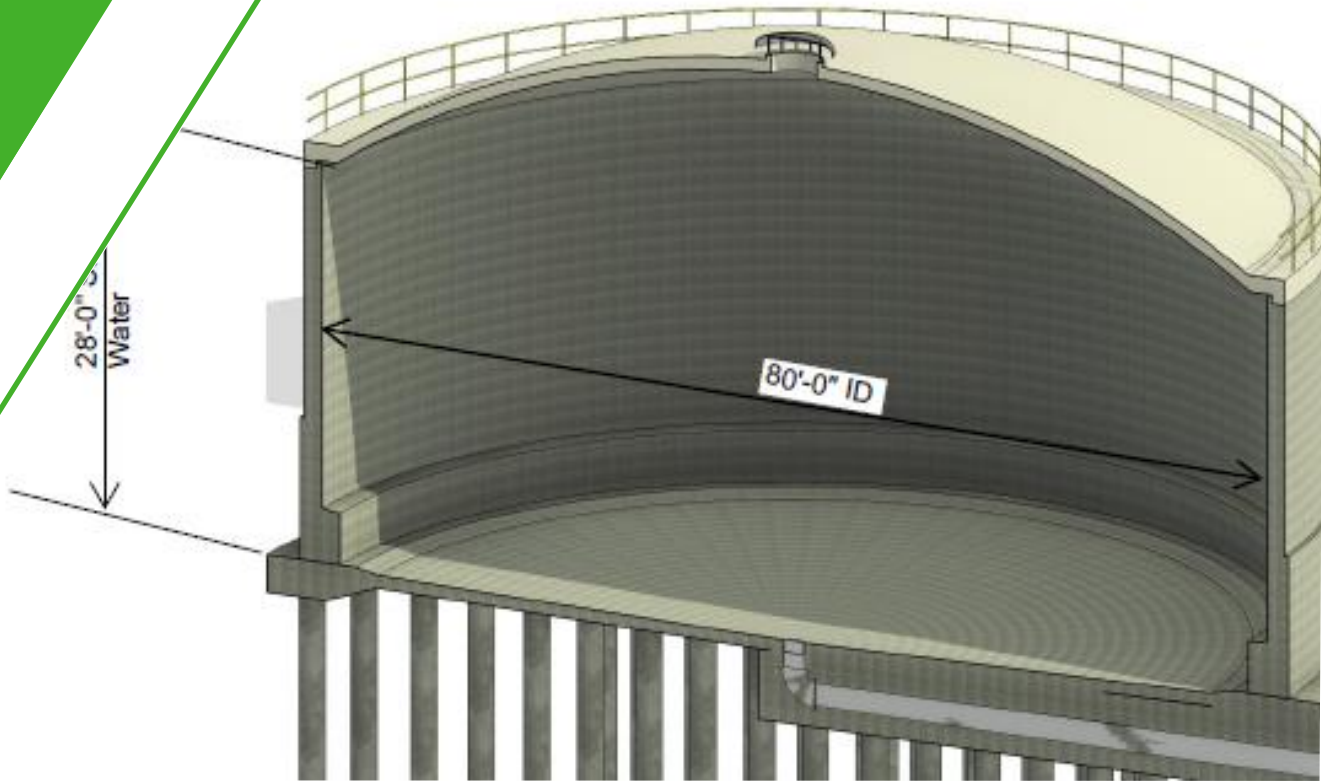
St. Joseph
CSO Compliance Program
Public Meeting

June 28, 2023



St. Joseph CSO Compliance Program - Agenda

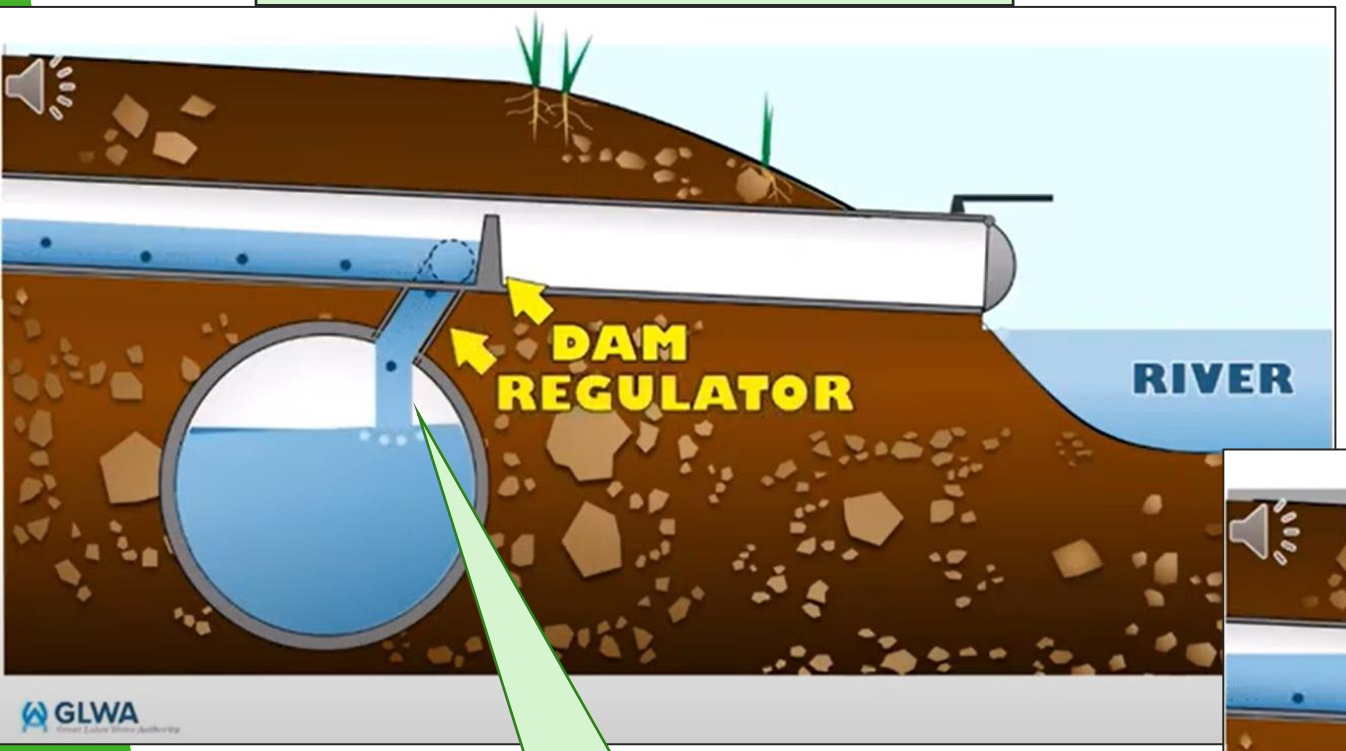
1. System Overview
2. What is a Combined Sewer Overflow (CSO)
3. Why do we need to address CSO control at this time
4. Preliminary screening of storage options
5. Feasible options evaluated
6. Early action project
7. Overall project schedule
8. Project cost summary
9. Pursuing matching funding from the State of Michigan

St. Joseph Sewer System Overview

1. Collection system sewers
2. Combined sewer overflows (CSO)
3. Waste Water Treatment Plant (WWTP)

What is a Combined Sewer Overflow?

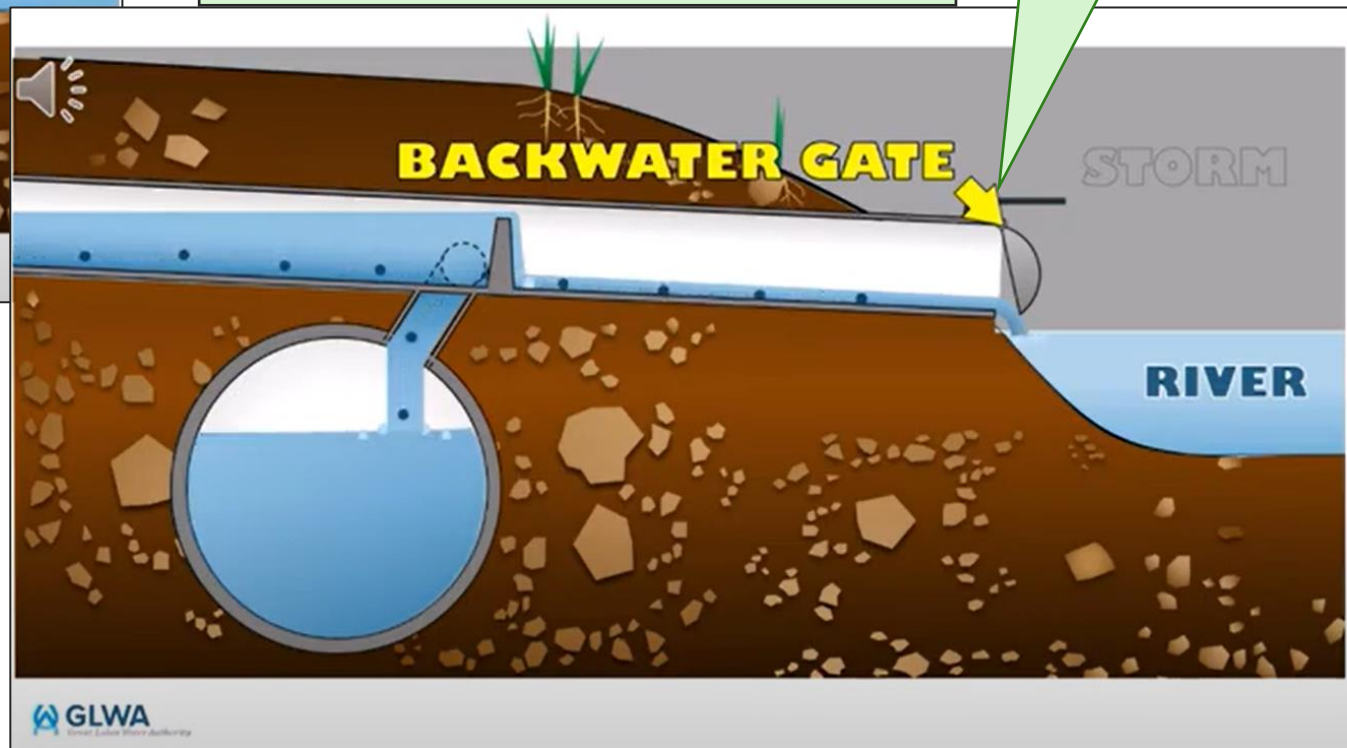
Dry Weather Flow Conditions



All Sanitary flow is Diverted to Interceptor

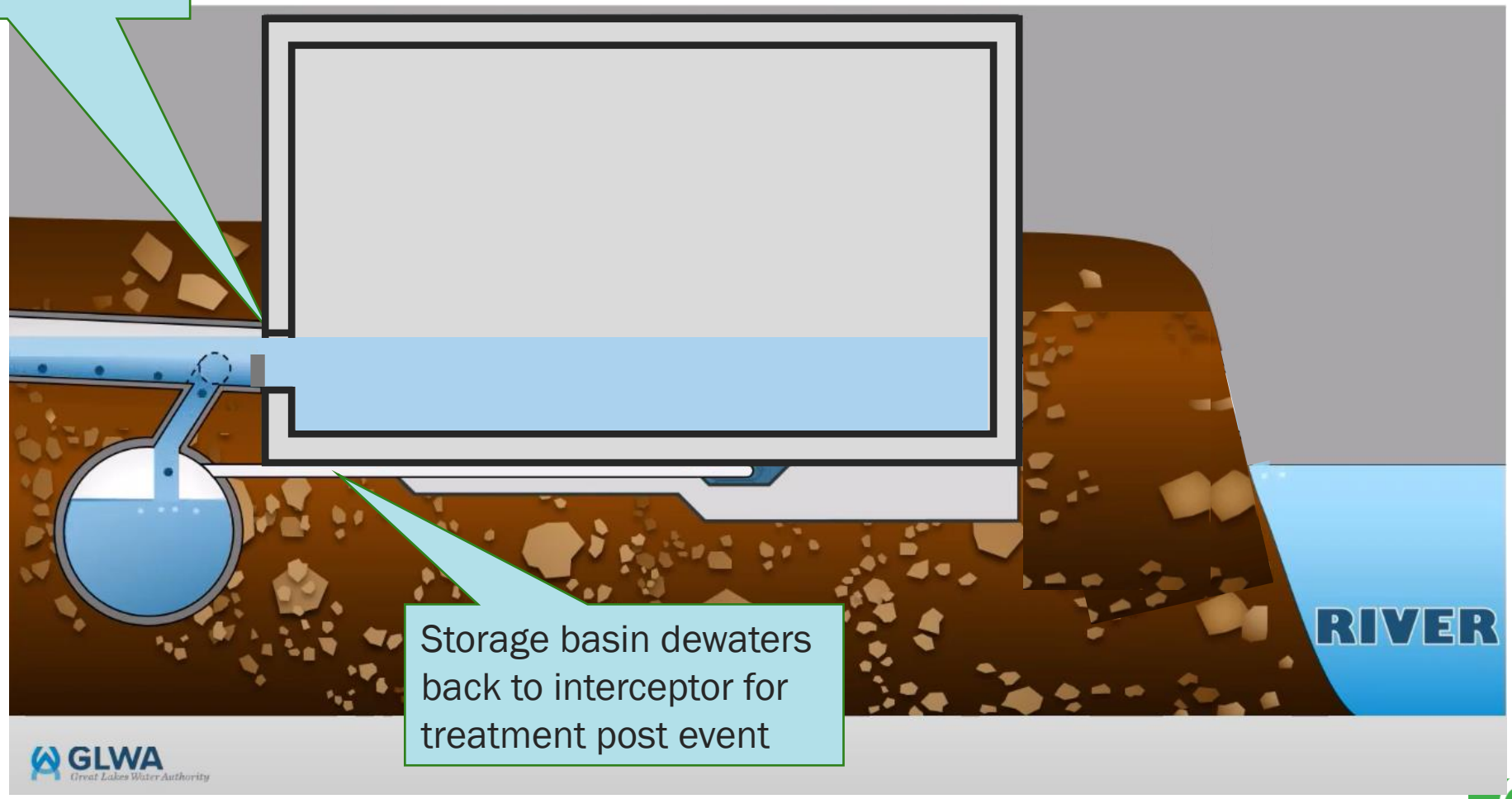
During wet weather, flow exceeds regulator capacity and a mix of sanitary and stormwater discharge to environment

Wet Weather Flow Conditions



Combined Sewer Overflow Control

Construction of Storage Basin



Why is CSO Control Being Addressed at this Time?

1. CSO control is mandated by the State of Michigan (EGLE)
2. St. Joseph has been working toward CSO control for over 20-years
   a. Improvements have included
      - Sewer separation of combined sewers areas
      - Sewer rehabilitation in areas with high infiltration and inflow
      - Implementation of flow and rainfall monitoring program
      - Development of a computer model of the system
   b. Final stage of CSO control is construction of a storage basin
      - Storage basin will intercept flow prior to discharge to river
      - Post event, captured flow will be dewatered back to the interceptor for treatment at the WWTP
      - Flow optimization toward the WWTP will be incorporated into design

Preliminary Review of Basin Storage Options

DPW Options

Above ground circular tank

Rectangular below grade tank

Kiwanis Park Options

Below grade deep shaft

Rectangular below grade tank

Below grade linear storage

Above ground circular tank

Rectangular tank partially buried in hillside

WADE TRIM

Preliminary Storage Basin Options – Below Grade Tank

Pros

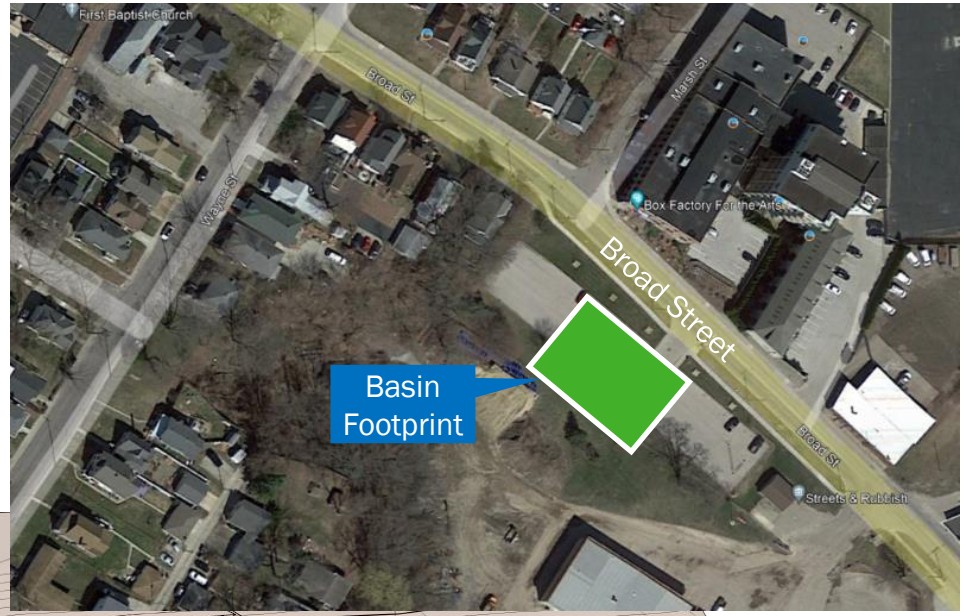
1. Less visual impact
2. Portion of footprint can be used for other activities
3. Gravity dewatering

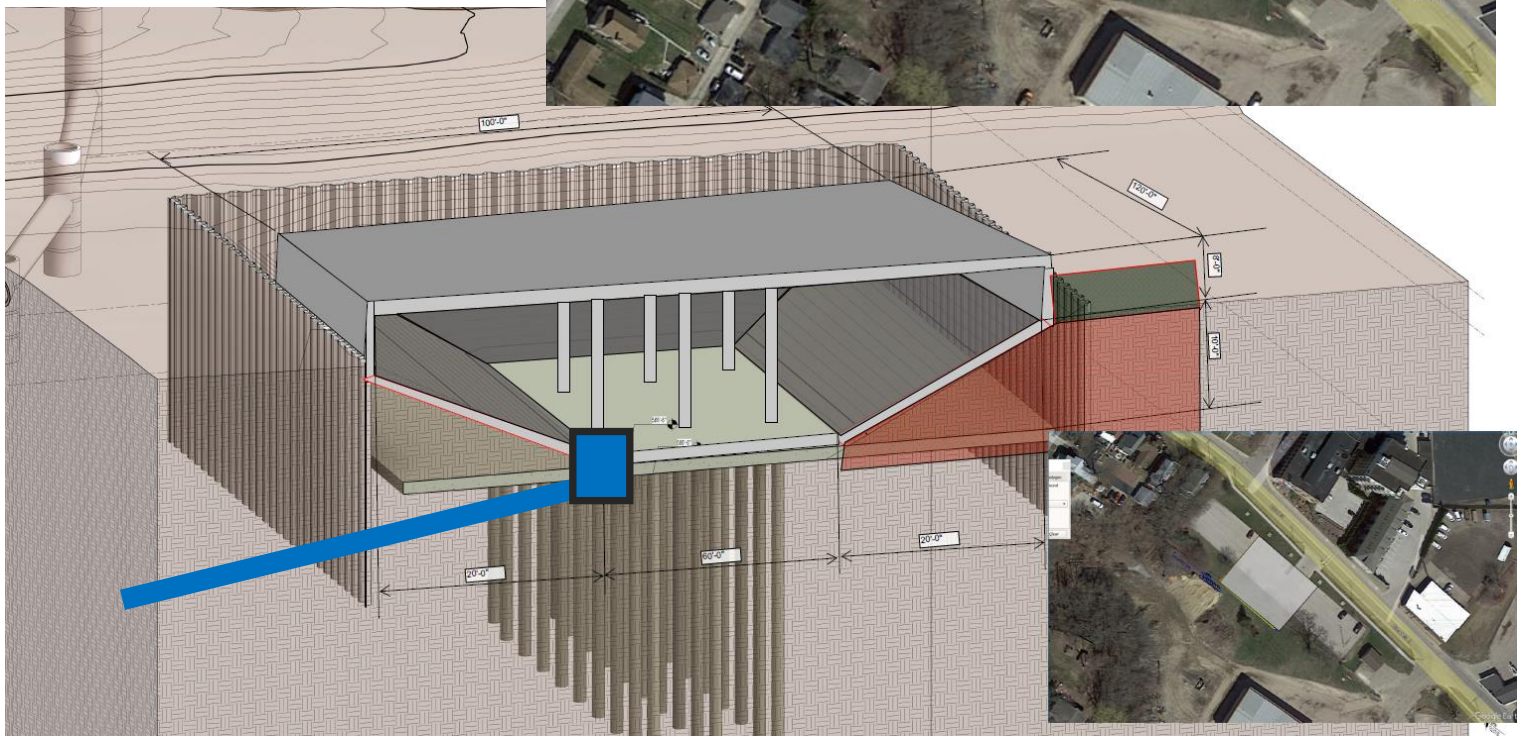
Cons

1. Higher construction cost

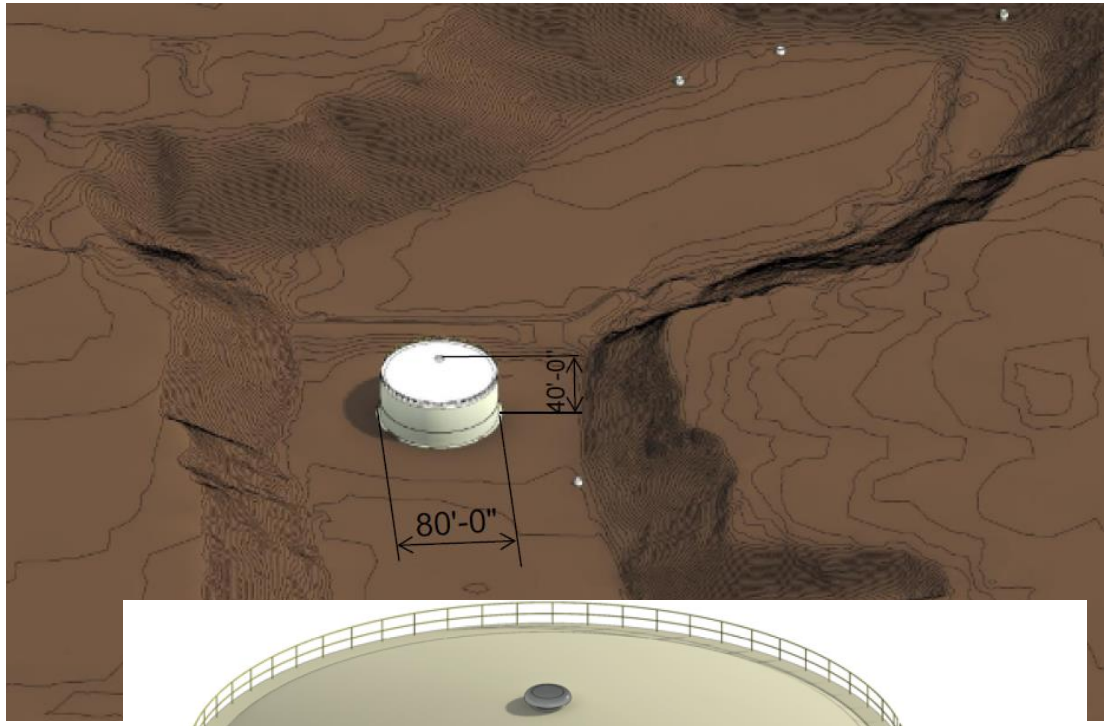
Outcome

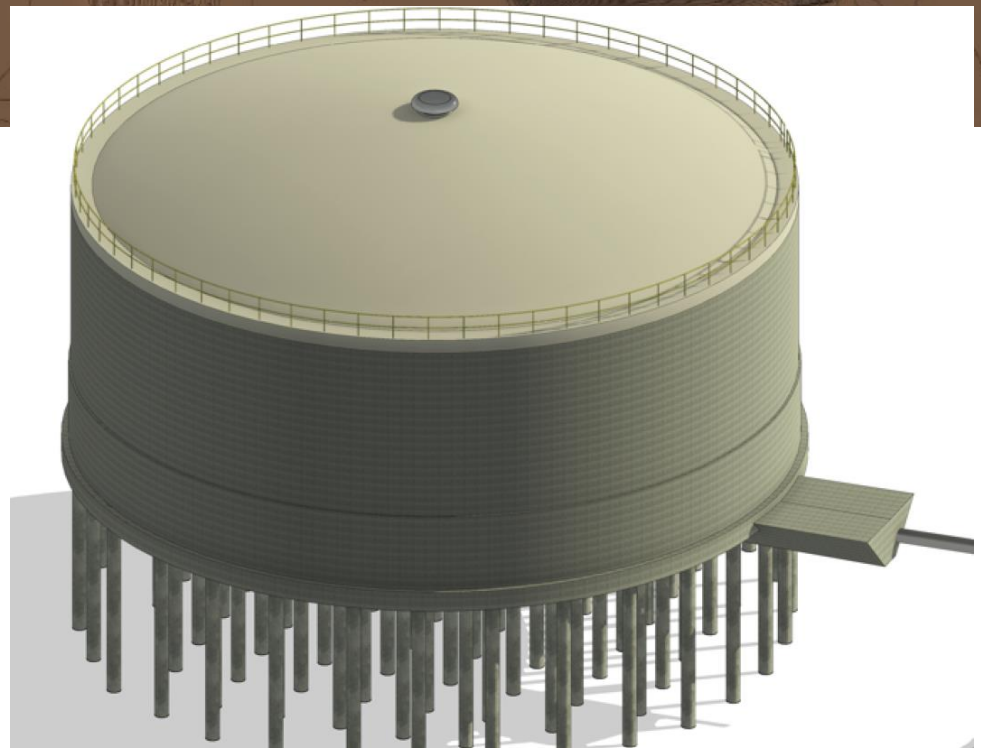
1. Option was carried forward for preliminary design





Preliminary Storage Basin Options Above Grade Circular Tank





Pros

1. Lower construction cost

Cons

1. More visible

Outcome

1. Option was carried forward for preliminary design

Preliminary Storage Basin Options – Deep Shaft

Pros

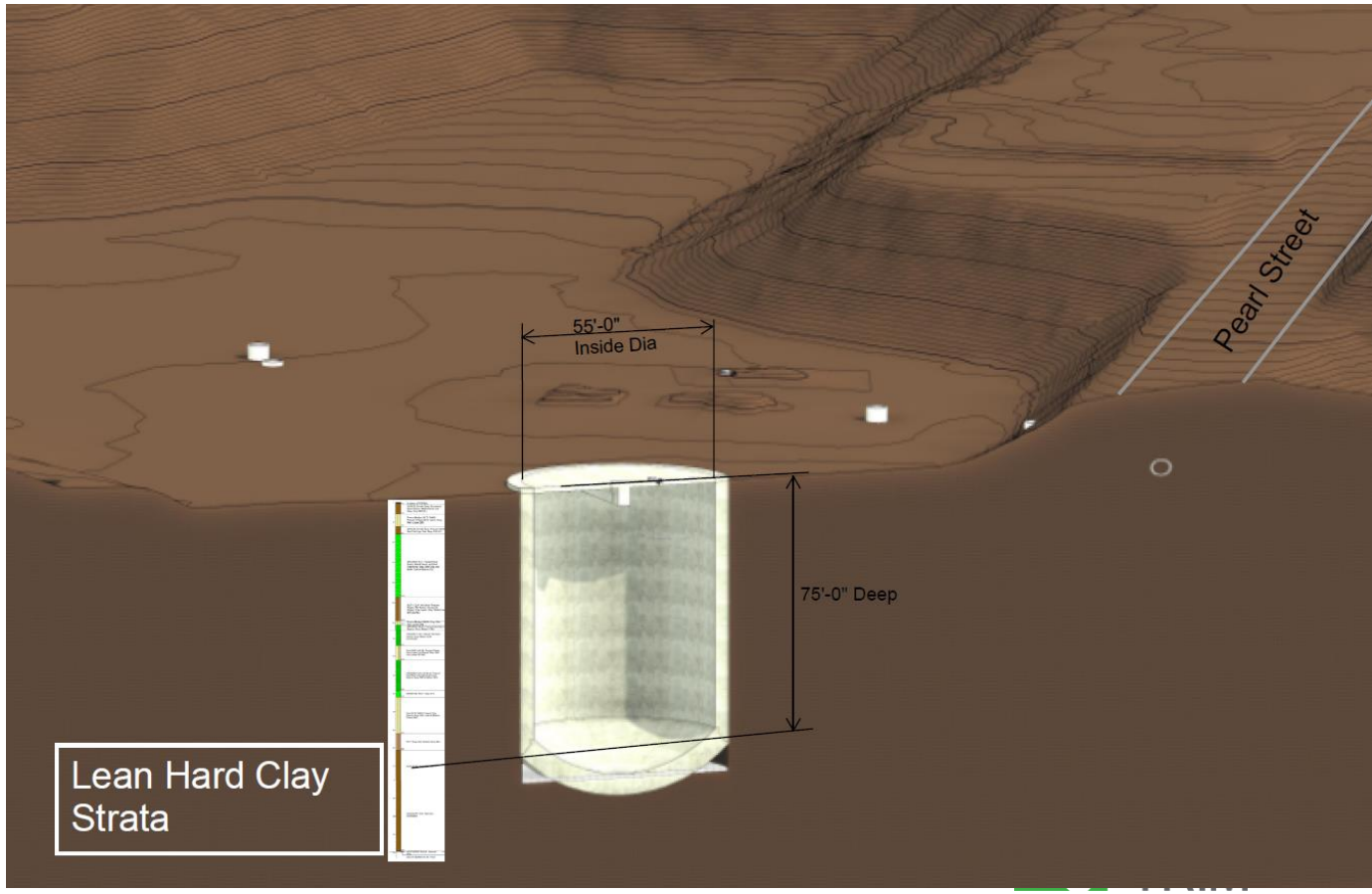
1. Small footprint
2. Less visual impact
3. Portion of footprint can be used for other activities

Cons

1. Higher construction cost
2. Riskier construction
3. Higher operating cost

Outcome

1. Option not carried forward



Preliminary Storage Basin Options – Linear Storage
(Large Storage Pipes)

Pros

1. Less visual impact
2. Portion of footprint can be used for other activities

Cons

1. Higher construction cost
2. Larger area of disruption during construction
3. More impact with local utilities

Outcome

1. Option not carried forward

Preliminary Storage Basin Options
Rectangular Tank in Hillside

Pros

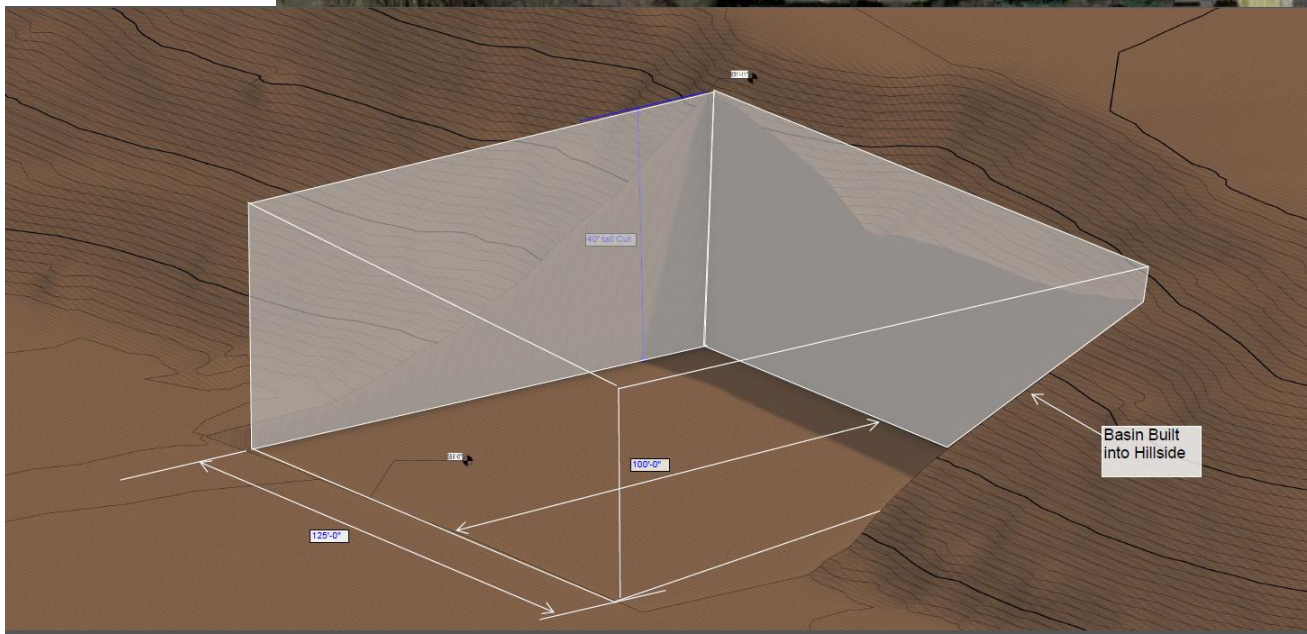
1. Reduced visual impact

Cons

1. Higher construction cost
2. Risky construction

Outcome

1. Option not carried forward



Evaluation of Feasible Options – Basin Siting

1. Preliminary screening of potential options identified the following storage options as a good fit for the St. Joseph system
    a. Below ground storage tank
    b. Above ground circular storage tank

2. Using these options, three site locations were identified
    a. DPW yard on Broad Street
    b. North end of Kiwanis Park
    c. South end of Kiwanis Park

Evaluation of Feasible Options – Basin Siting

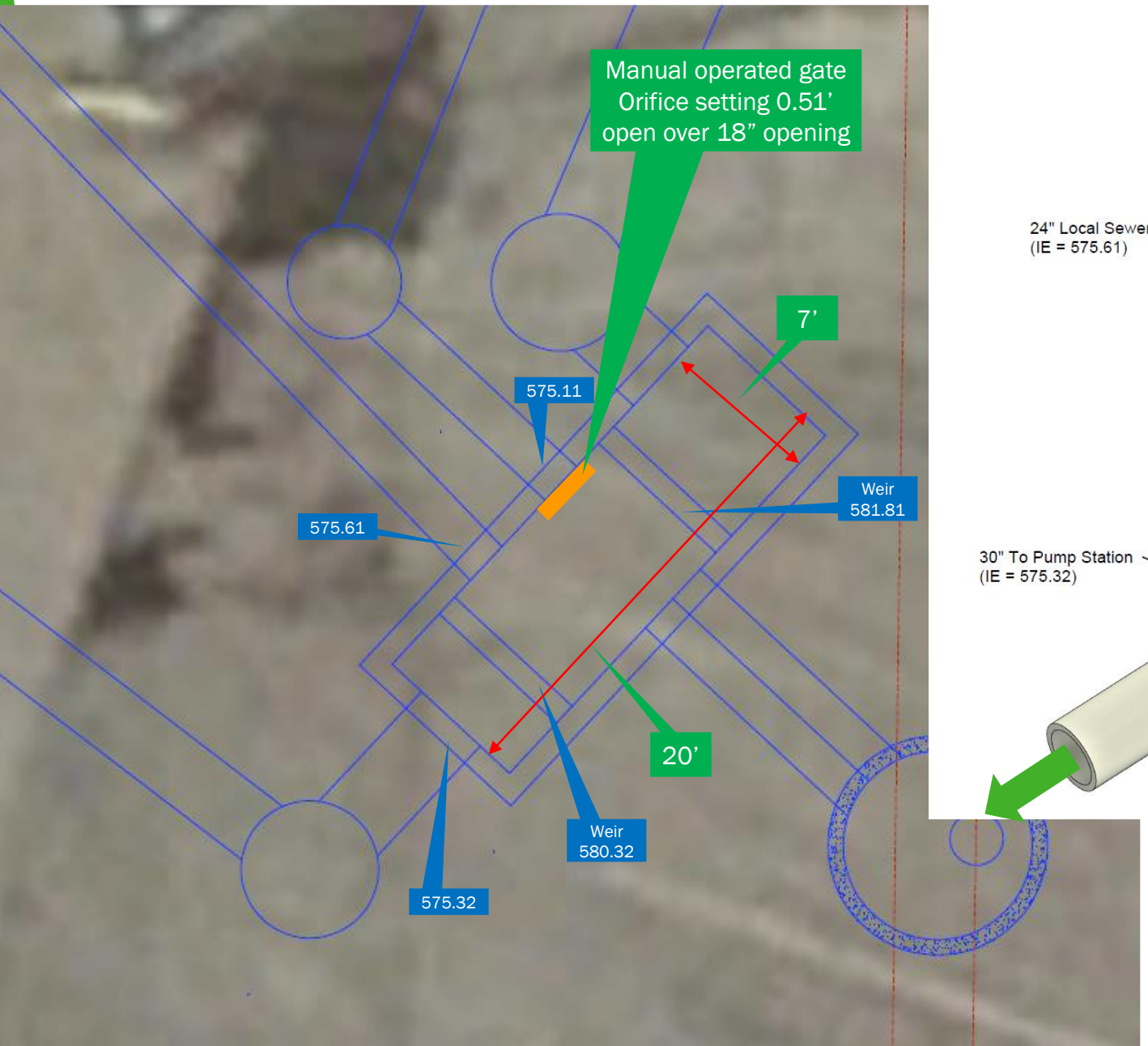
Diversion Chamber and Pump Station

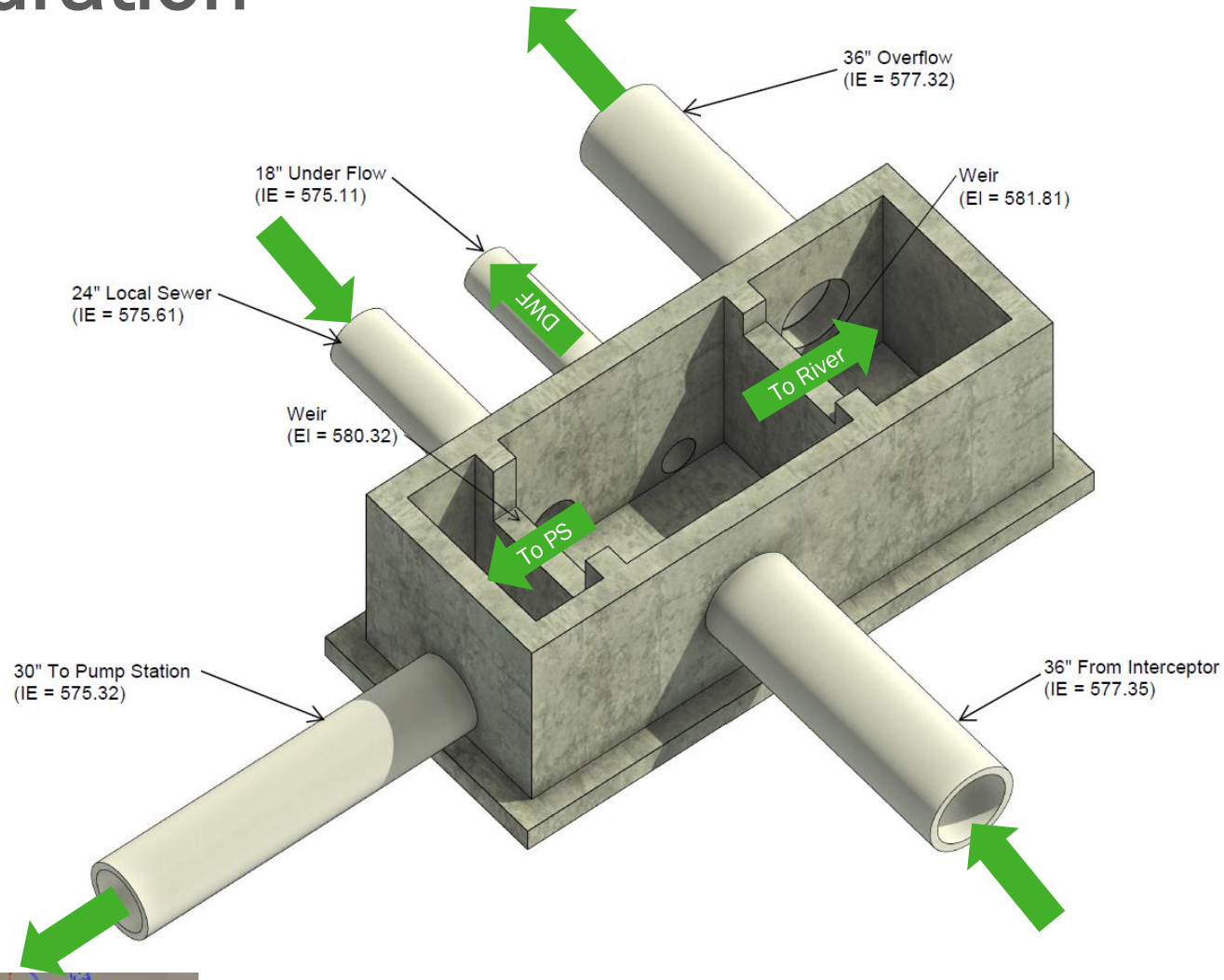
1. The optimal location for diversion to the basin storage is at the existing CSO-005 diversion chamber
2. This location intercepts all flow from the CSO-005 district and minimizes the size of the required storage basin
3. From this location, flow can be pumped to any of the storage site locations

Diversion Chamber and Pump Station Locations

- Pump station is located away from parking lot out of floodplain
- All infrastructure in parking lot can be flush with ground surface
- No interference with parking lot

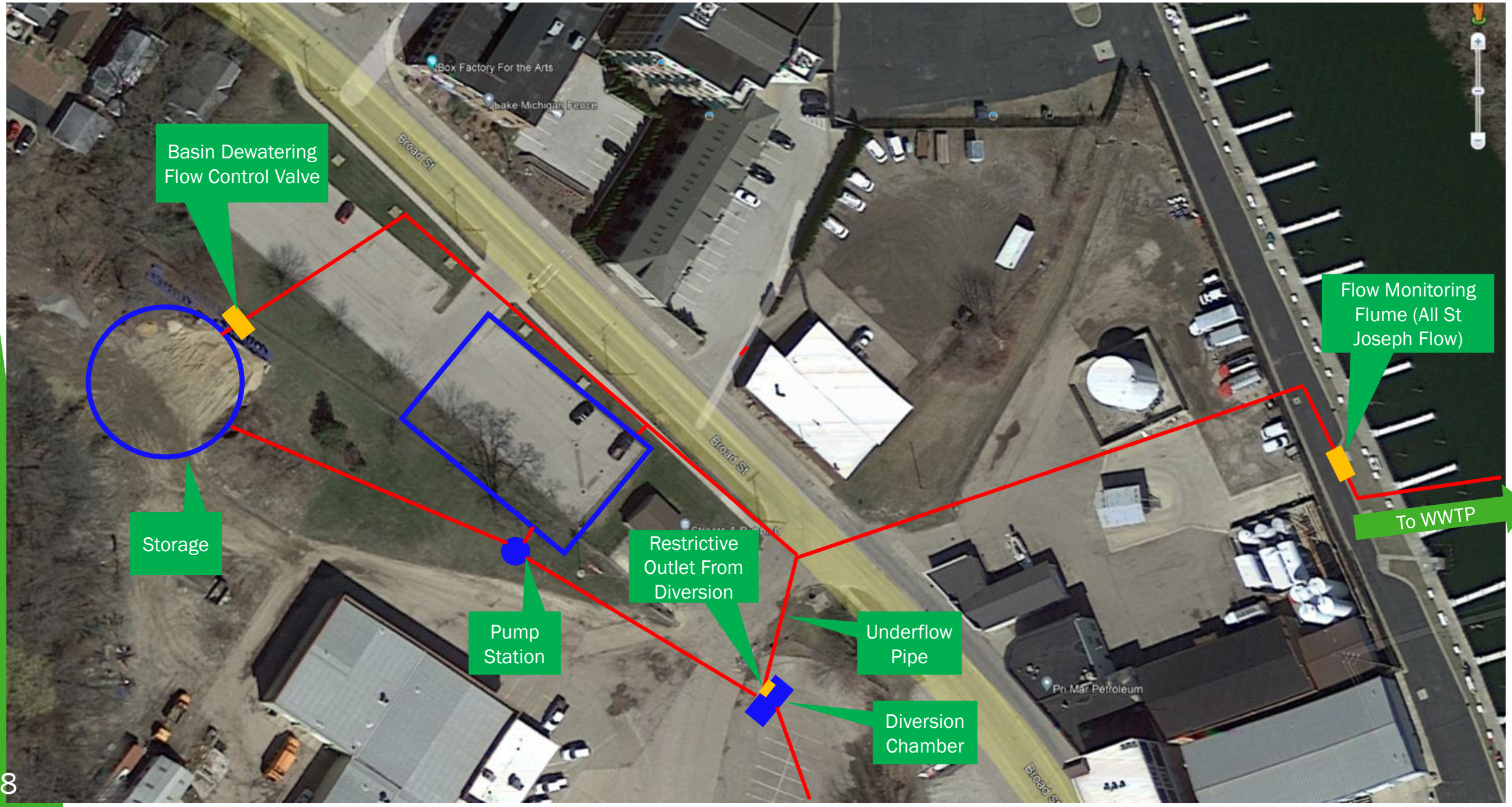
Diversion Chamber Configuration





WADE TRIM

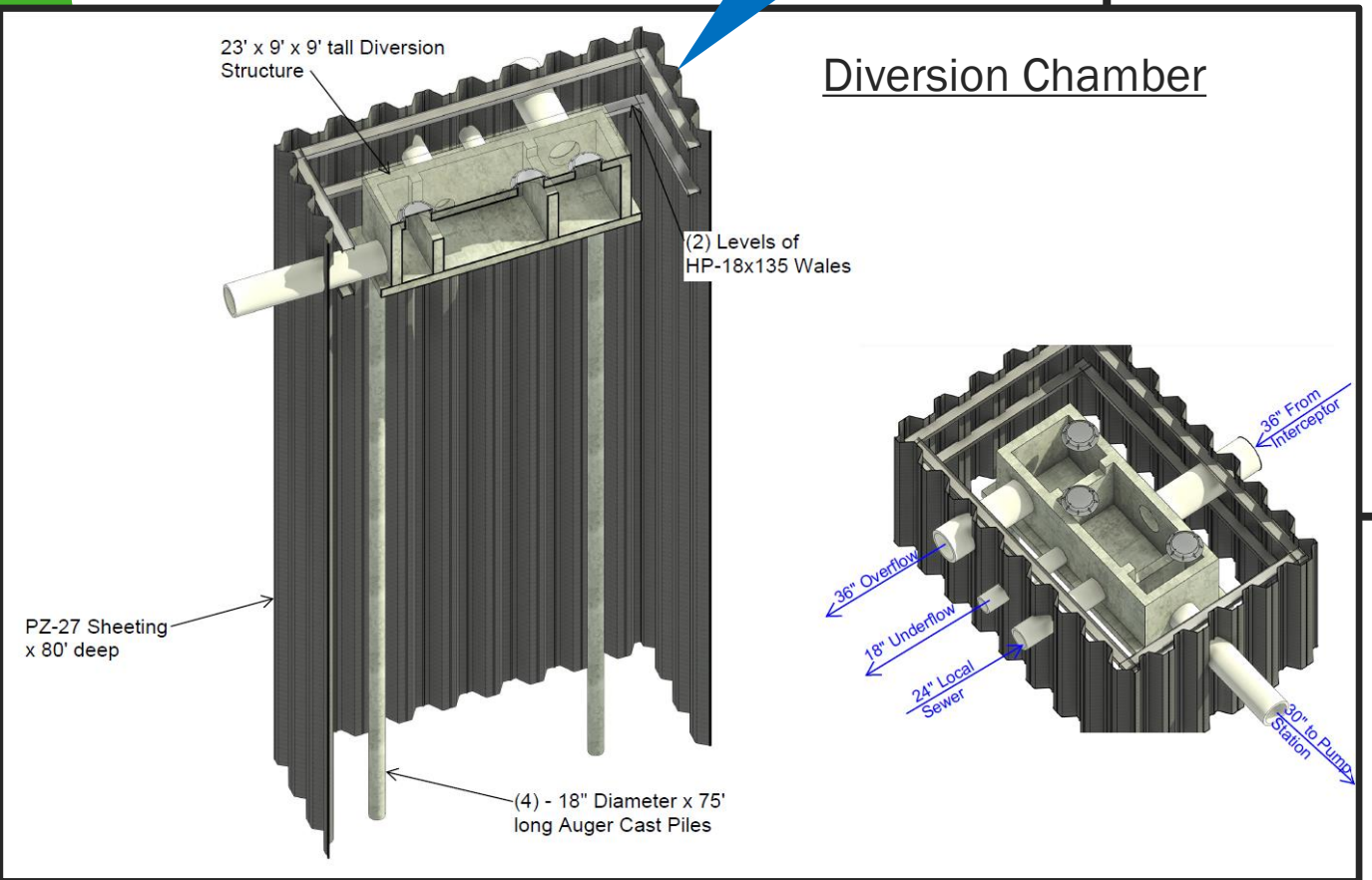
DPW Inlet and Outlet Sewers



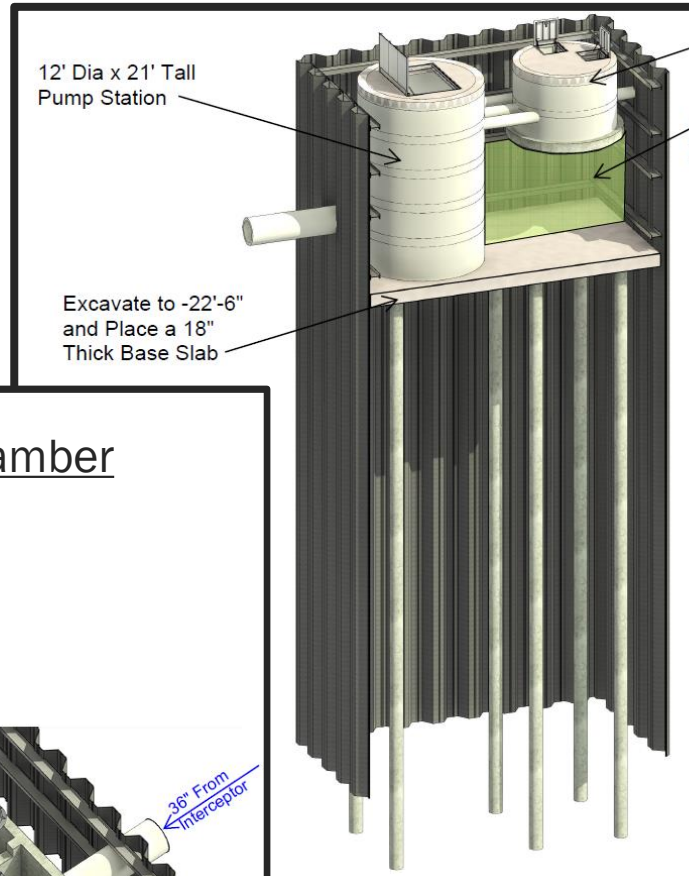
Kiwanis Park Inlet and Outlet Sewer Routes

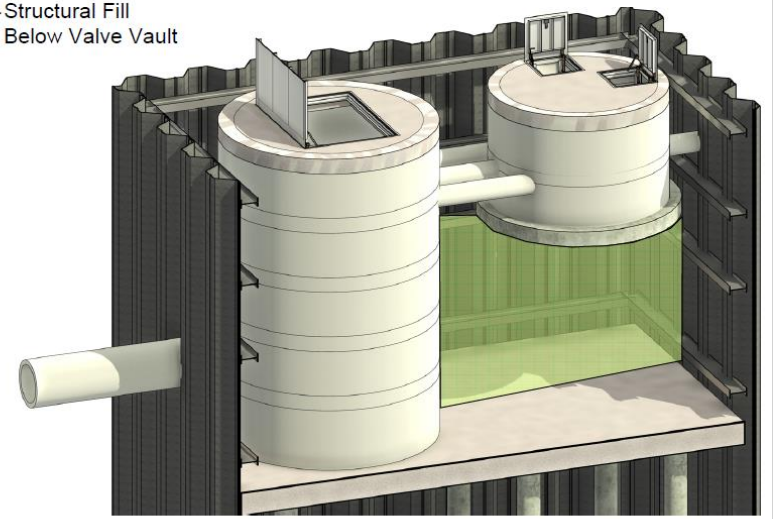
Diversion Chamber and Pump Station Configurations

Support of Excavation (SOE)



Diversion Chamber





Pump Station and Valve Vault

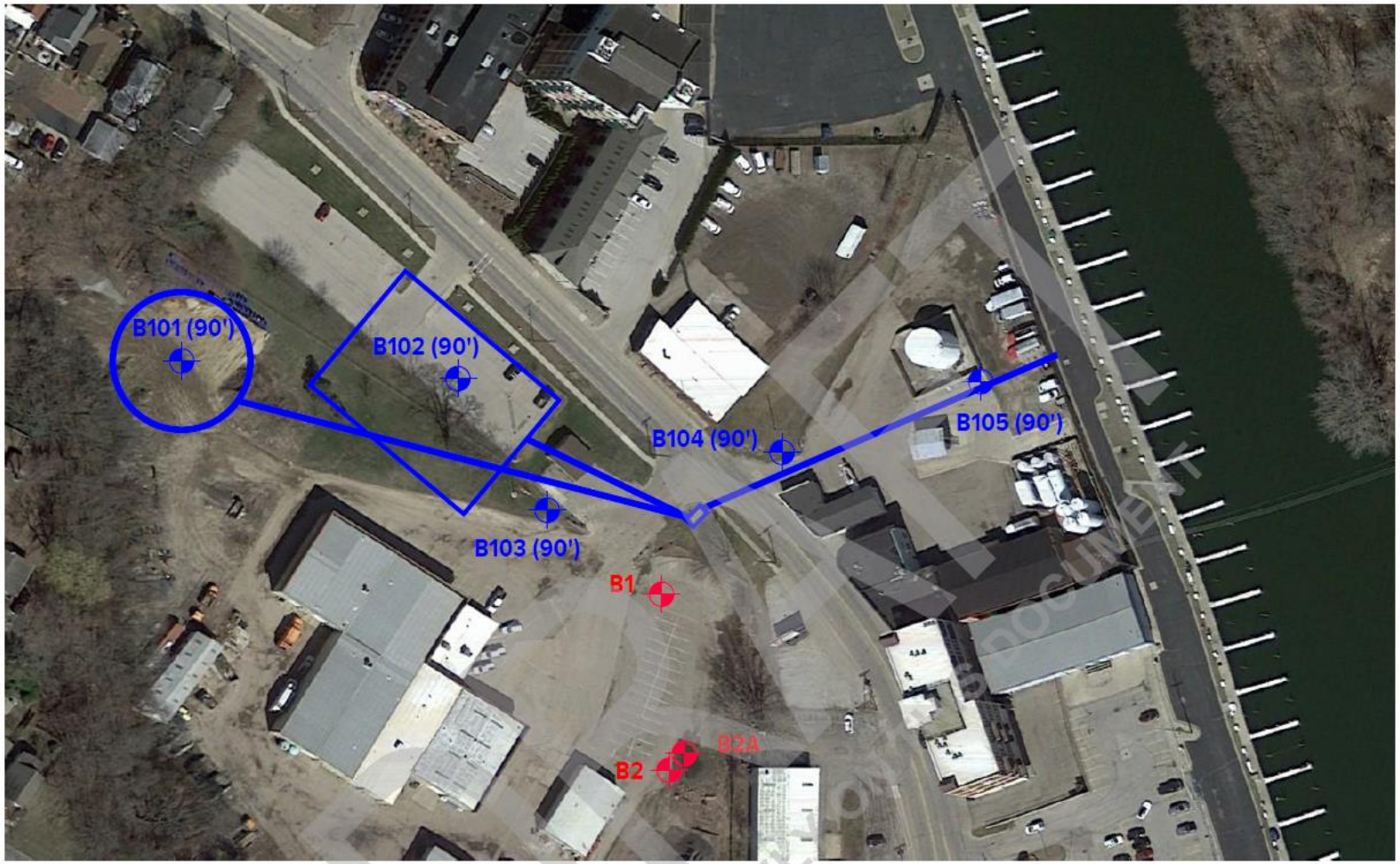
WADE TRIM

Geotechnical Considerations

1. Site specific soil bores taken at Kiwanis Park site
2. Historical soil bores available at low end of DPW site
3. Additional soil bores were collected at DPW basin and pump station locations
4. Based on soil bore information at DPW, tanks will require
   - Deeper pile supports
   - More robust support of excavation to control groundwater during construction

Geotech Considerations at DPW site

Geotech Considerations at DPW site



LEGEND

APPROXIMATE BORING LOCATION (SME PROJECT NO 075169.01)

Recent BOING LOCATION (PROPOSED BORING DEPTH)

NOTES: BORING LOCATIONS AND DEPTHS SUBJECT TO CHANGE DEPENDING ON FINAL DESIGN AND ENCOUNTERED SOIL CONDITIONS.

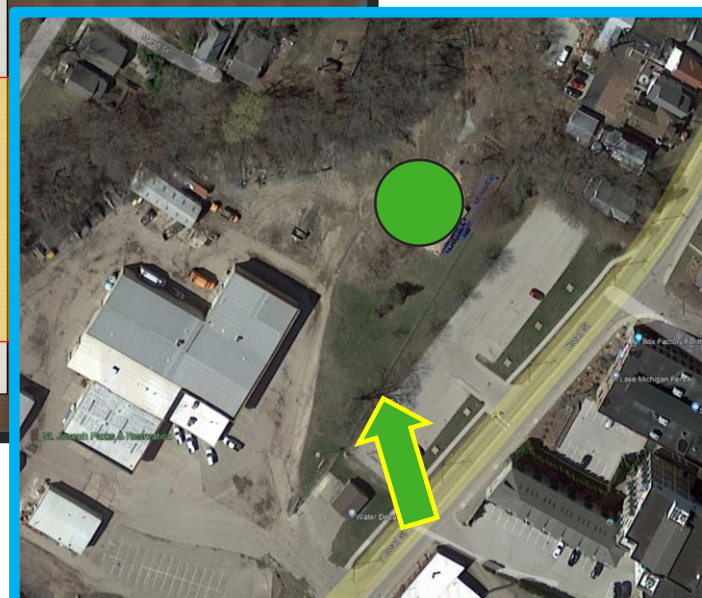
Cost Estimate – Cost Comparison (current June 2023)

Location	DPW Site Option A	DPW Site Option B	Kiwanis Park Option C	Kiwanis Park Option D
Storage Option	Above Grade Tank	Below Grade Tank	Above Grade Tank	Below Grade Tank
Project Component				
Storage Tank Structure only (includes excavation, structure, deep piles, support of excavation)	$4,000,000	$17,500,000	$3,370,000	$12,100,000
Tank Process Items (Flushing System , odor control, ventilation)	$700,000	$500,000	$700,000	$500,000
Pump Station with Inlet/Outlet connections				
Structural	$1,754,000	$1,754,000	$1,754,000	$1,754,000
Process	$1,100,000	$1,100,000	$1,100,000	$1,100,000
Force main/Dewatering from DPW PS to Tank	$631,000	$148,000	$2,542,000	$1,732,000
Diversion Chamber and Connections				
Underflow Pipe	$685,000	$685,000	$685,000	$685,000
Diversion Chamber	$941,000	$941,000	$941,000	$941,000
Gravity pipes in/out of New Diversion Chamber	$525,000	$525,000	$525,000	$525,000
Construction Cost Subtotal	**$10,336,000**	**$23,153,000**	**$11,617,000**	**$19,337,000**
Construction Contingencies (25%)	$2,584,000	$5,788,000	$2,904,000	$4,834,000
Engineering , Legal, and Administration (30%)	$3,101,000	$6,946,000	$3,485,000	$5,801,000
Total Project Cost*	**$16,021,000**	**$35,887,000**	**$18,006,000**	**$29,972,000**

*** Total project cost could be impacted by current market uncertainty.**

WADE TRIM

Above Grade Tank at DPW Site

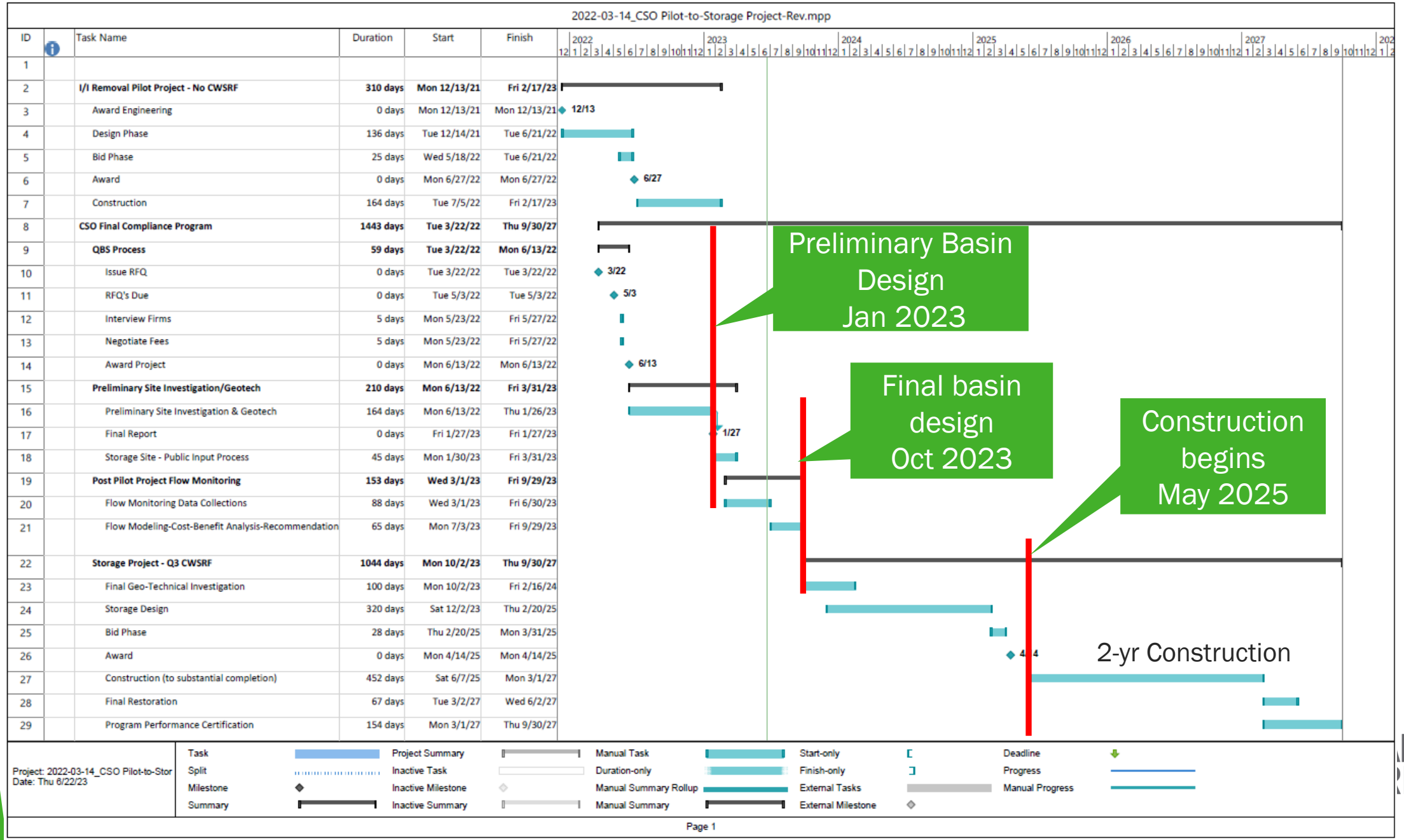


Thank you for attending!

Questions

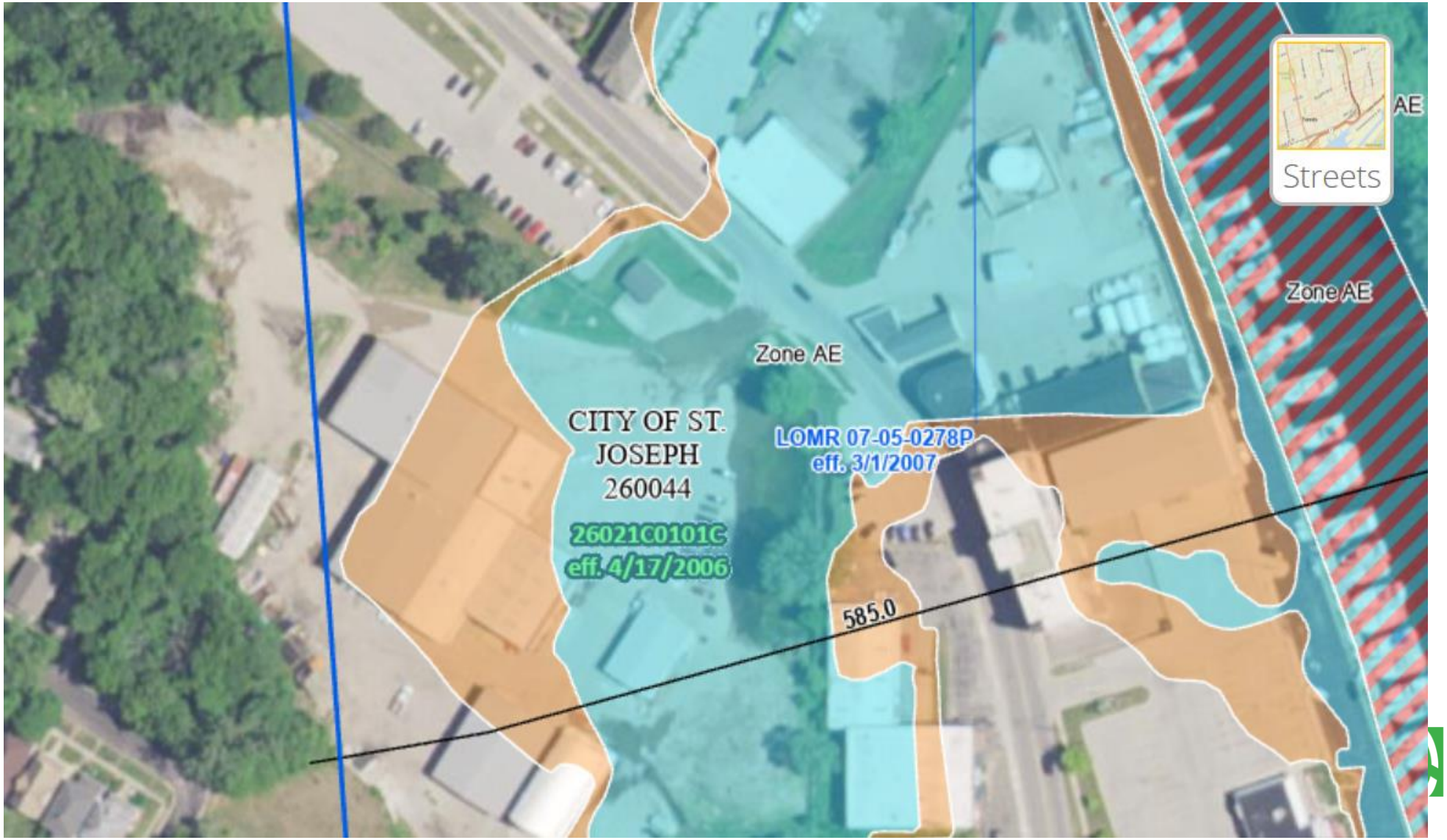
Extras

Schedule – Long Term



ID	Task Name	Duration	Start	Finish
1				
2	**I/I Removal Pilot Project - No CWSRF**	**310 days**	**Mon 12/13/21**	**Fri 2/17/23**
3	Award Engineering	0 days	Mon 12/13/21	Mon 12/13/21
4	Design Phase	136 days	Tue 12/14/21	Tue 6/21/22
5	Bid Phase	25 days	Wed 5/18/22	Tue 6/21/22
6	Award	0 days	Mon 6/27/22	Mon 6/27/22
7	Construction	164 days	Tue 7/5/22	Fri 2/17/23
8	**CSO Final Compliance Program**	**1443 days**	**Tue 3/22/22**	**Thu 9/30/27**
9	**QBS Process**	**59 days**	**Tue 3/22/22**	**Mon 6/13/22**
10	Issue RFQ	0 days	Tue 3/22/22	Tue 3/22/22
11	RFQ's Due	0 days	Tue 5/3/22	Tue 5/3/22
12	Interview Firms	5 days	Mon 5/23/22	Fri 5/27/22
13	Negotiate Fees	5 days	Mon 5/23/22	Fri 5/27/22
14	Award Project	0 days	Mon 6/13/22	Mon 6/13/22
15	**Preliminary Site Investigation/Geotech**	**210 days**	**Mon 6/13/22**	**Fri 3/31/23**
16	Preliminary Site Investigation & Geotech	164 days	Mon 6/13/22	Thu 1/26/23
17	Final Report	0 days	Fri 1/27/23	Fri 1/27/23
18	Storage Site - Public Input Process	45 days	Mon 1/30/23	Fri 3/31/23
19	**Post Pilot Project Flow Monitoring**	**153 days**	**Wed 3/1/23**	**Fri 9/29/23**
20	Flow Monitoring Data Collections	88 days	Wed 3/1/23	Fri 6/30/23
21	Flow Modeling-Cost-Benefit Analysis-Recommendation	65 days	Mon 7/3/23	Fri 9/29/23
22	**Storage Project - Q3 CWSRF**	**1044 days**	**Mon 10/2/23**	**Thu 9/30/27**
23	Final Geo-Technical Investigation	100 days	Mon 10/2/23	Fri 2/16/24
24	Storage Design	320 days	Sat 12/2/23	Thu 2/20/25
25	Bid Phase	28 days	Thu 2/20/25	Mon 3/31/25
26	Award	0 days	Mon 4/14/25	Mon 4/14/25
27	Construction (to substantial completion)	452 days	Sat 6/7/25	Mon 3/1/27
28	Final Restoration	67 days	Tue 3/2/27	Wed 6/2/27
29	Program Performance Certification	154 days	Mon 3/1/27	Thu 9/30/27

Federal Emergency Management Association (FEMA) Floodplain Map



Geotech Considerations at DPW site