

VERRADO WATER RECLAMATION FACILITY (WRF)
Aquifer Protection Permit No. P-105202
Place ID 16908, LTF No. 94502
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:

EPCOR Water Arizona, Inc. Owns and operates the Verrado Water Reclamation Facility (WRF), located at 1871 N. Lancaster Street, Buckeye, Arizona, Maricopa County, over groundwater of the Phoenix Active Management Area. The Verrado WRF is located on County Parcels 502-78-009B, while Vadose Zone Well #1 is located on Parcel 502-78-890 and Vadose Zone Well #2 is located on Parcel 502-78-889, and the property owner for all three parcels is Arizona American Water Company. Property/assets were obtained via stock purchases by EPCOR Water, Arizona, Inc. so the property name has remained the same on the deed.

III. Facility Description:

The permittee is authorized to operate the Verrado Water Reclamation Facility, with a maximum average monthly flow of 1.22 mgd. The Department has graded this facility as a Grade 3 wastewater treatment plant. The facility shall have an operator in direct responsible charge who is certified for the grade of the facility and inspects the facility Daily.

The Verrado WRF headworks consists of two influent pump station (IPS) wet wells, each with two 810 gpm pumps (3 duty, 1 standby), a mechanical step screen with screenings washer and compactor and a bypass manual bar screen, and a vortex grit removal tank system with a grit washer and concentrator that dumps into a roll off bin for disposal. One of the IPSs is at a lower elevation to provide extra storage and minimize pump cycling. IPS #1 overflows a weir and enters IPS #2. Flows over 1.3 mgd (900 gpm) overflow into two 0.73-million-gallon equalization basins with two 6-hp blowers that has a pump station with two 700-gpm vfd controlled pumps.

From the headworks, preliminary treated influent is delivered to an anoxic zone junction box that splits flows between two bio-nutrient reactor (BNR) treatment trains, that each have three anoxic zones (A, B, and C) and an aerated zone with three aerated swing zones to achieve nitrification/denitrification. The anoxic zones utilize jet motive pumps to keep the mixed liquors in suspension. Three 100-hp blowers (2 duty, 1 standby) deliver oxygen to both BNR aerobic

zones, and mixing is provided with jet motive pumps to keep the mixed liquors in suspension and distribute the air through a single jet aeration header fitted with dispersion nozzles with three aeration drop legs/swing zones. An IMLR pump transfers mixed liquors from the end of the aerated zone back to the head of the anoxic zone. A carbon feed system is available to deliver an additional food source to assist with denitrification

MLSS is split between two clarifiers which share a RAS pump station, with a RAS pump dedicated to each and a third redundant pump when the dedicated pump is out of service. WAS pumping is achieved by bleed off from the RAS discharge piping, through an electrically activated control valve, and conveyed to the sludge holding tank with modifications to allow decanting. The sludge will be stored in the modified dual tank 175,000-gallon total capacity sludge holding tank (with two 40-Hp blowers), and then pumped to a 1.0-meter belt filter press, or back-up 0.5-meter belt filter press for dewatering. The dewatered sludge is disposed off-site at an approved landfill.

Effluent from the clarifiers is delivered to a 10,000-gallon filter influent pump station with two 2,200 gpm pumps (1 duty, 1 standby), which raises the hydraulic grade line so that effluent flows by gravity through one of two 2.2-meter tertiary disc-filters (each with a 1.83 MGD capacity through 6 disks) and two chlorine contact tanks (each with three passes) to the effluent pump station. Sodium hypochlorite (NaOCl) solution is injected upstream of the contact tank in the 18-inch filter effluent header. An 18-inch static mixer provides instantaneous mixing of the chlorine and filtered effluent. The facility uses sodium bisulfite for effluent dechlorination.

The 18,000-gallon effluent pump station with two 1,900 gpm pumps (1 duty, 1 standby), delivers reclaimed water meeting the Class A+ Reclaimed Water Standards as per Title 18, Chapter 11, Article 3. The effluent may be delivered for beneficial purposes (reuse) under a required valid Class A+ reclaimed water permit or to the two (2) vadose zone wells at the aquifer recharge facility (ARF), located approximately one mile north-northwest of the facility, or to the outfall within the Lost Creek Wash. When discharged only for reuse, the effluent is delivered directly from the chlorine contact chamber and will not be dechlorinated. However, during times in which the effluent is discharged to the ARF and/or to the Lost Creek Wash, the effluent is required to be dechlorinated.

A single 12,700 cfm multi-stage wet scrubber odor control system uses sodium hydroxide and sodium hypochlorite to treat foul air ventilated from all odor producing processes.

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 rerate the Verrado WRF from 0.83 mgd to 1.22 mgd after improvements were performed in 2019 and 2021, and after an influent flow and loading analysis through February 2022. The flow and load analysis will provide supporting information for an APP amendment to rerate the plant 1.22 mgd ADMM and establish influent characteristics for future phases.

These improvements included the following:

- Optimizing the bioreactors aeration system- This upgrade was completed in 2019 by providing three aeration/swing zones in each aeration basin tank and providing jet aeration systems in each aeration basin. This improvement expanded the activated sludge process treatment capacity.
- Providing a new 1-meter Belt Filter Press and using the old 0.5-meter press as a standby unit. This upgrade was completed in 2021 and provided solids handling capacity to address the buildout solids dewatering capacity.

The permit category for this amendment was determined to be a “Significant Amendment” as per A.A.C. R18-9-A211(B)(2)(b). A ten percent or greater increase in design flow of the Verrado WRF is occurring with this permit amendment.

V. Regulatory Status

This amendment is in response to routine flow monitoring alert levels being reached, and capacity assurance concerns with Maricopa County Environmental Services Department. There are currently no regulatory notices issued by the ADEQ.

VI. 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).

When discharged only for reuse, the effluent is delivered directly from the chlorine contact chamber and will not be dechlorinated. However, during times in which the effluent is discharged to the ARF and/or to the Lost Creek Wash, the effluent is required to be dechlorinated.

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.

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

The depth to groundwater is approximately 230 feet below ground surface (bgs) at the WRF and 330 feet bgs at the ARF. Groundwater at the WRF appears to flow south-southeastward, and at the ARF appears to flow north-northeastward toward a hydraulic sink. Groundwater monitoring is required at POC # 2; MW #1, within 300 feet east of the Aquifer Recharge Facility vadose zone recharge wells. Groundwater monitoring is not required at POC#1 and POC #3 unless an additional point of compliance is required.