Town of Jerome Wastewater Treatment Plant
Aquifer Protection Permit No. P-100721
Place ID 1052, LTF No. 89387
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:

Town of Jerome
Sewer Plant Road Jerome, AZ 86331

III. Facility Description:

Town of Jerome WWTP Phase 1 (70,000-gpd)

The Town of Jerome WWTP has the capacity to treat a maximum average monthly flow of up to 70,000 gpd from the existing Phase 1 design as described herein. The WWTP process consists of a bar screen, a primary settling tank, two trickling filters, two reed beds for sludge dewatering and in situ composting, four vertical flow constructed wetland cells and a chlorination-dechlorination disinfection unit. The wetland cells are lined with a polyvinyl chloride (PVC) liner.

The wastewater influent enters through the headworks at the bar screen and is routed to the primary settling tank. The primary settling tank discharges to dosing tank A, where the wastewater can either be directed to the newer trickling filter or to the older trickling filter. Wastewater is primarily treated at the older trickling filter, with the newer filter providing additional capacity to the facility. The trickling filters discharge to dosing tank B. Dosing tank B controls which polishing wetlands receive flow. Flow can be recirculated from the older trickling filter back to Dosing Tank A. After treatment in the lined polishing wetlands, all the effluent is disinfected at the chlorination/dechlorination units. Final effluent is ultimately disposed of in Bitter Creek as regulated under Arizona Pollutant Discharge Elimination System (AZPDES) permit AZ0021804.

The sludge generated in the WWTP is dried and composted in the reed beds for approximately 7-10 years pursuant to state and federal regulations (40 Code of Federal Regulations (CFR) Part 503 and 18 A.A.C. Ch. 9, Art. 10). The sludge reed beds are lined with a polypropylene (PPE) liner. After the sludge is dried and composted, it is used in accordance with the requirements for sewage sludge disposal in 40 CFR Part 503 and 18 A.A.C. Ch. 9, Art. 10.

Town of Jerome WWTP Phase 2: (90,000-gpd)

The headworks system is comprised of a rock trap and two 0.27 million gallons per day (mgd) climber-type bar screens. The secondary process consists of two Sequencing Batch Reactors (SBR) and a post-treatment surge basin. One SBR basin will operate in treatment mode while the other collects influent from the Town's gravity sewer system. The SBR treatment cycle consists of mixed fill, react fill, react mode, settle mode, and decant mode to provide the conditions needed for nitrification, denitrification, and BOD oxidation. Oxygen required for biological treatment is provided through fine bubble aeration diffusers installed at the bottom of each SBR basin. There are three SBR aeration blowers, each equipped with variable frequency drives (VFD) to deliver the required air flow rates.

Treated wastewater is decanted from the SBR basins into the post treatment surge basin, designed to hold and discharge the effluent at a constant rate. The post-treatment surge basin discharges into the chlorine contact basin which provides disinfection to the effluent leaving the SBR basins. The chlorine contact channel is equipped with an adjustable weir to ensure that 15 minutes of contact time is provided during all flow conditions. Disinfection is provided by a chlorine tablet feeder. A second tablet feeder is installed at the discharge end of the chlorine contact channel to provide de-chlorination via ascorbic acid tablets. Effluent is discharged to Bitter Creek as regulated under AZPDES permit AZ0021804 following de-chlorination.

Each SBR is equipped with a submersible mixer and a waste activated sludge (WAS) pump. The sludge from the SBR basins is wasted to the aerobic digester equipped with fixed coarse bubble diffusers. The aerobic digester has a dedicated, direct-drive blower connected to the digester diffuser assembly. The digester is equipped with a telescoping valve to return supernatant to SBR No. 1.

The primary sludge dewatering method is a sludge bagging unit equipped with a solids feed pump and a dry polymer makeup and dosing unit. Digested sludge from the aerobic digester will be pumped to the bagging unit by the solids feed pump. Filled bags will be collected in a dumpster and hauled by a waste management service and disposed of in a landfill. The dewatering pad filtrate will drain to the Drying Bed Lift Station to be later returned to headworks. A dry mixing system and polymer feed pump will be located upstream of the dewatering pad and will inject polymer into the solids feed line.

The secondary dewatering method is sludge drying beds. Water collected from the dewatering process will be collected by underdrains placed beneath the sludge drying beds. The underdrains will convey water to the Drying Bed Lift Station, which will pump water back to headworks for additional treatment. The Drying Bed Lift Station is equipped with two submersible grinder pumps and also collects emergency overflow from the process SBR basins.

An Overflow Basin and Overflow Lift Station are designed to handle flows in that exceed the capacity of the headworks and/or SBRs. The Overflow Lift Station will pump water from the Overflow Basin back to the Drying Bed Lift Station after the high flow event has ceased.

The screenings, grit, and any dried sludge, shall be hauled off site for management and disposal at a state approved facility.

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 increase the permitted flow volume and the existing facilities becoming new facilities makes this a significant amendment as per A.A.C. R18-9-A211(B)(2)(a) and (1). Although the existing WWTP has the hydraulic capacity to handle incoming wastewater flows, a new biological treatment process is necessary to sufficiently reduce incoming ammonia concentrations. The improvements will also provide additional hydraulic capacity to the WWTP.

The existing screens, the settling tank, trickling filters, reed beds, and wetland cells will be replaced with new processes. Secondary treatment will be provided by sequencing batch reactors (SBR), which will be installed near the existing trickling filters are located. The new equipment will increase the plant capacity from 70,000 GPD to 90,000 GPD.

V. Regulatory Status:

Town of Jerome, received a Consent Order, Docket No. WS-02-18 dated July 3rd, 2023, for Exceedances of Ammonia Impact Ratio and Total Recoverable Copper limit outlined in Arizona Pollutant Discharge Elimination System Permit (AZPDES) AZ0021804.

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).

The treatment facility was designed not to 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 WWTP effluent monitoring point for all effluent standards will be located at the discharge of the outfall pipe, leading from the chlorine contact channel to the southern bank of Bitter Creek. The discharge pipe outfall is to be relocated at approximately: 34° 45’ 11.9” N, 112° 06’ 23.9” W. At this location, water discharged to the creek must meet regulatory requirements and standards. As specified in the design report, WWTP effluent is designed to meet Class B water quality standards based on the current Arizona Revised Statutes.

The nearest permanent surface water body is Bitter Creek itself, which may be impacted by the WWTP operations; however, discharge limits and alarm levels, as set forth in the existing APP, are in place to monitor creek quality and to alert operations staff of deteriorating effluent quality. The implementation of these restrictions will mitigate, if not prevent, negative impacts to Bitter Creek.

The points of compliance for groundwater monitoring will remain at the following locations:

- POC #1 – 34°45’10” N, 112°06’21” W (Theoretical Point of Compliance)
- POC #2 – 34°45’19.3” N, 112°06’24.1” W (Theoretical Point of Compliance)

These are the existing points of compliance for the WWTP as defined in the current version of the APP (LTF 33945). A need to move beyond theoretical points of compliance has not been demonstrated and these POCs shall remain theoretical.

Groundwater is believed to flow northeast based on the similarities normally exhibited between ground and groundwater slopes. The discharge impact area is reasonably considered to be the compilation of the area around the POCs and the point of discharge.