



Fact Sheet

Aquifer Protection Permit
 Place ID 3222, LTF 47334
 Significant Amendment
 Tucson Electric Power Company
 Springerville Generating Station

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an 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 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; 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.

I. FACILITY INFORMATION

Name and Location

Permittee's Name:	Tucson Electric Power Company (TEP)
Mailing Address:	TEP Springerville Generating Station P.O. Box 2222 Springerville, Arizona 85938
Facility Name and Location:	Springerville Generating Station 12 miles northeast of Springerville on Hwy 180, then 12 miles east on County Road #4162

Regulatory Status

The Springerville Generating Station (SGS) is an existing facility that has been in operation since 1985. The SGS is owned and operated by Tucson Electric Power Company (TEP). TEP submitted a Notice of Disposal for the SGS in January 1985. No Groundwater Quality Protection Permit was issued for the SGS facility. TEP submitted an Aquifer Protection Permit (APP) application for the SGS in April 1998. Additional information for an APP was submitted in 1999, 2001, and 2002. An Aquifer Protection Permit was issued April 1, 2003. An amendment application to the permit was submitted November 3, 2003 and a revised permit issued December 12, 2004.

Six surface impoundments located at the SGS are exempt from APP regulation as these reservoirs are used only for stormwater retention or groundwater storage. The

two stormwater retention basins that receive stormwater runoff from the plant site are exempt from APP pursuant to A.R.S. § 49-250(B)(10). The two raw water reservoirs used at the SGS site to store groundwater and two make-up water storage reservoirs used to store demineralized groundwater for Units 3 and 4, are exempt from APP pursuant to A.R.S. § 49-250(B)(6).

In November 1990, TEP discovered a release of unused diesel during an investigation of discrepancies between meter readings and inventory records. The volume of the fuel released was estimated at 10,000 to 30,000 gallons based on inventory records. TEP discovered that the diesel release resulted from failure of 3-inch underground fuel line located beneath the foundation of the boiler facility and connected to an above-ground storage tank near the main building. TEP initiated site investigations to characterize and determine the extent of contamination in 1991 and 1992. In June 1997, ADEQ (Solid Waste Section) approved TEP's Remedial Design and Risk Assessment Plan, dated February 27, 1997. The diesel release area and any associated remediation are exempt under APP pursuant to A.R.S. § 49-250 (18)(d) provided that the closure is completed and no further action is required by ADEQ Waste Division (Solid Waste Section), or if applicable, under ADEQ Voluntary Remediation Program (VRP).

The Tucson Electric Power Company is also regulated under a Resource Conservation and Recovery Act (RCRA) permit (AZ-D 981653009), an Air Quality Operating Permit (No. M010060P4-99), and an Arizona Pollutant Discharge Elimination System (AZPDES) permit (No. AZR00A796).

Facility Description

The Springerville Generating Station (SGS) is a three-unit pulverized coal-fired, steam electric generating facility with a combined net generating output of 1160-megawatts. TEP is the operator of the SGS and owner of the property and SGS Unit 1. San Carlos Resources, a wholly owned subsidiary of TEP, is the owner of Unit 2. TEP began commercial operations at the SGS in 1985 with Unit 1 and commenced operation of Unit 2 in 1990. Springerville Unit 3 commenced operations in 2006 and is owned by Tri-State Generation and Transmission Association. The proposed Unit 4 is currently planned for a net generating output of 400 megawatts and is owned by the Salt River Project and will be operated by TEP. The site occupies a total of area of 14,355 acres, which includes the power plant area, ash disposal area, and the east and west production well fields.

This area-wide permit is for the operation of impoundments associated with Units 1, 2, 3 and 4 utilized for industrial wastewater, a wastewater treatment plant with two sewage ponds, a coal storage area retention pond, a fire training facility, and an ash landfill. Process wastewater produced from plant operations is recycled within the plant and routed through various process wastewater collection systems and storage reservoirs

This area-wide permit also authorized the closure of several existing discharging facilities that are no longer in operation. These “closed” facilities are described in the permit and include: the Sludge Settling Reservoir, the Construction Debris and Asbestos Landfills. The closure requirements for operational facilities are stipulated in the permit.

Permitted discharging facilities at the site are as follows:

Facility	Status	Latitude	Longitude
Make-Up Reservoir A	Active	34° 19' 06" North	109° 09' 33" West
Make-up Reservoir B	Active	34° 19' 08" North	109° 09' 33" West
Sludge Settling Reservoir A	Active	34° 19' 08" North	109° 09' 15" West
Sludge Settling Reservoir B	Active	34° 19' 08" North	109° 09' 17" West
Sludge Settling Reservoir D	Active	34° 19' 08" North	109° 09' 19" West
Recoverable Water Reservoir A	Active	34° 19' 06" North	109° 09' 31" West
Recoverable Water Reservoir B	Active	34° 19' 08" North	109° 09' 31" West
Cooling Tower (CT) Blowdown Reservoir A	Active	34° 19' 08" North	109° 09' 25" West
CT Blowdown Reservoir B	Active	34° 19' 08" North	109° 09' 25" West
Process Water Collection Reservoir	Active	34° 19' 07" North	109° 09' 29" West
Evaporation Pond 1	Active	34° 19' 22" North	109° 09' 15" West
Evaporation Pond 2	Active	34° 19' 20" North	109° 09' 22" West
Evaporation Pond 3	Active	34° 19' 23" North	109° 09' 08" West
Evaporation Pond 4	Active	34° 19' 25" North	109° 09' 13" West
Evaporation Pond 5	Active	34° 19' 28" North	109° 09' 13" West
Evaporation Pond 6	Active	34° 19' 32" North	109° 09' 10" West
Wastewater Treatment Plant	Active	34° 19' 05" North	109° 10' 23" West
Sewage Pond 1	Active	34° 19' 17" North	109° 09' 23" West
Sewage Pond 2	Active	34° 19' 16" North	109° 09' 24" West
Ash Landfill	Active	34° 18' 05" North	109° 14' 30" West
Coal Storage Area Retention Pond	Active	34° 19' 14" North	109° 09' 13" West
Fire Training Facility/Catch Basin	Active	34° 19' 15" North	109° 10' 13" West
Unit 3 Evaporation Pond West (EPW)	Active	34° 19' 11" North	109° 10' 33" West
Unit 3 Evaporation Pond	Active	34° 19' 11" North	109° 10' 33" West

Facility	Status	Latitude	Longitude
East (EPE)			
Unit 3 Evaporation Storage Pond 1E	Proposed	34° 18' 57" North	109° 11' 01" West
Unit 3 Evaporation Storage Pond 1F	Proposed	34° 18' 57" North	109° 10' 54" West
Unit 4 Evaporation Storage Pond 1A	Proposed	34° 19' 03" North	109° 11' 03" West
Unit 4 Evaporation Storage Pond 1B	Proposed	34° 19' 09" North	109° 10' 56" West
Unit 4 Evaporation Storage Pond 1C	Proposed	34° 19' 05" North	109° 11' 09" West
Unit 4 Evaporation Storage Pond 1D	Proposed	34° 19' 15" North	109° 11' 19" West
Unit 3 & 4 Lime Sludge Storage Pond North (LSSPN)	Active	34° 19' 00" North	109° 10' 17" West
Unit 3 & 4 Lime Sludge Storage Pond South (LSSPS)	Active	34° 19' 00" North	109° 10' 17" West
Unit 3 & 4 Combined Effluent Storage Pond (CESP)	Active	34° 19' 00" North	109° 10' 13" West
Unit 4 Combined Effluent Storage Pond	Proposed	34° 19' 03" North	109° 10' 13" West
Unit 3 & 4 Cooling Tower Blowdown Storage Pond (CTBDSP)	Active	34° 18' 58" North	109° 10' 12" West

The site includes the following closed facilities:

Facility	Status	Latitude	Longitude
Sludge Settling Reservoir C	Closed	34° 19' 08" North	109° 09' 18" West
Construction Debris Landfill (Former)	Closed	34° 18' 00" North	109° 14' 30" West
Asbestos Landfill	Closed	34° 17' 58" North	109° 14' 30" West
Drywell Registration No. 01-25315-10 (DW-1)	Closed	34° 19' 05" North	109° 09' 55" West
Drywell Registration No. 01-25316-10 (DW-2)	Closed	34° 18' 59" North	109° 09' 29" West
Drywell Registration No. 01-25317-10 (DW-3)	Closed	34° 18' 59" North	109° 09' 29" West

Amendment Description

TEP initiated this significant amendment to their APP for the construction and use of the Springerville Generating Station Expansion Project which includes:

- Steam Generating Unit 4
- Proposed Unit 4 Evaporation Storage Ponds 1A & 1B
- Proposed Unit 4 Evaporation Storage Ponds 1C & 1D
- Proposed Unit 3 Evaporation Storage Ponds 1E & 1F
- Proposed Unit 4 Combined Effluent Storage Pond (CESP)

The applicant also proposed alert levels and discharge limits for the existing Units 1, 2 & 3 surface impoundments and included a proposal for the expansion of the existing coal storage area pad.

II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY

The BADCT demonstrated for this facility shall consist of a combination of the design of the wastewater management systems, low-permeability (minimum 10^{-6} centimeters per second (cm/sec)) liner systems in all impoundments containing wastewater exceeding AWQS, processes and operational methods employed at the site for reducing discharges, water conservation, and site-specific characteristics. The depth to groundwater at the site is approximately 600 feet bgs. The vadose zone beneath the site includes a stratigraphy with low-permeability clay ranging in depth from 130 to 528 feet bgs, limiting the infiltration and migration of pollutants from the facility.

A HELP-3 computer simulation model was used to evaluate the amount of potential leakage percolating from the surface impoundments and ash disposal area into the subsurface. The HELP model performed a water balance analysis of rainfall, runoff, evapo-transpiration, soil moisture storage, lateral drainage, and percolation for the discharging facilities. For the lined surface impoundments with either an 80-mil high density polyethylene (HDPE) liner or a 4-inch asphalt liner, the HELP model predicted approximately 0.00008 inches/year/acre of leachate percolation through the native soil. The estimated leakage was reduced to 0.00001 inches/year/acre in impoundments containing primarily sludge as the sludge is assumed to limit percolation. The annual leachate percolation through the native soil beneath an unlined impoundment was estimated at approximately is 0.06314 inches/year/acre. HELP modeling predicted no leakage (0.0000 inches per year) from the base of the landfill with a minimum amount of ash cover (one foot).

Below summarizes the general design of the permitted facilities:

Facility	BADCT Description
Make-up Water Reservoirs (A & B)	Make-up Reservoir A shall be lined with an 80-mil HDPE liner. Make-up Reservoir B shall be lined with a 4-inch asphalt liner.
Sludge Settling Reservoirs (A,B, & D)	Both impoundments shall be lined with a 4-inch thick asphalt liner with an approximate permeability of 1.1

Facility	BADCT Description
	x 10 ⁻⁶ cm/sec.
Recoverable Water Reservoirs (A & B)	Both impoundments shall be lined with a 4-inch thick asphalt liner with an approximate permeability of 1.1 x 10 ⁻⁶ cm/sec.
Cooling tower Blowdown Reservoirs (A & B)	Both impoundments shall be lined with an approximate permeability of 1.1 x 10 ⁻⁶ cm/sec.
Process Water Collection Reservoir	It shall be lined with an approximate permeability of 1.1 x 10 ⁻⁶ cm/sec.
Evaporation Ponds (1-6)	These impoundments shall be lined with an 80-mil HDPE liner with an estimated permeability of 10 ⁻¹⁴ cm/sec.
Sewage Ponds (1 & 2)	Both impoundments shall be lined with an approximate permeability of 1.1 x 10 ⁻⁶ cm/sec.
Ash Landfill	The landfill shall be constructed using compacted layers of fly ash and bottom ash with an estimated permeability of 10 ⁻⁵ cm/sec. The landfill shall be constructed in a bench and crest design. The ash material shall be covered with approximately 24 inches of native soil following completion of each bench. All surface runoff from the ash disposal area shall be contained.
Coal Storage Area Retention Pond	The Coal Storage Area Retention Pond is an unlined impoundment approximately 60-acre feet in size.
Fire Training Facility	The fire training area is approximately 250 feet in length and 100 feet wide and drains to the catch basin for containment of the fire suppression water. The catch basin is approximately 100 feet in length and 25 feet wide. The fire training area shall be lined with a minimum of 14 inches of fly ash compacted to 95% maximum dry density, covered with approximately four inches of ABC fill and 3/8-inch chips.
Unit 3 Evaporation Pond (East & West)	Both ponds shall be constructed with a 60-mil HDPE flexible membrane liner, a leachate collection and recovery system (LCRS) consisting of a geonet layer sloped to a center sand filled trough that has an embedded 60-mil HDPE pipe for collecting leachate and a lower composite liner consisting of 60-mil HDPE over a geosynthetic clay liner.
Unit 3 Evaporation Storage Pond (1E & 1F)	Both ponds shall be constructed with a 60-mil HDPE flexible membrane liner, a leachate collection and recovery system (LCRS) consisting of a geonet layer sloped to a center sand filled trough that has an embedded with a 6-inch perforated HDPE collection pipe and a lower liner consisting of a 60-mil HDPE flexible membrane.

Facility	BADCT Description
Unit 4 Evaporation Storage Pond (1A through 1D)	The 4 impoundments shall be constructed with a 60-mil HDPE flexible membrane liner, a leachate collection and recovery system (LCRS) consisting of a geonet layer sloped to a center sand filled trough that has an embedded with a 6-inch perforated HDPE collection pipe and a lower liner consisting of a 60-mil HDPE flexible membrane.
Unit 3 & 4 Lime Sludge Storage Pond (North & South)	Both impoundments shall consist of a 60-mil HDPE upper liner that has a 12-inch sand layer directly placed on the HDPE and 6-inch aggregate layer on the sand layer. Under the upper liner is a leak detection system consisting of geonet layer sloped to a center sand filled trough with an embedded perforated HDPE pipe for collection of leachate. Below the leachate collection system is a composite under liner consisting of a 60-mil HDPE liner on top of a geosynthetic clay liner.
Unit 3 & 4 Combined Effluent Storage Pond	The pond shall consist of a 60-mil HDPE upper liner below a 6 inch layer of aggregate material on top of a 12-inch layer of sand. A LCRS consisting of a geonet layer sloped to a center sand filled trough embedded with a perforated HDPE pipe is below the upper liner. The lower liner shall consist of a 60-mil HDPE on top of a geosynthetic clay liner.
Unit 4 Combined Effluent Storage Pond	The pond shall be constructed with a 60-mil HDPE flexible membrane upper liner, LCRS composed of geonet layer sloped to a center sand filled trough embedded with a 6-inch perforated HDPE collection pipe, and a lower liner consisting of a 60-mil HDPE flexible membrane.
Unit 3 & 4 Cooling Tower Blowdown Storage Pond	The pond shall consist of a 60-mil HDPE upper liner with a 12-inch layer of sand cover under a 6-inch aggregate layer over it. Under the HDPE upper liner shall be a geonet layer sloped to a center sand filled trough embedded with a perforated HDPE collection pipe. Under the geonet shall be a composite liner consisting of a 60-mil HDPE liner over a geosynthetic clay liner.

III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

Monitoring and Reporting Requirements

Initial characterization of the discharges directed to the new lined impoundments will be performed within 60 days of the start of operation and submit to ADEQ according to the Compliance Schedule in Section 3.0. The samples will be analyzed according

to Section 4.1, Tables 1 and 2. Routine leachate collection system monitoring for the lined impoundments will be performed according to Section 4.2, Table 3A. Discharge monitoring for the permitted facilities listed in Section 2.1 of the APP will be performed according to Section 4.2, Tables 1A through 1I. Facility /operational monitoring of the surface impoundments and ash disposal facility will be performed according to Section 4.2, Tables 2A through 2E. Seepage well monitoring will be performed according to Section 4.2, Tables 3 & 4.

The seepage wells are designed to detect fluids moving down through the vadose zone. The permittee shall monitor the seepage wells (A10 W, A3W, A14W, B2W, and B7W) to verify that the seepage wells are functioning in operating condition and to identify possible leakage from the site. The seepage wells shall be inspected for operating condition and monitored for the presence of fluids on a quarterly basis following any significant rainfall or storm event.

The depth to groundwater under this site ranges from 539 to 740 feet below ground surface. The vadose zone under the site consists of low permeability soils (Chinle Formation and Moenkopi Formation) ranging in thickness of 400 feet, extending from 130 to 528 foot depths beneath the site. This low permeability zone has a hydraulic conductivity estimated at 10^{-9} cm/sec. The facility is not located within a 100-year flood plain or in an area of geologic hazards.

Point(s) of Compliance (P.O.C)

P.O.C. Locations	Latitude	Longitude
Seepage Monitoring Well A10W (Plant PMA/WW Reservoirs)	34° 19' 21" North	109° 10' 37" West
Seepage Monitoring Well B7W (Ash Landfill PMA)	34° 18' 02" North	109° 14' 37" West
MW -1 Designated (Alternative location for this POC to be proposed as part of the Compliance Schedule in Section 3.0)	To Be Determined	To Be Determined

Routine groundwater monitoring is not required under the terms of this permit. If groundwater monitoring is required in the future, groundwater flow conditions shall be reassessed to determine if the designated point(s) of compliance are still appropriate locations for groundwater monitoring.

IV. STORM WATER AND SURFACE WATER CONSIDERATIONS

Based on the site location map, Coyote Creek, an ephemeral tributary to the Little Colorado River, is located, approximately three miles southwest of the ash disposal area and approximately five miles southwest of the power plant area. Several ephemeral washes cross the site. The SGS is located outside the floodplain and no impact from flooding is expected.

The SGS site was designed to divert stormwater away from the facility. Stormwater runoff from within the site is collected and diverted to the two stormwater retention ponds designed for the 100-year, 24-hour storm event. Stormwater runoff from the ash disposal areas is contained within the ash landfill area.

V. COMPLIANCE SCHEDULE

The following items are required in accordance to the Compliance Schedule in Section 3.0 of the APP:

1. Initial discharge characterization of the waste streams within 60 days of the start of operation from the Unit 3 Evaporation Storage Ponds 1E and 1F, Unit 4 Evaporation Storage Ponds 1A, 1B, 1C, and 1D, and Unit 4 Combined Effluent Storage Pond. The permittee will submit a report summarizing the results of the wastewater characterization within 90 days of the date of sample collection.
2. The final construction reports including quality assurance/quality control documentation and final design and as-built plans shall be submitted within 60 days of completion of construction for the double lined impoundments and leak collection systems for the Unit 3 & Unit 4 Evaporation Storage Ponds, the Unit 4 Combined Effluent Storage Pond.
3. Within 30 days of permit issuance the permittee shall submit the following as part of an amendment application:
 - Maps of the pollution management area (PMA)
 - Maps showing groundwater flow direction for the Main Plant PMA and the Ash Landfill PMA
 - Groundwater data from M-1 and any other upgradient groundwater well
 - Provide information on any past discharges in the area of all recently constructed and proposed ponds
 - Provide design details for the Fire Training Facility catch basin
 - A map of showing the location of the oil/water separators and a brief description of the design and operation
 - A process flow diagram that includes the dust suppression water and Rain Bird usage
 - Details on the surface water flow diversion strategies for the site
 - An inspection report for all existing seepage monitoring wells.
 - Propose alert levels and discharge limits for the existing impoundments at the site based on similar wastewater characteristics and impoundment design within 30 days of permit issuance
4. Within 90 days from the date of permit issuance the permittee shall submit Information and data for any groundwater supply wells that are upgradient of the PMA.
5. Install 3 new seepage monitoring wells within 90 days of permit issuance located as follows:
 - Location 1 shall be north of Unit 4 Evaporation Pond 1A
 - Location 2 shall be in the northeast portion of Section 27 and the main plant area

- Location 3 shall be northwest of the Coal Storage Area Retention Pond
6. Commence sampling of newly installed seepage monitoring well within 30 days of installation.
 7. Collect 4 additional quarterly samples from the Coal Storage Area Retention Basin and propose numeric alert levels within 30 days of receiving the 4th sample analytical results.
 8. The permittee shall characterize the wastewater effluent from the oil/water separator(s) and propose alert levels and discharge limits within 2 years of permit issuance

VI. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

Technical Capability

The Tucson Electric Power Company 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 Washington Group International is responsible for the design, construction and construction quality assurance for the installation of the proposed impoundments.

ADEQ 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 Tucson Electric Power Company 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. The permittee is expected to maintain financial capability throughout the life of the facility. The estimated closure and post-closure cost is \$1,223,400. The financial assurance mechanism demonstration was met through A.A.C. R-18-9-A203(C)(3).

Zoning Requirements

The Tucson Electric Power Company has been properly zoned for the permitted use and the permittee has complied with all Apache County zoning ordinances in accordance with A.R.S. § 49-243(O) and A.A.C. R18-9-A201(A)(2)(c).

VII. 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 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. This permit will be

public noticed in a local newspaper after a pre-notice review by the applicant and other affected agencies.

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

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. 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.

VIII. ADDITIONAL INFORMATION

Additional information relating to this proposed permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division – APP & Drywell Unit
Attn: Kathryn E. Boland
1110 W. Washington St., Mail Code: 5415B-3
Phoenix, Arizona 85007
Phone: (602) 771- 4618