

Inscription Canyon Ranch Sanitary District WWTP
Aquifer Protection Permit No. P-103119
Place ID 70, LTF No. 87458
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:

Permittee: Inscription Canyon Ranch (ICR) Sanitary District (ICRD)
Address: PO Box 1963, Prescott, AZ 86302

Facility name: ICRSD WWTP
Address: 14000 Grey Bears Trail, Prescott, AZ 86305

III. Facility Description:

The permittee is authorized to operate the Inscription Canyon Ranch Sanitary District Wastewater Treatment Plant (WWTP), with a maximum average monthly flow of 0.09 million gallons per day (mgd) (90,000 gpd) for the Existing WWTP and 0.17 mgd (170,000 gpd) upon completion of the WWTP expansion. The Department has graded this facility as a Grade 2 wastewater treatment plant. 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 representative" and ensures an onsite operator visits the facility "weekly".

Existing 0.09 mgd WWTP: The Existing 0.09 mgd treatment train consists of two (2) equalization (EQ) tanks with a volume of 16,135 gallons (EQ tank 1) and 28,887 gallons (EQ tank 2), two (2) anoxic tanks with a volume of 16,135 gallons and 10,544 gallons, Two (2) 22,989 gallons aeration basins each split in half with a baffle wall creating four (4) aeration zones, two (2) 10,402 gallons reaeration tanks, two (2) 12,869 gallons clarifiers, a 7,350 gallons chlorination tank, and a de-chlorination tablet feeder. The effluent is pumped through Effluent Lift Station to the existing effluent holding pond at the reuse site that will utilize the effluent water for irrigation at the golf course.

Upgraded 0.17 mgd WWTP: The Upgraded WWTP consists of 0.09 mgd existing train and a new 0.08 mgd treatment train. Raw wastewater from the collection system enters a flow dissipation basin and then passes through a 3/8 inch 1.0 mgd capacity inline screening unit consisting of a vertical, cylindrical perforated plate screen basket, concentric screw conveyor/dewatering screw, and a screening press. From the screening unit influent is directed into equalization (EQ) tank 1

and EQ tank 2 which are bottom connected so that flow can traverse between each of the tanks via gravity. The flow that enters EQ tank 2 is able to flow into EQ tank 3 through a bottom connection between the EQ tanks. All three EQ tanks are bottom connected so that influent can flow between them and have isolation valves in between to facilitate shutdowns. After flow equalization, wastewater influent splits between the existing and upgraded treatment trains. These treatment trains employ a single stage carbon oxidation-nitrification with nitrogen removal in anoxic and denitrification zones and reaeration zones following the denitrification process. The treatment train for the existing and upgraded plant includes the following components:

Existing 0.09 mgd treatment train: The Existing WWTP is rated at 0.09 mgd and consists of two (2) equalization (EQ) tanks with a volume of 16,135 gallons (EQ tank 1) with a duplex grinder pumping system consisting of two (2) 1.5-inch 80-gpm, 3.35 Hp submersible pumps, and 28,887 gallons (EQ tank 2), two (2) anoxic tanks with a volume of 16,135 gallons and 10,544 gallons, Two (2) 22,989 gallons aeration basins each split in half with a baffle wall creating four (4) aeration zones, two (2) 10,402 gallons reaeration tanks, two (2) 12,869 gallons clarifiers, a 7,350 gallons chlorination tank, and a de-chlorination tablet feeder.

Upgraded 0.17 mgd treatment train: The upgraded WWTP will have an additional capacity to treat 0.08 mgd of train, which when combined with the existing facility of 0.09 mgd provides a total plant capacity of 0.17 mgd. The upgraded treatment train is independent of the existing treatment facility with the flows being split through electronically controlled flow control facilities. The upgraded WWTP consists of a 16,690 gallons equalization tank with a duplex grinder pumping system consisting of two (2) 1.5-inch 80-gpm, 3.35 Hp submersible pumps, an inline electromagnetic flow meter to control process flow for flow equalization, and seven (7) 9-inch fine bubble diffusers for mixing and aerating the incoming sewage flow into the equalization tank, a 17,500 gallons anoxic tank with four (4) nozzle type mixers with air flow per mixer 5 scfm, two (2) 39,322 gallons aeration tanks with a combined volume of 78,723 gallons, twenty two (22) 9-inch fine bubble diffusers in each aeration tank with air flow rate per diffuser is 3 scfm, a 22,199 gallons denitrification tank which utilizes supplemental carbon addition in the form of methanol with six (6) nozzle mixers, a 18,371 gallons reaeration tank with twelve (12) 9-inch fine bubble diffusers, a 11,364 gallons secondary clarifier, a 833.33 gallons chlorine contact basin with a contact time of 15 minutes, a 6-inch 2650-gpm effluent electromagnetic flow meter, and a de-chlorination system which is a tablet-based system with disinfected effluent flowing over the tablets.

Both treatment trains: After de-chlorination, the effluent goes into the existing effluent pump station. The effluent from the upgraded treatment train (0.08 mgd plant) will tie into the existing effluent line prior to flowing to the effluent pump station. The effluent lift station consisting of two (2) 11.3 hp 243 gpm submersible pumps pump the effluent to the existing effluent holding pond that will utilize the effluent water for irrigation at the golf course. The WWTP is designed to produce reclaimed water meeting Class B+ Reclaimed Water Standards (A.A.C. R18-11, Article 3). Effluent is stored in lined storage ponds at the reuse site and reused for beneficial purposes under a Recycled Water Permit #R105241 per A.A.C. R18-9, Article 7. For odor control, the WWTP utilizes a Carbtrol activated carbon air filter system that will draw air from the EQ/Sludge holding tank and the main treatment tank.

The sludge is stored in a 20,359 gallons sludge holding tank which is sized to accommodate the entire facility. The sludge holding tank is designed to provide a minimum of two days storage and will accommodate the full build-out capacity of 170,000 gpd. Every two days, waste sludge is to be pumped via a solid handling pump into the existing sludge dewatering system. Seven (7) fine bubble diffusers are provided for mixing and aerating the sludge with a minimum rate of 1.00 scfm per 1,000 gallons of tank volume. The existing sludge dewatering system consists of a polymer mixer and a Geotube sludge bag. The Geo Tubes are stored on a concrete sludge drying pad for dewatering of sludge. The supernatant from the Geo Tubes is collected and returned to the equalization tank. Once the Geo Tubes are full and sludge is dewatered, the tubes are hauled off-site for disposal in accordance with state and federal regulations.

IV. Amendment Description:

The purpose of this amendment is to increase the permitted flow capacity from 0.09 mgd to 0.17 mgd. This expansion has become necessary as the community continues to grow and the existing facility is getting close to its design capacity. The expansion will maintain the B+ effluent quality and will continue to dispose of the effluent through the lined pond located at the Talking Rock Golf Course and utilized for golf course irrigation water. The following improvements to the treatment components will be made to accommodate the increased flow capacity:

- **Automatic Screening:** An automatic screening unit will be installed upstream of the Flow Equalization basin. This will remove the solids for the full treatment facility.
- **Flow Equalization:** Additional Flow equalization capacity will be provided to accommodate the full 170,000 gpd. Additional pumps will be installed in the Flow Equalization to supply the new treatment train.
- **Treatment Process:** The expansion will provide a separate treatment train. This treatment process will operate independently of the existing treatment plant but will be similar technology. The new facility will consist of one anoxic tank, two aeration tanks, one denitrification tank, one reaeration tank, one clarifier, one chlorine contact basin, and one dechlorination unit. The effluent will tie into the existing effluent line prior to flowing to the existing effluent lift station. The effluent will continue to be pumped from the effluent lift stations and utilized on the golf course as a source of irrigation water under a valid Recycled Water Permit.
- **Odor Control:** This expansion provides an odor control system to better control any nuisance odors.
- **Sludge Holding:** A new sludge holding tank will be installed and has been sized to accommodate the entire facility. The RAS/WAS & Skim lines from the existing treatment facility will be re-directed into the new Sludge tank and the existing sludge pump will be relocated to the new tank. The larger tank will allow the plant operator to store the sludge for a period and de-water the sludge tank on a scheduled basis.

In addition, the CSI#3 (closure plan approval for existing impoundment for Geo Tubes) and CSI#4 and #5 (closure activity completion for the existing impoundment) in the current permit (LTF 81954) have been reviewed and approved. As a part of this permit amendment, the impoundment for Geo Tubes in Table 1: Discharging Facilities are removed from the permit.

The permit category for this amendment was determined to be a “Significant Amendment” as per A.A.C. R18-9-A211(B)(2)(a).

V. Regulatory Status

This significant amendment application was received on March 19, 2024. There are no known regulatory actions.

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).

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 will be collected from the effluent pump station and will be monitored daily for fecal coliform, 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 B+ reclaimed water, representative samples of the reclaimed water will be collected from the effluent pump station and will be monitored daily for fecal coliform, and monthly for total nitrogen.

Point of Compliance (POC)

The Points of Compliance (POCs) have been established at the following locations:

Table 1: POINT(S) OF COMPLIANCE			
POC #	POC Location	Latitude	Longitude
1 (Conceptual)	North corner of the WWTP	34° 44' 45" N	112° 34' 38" W

Groundwater monitoring is not required at the point of compliance wells. POC #1 well is a conceptual well, monitoring is not required except as a contingency action. The director may require an amendment of this permit to install a monitoring well if there is cause or concern that groundwater quality may be impacted at the POC. The Director may amend this permit to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.