Luke 303 Wastewater Reclamation Facility
Aquifer Protection Permit No. P-511700
Place ID 148049, LTF No. 92968
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 facility is located at 5239 North Alsup Avenue in Litchfield Park, in Maricopa County, Arizona. The permittee is EPCOR USA, Inc.

III. Facility Description:

EPCOR Water Arizona Inc. is authorized to operate Luke 303 Water Reclamation Facility (WRF) with a flow of up to 4.25 million gallons per day (mgd), upon completion of all the phases of plant construction. The Department has graded this WRF as a Grade 4 wastewater treatment plant for all phases covered by this permit. The facility shall have an operator in direct responsible charge who is certified for the class of the facility, “Daily” for a Grade 4 WWTP .

The facility will be increasing the design flow to 4.25 mgd in two phases. The existing 0.25 mgd Moving Bed Bioreactor (MBBR) Package Plant will be in operation during all phases. The facility will be adding two new phases of 2.0-mgd Aerobic Granular Sludge System (AGS) each. The existing Phase 5 of 1.75 mgd consists of 0.25-mgd MBBR Package Plant and 1.5 mgd Sequencing Batch Reactor (SBR) treatment train.

0.25-mgd MBBR Package Plant: The 0.25-mgd MBBR Package Plant consists of a pre-equalization tank, a Moving Bed Bioreactor (MBBR) package treatment plant consisting of an anoxic tank, two bioreactors filled with high density polyethylene media, two circular clarifiers, a cloth media disk filter. The effluent from filter will be pumped to the chlorine contact basin for disinfection and will be de-chlorinated prior to discharge. The sludge will be stored in an aerated sludge storage tank prior to dewatering through belt press.

The 0.25-mgd MBBR Package Plant will remain in operational during all phases. It will add 0.25 mgd to the capacity of the WRF through the existing and new phases (Phases 5, 6 and 7) of operation covered by this permit.

Phase 5 - 1.75 mgd WRF: The Phase 5 - 1.75 mgd WRF consists of the 0.25-mgd MBBR Package Plant described above, and 1.5-mgd SBR Treatment Plant that contains three 0.5- mgd SBRs. The wastewater will flow to a common headworks consisting of an influent pump station which includes two 5-mgd pumps (1duty, 1standby), a 3-mm mechanical bar screen with washer and compactor and bypass 1-inch manual bar rack, before flowing into a pre-equalization tank with five pumps (1 duty,1 standby pump for the 0.25-mgd MBBR Package Plant, and 2 duty, 1 standby pumps for 1.5-mgd SBR Treatment Train). The wastewater from pre-equalization tank will be proportionally split between the 0.25-mgd MBBR package plant and 1.5-mgd SBR treatment plant. The facility will be providing nutrient feed to add urea and phosphoric acid at the IPS to condition the influent for treatment. The historic influent pump station will be used as a plant drain and recycle flow pump station.

The 1.5-mgd SBR treatment plant consists of three 0.5 mgd SBRs with fine bubble diffusers and two duty aeration blowers, a post equalization tank/filter influent pump station with 3 pumps that pump secondary effluent to three cloth media disk filters (1 mgd, 0.59 mgd, and 0.59 mgd in capacity), before traveling to the sodium hypochlorite chlorine contact basins with sodium bisulfite de-chlorination before discharge to the recharge basins.

WAS will be discharged from the three SBRs and pumped from the 0.25-mgd package plant to an aerobic digester with fine bubble diffusers and two duty blowers, before being sent to a belt filter press for sludge dewatering. The decant liquid from the aerobic digester is sent back to the pre-equalization tank for further treatment. A common standby blower is shared between the SBR blowers and the aerobic digester blowers.

The WRF is rated as producing Class A+ reclaimed water according to A.A.C. R18-11, Article 3 in all the phases. The effluent is discharged through recharge or is reused for beneficial purposes. The facility consists of five existing recharge basins #1-2, #3N, #3S, #13E and #13W. Recharge Basins #6 and #12 have been constructed under Phase 5 operation for further effluent recharge. Each recharge basin is provided with percolation holes to enhance the recharge rates. Recharge Basins #1-2, #3N and #3S has five percolation holes in each basin, #13E and #13W have four percolation holes and #6 and #12 each have eight percolation holes.

Phase 6 - 2.25 mgd WRF: Under the Phase 6 - 2.25 mgd WRF, the facility will continue to utilize the 0.25 MBBR Package Plant and will build a tank for an Aerobic Granular Sludge (AGS) System with a capacity to treat 2.0 mgd. Upon commencement of AGS system operation, the existing 3 conventional SBRs will be taken offline for treatment modification for Phase 7. Phase 6 treatment train will include adding two pumps to the IPS for a total of four pumps (3 duty, 1 standby) with 5.0 mgd capacity each, adding a 3mm mechanical screen to the headworks so that Phase 6 includes two 3-mm mechanical screens with a 1-inch manual bypass screen, and a 416,472 gallon pre-equalization tank with five pumps (1 duty and 1 standby pump for the 0.25-mgd MBBR Package Plant, and 3 duty and 1 standby pumps for 2.0-mgd AGS Treatment Train). The wastewater from pre-equalization tank will be proportionally split between the 0.25-mgd MBBR Package Plant and 2.0-mgd AGS Treatment Train. The facility will continue to provide a nutrient feed to add urea and phosphoric acid at the IPS.

The 2.0-mgd AGS Treatment Train will consist of one AGS reactor with four upgraded blowers that deliver air to fine bubble diffusers. The new plant will include sludge buffer tanks, a post equalization tank with two new pumps, or five 1,111 gpm pumps total (four duty, one standby,

three cloth media disk filters (2.0 mgd, 2.0 mgd and 1.0 mgd in capacity), additional four channels for chlorine contact basin. The AGS reactor will have fill, draw, react and settle cycle and will be providing nitrification/denitrification. The sludge will be digested in the existing aerobic digester with five blowers (four duty/one standby) that deliver air to the fine bubble diffusers in this aerobic digester and the aerobic digester under construction for use in Phase 7, below. The existing 2-meter belt filter press is adequate for the 4.25 MGD facility. The sludge from 0.25-mgd MBBR package plant and from the AGS SBR treatment plant is pumped to the aerobic digester. Sludge in the aerobic digester is thickened, through decanting, and is dewatered through a belt filter press.

Three new recharge basins #7, #8 and #11 will be added to the seven recharge basins from the previous phase. Recharge Basins #7, #8 and #11 will have eight percolation holes in each basin. Prior to the discharging the effluent to the recharge basins #7, #8 and #11, the facility shall submit the results of the percolation testing per Compliance Schedule Item #2.

Phase 7 - 4.25 mgd WRF: Under the Phase 7 - 4.25 mgd WRF, the facility will consist of the 0.25-mgd MBBR Package Plant, the 2.0 mgd AGS Treatment Train from Phase 6, and a second 2.0 mgd AGS reactor (converted from two of the conventional SBRs in Phase 5). Under Phase 7, the facility will be adding one additional 3mm mechanical screen, and converting the two conventional SBR from Phase 5 to 2nd 2.0-mgd AGS reactor and third SBR to a second aerobic digester.

The 4.0-mgd AGS Treatment Train will consists of two AGS reactors with fine bubble diffusers and four blowers, sludge buffer tanks, a post equalization tank with five 1,111 gpm pumps (four duty, one standby), three cloth media disk filters (2.0 mgd, 2.0 mgd and 1.0 mgd in capacity), chlorine contact basin, and de-chlorination. The sludge will be digested in two aerobic digesters with fine bubble diffusers and five blowers (four duty, one standby).

The WRF is rated as producing Class A+ reclaimed water according to A.A.C. R18-11, Article 3 in all the phases. The effluent will be disposed through recharge or will be reused for beneficial purposes. The effluent will recharge through the ten recharge basins described above.

IV. Amendment Description:

The purpose of this amendment is to:

1. Increase the design flow to 4.25 mgd by constructing two new phases at the WRF to accommodate the new industrial flows and domestic flows from the Luke 303 service area.
    - The facility will be increasing the flow to 4.25 mgd in two phases by constructing new Aerobic Granular Sludge (AGS) system and additional treatment component.
2. Add three new recharge basins #7, #8, and #11 to recharge the effluent and to construct eight percolation holes in each recharge basin

The permit category for this amendment was determined to be a "Significant Amendment" as per A.A.C. R18-9-A211(B)(9) because the facility is increasing the flow which is more than 10% of the existing design flow and adding two new recharge basins to dispose the effluent.

V. Regulatory Status:

ADEQ issued a Consent Order (Docket No. App-07-22) effective December 21, 2022 to Luke 303 WRF for not maintaining a minimum two feet of freeboard and failure to maintain recharge basins,

failure to discharge the effluent through a valid Recycled Water Permit and few other operation related violations. The Recharge Basin #6 and #12 will be constructed and approved under this amendment per the compliance condition of this Consent Order.

This amendment application was received on January 28, 2022.

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

The facility has entered into 'Industrial Discharge Service Agreement (IDSA) with the industrial discharger per A.A.C. R18-9-B204(B)(6)(ii). Per the IDSA, the industrial discharger shall meet the pre-treatment performance prior to discharging to the facilities collection system.

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

To ensure that site operations do not result in violation of Aquifer Water Quality Standards at the POC, representative samples of the effluent for Phases 5, 6 and 7, shall be collected downstream of the de-chlorination unit. The effluent samples will be monitored daily for fecal coliform, weekly for BOD and TSS, monthly for total nitrogen, quarterly for metals, semi-annually for volatile and semi-volatile organic compounds.

To ensure that site operations do not result in violation of Reclaimed Water Standards for the beneficial use of Class A+ reclaimed water, representative samples of the effluent shall be collected downstream of the de-chlorination unit for Phases 5, 6 and 7. The reclaimed water sample will be monitored daily for fecal coliform, daily for turbidity and monthly for total nitrogen.

To ensure that Aquifer Water Quality Standards will be met at the POC in the aquifer, representative samples of the groundwater are collected from POC Well #1, and are sampled monthly for total coliform, total nitrogen, nitrate-nitrite as N, nitrate as N, nitrite as N, total Kjeldahl nitrogen (TKN) and minimum depth to water, quarterly for metals, semi-annually for volatile and semi-volatile organic compounds.