Session 28
CSO/Wet Weather
Utilizing Prestressed Concrete for Cost Effective Long Term CSO Storage

JANUARY 26, 2022

Andy Begin, GAUD
Brian Tarbuck, GAUD
Kevin Obery, Wright-Pierce
Corey Meyers, DN Tanks

Greater Augusta Utility District
Water | Wastewater | Stormwater

WRIGHT-PIERCE
Engineering a Better Environment

DN TANKS
BUILT FOR THE FUTURE

SUMMIT GEOENGINEERING SERVICES

Outline

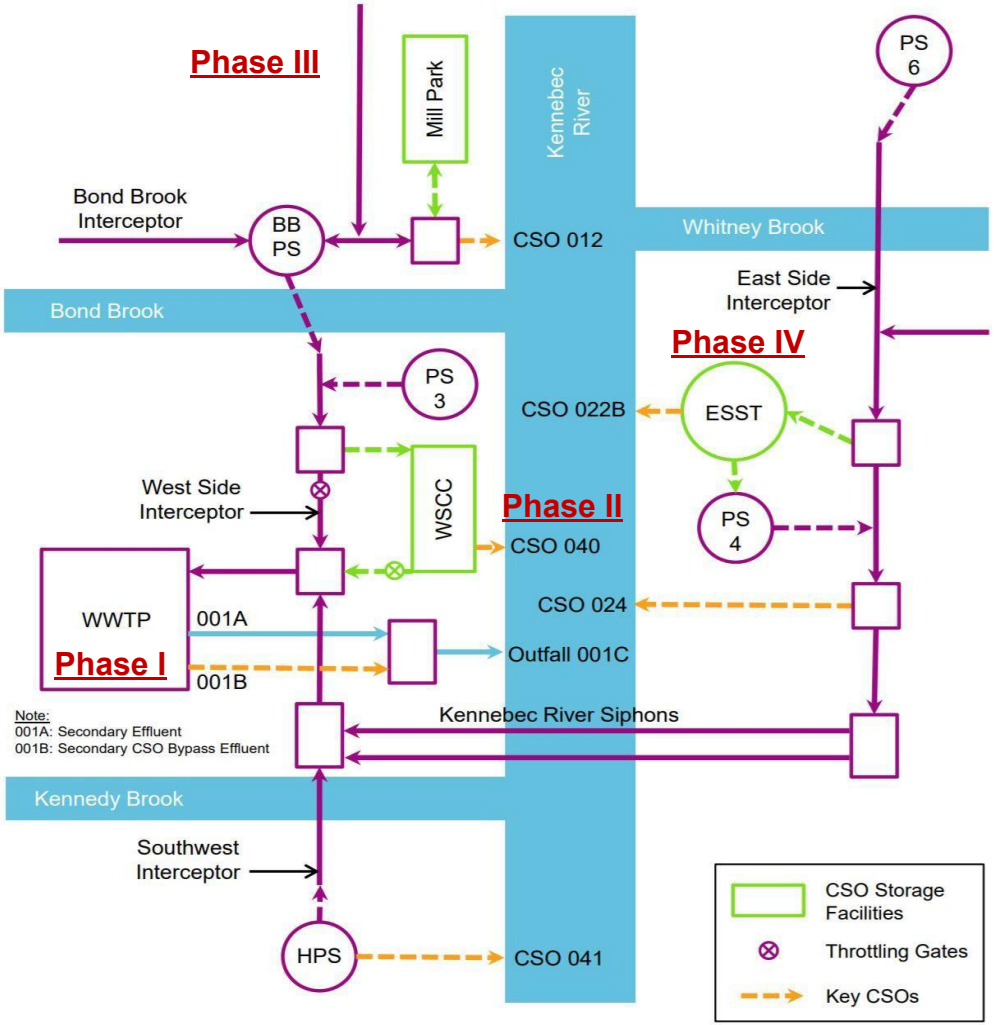
- Our Facilities
- Long Term Control Plan CSO Abatement
- Phased Abatement Solutions
- Storage Configurations
- Why Prestressed Concrete?
- Real-time Control of CSO storage

Greater Augusta Utility District
Water | Wastewater | Stormwater

	Water	Wastewater	Storm
Service Area	Aug, Man, Win	Many	Augusta Only
Customers	5,442	6,000	4,588
Population	15,000	33,822	19,103
Pipe (miles)	130	146	107
Treatment Facilities	2	1	
Stations	6	19	--
Tanks (Water/CSO)	8	3	
Capacity (MGD)	4 Average 1.7	8 (12,36) Average <4.5	?
Access Structures		SMHs 3,012	CBs 5,661 4,951 (Public)

LTCP Summary

- Phase I - 1998 WWTF Upgrades
- Phase II - 2002 WSCC CSO Storage
- Phase III - 2012 Mill Park CSO Storage
- Phase IV - 2020 East Side CSO Storage



Phase II — WSCC CSO Storage

- 3,700 linear feet, 10’ wide x 6’ tall
- Storage: 1.6 MG
- Precast Box Culvert
- Slope 0.09%
- Parallel to 42” interceptor, railroad & river.
- Cleaning by 7 inline flushers, cast in place
- Plant water for cleaning
- Electrical/Instrumentation to WWTF
- Installed Kennebec River Rail Trail
- Cost: $10 Million or $6.25/gallon
    - Today closer to $10.5/gallon

Phase III
Bond Brook/Mill Park

- Twin barrel linear tank, 10’ wide x 10’ tall x 670’ long
- 1.0 MG
- Precast Box Culvert
- Slope 0.5%
- Big open area
- Cleaning by (2) end of line flushers with manual operation
- Elec/Inst. monitoring level only and CSO discharge if active
- Cleaned up park area
- Voluntary Response Action Program (VRAP)
- Coal Tar, Petroleum Disposal
- $20 Million for all work, $13 Million for Station and Storage. The storage was about $6.5 Million.
- Cost: $6.5/gallon
    - Today closer to $7.74/gallon

Phase IV
East Side CSO Tank

- 100’ diameter x 17’ tall side wall
- 1.0 MG
- Wirewound Prestressed Concrete
- Sloped to drain
- Big open area-no interior columns
- Cleaning-manual, hose down
- Electrical/instrumentation
- Existing Property near a park.
- $4 Million for all work.
- $1.5 Million for tank.
- The remainder is piping, pumping station, and special structures
- Cost: Tank cost $1.5/gallon, or $2.2/gallon including structures and piping outside of the station upgrades.

Greater Augusta Utility District
Water | Wastewater | Stormwater

CSO Storage Tank Summary

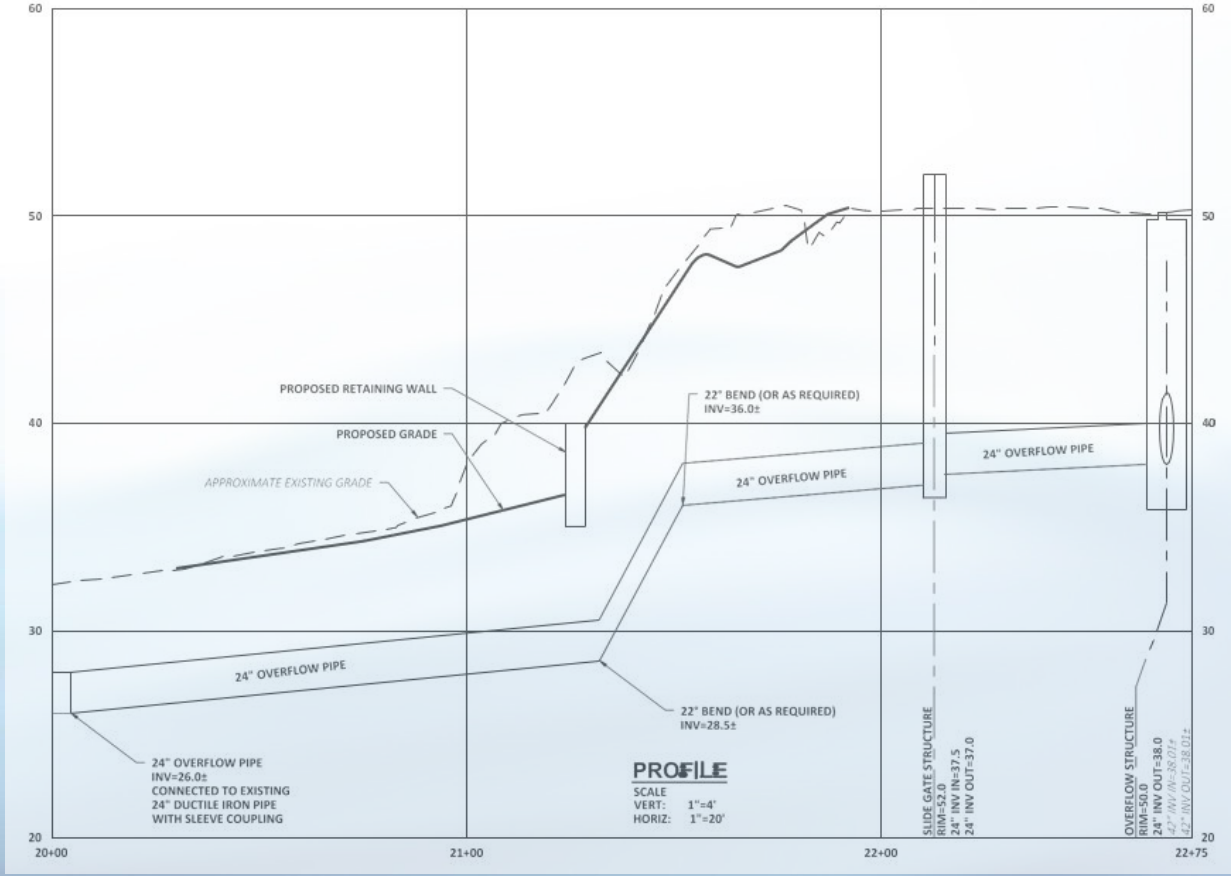
	Phase II WSCC	Phase III Bond Brook	Phase IV East Side
Tank Type	Concrete Box Culvert	Concrete Box Culvert & Pipe	Prestressed Concrete
Storage Capacity (MG)	1.6	1.0	1.0
Geometry	3,700’ long x 6’ tall x 10’ wide	Twin Barrel 670’ long x 10’ tall x 10’ wide	100’ diameter 17’ tall
Total Storage Cost (million)	$10.5 M	$6.5 M	$1.5 M
Cost/Gallon (corrected for 2020)	$10.5/gallon	$7.74/gallon	$1.5-2.2/Gallon
Construction Duration	1-2 years	> 1 year	3-4 months

Greater Augusta Utility District
Water | Wastewater | Stormwater

Existing Site

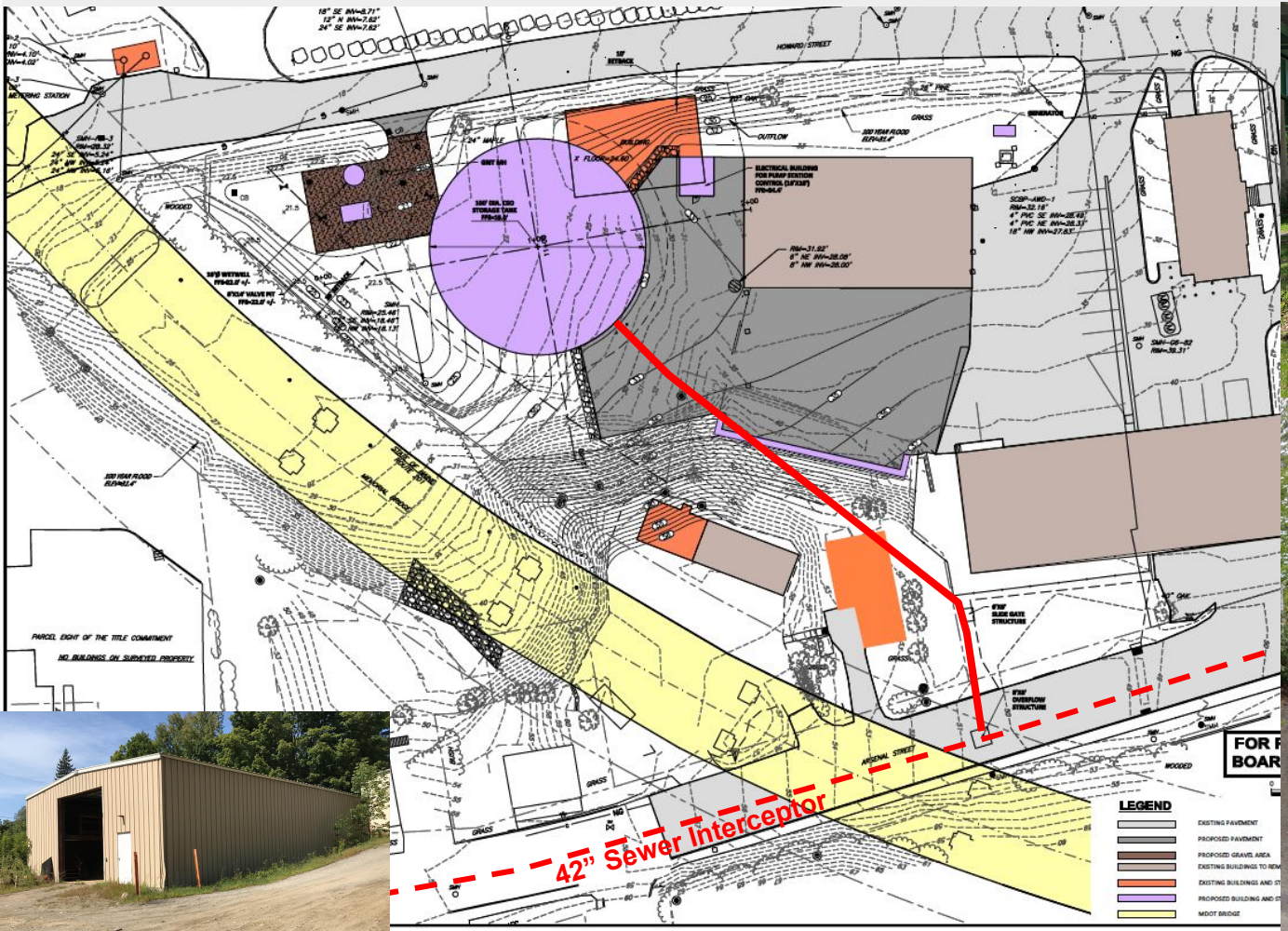
Why this site?

- Looking for cost effective CSO storage ideas
- 18’ elevation change
- Above grade tank construction
- Gravity tank filling
- No need to maintain/install a large linear conduit/tank.
- Passive filling and draining
- Integrated with existing site and an existing pumping station

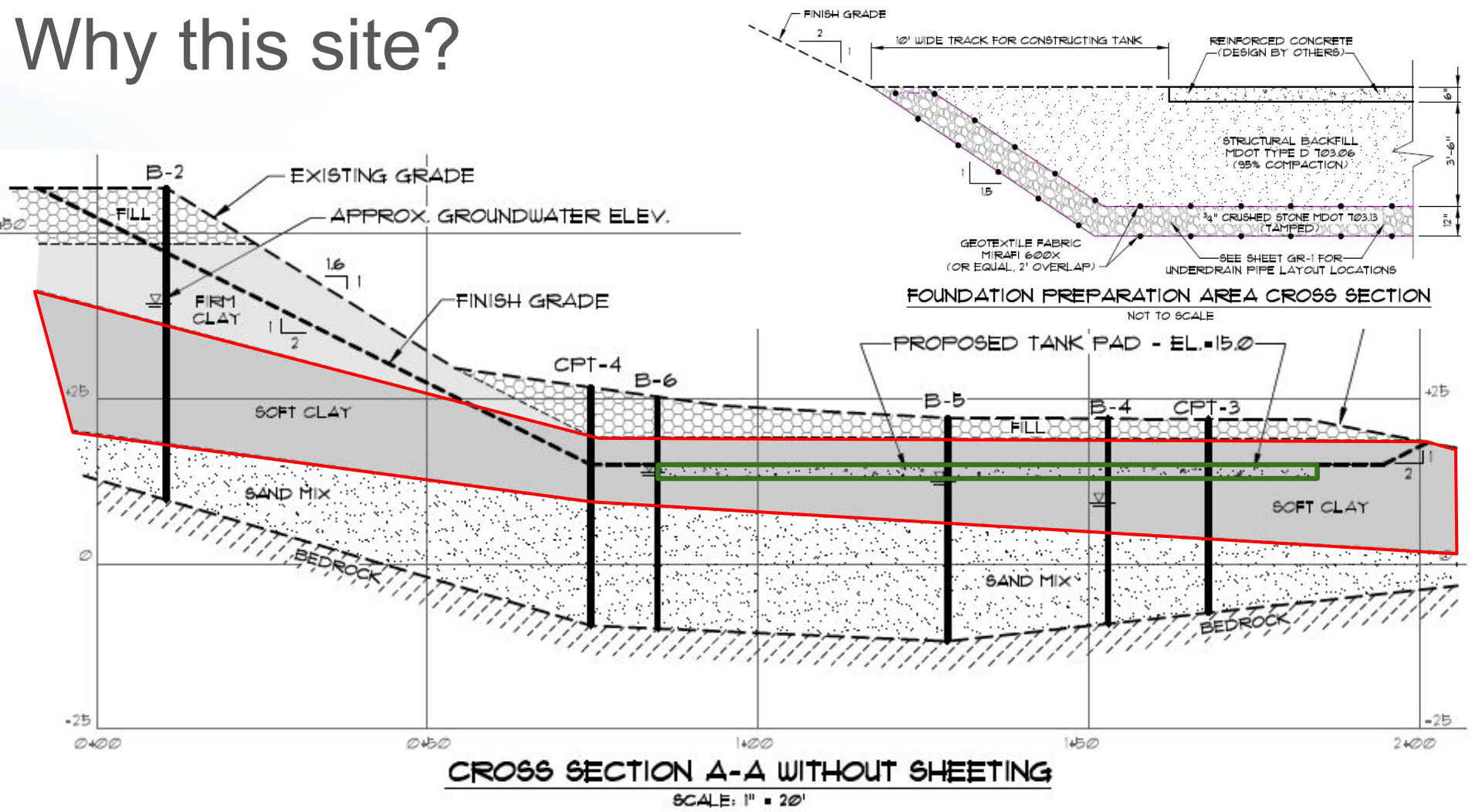


Greater Augusta Utility District
Water | Wastewater | Stormwater

Make Some Room



Why this site?



Contract 1
Dig a big hole

Geotechnical Concerns

Contract 2
Build a Tank


CONCRETE PUMPING

Falsework

Wall Assembly

Setting Wall Panels

Diaphragm & Seams


Interior Curb
Flood Relief Valve


Monolithic Dome Placement

Prestressing

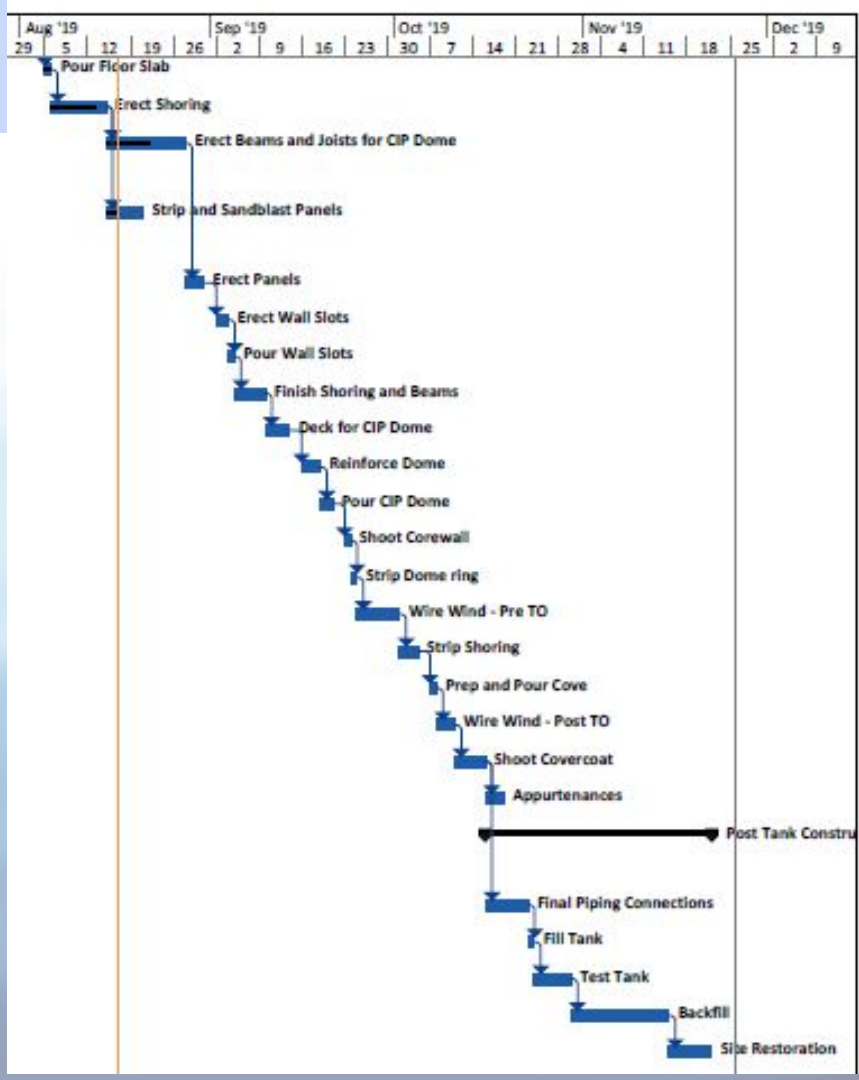
Shotcrete

Contract 3 Station Structures

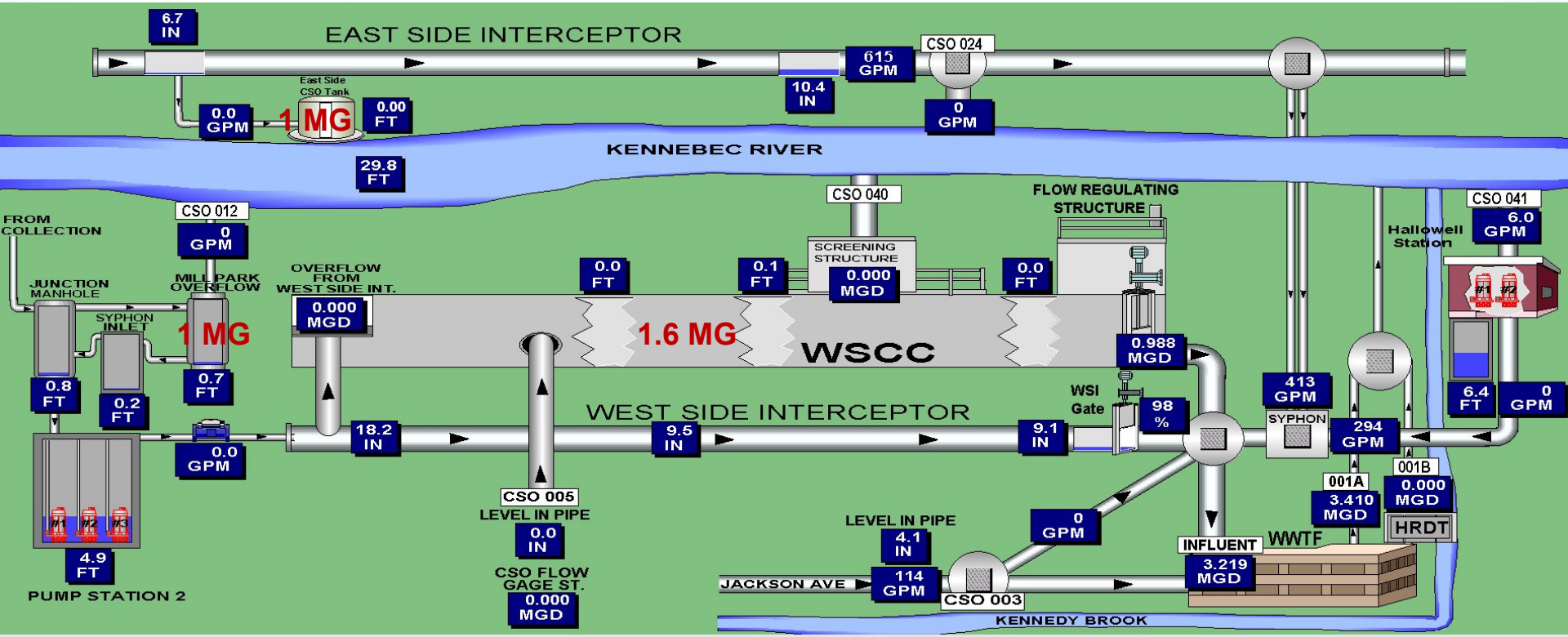
Construction Schedule

- **Contract 1 - Dig/Mitigate Geotechnical**
  - March 2019
  - 3-4 months
- **Contract 2 - Tank**
  - July 2019
  - 1 month of prep
  - 3 ½ months to build
  - 1 month backfill/cleanup
- **Contract 3 - Station/Structures**
  - January 2020
  - 6 months
  - 1-2 months cleanup

- **Why 3 Contracts??**



Real Time Optimization



Greater Augusta Utility District
Water | Wastewater | Stormwater

Acknowledgements

- AECOM - SWMM Model/Planning
- Wright-Pierce - Final Design
- Summit Geoengineering - Excavation & Soil Mitigation
- Contractors
  - McGee Construction
  - DN Tanks
  - St. Laurent & Son

Greater Augusta Utility District
Water | Wastewater | Stormwater

Contact Info

- Andy Begin, Greater Augusta Utility District, abegin@gaud.ws
- Brian Tarbuck, Greater Augusta Utility District, btarbuck@gaud.ws
- Kevin Obery, Wright-Pierce, Kevin.Obery@wright-pierce.com
- Corey Meyers, DN Tanks, Corey.Meyers@dntanks.com

Greater Augusta Utility District
Water | Wastewater | Stormwater