

Wet Pit Design

The wet pit was designed as the intake structure for the Advanced Water Purification Facility lift station. Its purpose is to receive incoming flow from Outfall 005, provide stable suction conditions for the pumping system, and maintain reliable conveyance of water to downstream treatment processes. Proper wet pit sizing was essential to balance hydraulic storage, pump performance, constructability, and long-term operational reliability.

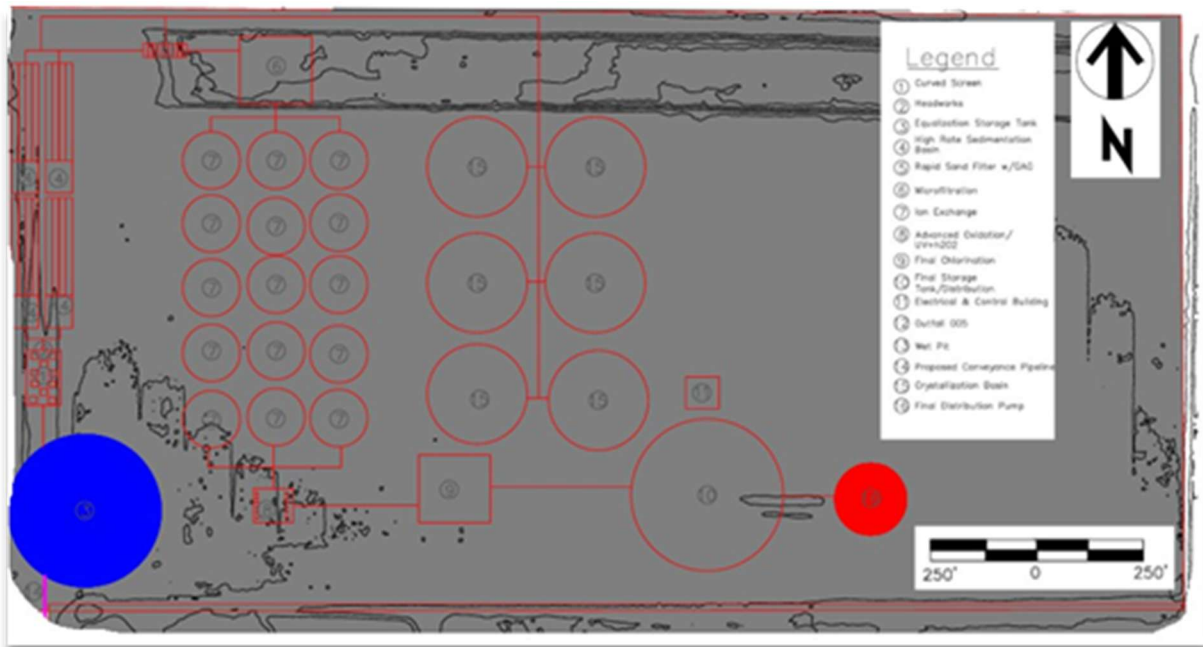


Figure 1. Proposed Wet Pit Location

Design Basis

The wet pit was sized using projected facility demand, operational peaking conditions, and pump station flow requirements.

Table 1. Design parameters for Flow

Parameter	Value
Population Served	300,000
Base Demand	30 MGD
Design Flow	40 MGD
Peak Flow Considered	70 MGD
Pump Configuration	4 Duty + 1 Standby

Final Wet Pit Configuration

After evaluation of multiple alternatives, the selected wet pit geometry was determined to provide sufficient storage volume while maintaining a practical construction footprint.

Table 2. Wet well parameters

Parameter	Value
Wet Pit Type	Open Sump
Diameter	35 ft
Operating Depth	26 ft
Surface Area	962 ft ²
Storage per Vertical Foot	7,197 gal

Design Flow Performance

The wet pit was evaluated under the proposed design flow condition to verify sufficient operating volume and stable pumping conditions. Buffer Volume helps reduce excessive pump starts and stops. Geometric volume represents available wet pit storage during operation.

Table 3. Pump Parameters

Parameter	Value
Design Flow	27,778 gpm
Design Capacity	40 MGD
Buffer Volume	83,333 gal
Geometric Volume	187,122 gal

Pump and Wet Pit Integration

The wet pit was coordinated with the selected vertical turbine pump system to maintain proper suction conditions and efficient operation.

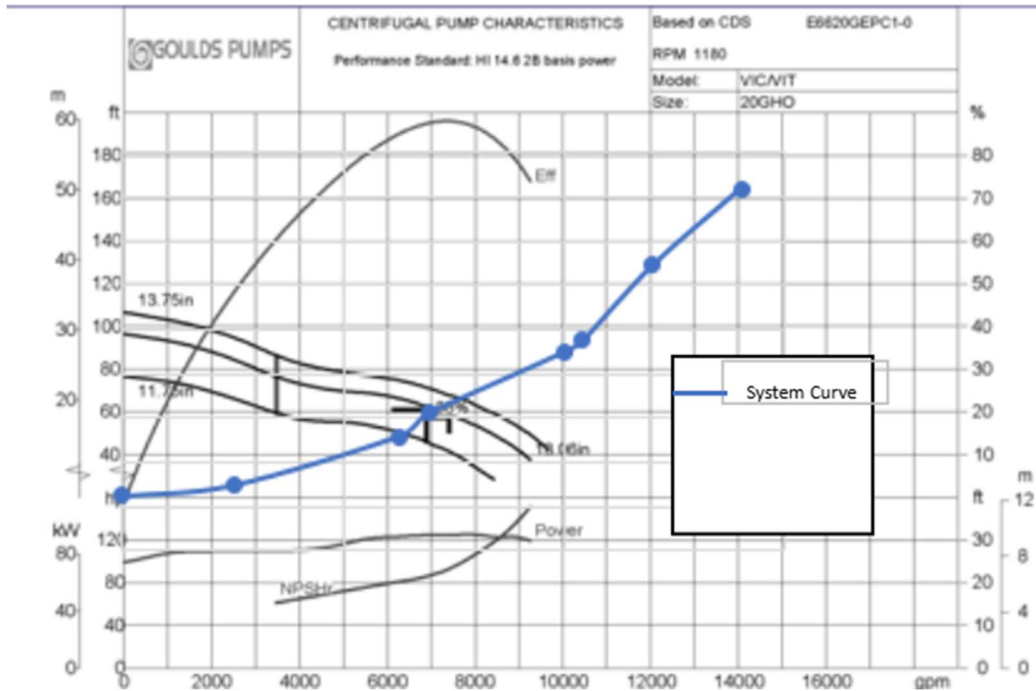


Figure 2. Pump curve + System curve

Table 4. Pump design information

Parameter	Value
Pump Type	Vertical Turbine
Number of Pumps	4 Duty + 1 Standby
Flow per Pump	~6,945 gpm
Total Dynamic Head	62.1 ft

Design Considerations

- Stable water level during operation
- Reduced risk of vortexing or air entrainment
- Supports efficient pump startup and shutdown
- Compatible with common discharge header system

Structural and Construction Considerations

In addition to hydraulic sizing, the wet pit concept was reviewed for construction practicality and long-term maintenance. Furthermore, the following was considered:

- Excavation depth and site access considered
- Concrete water-retaining structure assumed
- Maintenance access incorporated
- Compatible with valves, controls, and piping layout

Hydraulic Profile Summary

The hydraulic profile was developed to track energy and water surface elevations through the wet pit, pump station, treatment train, and final storage system.

Table 5. Hydraulic Profile Elevations

Location	Elevation (ft)	HGL (ft)	EGL (ft)	Description
Wet Pit (Start)	961	961.00	961.64	System starting point
Pump Discharge (to EQ Tank)	977	977.00	977.64	Initial pump lift (~16 ft added head)
End of Treatment Train	970	970.00	970.64	Gravity-driven flow with 1 ft of head-loss per process
Final Storage & Distribution	985	985.00	985.00	Final pump lift to storage

The profile confirms that pump head is sufficient to overcome static lift and system losses while maintaining gravity flow through downstream treatment processes.

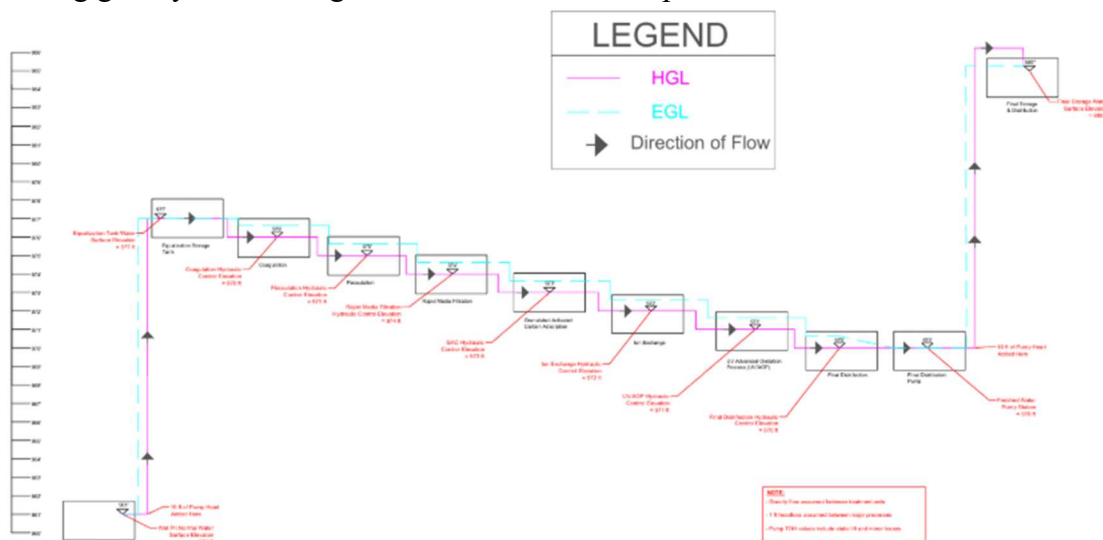


Figure 3. Hydraulic Profile