

Erie County Department of Environment and Planning

Southtowns AWTF Expansion

Project Overview for Prospective Bidders

Project Overview (PO)

PO.1 Project History, Current Status, and Implementation Approach

History: The Southtowns Advanced Wastewater Treatment Facility (AWTF), located at S-3690 Lakeshore Road in the Town of Hamburg, is owned by Erie County and operated and maintained by the Erie County Department of Environment and Planning (ECDEP) Division of Sewerage Management (DSM). The AWTF became operational in December 1980.

In February 2020, the New York State Department of Environmental Conservation (DEC) issued an approval letter for the expansion of the Southtowns AWTF from a peak secondary treatment capacity of approximately 30 to 40 million gallons per day (MGD) maximum to a peak secondary treatment capacity of 55 MGD, along with other regulatory driven improvements. The expansion will be implemented in two phases (i.e., Phase 1 and Phase 2) that must be completed as a requirement of the State Pollutant Discharge Elimination System (SPDES) permit in place at the time of the approval letter.

Status: The ECDEP selected Arcadis as the Project engineer, who has since developed Preliminary Engineering Reports (PER) for each Phase. Bidding Documents (Drawings and Specifications) are in production and will be submitted to DEC for approval on the timeline below. Phase 1 has since been completed and Phase 2 bidding was delayed due to SPDES permit discussions with DEC. Smaller projects from Phase 2 were broken off and initiated and subsequently deemed as Pre-Phase 2 work. This includes the ongoing Contract 81 Electrical Improvements Work and the completed Contract 82 Ash Landfill Reclamation Work.

Implementation Approach: The project delivery will be via a traditional design-bid-build method. A Project Labor Agreement (PLA) was developed and will be included in the Bidding/Contract Documents. Implementing the PLA means each Phase will be bid as a single prime contract.

PO.2 Anticipated Project Schedule

Major Milestones	Phase 1	Phase 2
Submit Engineering Plans and Specifications to DEC for Approval	March 2023	April 2024
Advertise for Bids	Summer 2023	Fall 2026
Award Contract and Commence Construction	Late Summer / Early Fall 2023	Q4 2026 / Q1 2027
Complete Construction	Summer 2026*	Fall 2030*

*Actual Milestones and Contract Times will be specified in the Bidding Documents

PO.3 Pre-Phase 1 Facility Information

Figure 1 presents an aerial view of the Southtowns AWTF before Phase 1 work began located at S3690 Lakeshore Road in the Town of Hamburg. The AWTF is bordered by Lake Shore Road (Route 5) to the east, Lake Erie to the west, Woodlawn Beach State Park to the north, and Hoover Road with several industrial and commercial businesses as well as some residential properties to the south. The main entrance to the AWTF is from the north in the northeast area of the AWTF. There is another “construction entrance” from the southeast from Hoover Road.

Subsurface explorations consisting of 20 borings were completed between December 2021 and February 2022, and two additional borings completed in October 2022, to document geologic conditions at the AWTF. The geotechnical engineering investigation report, including boring logs and supplemental information, will be available as supplemental information to the Bidding Documents.

The vast majority of the site lies within “Zone X”, which represents an area of minimal flood hazard. A small drainage area on the northernmost portion of the site lies within “Zone AE” with a base flood elevation of 581.00’ (NAVD-1988). The facility does not have documented history of damage due to flooding.

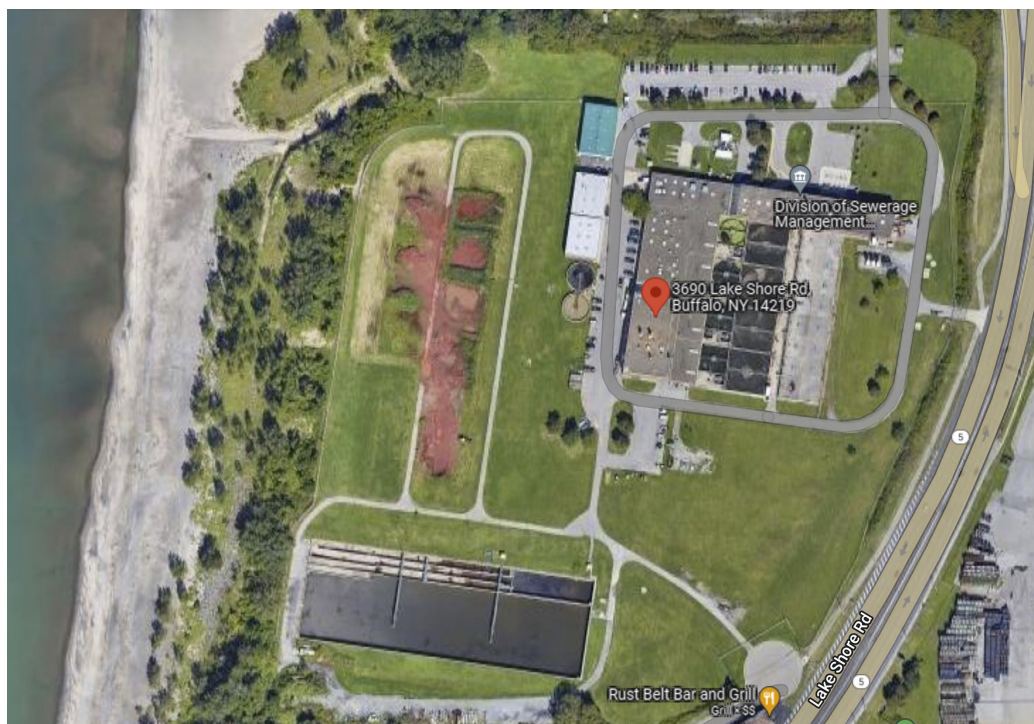


Figure 1. Aerial view of the Southtowns AWTF before AWTF expansion project began

The AWTF was permitted to discharge up to 16 MGD on a monthly average basis through the following main treatment processes:

- Influent screening and pumping
- High-pure oxygen activated sludge system (UNOX)
- Clarifiers

- Monomedia filtration
- Sodium hypochlorite disinfection
- Effluent pumping

Treated effluent was conveyed through a 66-inch diameter outfall prestressed concrete cylinder pipe (PCCP) to Lake Erie and discharged via 35 diffuser tees (i.e., seventy 6-inch diameter diffuser ports) starting roughly 1,200 linear feet offshore.

The AWTF also has a 7-million-gallon Overflow Retention Facility (ORF) located to the southwest of the main AWTF building. The ORF is used to store and provide the equivalent of primary treatment and disinfection with sodium hypochlorite to flows received during wet-weather events in excess of the AWTF capacity. In 2017 a chlorine contact tank (CCT) was added to the ORF to provide a minimum of 15 minutes of contact time with sodium hypochlorite at peak ORF flows. Facilities to provide the ability for dechlorination using sodium bisulfite in the future were installed but could not be used until after Phase 1 as it could adversely impact the ability to disinfect main AWTF discharges in the portion of the shared AWTF/ORF outfall.

Figure 2 depicts the major unit processes at the AWTF prior to the expansion project. In general, flows enter the AWTF from the northeast, travel south through the UNOX reactors, west through the clarifiers and monomedia filters, and then north to the effluent pump station where they are conveyed west through the outfall to Lake Erie. Since phosphorus removal is accomplished through the addition of ferrous or ferric chloride, the existing anaerobic phosphate stripper (“phostrip”) tanks between the clarifiers and monomedia filters have been taken out of service and abandoned.

PO.4 Content of the Phases of Expansion

The process and physical elements of the capacity expansion are illustrated in Figure 4.

The two phases of the expansion are operationally independent, allowing construction to be completed on separate timelines. Phases 1 and 2 are connected from a capacity standpoint, in that the hydraulic capacity for Phase 1 must be aligned with the planned capacity for Phase 2, which is 55 MGD.

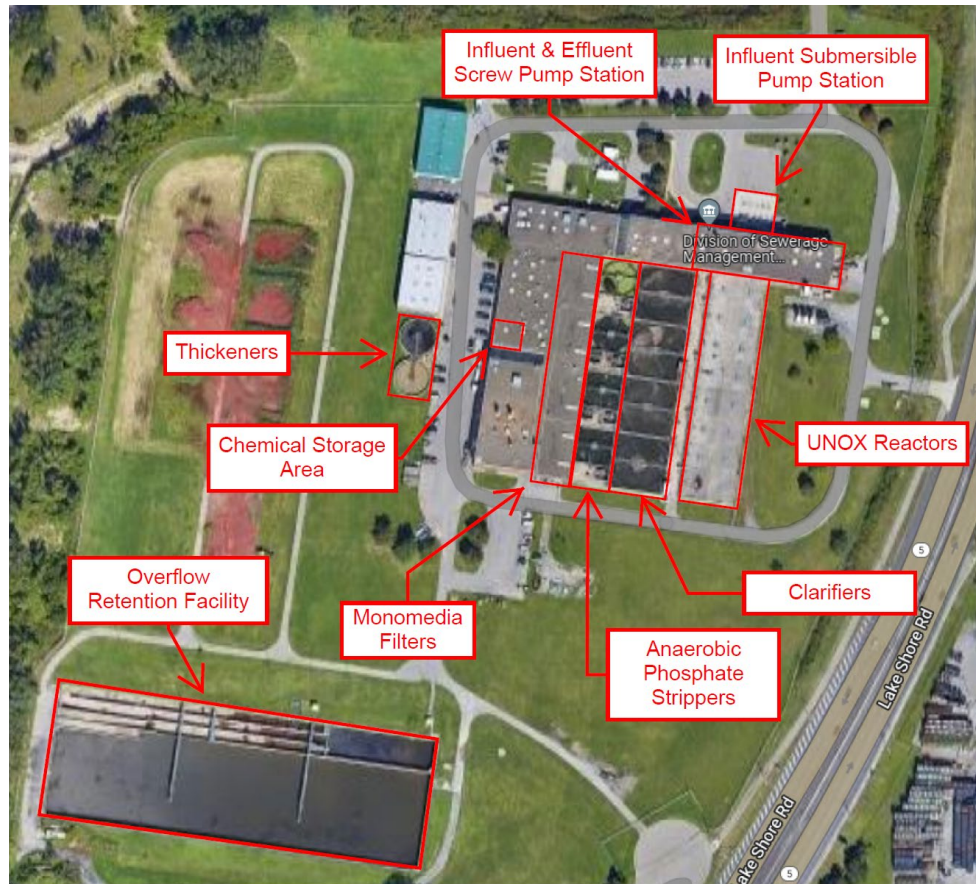


Figure 2. Aerial view of the major processes at the Southtowns AWTF

PO.4.1 Major Process and Physical Elements of Phase 1 (Construction Complete)

The major elements of Phase 1 included:

- New effluent submersible pump station (ESPS).
 - Building area: Approximately 5,000 square feet.
 - Building height: Approximately 55 feet (~30 feet buried)
 - Five new ~150-horsepower (Hp) wet-pit submersible pumps with design capacity of 9,550 gallons per minute (gpm) each at 31.5 feet total dynamic head (TDH)
 - One “low flow” ~75-Hp wet-pit submersible pump with design capacity of 6,600 gpm at 25.2 feet TDH
- New chlorine contact tank (CCT).
 - Quantity of Trains: Two
 - Total Pass Length per Train: ~480 feet
 - Pass Width: 10 feet
 - Typical Side Water Depth: ~10 feet (varying with operating levels)
 - Train Volume (each): ~48,000 cubic feet
- New sodium bisulfite facilities for dechlorination.
 - New 2,100 gallon fiberglass-reinforced plastic (FRP) bulk storage tank

- New pumping skid, including three 0.25-Hp peristaltic pumps
 - Existing fill station improvements
 - Existing containment area improvements to account for additional storage volume
- New/relocated ORF influent piping (expedited from Phase 2).
 - Pipe Diameter: 72-inch
 - Pipe Material of Construction: Fiberglass-Reinforced Polymer-Mortar
- New parallel piping from the existing ORF to the existing outfall.
 - Pipe Diameter: 66-inch
 - Pipe Material of Construction: Fiberglass-Reinforced Polymer-Mortar
- Existing outfall diffusers improvements.
- New hydraulic relief point.
- New electrical substation and plant-wide generator furnished by the Owner via a Procurement Contract:
 - 15KV and 5 KV switchgear, two dry-type transformers, and unit substation
 - 2,500 KW generator, 5 KV switchgear, and load center
- New electrical support systems.
- New instrumentation and control (I&C) system and features.
- New heating, ventilating, and air conditioning (HVAC) systems for new buildings.

Phase 1 also contained numerous subcomponents and support systems (i.e., site/civil, security, architectural, structural, mechanical, electrical, I&C, and appurtenant improvements) for major project elements.



Figure 3. Phase 1 Built Improvements

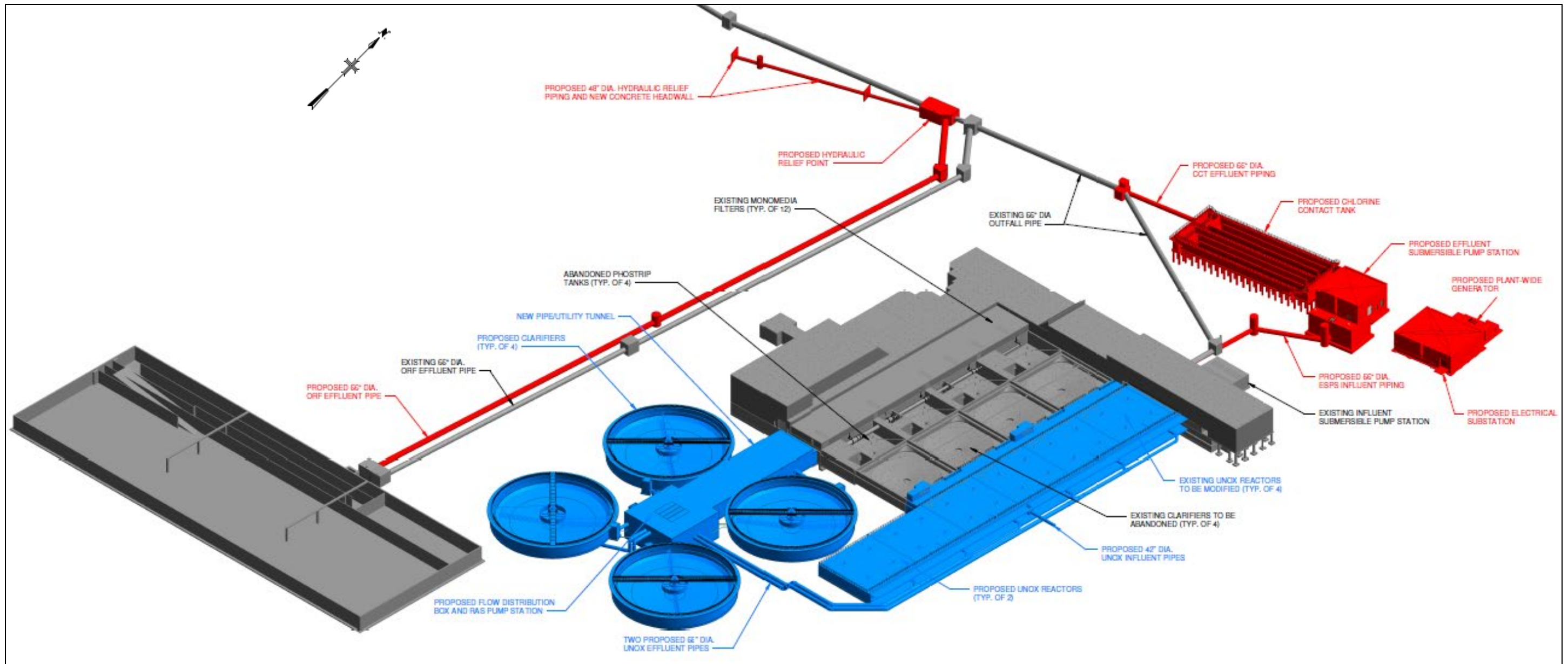


Figure 4. Image taken from Arcadis' 3D AutoCAD model showing Phase 1 improvements (in red), including the new CCT, ESPS, electrical substation, plant-wide generator, ORF effluent piping, and hydraulic relief point, but excluding the ORF influent pipe, and Phase 2 improvements (in blue), including four new circular clarifiers, new RAS pump station (between the clarifiers) and two new UNOX reactors. Outfall improvements in the lake and various site work features are not shown for clarity.

PO 4.2 Major Process and Physical Elements of Phase 2

The major elements of Phase 2 include:

- Improvements to the four existing UNOX reactors, including structural and mechanical upgrades and changes to the flow circulation path as follows:
 - Structural: Increase effluent weir height by approximately 1.75 feet, relocate ports for UNOX reactor influent and replace support beams for new aerator
 - Mechanical: Replace surface aerators and provide new influent/effluent piping on east side of UNOX reactors
 - Flow Path: Reverse flow path to enter cell A and exit cell D over the modified effluent weirs
- Two new UNOX reactors.
 - Reactor Length: 82 feet
 - Reactor Width: 85.3 feet
 - Reactor Height: 13 feet
- New center-fed aerated flow distribution channel along the east side of the existing and new UNOX tanks.
- New piping to connect the existing and the new UNOX reactors to the new clarifier distribution box.
 - Dual 36-inch diameter headers, each conveying flow from three of the UNOX reactors
- Four new circular clarifiers with an integrated central flow distribution box and new effluent piping to convey flow from the new clarifiers to the existing monomedia filters.
 - Clarifier diameter: 145 feet
 - Clarifier Side Water depth: 14 feet
 - Spiral rakes, Stamford baffles, energy dissipating inlets (EDI), spray water in the center feed well, and full-radius scum removal
- New central return activated sludge (RAS) pump station responsible for the following:
 - Pumping RAS to just upstream of the UNOX reactors
 - Six new “large” capacity pumps with max. design flow of ~10 MGD (total)
 - Two “small” capacity pumps with max. design flow of ~1.5 MGD (total)
 - Pumping WAS to the existing gravity thickener splitter box, including two new pumps to convey approximately 0.165 MGD each
 - Collecting and pumping scum to the existing scum processing area, including two new scum transfer pumps and two new scum mixing pumps.

PO.5 Applicable Permits

The following permits are being obtained by the Owner. All other permits will be the responsibility of the prime contractor(s).

Joint Permit for Outfall Work in the Lake (Phase 1) – completed	None for Phase 2
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PO.6 Engineer's Estimate of Probable Construction Cost

The total cost of Phase 2 is expected to be above \$100 million.

PO.7 Supplemental Information

- Engineer contact information:
Jason Williams, PE
Direct: 716 667 6603
E-mail: Jason.Williams@arcadis.com
- Draft Supplemental Drawings/Sketches – Attached

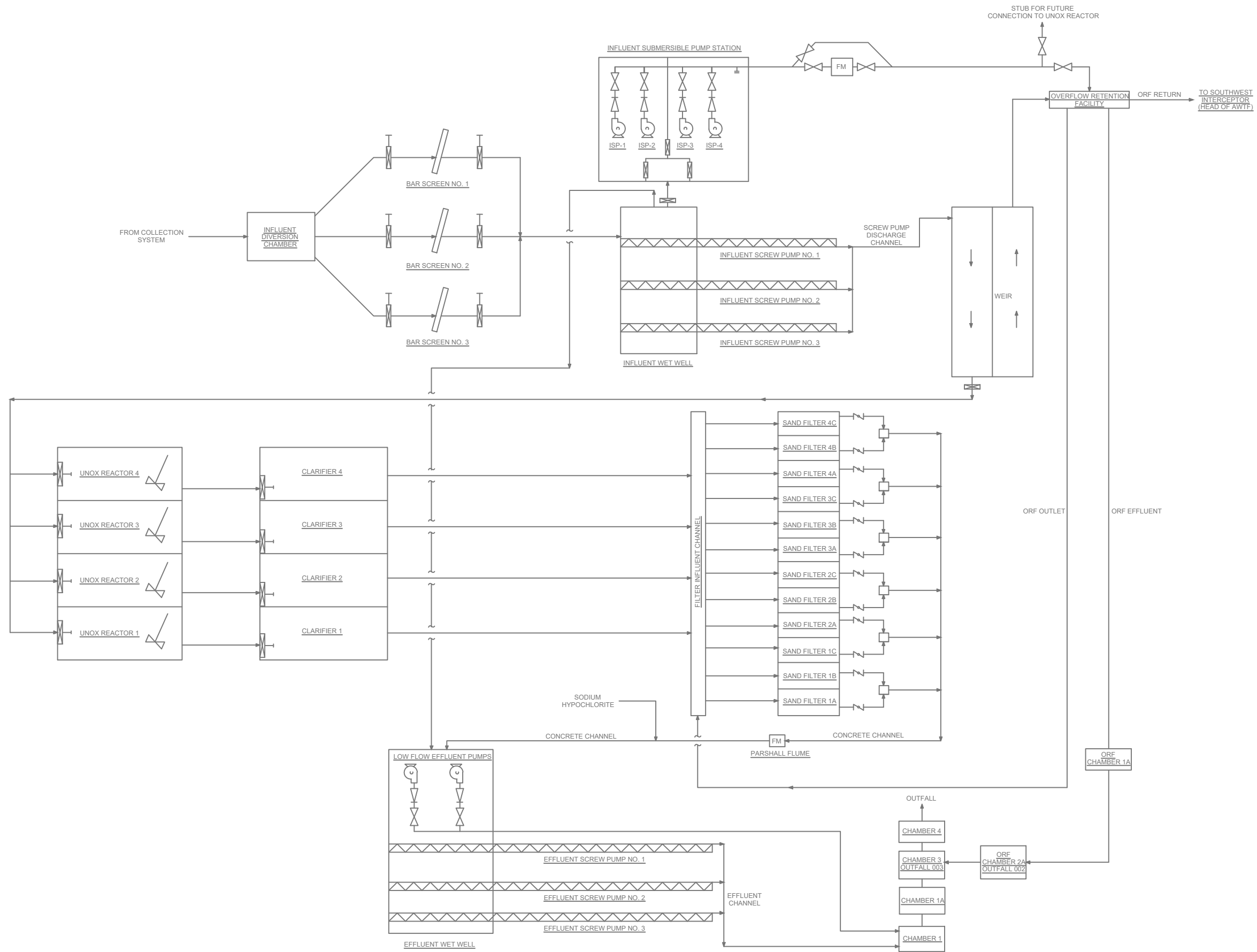
PO.8 Tours and Meetings with the Owner and Engineer

An in-person open house, followed by a tour of the AWTF Work areas, hosted by the Owner and Engineer is scheduled for August 25, 2026 at the AWTF. An option to join the open house (only) portion of the meeting via Microsoft Teams will also be available. Please contact Jason Williams at the e-mail indicated above in section "PO.7" if you would like to be included on the open house invite.

Intent and Use

This information is provided solely for the convenience of the contracting community and with the sole intent of providing an overview of the project and its phases. This information should not be used for bidding or construction purposes and the Owner and Engineer accept no responsibility for any Contractor's interpretation or use of these materials. Any cost associated with the review or use of these materials or the attendance at any open house or meeting is solely the responsibility of the Contractor(s).

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ERIE COUNTY DEPARTMENT OF ENVIRONMENT AND PLANNING
DIVISION OF SEWERAGE MANAGEMENT
SOUTHTOWNS AWWTF PHASE 1 AND 2 EXPANSION

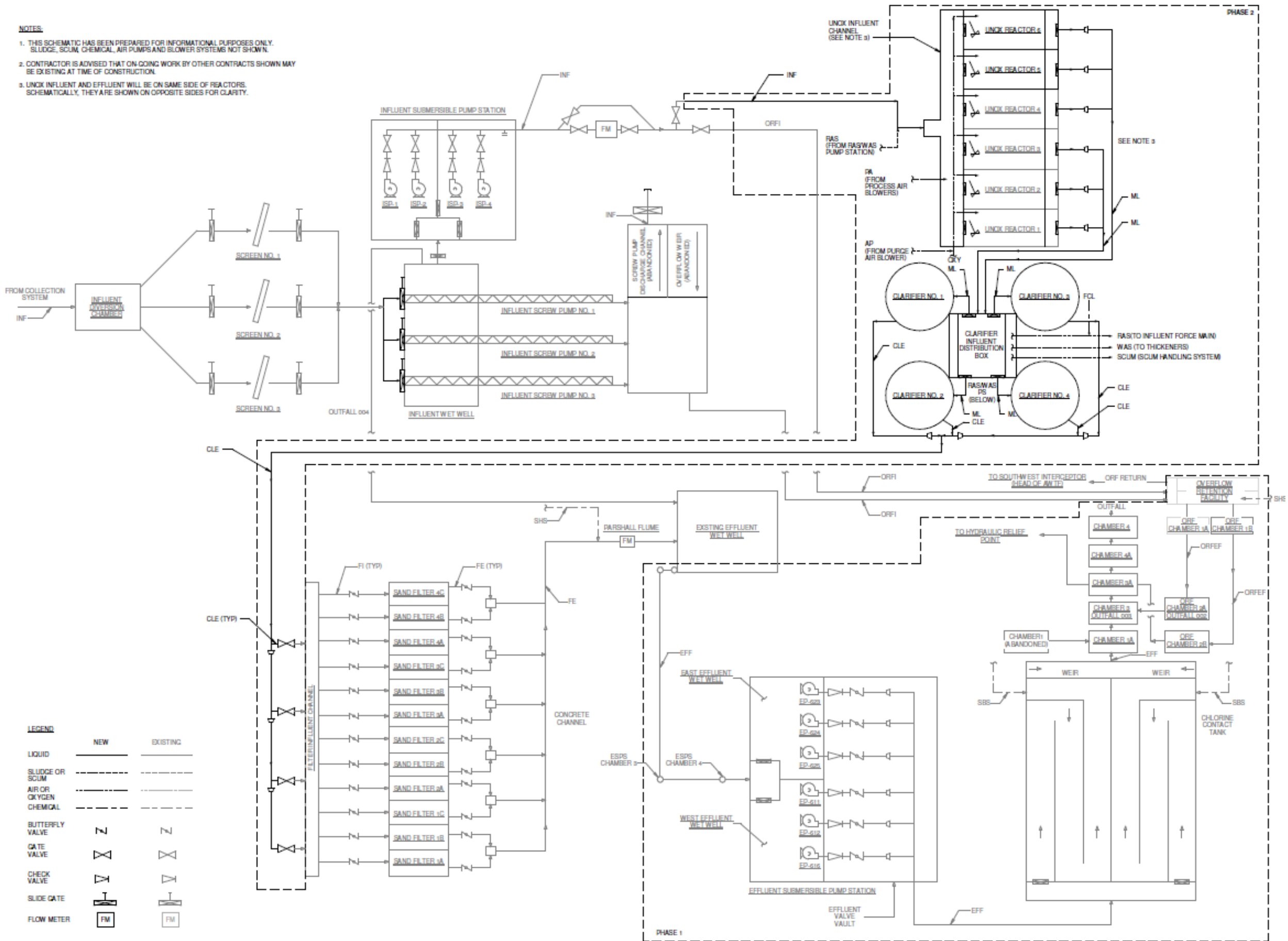
EXISTING PROCESS FLOW DIAGRAM

NOT TO SCALE

MARCH 2023

ATTACHMENT NO. 1

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ERIE COUNTY DEPARTMENT OF ENVIRONMENT AND PLANNING
DIVISION OF SEWERAGE MANAGEMENT

SOUTHTOWNS AWWTF PHASE 1 AND 2 EXPANSION

PROPOSED PROCESS FLOW DIAGRAM

NOT TO SCALE

AUGUST 2026

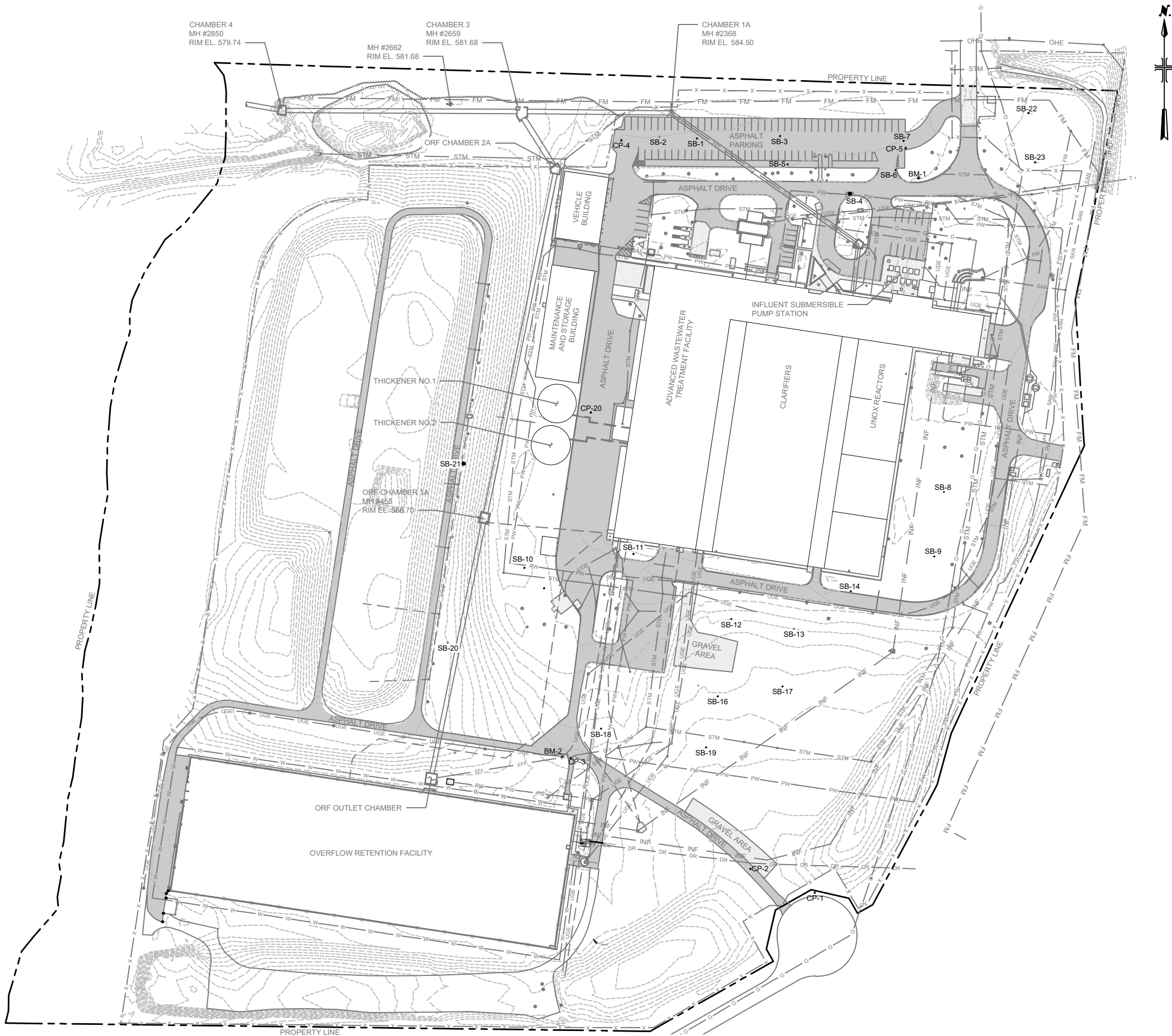
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BORE HOLE LOCATIONS			
VERTICAL DATUM = NAVD88 (GEOID 18)			
HORIZONTAL DATUM = NAD83 (2011)			
Northing	Easting	Elevation	Description
1015735.33	1077035.16	584.07	SB-7
1015691.73	1077022.92	584.38	SB-6
1015700.48	1076861.61	584.09	SB-5
1015657.38	1076954.64	583.79	SB-4
1015742.60	1076850.23	583.29	SB-3
1015741.86	1076669.53	582.99	SB-2
1015739.17	1076725.97	583.15	SB-1
1014984.18	1076353.22	594.34	SB-20
1015096.43	1076467.63	582.90	SB-10
1015065.77	1076497.01	583.37	SB-11
1014855.51	1076582.33	586.50	SB-18
1014827.59	1076739.44	590.83	SB-19
1014903.76	1076757.06	589.01	SB-16
980653.20	1076777.18	587.07	SB-12
1015005.08	1076871.15	587.18	SB-13
1014918.68	1076853.91	589.50	SB-17
1015061.52	1076955.98	584.54	SB-14
1015133.64	1077080.92	585.07	SB-9
1015210.10	1077095.66	584.52	SB-8
1015117.18	1076630.94	583.68	SB-11
1015451.11	1076411.82	596.00	SB-21
1015777.23	1077221.90	548.35	SB-22
1015703.40	1077231.74	584.51	SB-23
NOTE: SOIL BORING SB-15 DOES NOT EXIST			

SURVEY CONTROL POINTS				
VERTICAL DATUM = NAVD88 (GEOID 18)				
HORIZONTAL DATUM = NAD83 (2011)				
CP	Northing	Easting	Elevation	Description
1	1014610.25	1076902.42	593.48	REBAR & CAP
2	1014645.82	1076806.06	592.74	MAGNAIL
3	1014811.85	1076537.20	587.20	MAGNAIL
4	1015736.43	1076613.02	583.14	MAGNAIL
5	1015725.12	1077038.44	584.24	MAGNAIL
20	1015329.09	1076567.43	583.57	MAGNAIL

SURVEY BENCHMARKS				
VERTICAL DATUM = NAVD88 (GEOID 18)				
HORIZONTAL DATUM = NAD83 (2011)				
BM	Northing	Easting	Elevation	Description
1	1015679.58	1077057.56	584.55	SW BOLT OF LIGHT POLE
2	1014813.94	1076524.39	587.89	NE BOLT OF LIGHT POLE



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SOUTHTOWNS AWTF PHASE 1 AND 2 EXPANSION

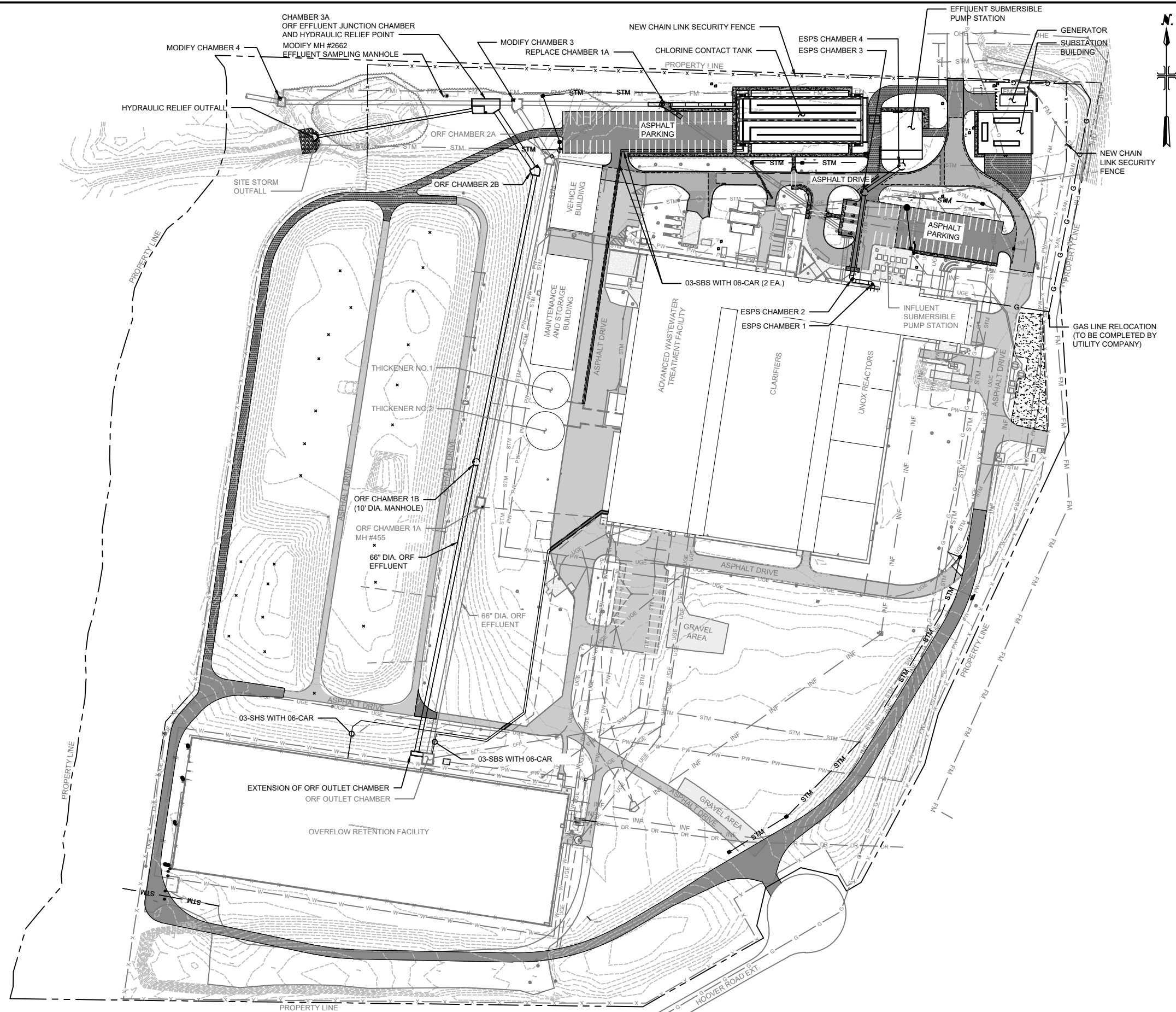
EXISTING SITE PLAN

NOT TO SCALE

MARCH 2023

ATTACHMENT NO. 3

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PAVEMENT SURFACE LEGEND:	
EXISTING PAVEMENT TO REMAIN	
NEW STANDARD DUTY ASPHALT PAVEMENT SECTION	
NEW HEAVY DUTY ASPHALT PAVEMENT SECTION	
PAVEMENT MILL AND OVERLAY	
NEW CONCRETE SIDEWALK SECTION	



