COPPER BASIN WATER RECLAMATION FACILITY (WRF)
Aquifer Protection Permit No. P-105764
Place ID 114026, LTF No. 77214
New Permit

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 Copper Basin WRF one mile south of the intersection of E Bella Vista Road and N Sierra Vista Drive at the Northeast corner of Section 27 of Township 3S and Range 8E; San Tan Valley, AZ 85143 in Pinal County, over the groundwater of the Phoenix Active Management Area. The permittee, EPCOR Water Arizona, Inc., is located at 2355 W. Pinnacle Peak Rd; Suite 300, Phoenix, Arizona, in Maricopa County and is in "good standing" with the Arizona Corporation Commission.

III. Facility Description:

The permittee is authorized to operate the Copper Basin WRF (CBWRF), with a maximum average monthly flow of 3.6 mgd for Phase 1. The ADEQ has graded this facility as a Grade 4 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 Phase I CBWRF plant consists of an influent pump station with three 3,700 gpm pumps (2 duty, 1 standby), that lifts influent to a headworks with two influent channels with a 6mm mechanical coarse screen with wash compactor and a bypass channel with 1-inch manual bar-screen. The influent then proceeds to a stacked tray grit removal system with concentrator/classifier unit and two (1 duty, 1 standby) grit pumps, a vortex grit classifier with grit dewatering unit. From the grit removal system, flow travels through two-2mm fine screens with built in dewatering units. All of the washed inorganic material will be delivered to one of two roll-offs for disposal. Both the 6mm screen and grit chamber have a bypass channel.

After the headworks, the maximum daily flow proceeds by gravity to one of two bioreactors, any excess flows overflow over an adjustable weir to a 175,000 gallon equalization tank, with two submersible mixers and two 600 gpm pumps. Influent is drained from the EQ tank during low flow periods to create relatively steady conditions for the biological treatment process. From the headworks and equalization tank, flow is sent to two bioreactors (Bioreactor #1 and Bioreactor #2). Each of the bioreactors have two (2) anoxic zones, each with a submersible propeller mixer,

an aerated zone with three distinct jet aeration grids (Jet aeration pump and jet pipe header), that flow into a common mixed liquor channel. From the common mixed liquor channel, flow is directed into three (2 duty, 1 standby) bioreactor membrane tanks with seven hollow fiber membrane cassettes and three empty slots for future expansion in each tank, before flowing into a common RAS channel with a pump station containing three 5,200 gpm RAS pumps (2 duty, 1 standby). RAS and supplemental carbon (as necessary) will be added to the first anoxic zone in each bioreactor train to assist with denitrification. WAS, scum, and foam is overflowed from the common mixed liquor channel to the WAS pump station with 2 (1 duty + 1 standby) 150 gpm submersible pumps that send this waste to two 53,000-gallon sludge holding tanks without decanting equipment for thickening. Alternatively, WAS can be drawn from the RAS pump station through an interconnecting pipe. From the sludge holding tanks, two sludge feed pumps (1 duty + 1 standby) send flow to two 2-meter belt filter presses each capable of processing between 135 and 215 gpm. Two process air blowers (1 duty + swing standby, that can supply 1,000-5,000 cfm each) supply air to both bioreactor aerated zones, and can supply scour air for membrane cleaning and coarse bubble air to the sludge holding tank.

Three MBR permeate (WRF effluent) pumps will deliver effluent to be disinfected by sodium hypochlorite within two single pass chlorine contact basins. Effluent will be dechlorinated prior to recharge. The Copper Basin WRF is equipped with a membrane filtration system and chemical fees system, which are utilized to meet Class A+ reclaimed water turbidity standards. Dechlorinated effluent is discharged to one of six (6) recharge basins with percolation wells or used for beneficial purpose under a valid reclaimed water permit. Two (2) non-potable water pumps deliver effluent for onsite use.

Odor from the influent pump station, headworks, bioreactors, and sludge holding tanks is collected in a common plenum and treated by two 8,500 cfm chemical odor scrubbers, operating in parallel. The dewatering facility odors will be captured and delivered to an activated carbon odor treatment system. A full diesel standby power 1500 kW kVA generator will be provided to support all duty loads that are critical to plant operations.

All the sludge, including screenings, and grit, will be hauled off-site for management or disposal in accordance with state and federal regulations.

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. Best Available Demonstrated Control Technology (BADCT):

The Copper Basin WRF 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 facility will:

- Be constructed with Duty and standby unit processes capable of treating raw wastewater with one unit out of service ultimately based around increased facility reliability and redundancy. This includes a redundant discharge recharge basin, so that the largest basin can be dry and capacity to discharge is still available.

- Denitrify the effluent to below 10.0 mg/l for total nitrogen. This treatment Plant technology is considered to meet BADCT requirements. Additionally, a carbon feed source is available, if necessary, to assist denitrification.;
- Utilize MBR membrane technology to produce a class A+ effluent;
- Will disinfect through two chlorine contact basins utilizing sodium hypochlorite. Sodium bisulfate will be fed to dechlorinate effluent prior to discharging to the six recharge basins.
- A plenum will capture odors from the fully enclosed IPS, headworks, bioreactor anoxic zones and sludge holding tanks, and deliver foul air to two 8,500 cfm chemical odor control units. The dewatering facility odors will be captured and delivered to an activated carbon odor treatment system.
- Future phases may include direct injection and vadose zone wells for discharging effluent back into the aquifer. Ambient groundwater monitoring in Point of Compliance well MW-1 will be required to document existing conditions prior to the influence of discharged effluent into the recharge basins.

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

To ensure that site operations do not violate the Reclaimed Water Quality Standards for the beneficial use of Class A+ reclaimed water, the permittee will monitor the reclaimed water at the effluent auto sampler, downstream of the chlorine contact chamber. The permittee will monitor the reclaimed water daily for flow rate, fecal coliform and turbidity, monthly for total nitrogen, and on a monthly/suspended basis for enteric virus.

To ensure that site operations do not violate Aquifer Water Quality Standards, the permittee shall monitor a downgradient POC Well MW-1 following 8 consecutive months of ambient groundwater monitoring, prior to discharge activities. Alert levels and Aquifer Quality Limits will be established for parameters listed in Table 11: PARAMETERS FOR AMBIENT GROUNDWATER MONITORING.

Facility inspection and operational monitoring will be performed on a routine basis (see Section 4.2, Table 12: FACILITY INSPECTION AND OPERATIONAL MONITORING, in the permit).

VI. Discharge Impact Area (DIA)/ Pollutant Management Area (PMA)

The DIA was calculated using MOUNDSOLV to assess groundwater mounding that would occur beneath three rectangular recharge areas designed to represent the infiltration basins. LRE simulated recharge of the total phased flow of 12 MGD for a duration of 50 years. The maximum mounding is expected to occur between the northern recharge areas, with approximately 106 feet of mounding and 95 feet of mounding below the southern infiltration area. The local groundwater gradient and the calculated inverse distance-weighted hydraulic conductivity value of 82.6 feet/day results in a groundwater flow velocity after recharge to be approximately 1.2 feet/day. This calculated flow velocity was multiplied by the number of days used in the simulation (50 years = 18,275 days) to yield the average travelled distance of 4.3 miles. Therefore, the DIA is a radius of 4.3 miles from the center of the site. The PMA is defined as the line circumscribing the property boundary as presented in Figure 15 in the hydrogeologic report.