

157TH AVENUE WATER RECLAMATION FACILITY (WRF)

Aquifer Protection Permit No. P-101324

Place ID 1378, LTF No. 100261

Significant Amendment

I. Introduction:

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an Aquifer Protection Permit (APP) for the subject facility that covers the life of the facility, including operational, closure, and post-closure periods unless suspended or revoked pursuant to Arizona Administrative Code (A.A.C.) R18-9-A213. The requirements contained in this permit will allow the permittee to comply with the two key requirements of the Aquifer Protection Program: 1) meet Aquifer Water Quality Standards (AWQS) at the Point of Compliance (POC); and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). BADCT's purpose is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., the local subsurface geology), to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer or to prevent pollutants from reaching the aquifer.

II. Permittee & Facility Location:

The City of Goodyear owns and operates the 157th Avenue WRF located at 5424 S. 157th Avenue, Goodyear, Maricopa County Arizona, 85338 over the groundwater of the Phoenix Active Management Area. The 157th Ave. WRF is located on County Parcel 500-83-008N. AZPDES Gila River Outfall 001 is located Southeast of the facility on the westside of Estrella Parkway, while AZPDES Gila River Outfall 003 is located Southwest of the facility. The City of Goodyear offices are located at 1900 N. Civic Square, Goodyear, Maricopa County, Arizona 85395.

III. Facility Description:

The permittee is authorized to operate the City of Goodyear - 157th Avenue Water Reclamation Facility (WRF) with a maximum average daily monthly maximum flow of 6.83 million gallons per day (mgd) for Phase 1 re-rating, 7.50 mgd for Phase 2 expansion, and 6.73 mgd for Phase 3 derating after 1.14 mgd of RO brine and backwash flows from Goodyear Water Treatment Facility (GWTF) diversions. The Department has graded this facility as a Grade 4 wastewater treatment plant for all phases. The facility shall have an operator in direct responsible charge who is certified for the class and grade of the facility and is available to the onsite operator and ensures an onsite operator visits the facility daily.

Phase 1 - 6.83 mgd Re-rating: The existing 6 mgd treatment train is being re-rated to 6.83 mgd Phase 1. The Phase 1 treatment process consists of an influent pump station with three (2-duty, 1-standby) 4,500-gpm (60-hp) VFD driven pumps, a headworks with two 6-mm mechanical fine screens (capacity 20-mgd step screen and 13-mgd perforated screen) each equipped with a washer/compactor, a 16-mgd grit chamber/classifier with a bypass channel for maintenance. From the headworks, continues to a Return Activated Sludge (RAS) mixing box before entering three (3) bioreactors for biological treatment, each with six zones. Bioreactor Zone 1 and 5 are anoxic, Zone 2, 3, and 6 are aerated, and Zone 4 is an anoxic zone that has been equipped with a mixer (installed to support Phase 2) to be operated manually as anoxic or aerated, dependent on the WRFs

needs. Each bioreactor has two IMLR pumps (both duty, with a shelf spare IMLR pump [minimum of 2 total]), that return mixed liquors from Zone 5 back to Zone 1 for enhanced denitrification. Two 1,800-scfm (150-hp soft start driven), and two 5,100-scfm (350-hp soft start driven) blowers supply air to all three bioreactors. Five rectangular sedimentation basins (2-duty 2,000-sf, 2-duty 3,300-sf, and 1-standby 3,300-sf) provide secondary clarification.

RAS and Waste Activated Sludge (WAS) are removed from the sedimentation basin through a drywell. Three 2,355-gpm (15-hp) RAS pumps are connected to a header to serve all five sedimentation basins and pump to the RAS/influent mixing box located after grit removal and prior to the bioreactors and two 300-gpm (3-hp) WAS pumps, connected to the same header, deliver wasted sludge to two oxidation ditches that have been converted to aerated sludge holding tanks (SHTs) that also receive sludge from the Corgett WRF. A scum pump station with two constant speed 150-gpm (3-hp) submersible pumps also discharge to the converted SHTs. The SHTs are each equipped with 402 diffusers that are supplied air with two 600 scfm (30-hp) blowers, and when the sludge in the SHTs reach a certain level, mechanical rotors help supplement the air and mixing. A sludge pump station with two 925-gpm (10-hp) pumps delivers sludge from the SHTs to one of three (3) centrifuges. The WRF also receives the wasted sludge from the City of Goodyear – Corgett Wash WRF (APP No. P-102424) for treatment and dewatering. The facility has a residual handling tank (converting from a historic reclaimed water storage tank) to store the sludge from City of Goodyear Water Treatment Plant. The repurposed tank is divided into three sections: thickener, equalization basin and mixing/conditioning chamber. The thickened sludge is pumped to the existing centrifuges at the WRF for dewatering. All dewatered and/or dried sludge is hauled off-site for management and disposal in accordance with state and federal regulations.

Three Evoqua disc filter systems (2-duty; 1-standby) each with 15 disks and one Hydrotech disk filter system with 14 disks (installed to support Phase 2), provide tertiary treatment prior to the continuous turbidity sampling point. The effluent is chlorinated using sodium hypochlorite in a chlorine contact basin (CCB) with a stationary mixer for chlorination, and de-chlorinated using sodium bisulfite system. A spray aeration system to minimize TTHM formation is installed above the CCB (utilized as needed). At the end of the CCB is an effluent pump station with three VFD driven 4,200 gpm (250-hp) turbine pumps (2-duty; 1-standby) and a VFD driven 4,200 gpm (250-hp) submersible pump (installed to support Phase 2), that provide 75 PSI to the reclaimed water system. The WRF is classified to produce Class A+ reclaimed water according to A.A.C. R18-11, Article 3. An emergency effluent storage basin is authorized to receive any off-specification effluent from the filters, in lieu of chemical feed facilities required by R18-11-303(A) to ensure that filtered effluent before disinfection complies with the 24-hour average turbidity requirements. This off-specification water will be slowly sent back to headworks of the WRF. A plant drain pump station delivers the decant from sludge thickening, centrate from the centrifuges and filter backwash with two 466-gpm (10-hp) pumps to the headworks for treatment.

Up to 7.5-mgd of effluent may be discharged to the combination of the Gila River (at two different outfalls) or delivered to the Buckeye Irrigation District (BID) canal under AZPDES permit No AZ0022357. Effluent may also be discharged at the City of Goodyear Soil Aquifer Treatment (SAT) site for recharge under APP No. P-511440, which permits the discharge for up to 5.87-mgd,

and permits discharge to the Vadose Injection Project wells as needed but not more than 0.13-mgd for a combined total of 6.0-mgd annual average. The City of Goodyear 157th Avenue WRF may accept reclaimed water from Liberty Utilities Palm Valley/Sarival WRFs (APP No P-100310 and No P-513981, respectively) for distribution to reclaimed water customers or discharge to the SAT site. Class A+ reclaimed water from City of Goodyear 157th Avenue WRF and Palm Valley/Sarival WRFs may be beneficially reused under a valid Recycled Water Permit, as per A.A.C. R18-9, Articles 7.

Phase 2 - 7.5 mgd Expansion: At the time this permit was issued, the three bioreactors had Zone 4 converted to swing zones by adding a mixer, the Hydrotech cloth media filter had been installed, and the submersible effluent pump had been installed. The City of Goodyear and their consultant were working to troubleshoot these items and submit ECOC's and as-builts to ADEQ. The Phase 2 Improvements will include the Department's acceptance of Zone 4 in the three bioreactors being converted to swing zones by adding a mixer, installation of a fifth 4,000-scfm (300-hp VFD driven) blower to serve with the other four bioreactor blowers listed above, complete installation of the Hydrotech cloth media disk filter system, complete installation of the 4,200 gpm (250-hp) submersible effluent pump located at the end of the CCB, installation of a booster pump station skid to distribute plant water with four (3-duty; 1-standby) 450-gpm (30-hp) VFD driven vertical multi-stage service water pumps, and installation of a third 600 scfm (30-hp) blower to serve the SHTs with the installation of 402 new diffusers per ditch, for a total of 804 diffusers per ditch.

For operation of the five rectangular sedimentation basins in Phase 2, the standby sedimentation basin will change from a large to a small basin (1-duty 2,000-SF, 3-duty 3,300-SF, and 1-standby 2,000-sf) to provide secondary clarification. The system pressure in the 16-in effluent line to the BID/River discharge will be utilized (as needed) for the TTHM recirculation and control system.

Phase 3 - 6.73 mgd Derating: Under this Phase 3, the facility will divert the 1.14 mgd of brine flow from the WRF and the treatment capacity will be de-rated to 6.73 mgd. The facility will continue to operate the existing treatment trains with Phase 1 and 2 components for this phase. This Phase will consist of the permittee notifying the Department of the 1.14 mgd of brine flow diversions from the facility in accordance with Section 3.0 compliance schedule item No. 6.

A single stage 2,400-scfm bio-scrubber treats foul air in the influent pump station. The headworks has a dispersion fan that blows foul odors upward, which could affect a park owned by the City located east of the headworks.

The backup power consists of a 650-kW rated diesel generator for the influent, CCB and effluent areas and a 180-kW rated diesel generator that supplies emergency power to the tertiary disc filter area.

All industrial hookups and other non-residential hookups to the treatment system shall be authorized according to the applicable federal, state or local regulations.

IV. Amendment Description:

The purpose of this amendment is to provide an interim capacity of 6.83 mgd while the WRF prepares to remove approximately 1.14 mgd of brine flow discharges. The brine flow (which includes reject water from the City’s groundwater treatment facilities from reverse osmosis systems and backwash waste from arsenic coagulation/filtration and adsorption systems) has relatively low levels of BOD and TSS and is reducing the organic loading compared to the loading projected under the design parameters established under the last 6.0 MGD plant expansion.

The City is in the process of performing other improvements that will increase the treatment and hydraulic capacity to 7.50 mgd while the brine flows are still being received at the WRF. The Brine flow diversion project is intended to separate the brine flow from the plant influent sewer. After the diversion project is complete, the capacity of the 157th WRF will revert to 6.83 mgd as the loading projected under the original WRF design will return to the original design parameters, but the treatment improvements will increase this capacity.

V. Regulatory Status

No current open enforcement actions.

VI. Pre-Operational Requirements

During a site visit on September 5, 2024, ADEQ found that the Hydrotech cloth media disk filter system was in continuous backwash and the 4,200 gpm (250-hp) submersible effluent pump located at the end of the CCB was experiencing cavitation. Final acceptance and installation of these two items, and an increase to Phase 2 Capacity will require a sealed engineering memo to serve as an addendum to the September 2, 2024 “157th Avenue WRF Phased Expansion Phase 2 Design Report” listed in Section 2.2.1 and as-builts that document the final and correct operation for these two items as provided by Section 3.0; Compliance Schedule Item No. 3.

VII. Best Available Demonstrated Control Technology (BADCT):

The treatment facility shall be designed, constructed, operated, and maintained to meet the treatment performance criteria for new facilities as specified in A.A.C. R18-9-B204. The facility shall meet the performance requirement for industrial pre-treatment as per A.A.C. R18-9-B204(B)(6)(b).

The current interim capacity evaluation was designed per the “157th Avenue WRF Phased Expansion Phase 2 Design Report” prepared, stamped, dated, and signed (sealed) by Arizona Registrant Rob D. Bryant (Civil #42726) with Waterworks Engineers on September 9, 2024 and miscellaneous submittals and attachments that accompanied the report.

The treatment facility shall not exceed a maximum seepage rate of 550 gallons per day per acre for all containment structures within the treatment works.

VIII. Compliance with Aquifer Water Quality Standards (AWQS):

Up to 7.50 mgd of effluent may be discharged to the Gila River Outfall 001, Gila River Outfall 003 and BID Canal under the AZPDES Permit No. AZ0022357, Up to 6.0 mgd can be recharged at the City of Goodyear SAT Site (5.87 mgd) or VIP Site (0.13 mgd) under APP No. P-511440. Flow does not discharge to more than one of the AZPDES permitted sites at any time, and flowmeter values are recorded while changing valves to the discharge sites under Goodyear **Standard Operating Procedure #####.**

City of Goodyear 157th Avenue WRF may accept A+ reclaimed water from Palm Valley WRF/Sarival WRF reclaimed water system (APP Nos. P-100310/P-513981) for distribution to water customers. Class A+ reclaimed water from City of Goodyear 157th Avenue WRF and Palm Valley WRF/Sarival WRF reclaimed distribution system may be beneficially reused under a valid recycled water permit, as per A.A.C. R18-9, Articles 7.

Groundwater monitoring is not required at POC No. 1 at the time of permit issuance. Groundwater monitoring at POC No. 2 is only required if effluent is discharged to Outfall 001 for seven (7) or more consecutive days within a 30-day period. In the event that discharge to the Gila River at Outfall 003 exceeds 250,000 gpd for at least three (3) consecutive months, the permittee shall install a monitor well at POC No. 3 and begin monitoring as per Section 3.0, Compliance Schedule. The Director may amend this permit to install a monitoring well if there is cause or concern that groundwater quality may be impacted at the POC, or may amend this permit to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.

The outfall to the BID canal is exempt from APP requirements as per A.R.S. § 49-250.B.6. It is not considered to be a discharging facility requiring a separate permit. Therefore, a Point of Compliance (POC) has not been designated for this outfall.

In the event that a discharge to the Gila River at Outfall 003 exceeds 250,000 gallons per day (gpd) for at least three (3) consecutive months, a well shall be installed at POC No. 3, as specified Section 3.0 compliance schedule items. The well shall be monitored for a minimum of eight (8) sampling events, and then the permittee shall submit an APP Amendment application to set Alert Levels (ALs) and Aquifer Quality Limits (AQLs) for POC No. 3.

The depth to groundwater is approximately 20 feet below ground surface (bgs), and the direction of groundwater flow is to the west. The WRF was designed and constructed according to plans approved by ADEQ.