ARIZONA DEPARTMENT OF WATER RESOURCES

CONSTRUCTED

UNDERGROUND STORAGE FACILITY PERMIT

MODIFIED

PERMIT NO. 71-563876.0007

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

This is to certify that Application No. 71-563876.0007 meets the requirements of Arizona Revised Statutes Title 45, Chapter 3.1, Article 2, for a Constructed Underground Storage Facility Permit. The Director hereby grants authority to the Pima County Flood Control District and the Town of Marana to operate a constructed underground storage facility, subject to the following limitations and conditions:

Permit Limitations

Permittees:

Pima County Flood Control District
97 East Congress
Tucson, Arizona 85701

Town of Marana
5100 West Ina Road
Marana, Arizona 85743

Name of Facility:

High Plains Effluent Recharge Project

Active Management Area:	Tucson AMA
ADWR Groundwater Basin/Sub-basin	Avra Valley
Cadastral Location of Facility:	SE¼ of NE¼ of SW¼, Sec. 33, T11S, R11E, GSRB&M
General Location of Facility:	Northwest of intersection of Sandario Road and Tangerine Road, on southern bank of Santa Cruz River
Maximum Storage at Facility:	Phase 1: 350 acre-feet per annum Phase 2: 450 acre-feet per annum Phase 3: 600 acre-feet per annum
Source Water to be Stored:	Effluent and Surface Water from Santa Cruz River
Effective Date:	June 10, 2009
Expiration Date:	November 24, 2028

Permit Conditions

1. Hydrologic Report:

   The facility shall be constructed and operated as specified in the following documents, correspondence and reports (collectively "the hydrologic report"), which are incorporated in and made a part of this permit:

   a. *Constructed Underground Storage Facility Permit Application Marana High Plains Effluent Recharge Project Marana, Arizona*, dated June 2007.

   b. *Response to Incomplete and Incorrect Determination for Underground Storage Facility Application No. 71-563876.0006*, dated May 29, 2008.

   c. *Response to Second Incomplete and Incorrect Determination for Underground Storage Facility Application No. 71-563876.0006*, dated July 18, 2008.

2. Annual Reporting Schedule:

   The permittee shall submit an annual report, on an ADWR-approved form, and a supplemental data report no later than March 31 following the end of each completed annual reporting period. Each reporting period shall be from January 1 through December 31. Annual reports are required regardless of the operational status of the facility. If no

deliveries are made to the facility during the reporting period, the permittee shall indicate that fact on the annual report and in the supplemental data report. **The permittee shall send two (2) copies of all annual reports and supplemental data reports to the Recharge Coordinator, Water Management Division, Arizona Department of Water Resources, 3550 North Central Avenue, Phoenix, Arizona 85012.**

3. Annual Supplemental Reporting Requirements:

The annual supplemental data reports shall include all information and monitoring data required by this permit and as described in the hydrologic report. The data reports shall include the following:

a. Facility Map:

The data reports shall include a facility map showing the location of all facility monitoring points and relevant facility features such as basins and measurement devices. The map shall include township, range, and section boundaries if applicable.

b. Water Level Monitoring Data:

The data reports shall contain static water levels measured at all water level monitoring points during the reporting period as specified in **permit condition 4.a.** and **Table 1**. The water level data shall be displayed in tables that contain the facility well identifier, ADWR well registration number, cadastral location, measurement date, the depth to water in feet below land surface, and the groundwater elevation in feet above mean sea level. The water level data for each well shall also be displayed in hydrographs showing the well identifier and depth to water in feet below land surface. The reports shall note any condition such as pumping from nearby wells, surface water flows, or any other hydrologic or environmental condition that may reasonably be known and could have affected the water level at the time of measurement.

c. Water Quantity Monitoring Data:

The data reports shall contain all water quantity data for the recharge facility as specified in **permit condition 4.b.** and **Table 2**. The data shall be presented in monthly summary tables indicating the month, the facility flowmeter identifier, daily flowmeter totalizer readings, daily delivered volume in gallons, and the total delivered volume for the month and year in gallons and acre-feet.

d. Operational Monitoring Data:

i. The data reports shall contain facility infiltration rates as specified in **permit condition 4.d.i**. The reports shall describe the method used to calculate the infiltration rates and present the data in a table with the infiltration rate in feet per day.

ii. The data reports shall contain the daily wetted area, in acres, for each recharge basin listed in **Table 3** and the monthly recharge facility evaporation in acre-feet, as specified in **permit condition 4.d.ii.**

iii. The data reports shall contain the total monthly and annual recharge facility transpiration losses in acre-feet, as specified in **permit condition 4.d.iii**.

e. Alert Level and Operation Prohibition Limit Exceedances:

i. The data reports shall summarize activities and information described in **permit condition 5.a.** for any exceedance of an alert level or operation prohibition limit for water levels at any monitoring point listed in **Table 1**.

ii. The data reports shall summarize the failure of the water quantity measuring device listed in **Table 2** that causes the measurement device to be out of compliance with **permit condition 5.b.** and corrective action(s) taken to resolve the failure.

iii. If Aquifer Protection Permit (APP) number **P-103195** is suspended, revoked, or terminated during the reporting period, then the supplemental data reports shall summarize events that resulted in the suspension, revocation, or termination. The summary shall include all water quality data collected during the reporting period and shall be presented in a table indicating the sample date, sample point identification, analyte(s), the APP limit(s) exceeded, and the sample results.

4. Monitoring Requirements:

a. Water Level Monitoring Requirements:

i. The permittee shall measure the depth to water at least monthly to the nearest one-tenth (0.1) foot at all water level monitoring points listed in **Table 1**.

ii. In wells equipped with a pump, water levels shall be allowed to recover for at least seventy-two (72) hours after the pump has been turned off before making depth to water measurements, except that if a 72-hour recovery period is not feasible, a shorter recovery time may be used and shall be noted in the data reports.

b. Water Quantity Monitoring Requirements:

The permittee shall measure the total volume of water delivered to the recharge facility each day with the approved water measuring device listed in **Table 2**.

c. Water Quality Monitoring Requirements:

The source water and groundwater quality shall be monitored at the recharge facility as specified in Aquifer Protection Permit (APP) number **P-103195**, issued by the Arizona Department of Environmental Quality (ADEQ).

d. Operational Monitoring Requirements:

i. The permittee shall measure, at least quarterly, the average infiltration rate in feet per day for all the recharge basins/cells listed in **Table 3** that were used during the reporting period.

ii. The permittee shall estimate the daily wetted area, in acres, for each recharge basin listed in **Table 3**. Evaporation from the wetted surface of the basins shall be estimated on a monthly basis using the maximum rating curve for evaporation and the applicable adjustment factor specified in *Evaporation from Open Water Surfaces in Arizona*, by Keith R. Cooley (1970).

iii. The permittee shall estimate transpiration losses from vegetated basins using the average monthly data reported by AZMET for the Marana Agricultural Station. The losses shall be calculated based on the area, type, and age of the vegetation on the floor or side slope of the basins as demonstrated in Appendix D of the 2006 Annual Monitoring Report for the Marana High Plains Effluent Recharge Project.

5. Alert Levels, Operational Prohibition Limits, and Response Requirements:

a. Water Level Alert Levels and Operational Prohibition Limits:

i. If the water level at any monitoring point listed in **Table 1** rises to, or above, the alert level specified for that monitoring point in the table, a water level alert status shall exist and the permittee shall implement the following:

(1) Take actions that are sufficient to prevent water levels from reaching the operation prohibition limit for water levels at all monitoring points.
(2) Notify ADWR in writing within forty-eight (48) hours of becoming aware of the alert status.
(3) Increase the frequency of water level measurements at all monitoring points listed in **Table 1** to daily.

(4) Submit weekly reports of daily water level measurement results to ADWR. The water level data shall be displayed in tables containing the facility well identifier, ADWR well registration number, cadastral location, measurement date, the depth to water in feet below land surface, and the groundwater elevation in feet above mean sea level. The water level data shall also be displayed in hydrographs showing the well identifier and depth to water in feet below land surface. The reports shall note any condition such as pumping from nearby wells, surface water flows, or any other hydrologic or environmental condition that may reasonably be known and could have affected the water level at the time of measurement.
(5) Resume routine water level monitoring when the alert status ends. The alert status ends when water levels remain below the alert level for fourteen (14) consecutive days.
(6) Submit a final report to ADWR describing the incident within fourteen (14) days after the alert status ends. The report shall include a listing of all water level measurements made during the alert status for water levels, a description of actions taken to lower water levels to below the alert levels, and an assessment of any potential impacts to land and other water users.

ii. If the water level at any monitoring point listed in **Table 1** rises to, or above, the operation prohibition limit specified for that monitoring point in the table, a water level prohibition status shall exist and the permittee shall implement the following:

(1) Immediately cease all recharge activities pursuant to this permit.
(2) Take actions that are sufficient to prevent water levels from causing unreasonable harm to land and other water users.
(3) Notify ADWR in writing within forty-eight (48) hours of becoming aware of the prohibition status.
(4) Increase the frequency of water level measurement(s) at all monitoring points listed in **Table 1** to daily. If daily water level measurements are already required under an alert status, continue the daily water level measurement(s).
(5) Submit weekly reports of daily water level measurement results to ADWR. The water level data shall be displayed in tables containing the facility well identifier, ADWR well registration number, cadastral location, measurement date, the depth to water in feet below land surface, and the groundwater elevation in feet above mean sea level. The water level data shall also be displayed in hydrographs showing the well identifier and depth to water in feet below land surface. The reports shall note any condition such as pumping from nearby wells, surface water flows, or any other hydrologic or environmental condition that may

reasonably be known and could have affected the water level at the time of measurement.

(6) The prohibition status ends when water levels decline below the operational prohibition limit for seven (7) consecutive days. Alert level status and associated monitoring frequency and reporting requirements as specified in **permit condition 5.a.i.** shall resume at this time and recharge activities pursuant to this permit may recommence.

b. Water Quantity Operational Response Requirements:

i. The water quantity measurement device listed in **Table 2** shall continue to quantify flow accurately pursuant to A.A.C. R12-15-905. If the water quantity measurement device fails to perform its designated function for more than seventy-two (72) hours, the permittee shall notify ADWR in writing within seven (7) calendar days of the failure (A.A.C. R12-15-906). The notice shall state the reason for the failure and include the estimated date the device will be returned to service.

ii. The permittee shall notify ADWR in writing within seven (7) days after the measuring device is returned to service. The notice shall identify the device that failed and include the date of the malfunction, the amount of time the device failed to properly operate, an estimate of the amount of flow during the period the device was out of service, and a description of the method(s) used to calculate the amount of flow while the device was out of service.

c. Water Quality Alert Levels and Operational Prohibition Limits:

The Permittee shall notify ADWR in writing of any suspension, revocation, or termination of APP No. **P-103195** within ten (10) days of the suspension, revocation, or termination. The notification shall include a written description of the reason for the suspension, revocation, or termination and a copy of any written action by ADEQ suspending or revoking the APP. The Permittee shall not store water pursuant to this permit during any period in which the APP is suspended by final administrative decision of ADEQ. If the APP is revoked by a final administrative decision of ADEQ or otherwise terminates, the Permittee shall cease water storage pursuant to this permit and ADWR shall terminate this permit.

6. Operational Provisions:

a. Monitoring Plan Changes:

Any changes to the design, operation, and/or monitoring of the facility other than those specified in **permit condition 6.c.** and **Tables 4 and 5** are prohibited except through a modification of this permit.

b. Operational Phases:

Annual recharge volume during each permit phase is limited to the volumes shown in **Table 4**.

c. Contingencies:

The permittee may construct any design contingency or combination of contingencies described in **Table 5** in any of Recharge Cells 1 through 4. These contingencies may be constructed at any time during Phases 2 or 3. These design contingencies are additional to the requirements of Phases 2 and 3 and do not replace any design components described in **Table 4**.

d. Facility Construction Data:

i. The permittee shall submit as-built construction diagrams of Recharge Cells 1, 3, and 4 showing the location and construction of the in-basin trenches prior to commencing recharge pursuant to Phase 2.

ii. The permittee shall submit an as-built construction diagram for Recharge Cell 2 prior to commencing recharge pursuant to Phase 3.

iii. The permittee shall submit as-built construction diagrams for any contingencies that are constructed as described in **Table 5**. Any vadose zone recharge wells constructed as a contingency must be registered through ADWR and must comply with all ADWR regulations, rules, and policies.

7. General Provisions:

a. In accordance with A.R.S. § 45-814.01(G), the Director may modify the conditions of this permit.

b. The facility shall continue to meet the requirements of A.R.S. § 45-811.01 during operation of the facility.

c. No waters other than those waters specified under the permit limitations are authorized for recharge at this facility.

d. The issuance of this permit does not waive compliance with any federal, state, county, or local government statutes, rules or permits.

e. The facility shall be operated only in conjunction with the applicable Water Storage Permit(s) and subject to the conditions set forth within that/those permit(s).

f. Recharge pursuant to Phase 1 of this permit may not commence until ADWR conducts a pre-recharge inspection and notifies the permittee that recharge may commence. Recharge pursuant to Phases 2 or 3 may not commence until ADWR conducts a pre-recharge inspection of the components associated with each phase as described in **Table 4** and notifies the permittee that recharge may commence. The permittee shall contact ADWR at least thirty (30) days prior to commencing recharge pursuant to each phase to schedule a pre-recharge inspection of the site.

g. The Director may terminate this permit if after recharge activities are commenced the permittee suspends those activities for a period of five (5) or more consecutive years.

h. All ADWR agency notifications and reports, other than annual reports, shall be addressed to the Recharge Coordinator, Water Management Division, Arizona Department of Water Resources, 3550 North Central Avenue, Phoenix, Arizona 85012.

Witness my hand and seal of office this 10th day of June, 2009.

Sandra Fabritz-Whitney, Assistant Director

Table 1
Water Level Monitoring
Monitor Wells and Piezometers

Monitor Point ID	ADWR Registration Number	Cadastral Location	Well Elevation (feet amsl)	Well Depth (feet bls)	Screened Interval (feet bls)	Measuring Device	Monitoring Frequency	Reporting Frequency	Alert Water Level (feet bls)	Operation Prohibition Limit (feet bls)
HP-1	55-574110	D(11-11)33cad	1985.2	340	220-330	Electric Sounder	Monthly	Annually	30	20
HP-2	55-593607	D(11-11)33cad	1986.8	80	70-80	Electric Sounder	Monthly	Annually	30	20
SC-10	55-520129	D(11-11)33bcb	1978.1	375	300-370	Electric Sounder	Quarterly	Annually	30	20

Table 2
Water Quantity Monitoring

Monitor Point ID	Measuring Device	Parameter	Cadastral Location	Project Phase	Monitoring Frequency	Reporting Frequency
FMeq	Totalizing Flowmeter	Total Inflow to Facility	D(11-11)33dbc	All Phases	Daily	Annually

Table 3
Recharge Basin Description

Basin Identifier	Location	Maximum Wetted Area (acres)
Equalization Basin	See Figure 2[1]	0.62
Recharge Cell 1		0.63
Recharge Cell 2		1.21
Recharge Cell 3		0.78
Recharge Cell 4		1.26

[1] Figure 2 is located in Attachment 3 of the permittee's *Response to Incomplete and Incorrect Determination for Underground Storage Facility Application No. 71-563876.0006*, dated May 29, 2008.

Table 4
Phased Recharge Schedule

Project Phase	Phase Description	Annual Recharge Volume (acre-feet)
Phase 1	Recharge Cells 1 through 4 and Equalization Basin Used for Recharge	350
Phase 2	Recharge Enhancement Trenches Installed in Recharge Cells 1, 3, and 4	450
Phase 3	Recharge Cell 2 Excavated to a Depth of 5 to 7 Feet bls	600

Table 5
Design Contingencies

Contingency Number	Contingency Description	Project Phase
1	Four vadose zone recharge wells within a basin/cell using perforated culvert pipe with pea gravel fill material	Phases 2 and 3
2	Two sets of vadose zone recharge wells connected with 100 to 150 feet of 36-inch slotted culvert pipe filled with pea gravel in the permeable strata of a basin or cell.	Phases 2 and 3
3	Earthen ridges and furrows within a basin/cell	Phases 2 and 3
4	Earthen ridges and furrows over trenches backfilled with permeable materials within a basin or cell	Phases 2 and 3

* Different design contingencies or a combination of contingencies may be used in any of Recharge Cells 1 through 4.