

**CITY OF KINGMAN HILLTOP WASTEWATER TREATMENT PLANT (WWTP)**

Aquifer Protection Permit No. P-100611

Place ID 987, LTF No. 104689

**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 City of Kingman, owns and operates the City of Kingman Hilltop WWTP located at 5925 East Highway 66, Kingman, Arizona, Mohave County, 86401, over the groundwater of the Hualapai Valley Basin. The WWTP, effluent equalization pond, vadose zone recharge well No. 1, and sludge/biosolids/composting area is located on Mohave County Assessor Parcel No. (APN) 310-01-005, the discharge to Mohave Wash (a non-Waters of the U.S. surface water discharge that does not currently require an AZPDES permit) is located on APN 310-01-058, and the constructed wetland cells and rapid infiltration basins are located on APN 310-01-061. All three APNs are owned by the City of Kingman.

**III. Facility Description:**

The permittee is authorized to operate the City of Kingman Hilltop Wastewater Treatment Plant (WWTP), with a maximum average monthly flow of 5.1 mgd. The Department has graded this facility as a Grade 4 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 operator and ensures an onsite operator visits the facility "Daily".

Flows come into the City of Kingman Hilltop WWTP through a junction box that transfers effluent by gravity through an above ground channel equipped with a Parshall Flume flow meter and through a screen and a compactor and a backup manual bar rack. After the influent is screened, five 25-hp (1,700-gpm) pumps (4-duty, 1-standby) lift the influent through a grit chamber and classifier, before an influent splitter structure directs influent to one of two oxidation ditches with anoxic zones at the head of these biological treatment processes. From the oxidation ditches, mixed liquors flow through an above ground channel to the two secondary clarifiers. From the clarifiers, up to 1 mgd of secondary effluent can flow to two tertiary disk filter units, (Previously permitted separately through APP P-106051), if Kingman chooses to produce effluent meeting Class A+ reclaimed water standards, or flow directly to the Secondary chlorine contact basin (CCBs).

Effluent from the Secondary CCB flows through a dechlorination system, from which the effluent can be used as Class B+ reclaimed water, or it is discharged to a nearby effluent equalization pond or the effluent flows northeast a quarter mile, by gravity, and discharges to Mohave Wash (a non-Waters of the U.S. surface water discharge). From the effluent equalization pond, two 35-hp (1,750-gpm) transfer pumps, located near the westside of the effluent equalization pond, send the effluent to a constructed

wetland cells to keep the wetland vegetation alive, or to send the effluent to 22 Rapid Infiltration Basins (RIBs) on an emergency basis only.

Alternatively, a 30-hp (1, 110-gpm) filter supply pump, located at the end of the Secondary CCB, can discharge up to 2.4-mgd of treated effluent through direct injection. The effluent is pumped from the end of the Secondary CCB chamber No 1 through a dual glass-media pressure filter skid, and to Vadose Zone Recharge Well (VZRW) No. 1 (ADWR Well #55-230988). Disinfection must continue through the glass media pressure filtration system. A sulfur dioxide injection point will be located after the filtration skid, but prior to the VZRW-1 to help prevent continuous injection of chlorinated effluent and the formation of disinfection byproducts. Discharge monitoring for the VZRW-1 will also occur after the filtration skid. The filter backwash (from the tertiary filters and the glass-media pressure filters) will be discharged into the lined effluent equalization basin.

If Kingman delivers reclaimed water meeting the Class A+ Reclaimed Water Standards as per Title 18, Chapter 11, Article 3, the effluent will go through the tertiary filters and the Tertiary CCB will be dedicated to disinfecting the higher quality reclaimed water. Effluent may be delivered for beneficial purposes (reuse) under a required valid Class A+ reclaimed water permit for the tertiary treated effluent or Class B+ reclaimed water permit for the unfiltered effluent.

Return Activated Sludge (RAS) from the clarifiers flows by gravity from the secondary clarifiers to a RAS/WAS pump station with four 25-hp (1,060-gpm) RAS pumps that return the sludge to the influent splitter structure or two 5-hp (250-gpm) WAS pumps deliver the sludge to a (439,900-gallon) aerated (with three 50-hp blowers 2-duty, 1-standby) sludge holding/equalization tank. Scum from the clarifiers is also pumped to the sludge holding tank. The sludge from the aerated sludge holding/equalization tank is pumped to a belt filter press and then hauled to an engineered pad, with a lined surface water impoundment, where it awaits being mixed with other city waste for composting (also performed onsite) in order to produce biosolids (regulated under a valid AZPDES permit), or the sludge can be hauled off-site with the screenings and grit to a landfill for disposal in accordance with state and federal regulations. Filtrate is pumped to the influent splitter box. A Pump truck discharge apron is located near the influent junction structure. The influent building and sludge processing building are equipped with odor control equipment. There are two generators as a backup energy source.

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 SIGNIFICANT amendment is to:

1. Consolidate Kingman Hilltop's two (2) APPs for Place ID No. 987 [Hilltop Tertiary WWTP (P-106051) into City of Kingman Hilltop WWTP (P-100611)] into a single APP City of Kingman Hilltop WWTP (P-100611);
2. Add a new disposal method for the City's implementation of the aquifer recharge project, which included adding a dual glass-media pressure filter skid, and to Vadose Zone Recharge Well (VZRW) No. 1 (ADWR Well #55-230988); and
3. Address miscellaneous site description in Section 2.1, and clarify the discharge locations, including updating GPS locations in the permit.

The permit category for this amendment was determined to be a “Significant Amendment” as per A.A.C. R18-9-A211(B)(9). Material and substantial alterations or additions to a permitted facility, including a change in disposal method, justify a change in permit conditions.

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

**VI. Compliance with Aquifer Water Quality Standards (AWQS):**

To ensure that site operations do not violate AWQS at the point of compliance (POC), representative samples of the effluent shall be collected from the point of discharges located downstream of the dechlorinator for the Secondary and the Tertiary Chlorine Contact Basin, and upstream of the Vadose Zone Recharge Well. The facility shall monitor effluent for total nitrogen, nitrate as N, nitrite as N, nitrate-nitrite as N, cyanide, fecal coliform, fluoride, metals and volatile and semi-volatile organic compounds, per the monitoring requirements in Table 9 in Section 4.2.

To ensure that AWQS will be met at the POC in the aquifer, representative samples of the groundwater will be collected from the POC Wells (No.1 and No.2), and will be sampled quarterly for metals, cyanide, and fluoride; and monthly for depth to water, total coliform, e. coli, nitrate as N, nitrite as N, nitrate-nitrite as N, total Kjeldahl nitrogen (TKN), and total nitrogen. Volatile and semi-volatile organic compounds will be sampled semi-annually. Refer to per the monitoring requirements Table 12 in Section 4.2.

The site includes the following permitted discharging facilities:

Table 1: DISCHARGING FACILITIES		
Facility	Latitude (North)	Longitude (West)
Hilltop WWTP	35° 17' 54"	113° 57' 03"
Constructed Wetland Cells	35° 18' 52"	113° 57' 28"
22 Rapid Infiltration Basins (RIBs)	35° 19' 15"	113° 57' 00"
Mohave Wash (non-WOTUS)	35° 18' 10"	113° 56' 49"
VZRW No. 1 (55-230988)	35° 17' 58"	113° 56' 58"

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

Table 2: POINT(S) OF COMPLIANCE			
POC #	POC Location	Latitude (North)	Longitude (West)
1	MW-1 (Approximately 1,500 feet North of VZRW No. 1 (55-230988))	35° 18' 12"	113° 56' 58"
2	MW-2 (at the northeast edge of the RIBs)	35° 19' 28"	113° 56' 52"
3 (Conceptual)	Conceptual POC (approximately 1,000 feet downstream of the outfall to Mohave Wash)	35° 18' 20"	113° 56' 49"

**VII. Reclaimed Water Monitoring:**

City of Kingman Hilltop Wastewater Treatment Plant (WWTP)  
 APP Inv. No. P-100611 LTF No. 104689 Place ID No. 987

The Tertiary WWTP permit historically covered Class A+ effluent that had been filtered through disk filters and disinfected by the Tertiary Chlorine Contact Basin, while the City of Kingman Hilltop WWTP permit covered Class B+ effluent disinfected by the Secondary Chlorine Contact Basin.

The City of Kingman Hilltop Wastewater Treatment Plant treatment facility is rated as producing reclaimed water meeting the Class A+ and Class B+ Reclaimed Water Quality Standards (A.A.C. R18-11, Article 3). The Class B+ effluent typically produced by the Kingman Hilltop WWTP may be used for any allowable Class B or C use under a valid reclaimed water permit (A.A.C. R18-9, Article 7). The Class A+ water produced by operating the tertiary treatment system may be used for any allowable Class A, B or C use under a valid reclaimed water permit (A.A.C. R18-9, Article 7).

The permit has two Reclaimed Water Monitoring tables to cover both classes of reclaimed water discharged from the City of Kingman WWTP:

Table 10: Class B+ RECLAIMED WATER MONITORING				
Reclaimed water monitoring under shall be performed in addition to routine discharge monitoring required under Section 4.2, Table 9: ROUTINE DISCHARGE MONITORING				
Sampling Point Number	Sampling Point Identification		Latitude (North)	Longitude (West)
7	Immediately downstream of the dechlorinator for the Secondary Chlorine Contact Basin Chamber No. 1 (after dechlorination diffuser)		35° 17' 57.5"	113° 56' 59.5"
Parameter	Discharge Limit	Units	Sampling Frequency	Reporting Frequency
Fecal Coliform Single-sample maximum:	800	MPN <sup>8</sup>	Daily <sup>9</sup>	Quarterly
Fecal Coliform: Four (4) of last seven (7) samples	200	MPN	Daily Evaluation	Quarterly
Total Nitrogen <sup>15</sup> : Five-sample rolling geometric mean <sup>16</sup>	10	mg/l <sup>17</sup>	Monthly Calculation	Quarterly

Table 11: Class A+ RECLAIMED WATER MONITORING				
Reclaimed water monitoring under shall be performed in addition to routine discharge monitoring required under Section 4.2, Table 9: ROUTINE DISCHARGE MONITORING				
Sampling Point Number	Sampling Point Identification		Latitude (North)	Longitude (West)
8	Immediately downstream of the dechlorinator for the Tertiary Chlorine Contact Basin		35° 17' 59.0"	113° 57' 3.0"
Parameter	Discharge Limit	Units	Sampling Frequency	Reporting Frequency
Fecal Coliform Single-sample maximum:	23	MPN <sup>8</sup>	Daily <sup>9</sup>	Quarterly
Fecal Coliform: Four (4) of last seven (7) samples	Non-detect <sup>25</sup>	MPN	Daily Evaluation	Quarterly
Total Nitrogen <sup>15</sup> : Five-sample rolling geometric mean <sup>16</sup>	10.0	mg/l <sup>17</sup>	Monthly Calculation	Quarterly
Turbidity <sup>26</sup> : Single reading	5.0	NTU <sup>27</sup>	Daily <sup>28</sup>	Quarterly
Turbidity: 24-hour average	2.0	NTU	Daily Calculation	Quarterly
Enteric Virus <sup>29</sup> : Four (4) of last seven (7) samples	Non-detect	PFU	Monthly / Suspended <sup>30</sup>	Quarterly