



Fact Sheet

Aquifer Protection Permit #P-100620
Place ID 1003, LTF 46556

Nogales International 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 Permittees:	1) United States Section of the International Boundary and Water Commission, co-owner	2) City of Nogales, Arizona, co-owner
Mailing Address:	865 Rio Rico Industrial Park, Rio Rico, Arizona 85648	777 N. Grand Ave. Nogales, AZ 85621
Facility Name and Location:	Nogales International Wastewater Treatment Plant 865 Rio Rico Industrial Park, Rio Rico, Arizona 85648 Santa Cruz	

Regulatory Status

A Groundwater Protection Permit No G-0006-12 was issued for Nogales International Wastewater Treatment Plant (WWTP) on July 6, 1989. An AZPDES (# AZ0020150) permit was issued on May 29, 2001 for this facility. The facility is operating under Aquifer Protection Permit (APP) which was issued on March 27, 2003. The facility was issued a renewed AZPDES (# AZ0025607) permit on November 19, 2007. An application for a Significant APP Amendment was received by ADEQ on January 16, 2008 to construct and operate the new Biological Nutrient Removal (BNR) with a permitted capacity of 17 mgd.

At time of permit issuance, there are three active Notices of Violation (NOVs) and the permittee is not in compliance with the existing APP. The NOVs are described as below:

1. The NOV was issued on August 3, 2006 as the permittee failed to renew the AZPDES permit prior to six month of the expiration date and the effluent from the Nogales

International WWTP (WWTP) was discharged to the Santa Cruz River without AZPDES permit coverage.

2. The NOV was issued on October 8, 2008 for following violations:
 - The permittee failed to obtain approval before storing the biosolids in an old lagoon since two years.
 - The permittee failed to sample the biosolids every 60 days in 2007 as required in the AZPDES permit.
 - The permittee failed to provide information the crops grown, dates of seeding and harvesting on its 2006 annual biosolids report as required by AZPDES permit.
 - The permittee failed to provide ADEQ at the time of the inspection, the lab results documenting the pollutant levels, pathogen and vector attraction reduction methods utilized, nitrogen levels and information on the amount and disposition of biosolids removed from Partially Mixed Lagoon -2 in January 2008.
3. The NOV was issued on October 29, 2008 for following violations:
 - The permittee failed to submit Discharge Monitoring Reports (DMRs) for April 2008 and also other DMRs are submitted late.
 - The DMRs submitted to ADEQ indicate deviations in sampling results from limit set in the permit.
 - The permittee used analyses with detection levels that were higher than those specified in the 1996 Sampling Plan so the influent samples taken from 2004 through the first half of 2008 were inconclusive for reviewing the mass influent objectives and other pretreatment objectives.
 - The permittee failed to develop and implement mass influent objectives for pollutants that may cause or contribute to interference, pass through or the other problems described at 40 CFR Part 403.5.

Facility Description

The permittee is authorized to operate the Nogales International Wastewater Treatment Plant (WWTP) with an average monthly flow of 17 millions gallons per day (mgd). The construction of new facility will take place within the footprint of the existing lagoon treatment system. The WWTP process consists of headworks which includes refurbished existing mechanical screen, new vortex grit chamber and new fine screen with odor control, new Biological Nutrient Removal (BNR) treatment which includes aeration basins with anoxic zones and aeration zones, new secondary clarifiers, existing sand filters, new UV disinfection system and existing chlorine disinfection for backup, aerobic digester, a sludge belt filter press and Waste Activated Sludge (WAS) storage pond for sludge storage. One of the existing lagoons, Complete Mixed Lagoon (CML) -1 will be used to equalize the flow. Other existing lagoons will be taken out of the service, once new BNR treatment plant is in operation.

The effluent is discharged to the Santa Cruz River near the confluence of Potrero Creek and the Santa Cruz Rivers in accordance with AZPDES permit AZ0025607. The dried sludge will be

hauled offsite to be used for beneficial land application. The solids generated from screenings, grit, and scum will be hauled off-site for disposal in accordance with state and federal regulations. The WWTP is designed and constructed according to plans approved by the ADEQ APP and Reuse Unit.

In addition to the APP conditions pertaining to treatment and disposal of sewage sludge, the permittee must also comply with the requirements for sewage sludge disposal, use, and transportation in 40 Code of Federal Regulations (CFR) Part 503 and 18 A.A.C. 9, Article 10

The depth to groundwater at the site is generally 5 to 20 feet and is generally shallower closer to Santa Cruz River and Potrero Creek. The direction of groundwater flow generally is to the north or northwest.

The WWTP accepts sewage from the collection systems of the following communities: (1) The community of Rio Rico operated by Rio Rico Utilities; (2) the City of Nogales, Arizona, operated by the City of Nogales, Arizona; and (3) the City of Nogales, Sonora, Mexico, operated by the Organismo Operador Municipal de Agua Potable, Alcantarillado y Saneamiento de Nogales, Sonora (OOMAPAS-NS). The flows from Nogales, Sonora, Mexico, include storm water (combined flows) directed into the sewer system.

This amendment is to construct and operate the new Biological Nutrient Removal (BNR) treatment plant with capacity of 14.74 mgd. The facility has demonstrated that though the new BNR treatment plant is designed for 14.74, the WWTP can treat up to 17 mgd of wastewater. Based on hydraulic modeling, the permittee has demonstrated that the WWTP can meet the discharge limit described under Section 4.2, Table I for flow up to 17 mgd.

During the initial start-up of 30-day period, the effluent will be monitored as per Section 4.1, Table I. Monitoring will begin after 30 days from the signature date of permit as per Section 4.2, Table I.

Amendment Description

This significant permit amendment was initiated by the permittee, for the purpose of constructing and operating a new mechanical wastewater treatment plant with capacity of 17 mgd. The facility description is updated for new mechanical WWTP and the monitoring tables are updated to reflect the changes. In addition, relevant permit language has been changed to conform to the current APP format.

II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY (BADCT)

The WWTP is designed to meet the treatment performance criteria for new facilities with a design flow of more than 250,000 gpd as specified in R18-9-B204.

III. HYDROGEOLOGIC SETTING

Tertiary and Quaternary alluvial deposits comprise the main aquifer in the Nogales International WWTP area. These deposits are present along the Santa Cruz River floodplain to depths of at least several hundred feet. In most of the area south of the Tumacacori Mountains, water levels are shallow, and the aquifer is considered essentially full.

Consolidated rocks, which are generally non water-bearing, crop out on both sides of the floodplain in the area south of the Nogales International WWTP. Jurassic intrusive rocks, which also are generally non water-bearing rocks, crop out, and they are likely present beneath the Santa Cruz River SE of the WWTP. Rock of the Tertiary Nogales Formation crop out and extend beneath and to the west of much of the Nogales Wash. The formation in this area comprises conglomerate, fanglomerate, tuffaceous sandstone, and tuff. Rocks of the Nogales Formation were believed to be present at depths ranging from about 70 feet to 130 feet along the Santa Cruz Wash. Those formations were also found at depths of up to 530 feet in a well at Rio Rico. Older alluvial deposits, which are generally red in color, normally comprise slightly to moderately consolidated cobbles, gravel, sand, silt, and clay, with the course-grained fraction predominant in most of the area. Younger alluvial deposits are generally the most permeable deposits in the area. They are comprised of unconsolidated and primarily course-grained deposits that are usually less than 50 to 100 feet thick, and they comprise the floodplain and channel deposits along the Santa Cruz River and its major tributaries.

IV. STORM WATER/SURFACE WATER CONSIDERATIONS

The project is constructed over the groundwater in the Santa Cruz Active Management Area basin. Nogales, Arizona and Nogales, Sonora share the Santa Cruz River Basin. The upper Santa Cruz River Basin is a north-south trending valley that extends from the international boundary to the north end of the Tucson basin at the Rillito Narrows. Along the reach of the Santa Cruz River in the area the valley is bounded on the west by Atascosa and Tumacacori Mountains and on the east by Patagonia and Santa Rita Mountains. Major tributaries of the Santa Cruz River along this reach include Nogales Wash (Potrero Creek), Sonoita Creek, Peck Canyon, Josephine Canyon, and Sopor Wash. Land surface elevations along the floodplain range from about 3,450 feet above mean sea level near the Nogales International WWTP to 3,000 feet near Elephant Head Road. The Santa Cruz River, which flows from Mexico to the United States in the project area, is used by both communities as an important potable water source, providing nearly half of the total water supply for each of the two communities. The Nogales wash flows through the lowest areas of both cities and provides storm drainage for all the urban area. Mean annual precipitation at Nogales is about 16 inches, and about 70% of it falls during the months of July through September. Mean annual flow at the Santa Cruz River is 15,000 to 17,000 acre feet.

The Nogales International WWTP site is located within the 100-year flood plain with berm protection all around the facility to protect from a 100 year flood. The facility will be constructing the berms to bring it up to 100-year flood standards. After construction, the WWTP will be protected from 100-year flood event. The construction of berms will be conducted as per the Compliance Schedule described under Section 3.0 of this permit.

V. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

The major sources of recharge to the aquifer are recharge from the Santa Cruz River and its tributaries which is estimated at about 14,000 acre feet per year; and an estimated 9,000 acre feet per year from mountain-front recharge. Groundwater elevations in the area ranged in elevation from flood plain elevation to 30 feet below flood plain elevation. Groundwater elevations in the Nogales International WWTP area show a hydraulic gradient towards the northwest. Groundwater elevations are generally correlated with stream flow in the Santa Cruz River and pumping in the area, where cones of depression may be formed. Average hydraulic gradient under the Nogales Wash is about 55 feet per mile and becomes as low as 5 feet per mile under the Santa Cruz River downstream from the Nogales International WWTP. It is estimated that there was more than 8,000,000 acre feet of groundwater in storage above 1,200 feet in alluvial deposits between the international boundary and the county line as of 1972. It is also estimated that there was about 10,000 acre feet per year of groundwater underflow entering Pima County from Santa Cruz County along the Santa Cruz River valley at county line as of 1970-1972.

Monitoring and Reporting Requirements

To ensure that site operations do not violate Aquifer Water Quality Standards at the point of compliance, representative samples of the effluent shall be collected from the point of discharge at AZPDES Discharge Point to the Santa Cruz River. The permittee shall monitor the effluent daily for flow rate and fecal coliform, monthly for total nitrogen, quarterly for metals and for major cations and anions, and semi-annually for volatile organic compounds (see Section 4.2, Table IA in the permit).

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

Groundwater monitoring is required at the Point of compliance wells. The permittee shall monitor the groundwater monthly for total nitrogen, nitrate-nitrite as N, total Kjeldahl nitrogen (TKN), nitrate as N, nitrite as N, total coliform and groundwater depth, quarterly for metals and for major cations and anions, and semi-annually for volatile organic compounds and radionuclide (see Section 4.2, Table IA in the permit).

Point of Compliance (POC)

Three points of compliance (POC) wells are established for this facility based upon the north to north westward groundwater flow direction.

The hazardous/non-hazardous POC is located as follows:

POC #	Descriptive Location	Latitude	Longitude
MW # 4	North/East side of WWTP up gradient of the AZPDES Discharge and WWTP	31° 27' 20" N	110°58' 02"W

POC #	Descriptive Location	Latitude	Longitude
MW # 5	450 feet North/West and down gradient of AZPDES effluent discharge point and WWTP	31° 27' 26"N	110° 58 '02"W
MW # 6	1900 feet northwest and down gradient of the AZPDES effluent discharge point and WWTP	31° 27' 36"N	110° 58' 28"W

VI. COMPLIANCE SCHEDULE

The following compliance schedule items shall be included in the permit.

Description	Due by:
WWTP Construction:	
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
Notify ADEQ about completion of start up period.	Within 15 days of the date of the completion of start up period.
Berm Construction for 100-yr Flood Event:	
The permittee shall finish construction of berms around the WWTP to protect the facility from 100-yr flood event.	Within 120 days of the date of permit issuance
The permittee shall notify ADEQ about completion of berm construction.	Within 30 days of the date of completion of the berm construction
Hydrology Study:	
The permittee shall perform a hydrologic study for the project area and shall address all the following items that were not provided in response to the department’s request for more information: <ul style="list-style-type: none"> a. Pursuant to A.A.C. R18-9-A202, Please provide an updated hydrogeologic study for the project area. The 	Within 24 months of the date of permit issuance ¹ .

¹ In case the permittee is unable to acquire the funds in 2011 budget to conduct hydrology studies, the permittee shall submit an amendment to modify the due date in this compliance schedule.

hydrologic report shall include a summary of the hydrogeologic setting at the facility and surrounding area. The summary must include the name of the geologic basin in which the facility is located; a description of the underlying geologic units, including depth of each unit and the geologic composition; the location and description of any water bearing and low-permeability units.

- b.** Pursuant to A.A.C. R18-9-A202(A)(11), please provide a site map based on either an aerial photograph or a topographic map showing the following information: site topography; facility site plan showing all known property lines and structures; the wastewater treatment facilities; all discharging sites with latitude and longitude coordinates; the outline of the 100-year flood plain if it exists in the map area; the location of the Point(s) of Compliance (POCs) with latitude and longitude coordinates; the area of the Pollutant Management Area (PMA) and the land uses

surrounding the PMA; the Discharge Impact Area (DIA); the location of any nearby surface water bodies (rivers, lakes, ephemeral washes, etc.); the depth to groundwater and the direction of groundwater flow and equipotential lines showing the elevation of groundwater and the direction of groundwater flow; the location of each well and its use within one mile radius of the PMA; any injection wells, and drywells and their uses; and all known borings. The site map should fit on an 8½ x 11 inch sheet of paper or folded to fit that space.

- c.** Pursuant to A.A.C. R18-9-A202(A)(4), please provide the location(s) of the discharge and a map outlining the Pollutant Management Area (PMA).
- d.** Pursuant to A.A.C. R18-9-A202(A)(8)(b)(xii) and (xiii), please provide a map of the facilities Discharge Impact Area (DIA) and the criteria and methodologies used to determine the DIA.
- e.** Pursuant to A.A.C. R18-9-A202(A)(11), please provide the depth to groundwater and the direction of groundwater flow. If available, please submit an equipotential map showing the elevation of groundwater and the direction of groundwater flow.

<ul style="list-style-type: none"><p>f. Pursuant to A.A.C. R18-9-A202(A)(8)(b)(x), please describe any expected changes in the elevation or flow directions of the groundwater that may be caused by the facility.</p><p>g. Pursuant to A.A.C. R18-9-A202(A)(8)(b)(vi), please provide documentation of the existing quality of the water in the aquifers underlying the site, including, where available, the methods of analysis and quality assurance and quality control procedures. Provide water quality data from the surrounding wells.</p><p>h. Pursuant to A.A.C. R18-9-A202(A)(8)(b)(x), please provide any anticipated changes in groundwater quality as a result of the discharge.</p><p>i. Pursuant to A.A.C. R18-9-A202(A)(11), please provide a list of all wells within a ½ mile radius of the facility. The list should include the ownership of the well, the Arizona Department of Water Resources (ADWR) well registration number, the well depth, the screened interval and the well use. Please provide a map showing the location of all wells described in the list.</p><p>j. Pursuant to A.A.C. R18-9-A202(A)(8)(b)(vii), please provide documentation of the extent and degree of any known soil contamination at the site.</p><p>k. Pursuant to R18-9-A202(A)(8)(b)(viii), please provide an assessment of the potential of the discharge to cause the leaching of pollutants from surface soils or vadose materials or cause the migration of contaminated groundwater.</p><p>l. Pursuant to A.A.C. R18-9-A202(A)(6), please demonstrate that:</p><ul style="list-style-type: none"><p>a. The facility will not cause or contribute to a violation of the Aquifer Water Quality Standards at the proposed point of compliance, or</p><p>b. If an Aquifer Water Quality Standard for a pollutant has been exceeded in an aquifer at the time of permit issuance, no additional degradation of the aquifer relative to that pollutant and determined at the proposed point of compliance</p>	
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<p>will occur as a result of the discharge from the facility.</p> <p>m. Pursuant to A.A.C. R18-9-A202(A)(6), please discuss the effect of the presence/ potential of fissures and land subsidence in the area of the facility.</p> <p>n. Pursuant to A.A.C. R18-9-A202(A)(8)(b)(ii), please provide the location of any perennial, intermittent, or ephemeral surface water bodies.</p> <p>o. Pursuant to A.A.C. R18-9-A202(A)(8)(b)(iv), please provide the rates, volumes, and directions of surface water flow, including hydrographs, if available, and equipotential maps.</p> <p>p. ADEQ generally requests that POC monitoring wells be perforated 5-20 feet above the water table and 20-40 feet below the water table. In accordance with A.A.C. R18-9-A202(A)(6), please provide POC well details showing conformance with ADEQ monitoring requirements.</p> <p>Based on the results of the hydrologic study the department will decide if any changes to the POCs locations and/depths will need to be made to better monitor the effects of the discharge on the groundwater quality in the area affected by the discharge.</p>	
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VII. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

Technical Capability

The permittee 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 by Stantec Consulting Inc., employing professional engineers registered in the state of Arizona. The design report dated May 16, 2007 in support of the significant permit amendment to construct and operate Biological Nutrient Treatment (BNR) facility. The permittee is expected to maintain technical capability throughout the life of the facility.

Financial Capability

The permittee 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 \$3,000,000

operating costs and \$2,275,000 closing costs. The permittee shall maintain financial capability throughout the life of the facility.

Zoning Requirements

The Nogales International 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 Nogales International on March 20, 2009 under public notice no. 28-09.

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.

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: Shivani Shah
1110 West Washington Street, Mail Code 5415B-3
Phoenix, Arizona 85007
Phone: (602) 771-4465

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