U.S. Department of Interior – National Park Service
Phantom Ranch Water Reclamation Facility (WRF)
Aquifer Protection Permit No. P-513236
Place ID 1066, LTF No. 79620
New Permit

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 facility is located at 46 N. Kaibab Trail, North Rim Grand Canyon, Arizona, 86052, Coconino County in Section 5, Township 31N, Range 3E of the Gila and Salt River Base Line and Meridian.

III. Facility Description:

The National Park Services (NPS) originally operated Phantom Ranch WRF under Type 1.09 General Permit issued by the Department. Due to the alteration of the existing treatment system, the facility is no longer covered under Type 1.09 General Permit and is required to obtain an Individual APP. The existing treatment system will be rehabilitate upgraded and a new percolation-evaporation pond will be added for effluent disposal.

Under this permit, NPS is authorized to operate Phantom Ranch WRF with a maximum monthly average flow of 0.007 million gallons per day (MGD). The WRF serves the Phantom Ranch cabins and dormitories, Bright Angel Campground, an NPS bunkhouse, and restrooms serving passthrough hikers and river riders visiting Phantom Ranch.

Upgraded Treatment Train: The existing treatment system will be upgraded and rehabilitated. The upgraded treatment will be rated at 0.007 mgd. The treatment system will consist of a headworks with a new screw screen with a bar spacing of 6 mm and a bypass manual screen, a 4,100-gallons equalization tank with new mixers and pumps, an aeration tank with an integrated fixed-film activated sludge (IFAS) process installed with a media module with a dual coarse bubble and fine bubble aeration grid, a clarifier with reinstated settler tubes, a new drum filter, chlorination and effluent pump station. The sludge will be digested in an aerobic digester and discharged to two sludge drying bed for dewatering.

The WWTP is rated as producing Class B reclaimed water according to A.A.C. R18-11, Article 3. The effluent will be discharged through a new percolation-evaporation pond. The existing overflow trench will be used as required during emergency. The existing bubbler irrigation system may be rehabilitated as need in future.

IV. 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-B205. The facility shall meet the performance requirement for industrial pre-treatment as per A.A.C. R18-9-B205.

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.

All industrial hookups and other non-residential hookups to the treatment system shall be authorized according to the applicable federal, state or local regulations.

V. Pre-Operational Requirements:

Temporary Treatment Train: During the modification to the existing treatment train, the existing treatment plant components will be taken out of the service for two months. The facility will be installing a temporary packaged plant to continue the treatment of sewage. The temporary system will be rated at 5,400 gpd. The influent will flow through headworks to the bypass treatment system via two submersible sewage pumps located in the existing headworks. The temporary treatment train will include duplex basket strainer, an equalization tank, packaged Membrane Bed Bioreactor (MBBR) skids with anoxic, aerobic zones and sludge tank, and Dissolved Air Floatation (DAF). The effluent line from the dissolved air floatation will be tied into the existing overflow trench piping to discharge to through disposal trenches.

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

There is one conceptual point of compliance well location and monitoring is not required except as a contingency action. The Director may amend this permit to require installation of the well(s) and initiation of groundwater monitoring at the POC or to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.