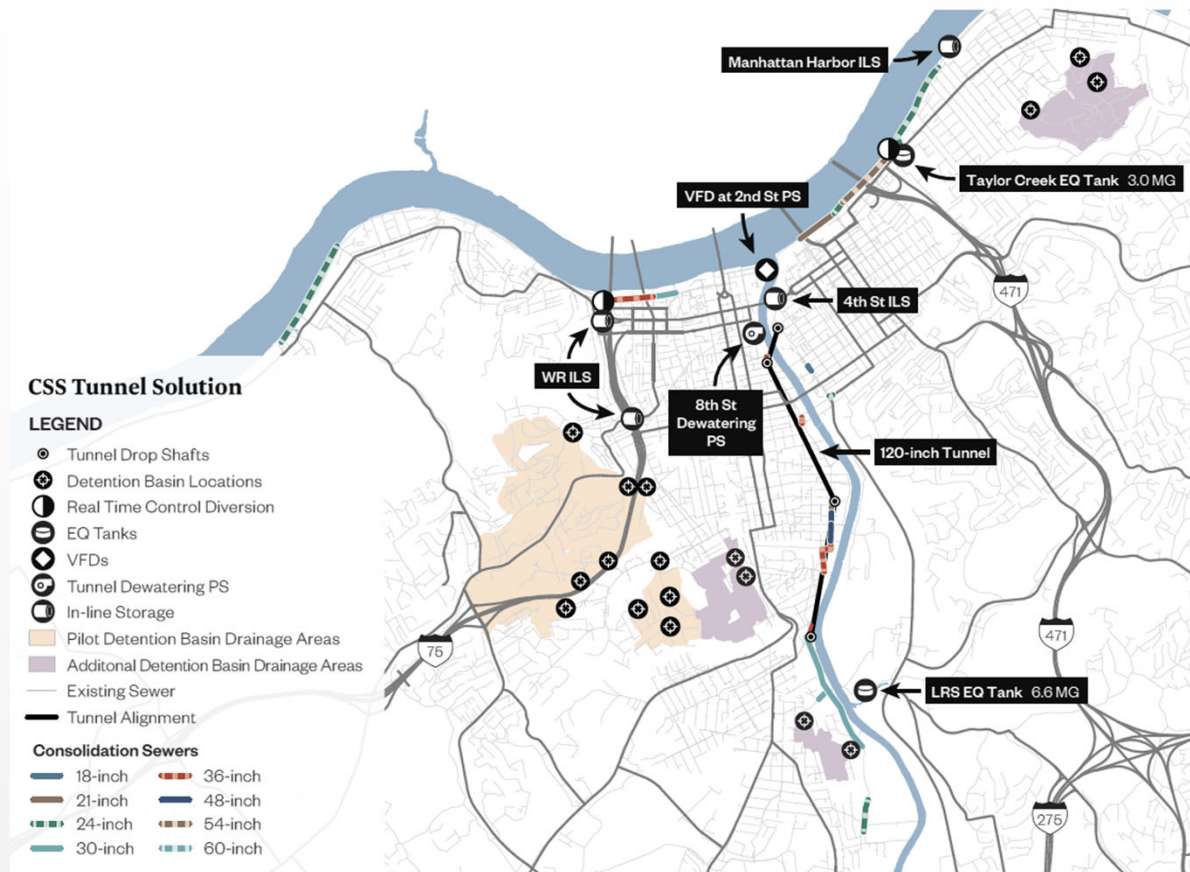
The Problem

- Achieve percent capture milestone reductions in CD.
- Achieve CSO activation waterbody reductions by 2040.
- 2040 CSO volume (no improvements) = 1,556 MG
- Each percent capture represents ~50 MG CSO reduction.
- Need to reduce CSO volume by ~1,000 MG by 2040.

Milestone Date	Typical Year CSO Percent Capture
July 1, 2023	67%
January 1, 2029	75%
July 1, 2034	80%
January 1, 2040	85%



The Solution



How do we prioritize these projects to achieve interim percent capture milestones while maximizing benefit?



2023 Plan

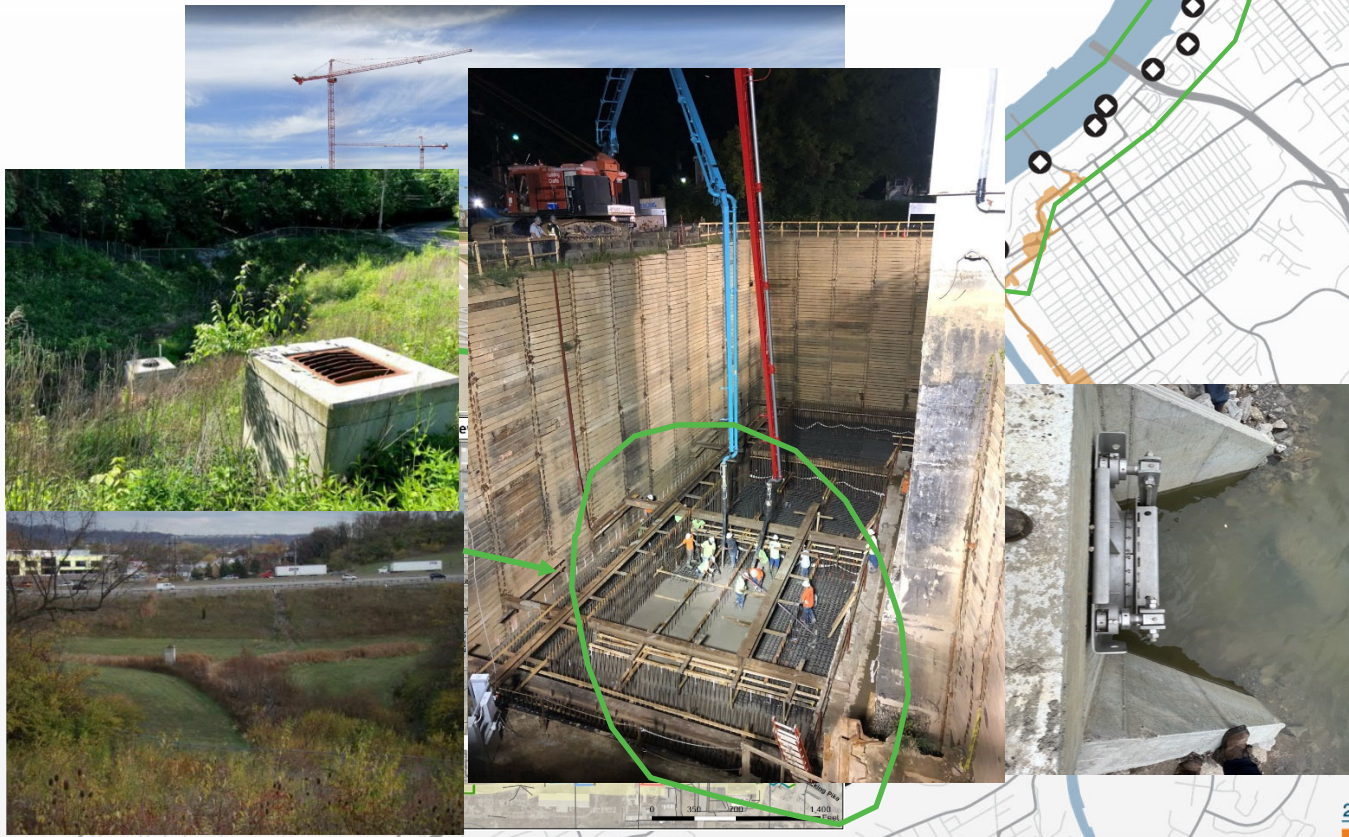


Legend

- Waters Edge
- Aqua on the Levee
- Washington / Saratoga
- Church St Phase 2
- Jacob Price Phase 2
- River Center Covington
- ◊ Diversions Protected up to 47'
- ◉ EQ Tank



2029 Plan



Legend

- SR9
- Detention Basin
- Diversions Protected up to 47'
- Upgraded PS

2034 Plan

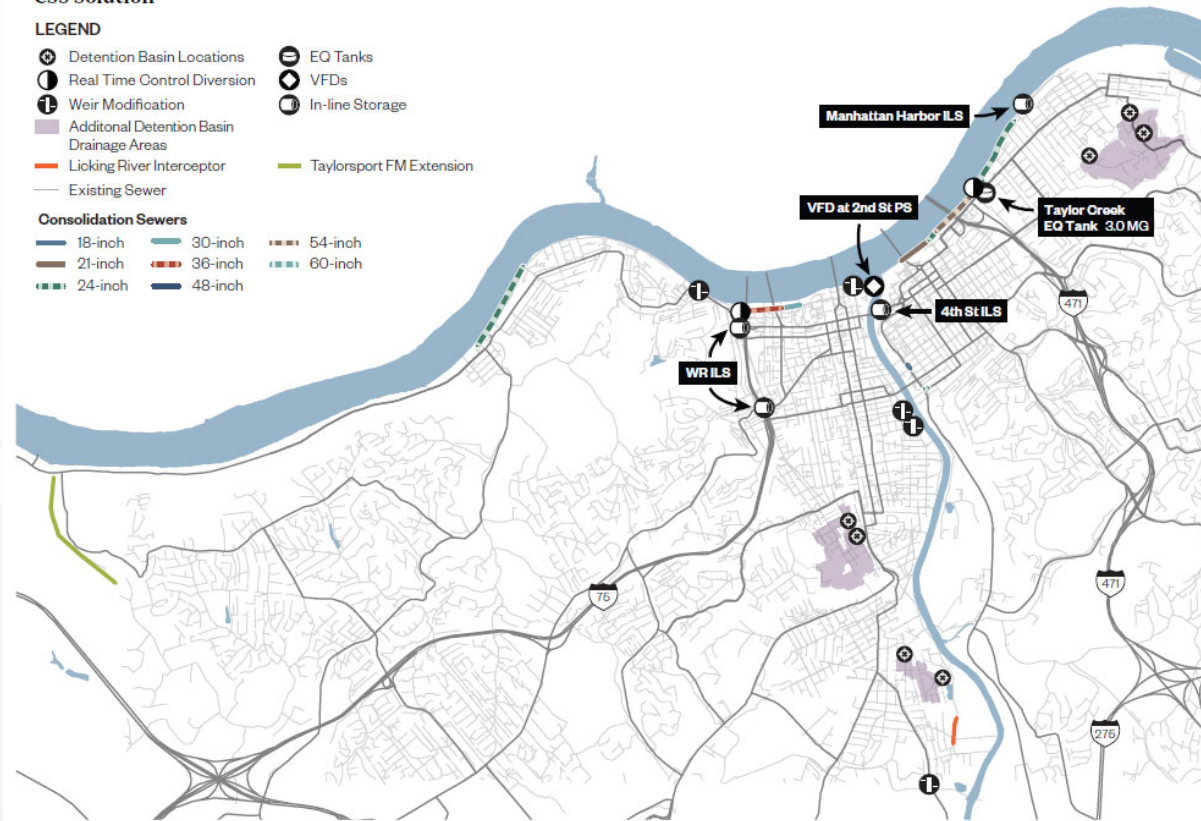
CSS Solution

LEGEND

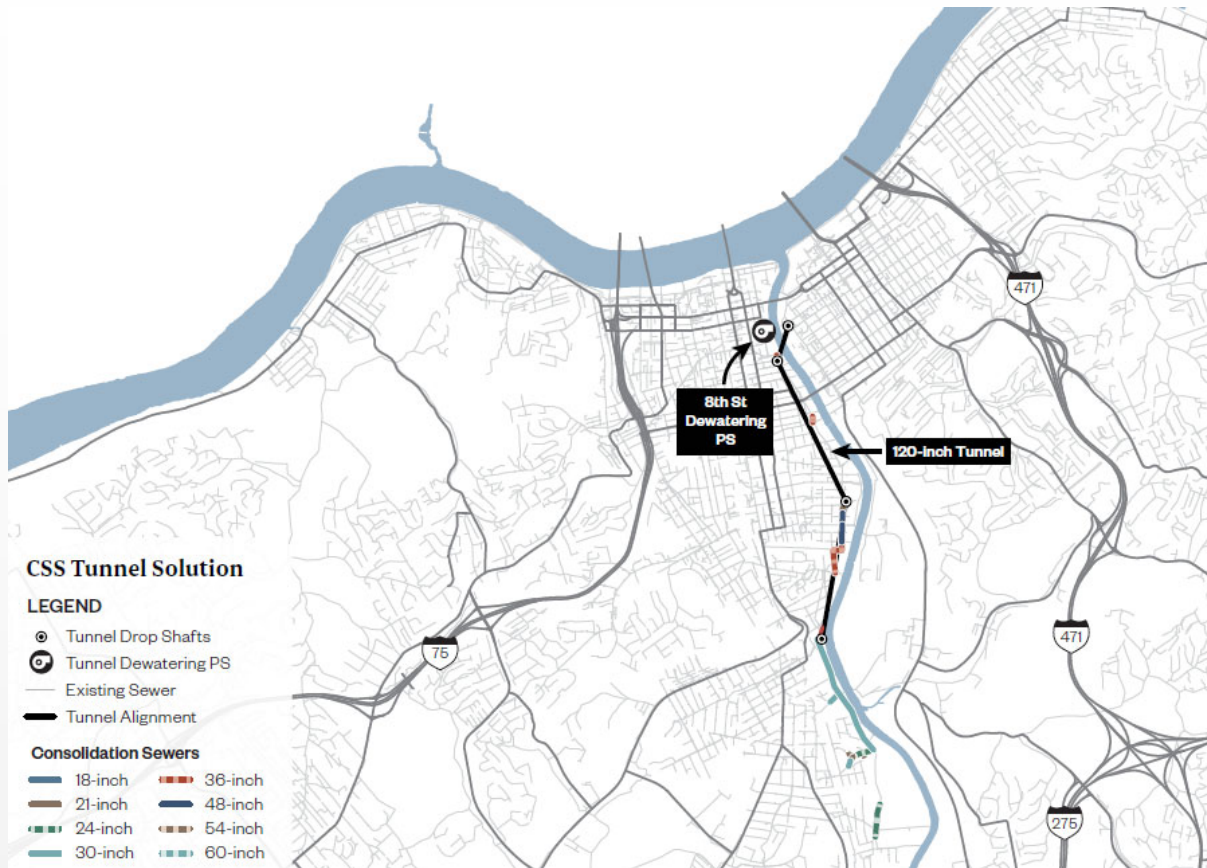
- Detention Basin Locations
- Real Time Control Diversion
- Weir Modification
- Additional Detention Basin Drainage Areas
- Licking River Interceptor
- Existing Sewer
- EQ Tanks
- VFDs
- In-line Storage
- Taylorsport FM Extension

Consolidation Sewers

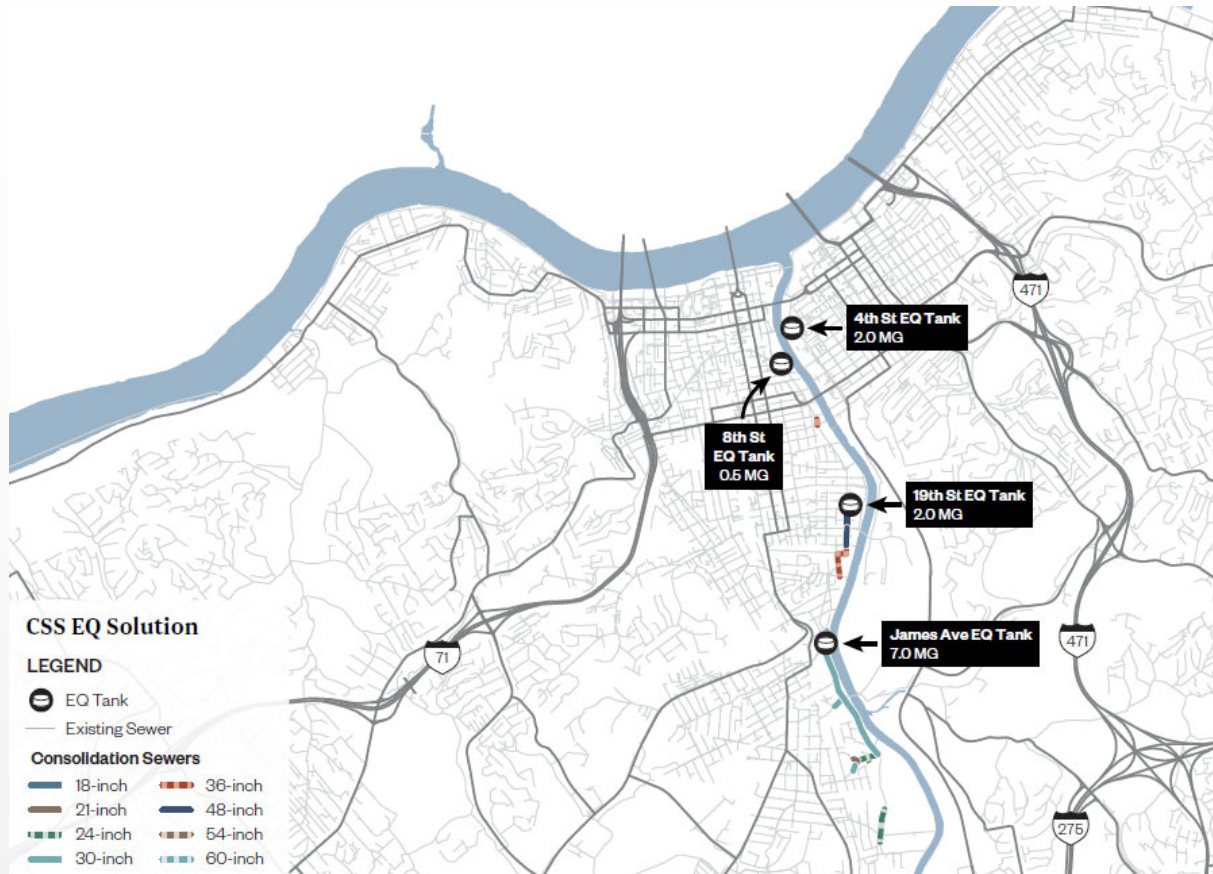
- 18-inch
- 21-inch
- 24-inch
- 30-inch
- 36-inch
- 48-inch
- 54-inch
- 60-inch



2040 Plan - Licking River Tunnel



2040 Plan - Licking River EQ



CSO Plan Summary

Milestone	Project	Remaining CSO Volume (MG)	Required Percent Capture	Achieved Percent Capture
2023	RWI Mitigation Phases I & II	1,475	67%	68.6%
	Targeted Sewer Separation			
	Ash St EQ (completion 12/1/21)			
2029	Bromley PS Short-Term Improvements	1,177	75%	75.3%
	RWI Mitigation Phase III			
	Willow Run Detention Basin Pilot Project			
	SR9 Sewer Separation			
2034	All CSS Components Except Licking River Solution	932	80%	80.6%
2040	CSO Licking River Tunnel	627	85%	86.9%
	CSO Licking River EQ Tanks	652	85%	86.4%



Cost Summary

Categories of Projects	Licking River Tunnel Alternative		Licking River EQ Alternative	
	Construction Cost (2019 \$M)	Capital Cost (2019 \$M)	Construction Cost (2019 \$M)	Capital Cost (2019 \$M)
2023 CSO Projects	\$8.4	\$13.0	\$8.4	\$13.0
2029 CSO Projects	\$6.3	\$9.8	\$6.3	\$9.8
2034/2040 CSO Projects	\$167.4	\$261.6	\$151.0	\$237.3
CSO Project Total	\$182.1	\$284.4	\$165.6	\$260.1

CSO Solution	Total Capital Cost (2019 \$M)
UWSP Licking River Tunnel	\$284
UWSP Licking River EQ	\$260
IWSP	\$634



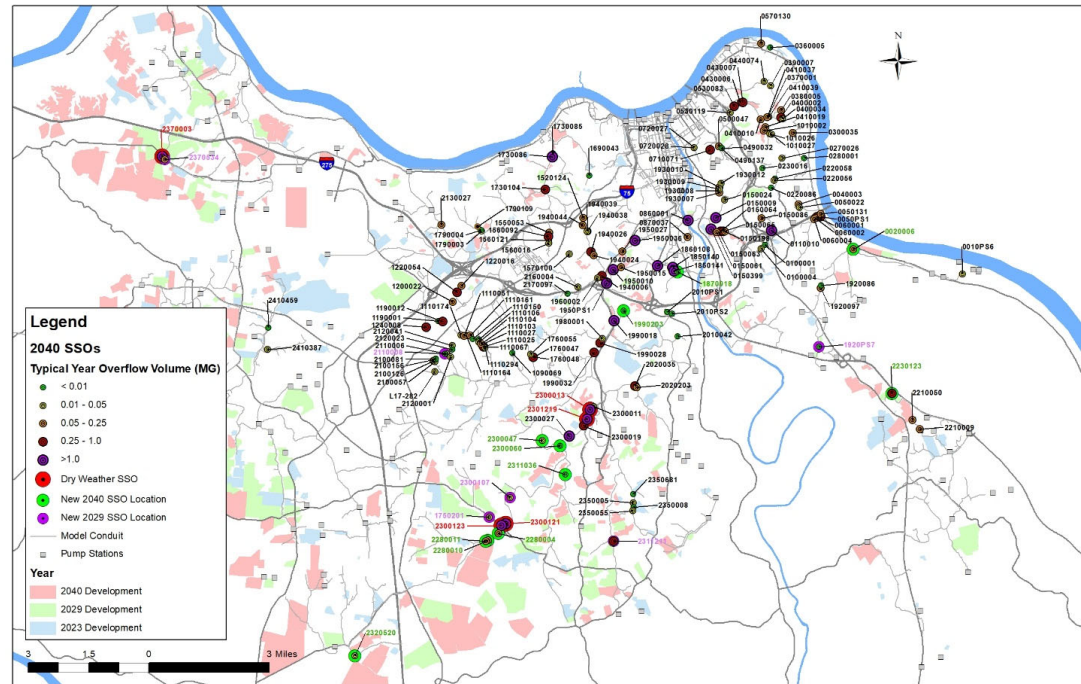
Revised SSO Plan



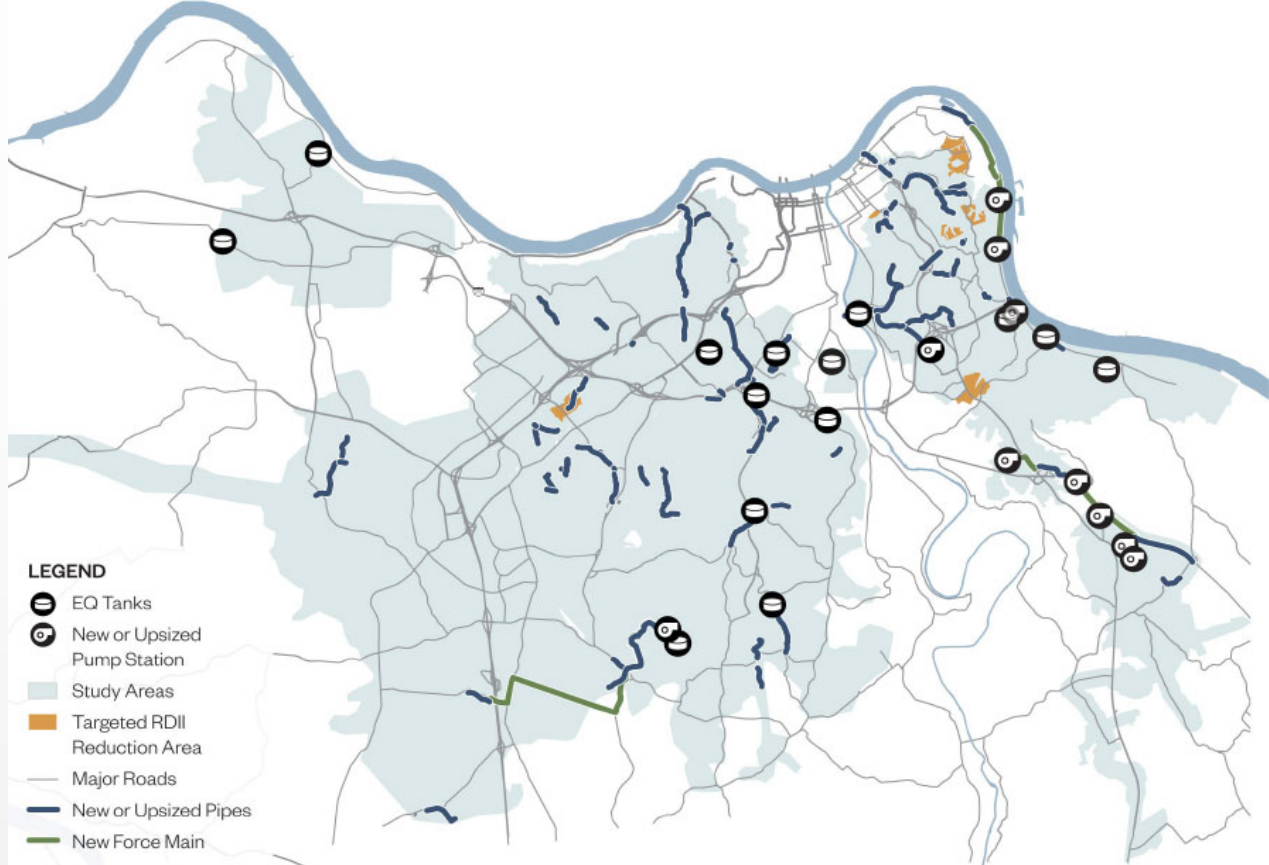
The Problem

- Achieve SSO volume reduction milestones in CD.
- Eliminate all SSOs in typical year by 2040.
- 2040 SSO volume (no improvements) = 242 MG
- 5 Dry Weather SSOs

Milestone Date	Typical Year SSO Percentage of Baseline Volume Remaining
July 1, 2023	80%
January 1, 2029	25%
July 1, 2034	10%
January 1, 2040	0%



The Solution






How do we prioritize these projects to achieve interim SSO volume reduction milestones while maximizing benefit?



2023 Plan







Legend

-  EQ Tank
-  Existing Pump Station
-  12-inch Double Siphon

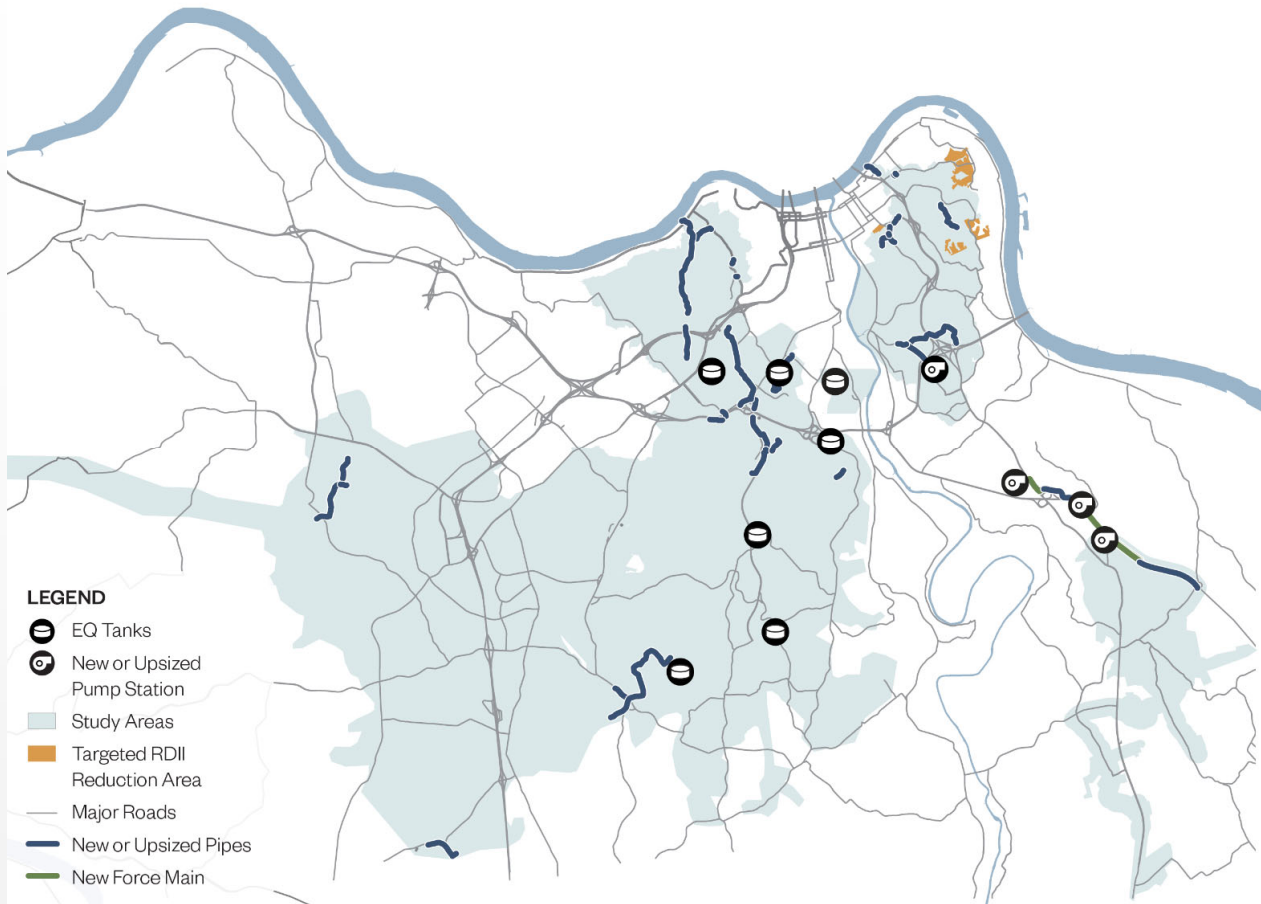
2029 Plan



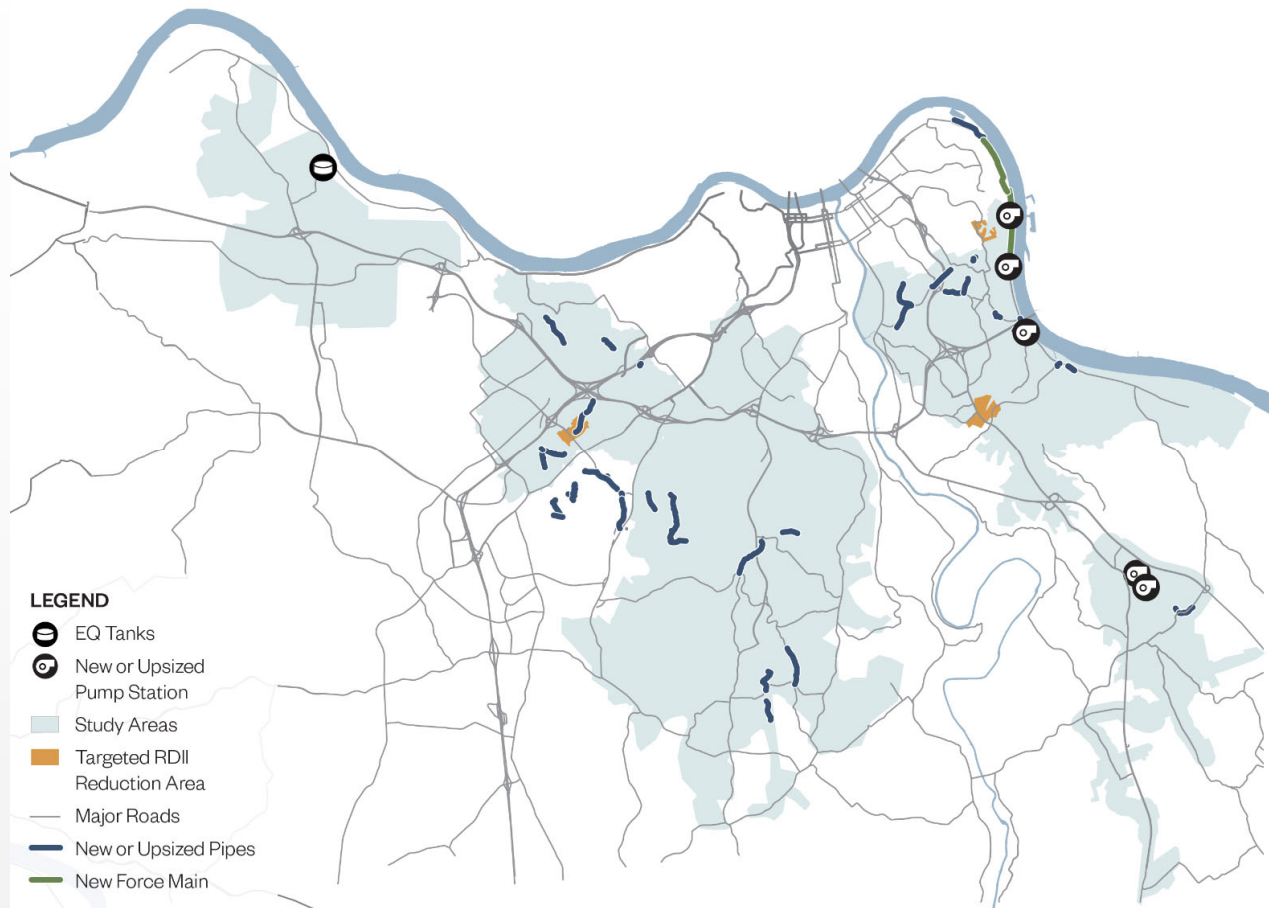
Legend

-  EQ Tank
-  Pump Station
-  Proposed Sewer
-  W6 Force Main

2034 Plan



2040 Plan



SSO Plan Summary

Milestone	Project	Remaining SSO Volume (MG)	Required Percentage of Baseline SSO Volume Remaining	Achieved Percentage of Baseline SSO Volume Remaining
2023	SG/HH EQ (completion 12/1/21)	48.8	80%	42.4%
	LRS Double Siphon			
2029	LRS EQ	28.6	25%	24.8%
	LRS Conveyance Piping			
	W6 PS			
	Lakeview EQ			
	Bullittsville PS Improvements			
	Waterworks Rd. Conveyance (PH I & II)			
	BCS Conveyance			
2034	2034 SSO Projects	9.3	10%	8.1%
2040	2040 SSO Projects	0	0%	0%



Cost Summary

Categories of Projects	Construction Cost (2019 \$M)	Capital Cost (2019 \$M)
2023 SSO Projects	\$10.3	\$16.2
2029 SSO Projects	\$66.9	\$104.7
2034/2040 SSO Projects	\$175.4	\$274.1
SSO Project Total	\$252.6	\$395.0

SSO Solution	Total Capital Cost (2019 \$M)
UWSP	\$395
IWSP	\$1,184

Current Implementation Status

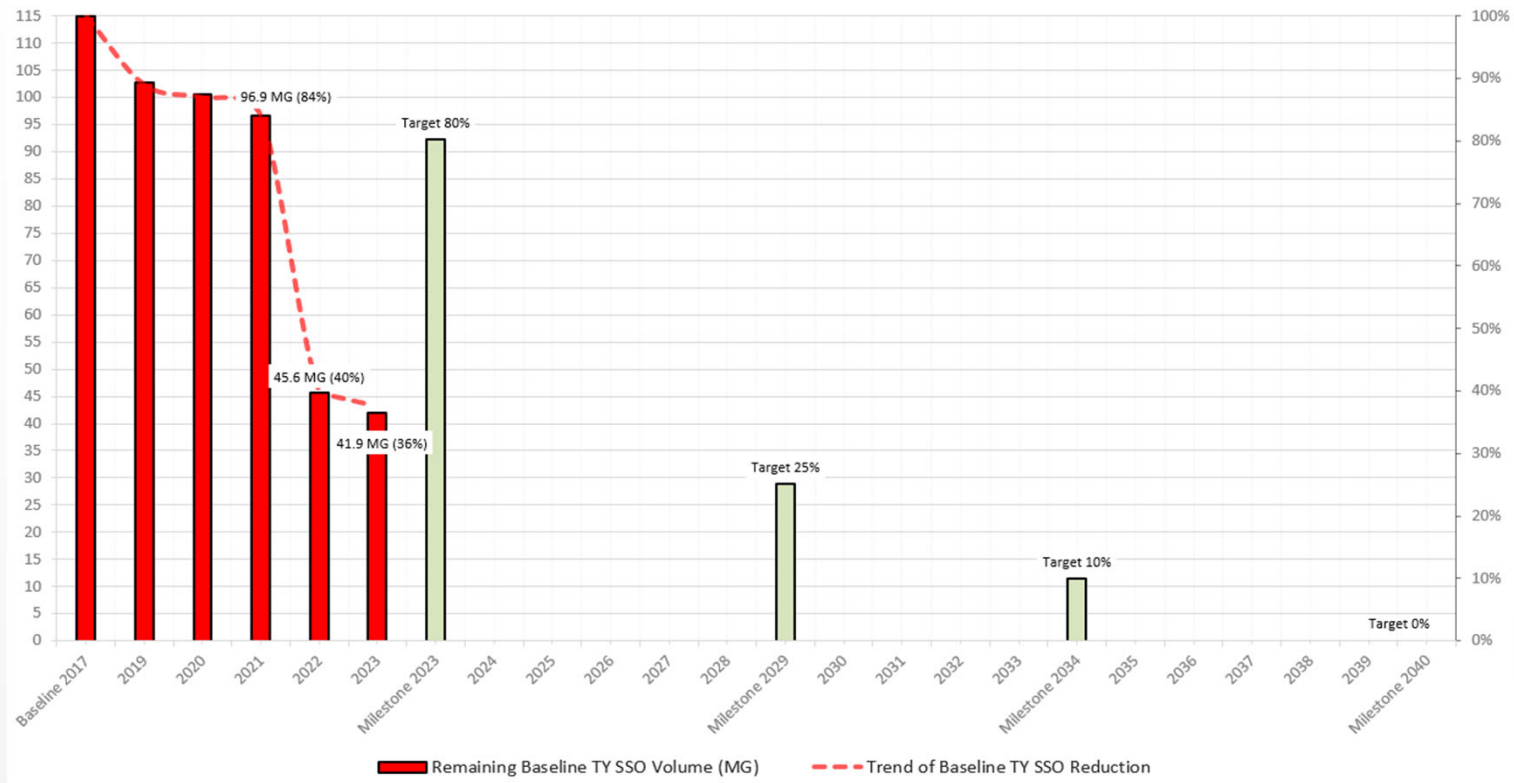


SSO Project Status

Milestone	Project	Current Status
2023	SG/HH EQ (completion 12/1/21)	Complete
	LRS Double Siphon	Complete
2029	LRS EQ	Complete
	LRS Conveyance Piping	Construction
	W6 PS	Design
	Lakeview EQ	Design
	Bullitsville PS Improvements	Design
	Waterworks Rd. Conveyance PH I	Design
	Waterworks Rd. Conveyance PH II	Complete
	BCS Conveyance	Complete



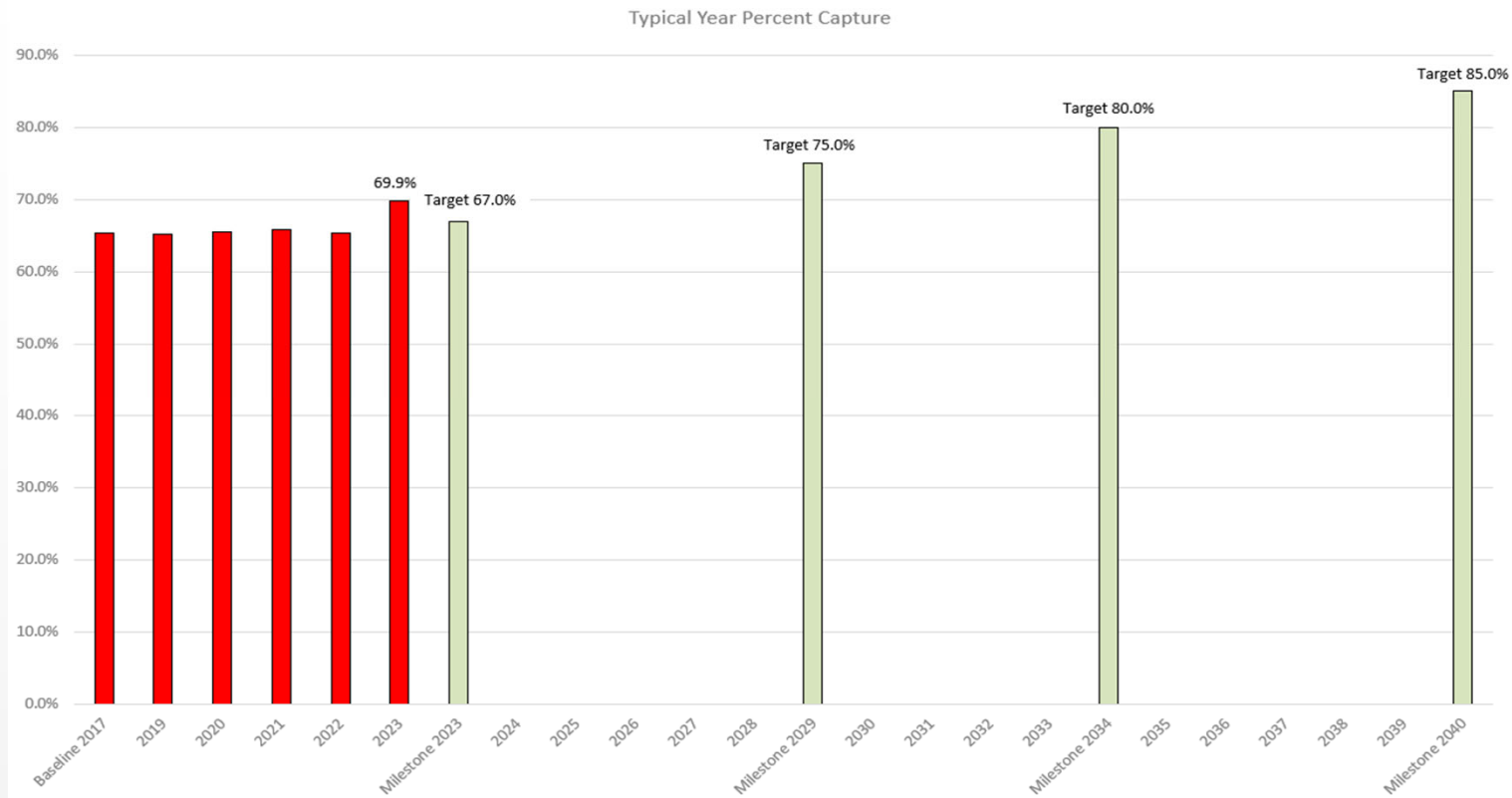
SSO Remaining Volume



CSO Project Status

Milestone	Project	Current Status
2023	RWI Mitigation Phases I & II	Complete
	Targeted Sewer Separation	Complete
	Ash St EQ (completion 12/1/21)	Complete
2029	Bromley PS Short-Term Improvements	Construction
	RWI Mitigation Phase III	Complete
	Willow Run Detention Basin Pilot Project	Design
	SR9 Sewer Separation	Construction

CSO Percent Capture



Conclusions



Conclusions

- UWSP represents an improvement over the IWSP in two key ways:
 - Affordable Plan
 - Attainable Schedule
- UWSP achieves these important objectives:
 - Protection of public health
 - Protection of environment
 - Supports economic growth
 - Incorporates innovative strategies
 - Maximizes utilization of existing assets
 - Prioritizes projects that achieve multiple objectives
- UWSP will be revisited in ~7 years to further refine projects in last 10 years.

