

**Santa Cruz River Heritage Project
Aquifer Protection Permit #512598
Place ID #154239, LTF #67891**

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. This document gives pertinent information concerning the issuance of the permit. 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 at the Point of Compliance (POC); and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). The purpose of BADCT 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.

I. FACILITY INFORMATION

Name and Location

Name of Permittee:	City of Tucson - Tucson Water Department (TWD)
Mailing Address:	310 West Alameda Street Tucson, Arizona 85701
Facility Name and Location:	Santa Cruz River Heritage Project 1580 South Santa Cruz Lane Tucson, Arizona, 85713

Regulatory Status

This application was received on February 15, 2018.

Facility Description

The City of Tucson – Tucson Water Department (TWD) is authorized to operate Santa Cruz River Heritage Project (Heritage Project). The facility is designed to recharge for 20 years, a maximum total of 4,000 acre-feet per year (ac ft/yr) of Class A Reclaimed Water from the Tucson Reclaimed Water Treatment Plant (RWTP, APP #100147) and in addition to a minor amount of water will be pumped directly into the reclaimed distribution system from recovery well EW-007A. The RWTP receives the reclaimed wastewater from Pima County Agua Nueva Water Reclamation Facility (ANWRF, APP #100655). The project and outfall will be developed within two adjacent parcels

(118-09-034A and 118-09-039B) owned by TWD that include undeveloped land, a Tucson Water well site and underground potable water piping located on the eastern side of the Santa Cruz River.

The project will be discharging in two phases (Silverlake Road and south of Cushing Street). Phase one discharges shall be limited to 3,570,696 gallons per day (gpd) with a maximum total of 4,000 ac ft/yr to the Santa Cruz River under an AZPDES permit AZ0026166, by tapping into the approximately 4,000 foot long existing 12-inch reclaimed waterline running along Silverlake Road.

Phase one

The Heritage Project consist of the Silverlake Road Control Valve Station (treatment facility), the outfall to the Santa Cruz River and a monitoring well. The Silverlake Road Control Valve Station will consist of site piping, a flow meter, valving, a dechlorination mixer, and water quality testing equipment.

The project will operate continuously, except during the summer peak reclaimed use, when rainfall generates natural flows to the Santa Cruz River, or when the de minimis discharge location is in use. Flow in the Santa Cruz River resulting from rain will trigger a shutoff valve in the outfall vault and discontinue discharges to the Heritage Project, with reclaimed flows resuming after rain flow events.

The depth to groundwater at the site ranges from approximately 100 ft. bgs in the southern portion of the site to approximately 150 ft. bgs to the north.

II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY

Flow in the Santa Cruz River resulting from rain will trigger a shutoff valve in the outfall vault and discontinue discharges to the Heritage Project, with reclaimed flows resuming after rain flow events.

III. HYDROGEOLOGIC SETTING

The regional subsurface geology of the Tucson basin has been described extensively in previous reports, including Houser and others (2005), who examined geophysical logs and drill cuttings from a test well drilled by Exxon. The well, known as the Exxon State (32)-1 Well, was drilled to a total depth of 12,556 feet, approximately 14 miles southeast of the project site (Figure 3). According to Houser and others (2005), the following stratigraphic section was described from (32)-1:

- Upper basin-fill 0 – 2,980 ft. bgs
- Lower basin-fill 2,980 – 6,170 ft. bgs
- Lower Miocene and Oligocene Pantano Formation 6,170 – 8,256 ft. bgs
- Oligocene to Paleocene volcanic/sedimentary rocks 8,256 – 10,026 ft. bgs
- Lower Cretaceous to upper Jurassic Bisbee Group 10,026 – 12,001 ft. bgs
- Pre-Late Jurassic granitoid plutonic rock 12,001 – 12,556 ft. bgs

The local subsurface geology is also relatively well characterized by a number of well logs that are located near the project site. The available lithologic logs show alluvial sands, gravels, and fines, typical of river channel deposits up to a depth of approximately 100 feet below the project site. No significant, laterally continuous, fine-grained units appear to be present in the immediate project area, except for a clay unit that directly overlies bedrock at some well locations.

Estimated Depth-to-bedrock contours published by the Arizona Geological Survey (AGS) (Richard et al., 2007) indicates approximately 400 feet or less in the area of the Heritage Project site.

Pollutant Management Area (PMA)

The discharge will be confined to the Santa Cruz River and, as such, the maximum extent of the PMA will be limited from side bank to side bank from the discharge point to a location approximately 1.6 miles downstream.

Discharge Impact Area (DIA)

Clear Creek delineated the DIA using MODPATH. MODPATH applies a semi-analytical method to MODFLOW output to compute the flow paths of simulated particles released in the model domain. The DIA was delineated from the maximum distance that the particles had traveled from the model cell boundaries at the end of the 20-year simulation. Hydraulic conductivity values of Layer 2 are lower than those of Layer 1. Therefore, the DIA was extended beyond the particle track limits by a factor of 3.2 to the north and 2.2 to the east to account for a proportional difference in K values between layers and to provide a more conservative estimate of the DIA.

The adjusted DIA encompasses about a five mile stretch of the Santa Cruz River with a width of approximately one mile.

Point of Compliance

The POC for this facility is designated at the following location:

POC#	POC Locations	Latitude	Longitude	ADWR #
1 (WR-364A)	The POC well is located near the eastern bank of the Santa Cruz River, near Verdugo Park, approximately ¾ miles downstream of the outfall.	32° 12' 35.23" N	-110° 59' 12.51" W	55-581137

Groundwater monitoring is required at POC #1. The Director may amend this permit to designate additional POCs if information on groundwater gradients or groundwater usage indicates the need.

IV. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

Monitoring and Reporting Requirements

To ensure that site operations do not result in violation of Aquifer Water Quality Standards at the point of compliance, representative samples of the effluent shall be collected from the Silverlake Road Outfall. The permittee shall monitor the effluent daily for *E.coli*, monthly for total nitrogen, quarterly for metals, and semi-annually for volatile and semi-volatile organic compounds. (see Section 4.2, Table IA in the permit).

To ensure that Aquifer Water Quality Standards will be met at the POC in the aquifer, representative samples of the groundwater will be collected from POC #1 and will be sampled monthly for total coliform, total nitrogen, nitrate-nitrite as N, total Kjeldahl nitrogen (TKN), quarterly for metals, and semi-annually for volatile and semi-volatile organic compounds. (see Section 4.2, Table II in the permit).

Facility inspection and operational monitoring shall be performed on a routine basis (see Section 4.2, Table III in the permit).

V. SURFACE WATER CONSIDERATIONS

The Heritage Project and the associated recharge activities are located in Zone AE and Zone X. Zone AE is defined as a “regulatory floodway” under the category of “special flood hazard areas,” and Zone X is defined as “0.2% annual chance flood hazard, areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile” under the category of “other areas of flood hazard.” The Heritage Project is protected from 100-yr flood event.

The Flood Insurance Rate Map (FIRM) for this area prepared by the Federal Emergency Management Agency (FEMA).

VI. COMPLIANCE SCHEDULE

The compliance schedule items included in the permit requires submittal an off-site monitoring plan and an Annual Contingency Monitoring Report if monitoring indicates that the groundwater level has exceeded the Alert Level.

VII. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

Technical Capability

The City of Tucson has demonstrated the technical competence necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A202(B).

The permit requires that appropriate documents be sealed by an Arizona-registered Geologist or Professional Engineer. This requirement is a part of an on-going demonstration of technical capability. The permittee is expected to maintain technical capability throughout the life of the facility.

Financial Capability

The City of Tucson has demonstrated the financial responsibility necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A203(B)(1) and (2). The closure costs are \$59,705.00, post-closure costs for 10 years are \$50,000.00. The total estimated dollar amount demonstrated for financial capability is \$109,705.00. The permittee is expected to maintain financial capability throughout the life of the facility.

Zoning Requirements

The Heritage Project has been properly zoned for the permitted use and the permittee has complied with applicable zoning ordinances in accordance with A.R.S. § 49-243(O) and A.A.C. R18-9-A201(B)(3).

VIII. ADMINISTRATIVE INFORMATION

Public Notice (A.A.C. R18-9-108(A))

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft permit or other significant action with respect to a permit or application. The aquifer protection program rules require that permits be public noticed in a newspaper of general circulation within the area affected by the facility or activity and provide a minimum of 30 calendar days for interested parties to respond in writing to ADEQ. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to a permit application or permit.

Public Comment Period (A.A.C. R18-9-109(A))

The Department shall accept written comments from the public prior to granting the significant amendment. The written public comment period begins on the publication date of the public notice and extends for 30 calendar days. After the closing of the public comment period, ADEQ is required to respond to all significant comments at the time a final permit decision is reached or at the same time a final permit is actually issued.

Public Hearing (A.A.C R18-9-109(B))

A public hearing may be requested in writing by any interested party. The request should state the nature of the issues proposed to be raised during the hearing. A public hearing will be held if the Director determines there is a significant amount of interest expressed during the 30-day public comment period, or if significant new issues arise that were not considered during the permitting process.

A public hearing was deemed to be unnecessary for this permit application.

IX. ADDITIONAL INFORMATION

Additional information relating to this permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division - APP Unit 1
Attn: Monica Phillips
1110 W. Washington Street, Mail Code 5415B-3
Phoenix, Arizona 85007
Phone: (602) 771-4465