



# Fact Sheet

Aquifer Protection Permit #P-102475  
Place ID 1914, LTF 43461

Bullhead City Section 18 Wastewater Treatment Plant  
SIGNIFICANT AMENDMENT

The Arizona Department of Environmental Quality (ADEQ) proposes to issue **an amendment** to the Aquifer Protection Permit for the subject facility that covers the life of the facility, including operational, closure, and post-closure periods unless suspended or revoked pursuant to 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; 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., local subsurface geology) to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer, or to keep pollutants from reaching the aquifer.

## I. FACILITY INFORMATION

### Name and Location

Name of Permittee:	City of Bullhead City
Mailing Address:	1255 Marina Boulevard Bullhead City, AZ 86442
Facility Name and Location:	Bullhead City Section 18 Wastewater Treatment Plant 1601 Bullhead Parkway Bullhead City, AZ 86442 (Mohave County)

### Regulatory Status

An Aquifer Protection Permit (APP) was issued on June 4, 1993 and an Individual Reuse Permit was issued on November 30, 1999. An application for an Other Amendment was received on May 21, 2004 and was issued on May 17, 2005. An application for Significant Amendment was received on March 1, 2007.

There are no known compliance issues or violations for this facility.

### Facility Description

The City of Bullhead City is authorized to operate the Section 18 Wastewater Treatment Plant (WWTP) designed to treat two million gallon per day (mgd) for treatment of municipal sewage. The tertiary treatment process includes odor controlled headworks with bar screens, flow equalization basin, anoxic and aeration tanks followed by membrane filtration, chlorination, and de-chlorination. The effluent is disinfected through an existing chlorination unit. From the effluent pump station, the treated effluent is disposed by reuse under a valid reclaimed water

permit and excess effluent will be delivered to eight infiltration basins which were constructed on site. The effluent will also be used for various on-site plant operations and fire protection.

All sludge including screenings, grit, and scum will be dewatered onsite before being hauled off-site for disposal in accordance with state and federal regulations. The existing sludge drying beds will be used as a backup to the belt filter press.

Groundwater in the regional aquifer is reportedly present at depths ranging between 350 to 800 feet bgs. Depth to groundwater at an on-site well is approximately 350 feet bgs and the direction of groundwater flow is believed to be towards the west-southwest. The WWTP was designed and constructed according to plans approved by the ADEQ, APP & Reuse Unit on March 6, 2009.

The WWTP is rated as producing Class A+ reclaimed water (A.A.C. R18-11, Article 3) and may be delivered for beneficial use under a valid reclaimed water permit (A.A.C. R18-9, Article 7).

### **Amendment Description**

This significant permit amendment was initiated by the permittee, the City of Bullhead City to increase the design flow to two (2) mgd and to modify the WWTP. The wastewater treatment plant will include a new headworks, membrane bioreactor, and belt filter press. The existing effluent pump station and chlorine contact basin will be used in treatment process. The existing aeration basin will be available for use as-needed to equalize the flow. The existing sludge drying beds will be used during contingency. Sections in the permit being updated include:

1. Section 1.1 - Facility Address: Changed to 1601 Bullhead Parkway from 2525 Rio Rancho
2. Section 2.1 - Facility/Site Description: Changed the treatment process description to add new headworks, membrane bioreactor and belt filter press. And also added that effluent will be disposed by reuse under a valid reuse permit and excess effluent will be recharged to eight infiltration basins which will be constructed on site. The effluent will also be used for various plant operations and fire protection on site.
3. Section 2.2.1 - Engineering Design: Added the following: The design report in support of the significant permit amendment was prepared by J. Douglas Kobrick, P.E., Camp Dresser & McKee, Inc., dated February 28, 2007.
4. Section 3.0 - Compliance Schedule: Added schedule items to include submittal of engineer's statement of completion, install POC well at POC #2 and to perform ambient groundwater monitoring and to submit amendment to set ALs and AQLs for routine groundwater monitoring parameters.
5. Section 4.0 - Tables of Monitoring Requirements: This section has been reformatted to include: Table IA, monitoring for flow; Table IB, Routine Discharge Monitoring for metals, VOCs, and Indicator parameters; Table IC, Routine Discharge Monitoring for Trihalomethanes; Table ID, Reclaimed Water Monitoring (Class A+); Table IIA, Ambient Groundwater Monitoring; Table IIB, Routine groundwater monitoring; Table III, Facility Inspection/Operational Monitoring.
6. Section 5 - References and Pertinent Information: Added information on the significant APP amendment application.

In addition, relevant permit language has been changed to conform to the current APP format.

## II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY (BADCT)

BADCT is achieved through tertiary treatment, denitrification and disinfection via chlorination. The WWTP is designed to meet the treatment performance criteria for new facilities as specified in A.A.C. R18-9-B204.

## III. HYDROGEOLOGIC SETTING

The Bullhead City area is located within an alluvial filled basin in the Basin and Range physiographic province in extreme west-central Arizona. The area is bordered on the east by the Black Mountains and on the west by the Colorado River. The basin fill material consists of a thick section of both alluvial and lacustrine sediments deposited during the late Tertiary to Quaternary periods. Based on well logs, the sediments in the area of the WWTP extend to a depth of at least 1300 feet below ground surface (bgs). The sediments are dominated by sands and gravels with locally interbedded silt and clay. Correlation of individual lithologic units between well bores is poor indicating a complex depositional history within the basin. The sediments range from poorly consolidated to well-cemented. The WWTP site is located within the Sonoran Seismic Zone, a relatively stable tectonic region, with no known active faults underlying the site.

The WWTP is located within the watershed of the Lower Colorado River Basin. The Colorado River is located approximately 1.75 miles to the west of the WWTP and is the only naturally occurring perennial surface water body in the area. Groundwater in the regional aquifer is reportedly present at depths ranging between 350 to 800 feet bgs. The potentiometric surface, as measured in an on-site well, is approximately 350 feet bgs. Groundwater is present in layers of medium to coarse-grained sands and gravels occurring under semi-confined to confined conditions. The direction of groundwater flow is to the west-southwest. Groundwater quality, based on samples from the on-site domestic well, is good, with no exceedances of an Aquifer Water Quality Standard (AWQS) reported in the samples.

The discharge impact area (DIA) for the WWTP was calculated by HydroSystems, Inc., using the computer program THWells. The model estimated the lateral extent of a one-foot rise in water levels resulting from the discharge predicted from the recharge basins. Two model runs were also made using a particle tracking model to estimate the distance that a particle of water might travel over a 20-year period. The first run simulated the impacts of recharging the entire 2.0 MGD over the 20-year timeframe. The results indicated that a particle of water would travel a distance of 9,527 feet during the modeled period. For the second and more realistic model run, 2.0 MGD was recharged to the aquifer for four months during each year of the 20-year simulation. This model run accounted for seasonal variations in the actual discharge to the basins. In this simulation, the particle of water travels a distance of 3,285 feet from the source of recharge. The DIA illustrated in the hydrology report in the application is based on the second model run and is shown as a circle 3,285 feet in diameter circumscribing the WWTP.

## IV. STORM WATER/SURFACE WATER CONSIDERATIONS

The nearest surface water body to the WWTP is the Colorado River, located approximately 1.75 miles west of the facility. There is no naturally occurring surface water body within ½-mile of the WWTP. The facility is surrounded by native desert with no known soil contamination present in

the immediate area. The site is within Zone A and Zone X of the FEMA 100-year flood plain map. Storm water run-off at the WWTP is diverted into southwest trending drainage channels on both the north and south sides of the plant site. The proposed infiltration basins will be bermed to prevent any storm water run-off from entering the basins.

## **V. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS**

Groundwater monitoring is not required in the current APP, but is required as a part of the significant amendment to the permit. A monitor well must be installed at the point of compliance (POC # 2) and routine groundwater monitoring conducted in accordance with conditions to be specified in the amended APP. The POC well must be installed downgradient of the discharging facilities and can be located no greater than 750 feet from the boundary of the pollutant management area (PMA). The well must be screened within the uppermost aquifer and constructed in accordance with industry and Arizona Department of Water Resources (ADWR) standards for monitor well construction.

Available well logs are provided in the application for wells located within a two-mile radius of the WWTP. The only well within ½-mile of the site is a small diameter, on-site well (ADWR # 55-541966) used as a water supply for the WWTP laboratory. The well is located southwest of the existing WWTP, but is approximately 600 feet upgradient of the proposed easternmost infiltration basin. The well is completed to a depth of 450 feet bgs and perforated from 250 to 450 feet bgs. The potentiometric surface in the well was measured at 350 feet bgs in 1994. Laboratory analytical results from a groundwater sample collected from this well in 1994 showed no analytes exceeding the AWQS. The sample had an elevated concentration of nitrate of 7.7 mg/l, however, the concentration was below the AWQS (10 mg/L) for nitrate. Analytical results from six additional groundwater samples from this well collected in 2006 were provided in the application. There were no exceedances of an AWQS in any of the samples.

### **Monitoring and Reporting Requirements**

Groundwater in the regional aquifer is reportedly present at depths ranging between 350 to 800 feet bgs. The potentiometric surface, as measured in an on-site well, is approximately 350 feet bgs.

To ensure that site operations do not impact either the surface water or the groundwater, representative samples of the effluent shall be collected from sampling points #1, 2, 3, 4, and 5 for discharge monitoring. Discharge monitoring is required daily for flow and pathogens, monthly for total nitrogen, quarterly for metals and indicator parameters, and semi-annually for VOCs, as described in the permit (see Section 4.2, Tables IA, IB, and IC in the permit).

To ensure that site operations do not violate the Reclaimed Water Quality Standards for the beneficial use of Class A+ reclaimed water, the permittee shall monitor the reclaimed water at sampling point #3 daily for fecal coliform and turbidity, and monthly for total nitrogen (see Section 4.2, Table ID in the permit).

To ensure that the site operations do not violate Aquifer Water Quality Standards, Routine groundwater monitoring is required as a part of the significant amendment to the permit, as well as ambient groundwater and discharge characterization (see Section 4.2, Table IIA in the permit).

The permit requires the permittee to initiate groundwater monitoring in POC-2 well for eight (8) consecutive months and submit a report on the groundwater quality data collected from the POC-2 well, along with a request to amend the permit with a recommendation for setting ALs and AQLs for parameters listed in Table IIB (see Section 4.2, Table IIB in the permit) Routine Groundwater Monitoring.

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

**Point of Compliance (POC)**

The Points of Compliance (POCs) are designated at the following locations:

<b>POC #</b>	<b>POC Location</b>	<b>Latitude</b>	<b>Longitude</b>
1	Southwest edge of the facility	35° 07' 29" N	114° 32' 59.1" W
2	Downgradient (west) of the infiltration basins, and is approximately 300 feet from the boundary of Pollutant Management Area (PMA), ADWR Well # 55-909558	35° 07' 27.6" N	114° 33' 9.536" W

POC # 1 is a conceptual location. It is the initial POC in the APP and a well is not to be installed at this location for monitoring purpose. POC # 2, ADWR Well # 55-909558 is the new proposed POC location. A well needs to be installed and to be sampled for both ambient and routine groundwater monitoring.

The Director may amend this permit to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.

**VI. COMPLIANCE SCHEDULE**

For each compliance schedule item listed below, the permittee shall submit the required information, including a cover letter that lists the compliance schedule items, to the Groundwater Section. A copy of the cover letter must also be submitted to the ADEQ Water Quality Compliance Section.

<b>Description</b>	<b>Due by:</b>
The permittee shall submit a signed, dated, and sealed Engineer's Certificate of Completion in a format approved by the Department that confirms that the facility is constructed according to the Department-approved design report or plans and specifications, as applicable.	Prior to discharging under this permit and within 90 days of completion of construction.
Install monitoring well at POC-2	Within 30 days of issuance of the permit

Submit a Well Installation Report to ADEQ for review pursuant to Section 2.7.5	Within 60 days of issuance of the permit.
The permittee shall begin monthly ambient groundwater quality sampling for 8 consecutive months at the POC-2 Well for the pollutants and parameters listed in section 4.2, Table IIA.	Within 90 days after permit issuance
The permittee shall submit a report on the groundwater quality data collected from the POC-2 well, along with a request to amend the permit with a recommendation for setting ALs and AQLs for parameters listed in Table IIB, Routine Groundwater Monitoring.	Within 12 months of permit issuance.

**VII. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT**

**Technical Capability**

The City of Bullhead City 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 WWTP was designed as per the design report prepared by J. Douglas Kobrick, Camp Dresser & McKee, Inc., dated February 28, 2007. The permittee is expected to maintain technical capability throughout the life of the facility.

**Financial Capability**

City of Bullhead City has demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203. The estimated dollar amount demonstrated for financial capability is \$820,000 for closure and \$5,000 (annual) for post-closure costs. The permittee shall maintain financial capability throughout the life of the facility.

The applicant, being a local government, provided a detailed financial plan on its letterhead for meeting the requirements for financial capability, according to rule A.A.C. R 18-9-A203 (B) (1).

**Zoning Requirements**

The Bullhead City Section 18 WWTP has been properly zoned for the permitted use and the permittee has complied with all zoning ordinances in accordance with A.R.S. § 49-243(O) and A.A.C. R18-9-A201(A)(2)(c).

**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.

The public notice for this permit was published in the (enter name of publication) on (enter date) under public notice no. (enter public notice number).

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

The Department shall accept written comments from the public before a significant permit amendment is made. 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 (un)necessary for this significant permit amendment. (If a public hearing was held, include the details (location and date) in the final factsheet.)

**IX. ADDITIONAL INFORMATION**

Additional information relating to this permit may be obtained from:

Arizona Department of Environmental Quality  
Water Quality Division - Groundwater Section - APP and Reuse Unit  
Attn: Swathi Kasanneni  
1110 West Washington Street, Mail Code 5415B-3  
Phoenix, Arizona 85007  
Phone: (602) 771-4577