

**UNDERGROUND STORAGE FACILITY
PERMIT APPLICATION**

**HIGH PLAINS EFFLUENT RECHARGE PROJECT
MARANA, ARIZONA**

Underground Storage Facility Permit Report

Permit Number 71-563876

**Pima County Regional Flood Control District
Water Resources Division
and
Town of Marana
Water Department
June 2007**

EXECUTIVE SUMMARY

The Marana High Plains Effluent Recharge Project (Project or MHP) was established as a four-year pilot project to investigate the feasibility of using treated effluent to enhance riparian habitat while recharging the underlying groundwater aquifer. The Project is located immediately west of the Santa Cruz River and ½-mile east of Sanders Road in Marana, Arizona. It is the only recharge project in Arizona that relies on effluent-dominated flows diverted from a natural river channel by means of a berm and an abandoned meander (“oxbow”).

A total of approximately 853 acre-feet of effluent has been recharged by diversion from the Santa Cruz River into an oxbow channel to the constructed 3.9-wetted acre recharge facility since operations began in mid-February 2003 up through March 2007. Infiltration rates ranged from as high as 2.65 feet/day in a basin without vegetated side slopes to a low of 0.13 feet/day as recharge continued. The facility is not operated an average of four months per year, due to storms which wash out the diversion.

The basin with vegetated side slopes (Cell 3) had infiltrations rates ranging from 0.13 feet/day to 1.31 feet/day. The lowest rates were observed in the fully vegetated basin (Cell 4), ranging from 0.08 feet/day up to 0.93 feet/day. Noticeable environmental benefits were observed as a result of the additional vegetation and wetland environment, including activity by residential songbirds. A large number of waterfowl and wading birds have been identified at the Project site. Establishment of native vegetation at the site appears successful. This new vegetation expands the extent of the riparian vegetation. The oxbow channel itself possesses some of the densest riparian vegetation along the Santa Cruz River in Pima County.

The research objectives having been satisfied, Pima County Regional Flood Control District (District) and Town of Marana (Marana) are now applying to extend the facility permit for 20 years. Several modifications are proposed based on the previous four years of experience:

- Utilize the Equalization Basin as recharge basin
- Deepen Pond #2 to 5-7 feet below basin bottom to access coarser grained media
- Install 10-12 foot recharge enhancement trenches in ponds #1,3 and 4 filled with river rock or coarse gravel to access coarser substrata for recharge

A revised mounding analysis was performed to account for increased recharge at the Project of 600 AF per year over a 20-year period. A total amount of four feet of water level rise beneath the basins was projected and one-foot rise 1.75 miles from the basin. The estimated depth to water beneath the MHP project is primarily influenced by adjacent recharge facilities operated by others. Water levels would be projected to rise a total of 7.5-9.25 feet per year beneath the Marana High Plains Facility as a result of nearby CAP recharge facilities and the Lower Santa Cruz River Managed Recharge Project.

Total long-term rise would be approximately 0-40 feet below land surface at the end of the next twenty-year period if CAP and effluent recovery is not implemented in the vicinity of the recharge facilities; however, permit conditions would limit recharge at the much larger Lower Santa Cruz Replenishment Project long before this could happen. **No unreasonable harm is projected as a result of the recharge activities from this project.**

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Appendices

<u>Appendix</u>	<u>Title</u>
A Required Permits	A.1 Special Use Permit from ASLD A.2 Section 404 Permit from ACOE A.3 Aquifer Protection Permit
B	As-builts for Project facility
C	As-builts, NOIs and well completion reports for on-site monitor wells HP-1 and HP-2
D	2006 Annual Report, Marana High Plains Effluent Recharge Project
E	Well hydrographs for off-site monitor wells (SC-09, SC-10 and AVMW-1)
F	Mounding analysis for Project area
G	Memorandum of Understanding between Pima County (Wastewater Mgmt. & Solid Waste Mgmt.), Pima County Flood Control District and Central Arizona Water Conservation District
H	Well construction diagrams, well completion reports and well logs from off-site monitor wells

1.0 INTRODUCTION AND BACKGROUND

In February 2003, the Marana High Plains Effluent Recharge Project (Project) was established as a two-year pilot project to investigate the feasibility of using treated effluent to enhance riparian habitat while recharging the underlying groundwater aquifer. The Project represented a joint effort between the Pima County Regional Flood Control District (District), the U.S. Bureau of Reclamation, Arizona Water Protection Fund and the Town of Marana. The District's primary objective for the Project was to evaluate and research the operational costs and environmental benefits of a multi-purpose recharge facility, including comparisons of recharge of effluent in bare basins and basins re-vegetated with native emergent and riparian vegetation.

The Project, which is located in the Town of Marana along the southern bank of the Santa Cruz River (**Figures 1 & 2**), utilizes effluent flows that are diverted directly from the Santa Cruz River into an adjacent riparian area. This site was chosen because it is one of the few stable places where effluent can be diverted from the channel without invasive earthworks and without diminishing flows to the most significant effluent-supported riparian areas along the river.

The Project's permit was renewed in September 2005. Past operations utilized an appropriable surface water right from the Cortaro-Marana Irrigation District (CMID) to provide water for recharge. CMID benefited by obtaining recharge credits from the stored water. The Project is currently permitted by the Arizona Department of Water Resources (ADWR) to recharge up to 600 acre-feet per year (af/yr) through September 2007.

The following document is submitted by the District and provides information required to modify the Underground Storage Facility Permit for the Project.

2.0 PURPOSE AND SCOPE

Pima County Wastewater Management Department has recently filed storage Permit No. 73-563876.0200 to store up to 600 acre-feet of County-owned effluent at the High Plains facility. The existing USF Permit will end on September 26, 2007.

The purpose of this report is to provide ADWR with the information needed to renew and modify existing **Permit No. 71-563876.0005** for an additional 20 years at 600 acre-feet per year. Changes to improve basin infiltration rates and improve monitoring are proposed in this application, and support the primary purpose of the facility, which is to recharge the aquifer. Over the next 20 years, the source waters to be recharged will include Pima County effluent, Cortaro-Marana Irrigation District surface water, and possibly effluent owned by the U. S. Bureau of Reclamation or Town of Marana.

3.0 FACILITY AND SITE CHARACTERISTICS

3.1 Narrative Description

The Project site is located in the Town of Marana and covers approximately 18 acres in the southeast 1/4 of the northeast 1/4 of the southwest 1/4 of Section 33, Township 11 south, Range 11 east (**Figures 1 & 2**). The site is located within a larger parcel currently owned by the State of Arizona and leased to BKW Farms. The District has a Right-of-Way with the State Land Department to construct, operate and maintain the effluent recharge basin project through May 2, 2011 (**Appendix A.1**). The proposed location was selected because it is one of the few stable places along the river where effluent flows can be utilized without invasive earthworks and without diminishing flows to the most significant effluent-supported riparian areas along the river. In addition, due to location and condition, use of the site should not significantly impact land use activities in the surrounding area.

The site is generally flat with a mild slope to the northwest. The site outside the effluent diversion channel and canal sustains only very sparse vegetation. The site is located on the southern bank of the Santa Cruz River approximately 250 feet from the current main channel. Based on a jurisdictional delineation completed by the Corps of Engineers, the proposed recharge basins are located outside of the normal high water mark for the river and are, therefore, not subject to permitting under Section 404 regulations. The diversion structure requires a Section 404 permit (**Appendix A.2**). Annual precipitation in the area is reported to be 8-12 inches and average annual evaporation in the area is reported to be 70 inches (Anderson, 1989). There are no fissures known to occur in the vicinity.

3.2 Facility Characteristics

Water is delivered to the Project via an “oxbow” channel, a remnant channel of the Santa Cruz River from when the riverbed was less incised and the channel meandered back and forth across the floodplain (**Figure 3**). A berm consisting of streambed materials is used to divert some of the effluent flowing down the main channel of the Santa Cruz River into the oxbow channel. Sources of the effluent discharges are the Roger Road Wastewater Treatment Plant and the Ina Road Wastewater Treatment Plant, which are located approximately 15 miles and 10 miles upstream of the diversion structure respectively. The effluent flows down the oxbow channel for about one mile before reaching the Project.

A constructed wet well (**Figure 4**) collects the oxbow channel flows and two non-clogging, submersible pumps (**Figure 5**) convey the effluent through an eight-inch line into an equalization basin. The equalization basin (**Figure 6**) is used to provide a more constant source of available effluent for recharge and to help serve as a settling basin for removing particulate materials that could clog the recharge cells. A level sensor is installed in this basin to automatically turn the pumps on and off based on levels within the oxbow channel and the equalization basin. From the equalization basin, the effluent passes through a 16-inch isolation valve into the main distribution

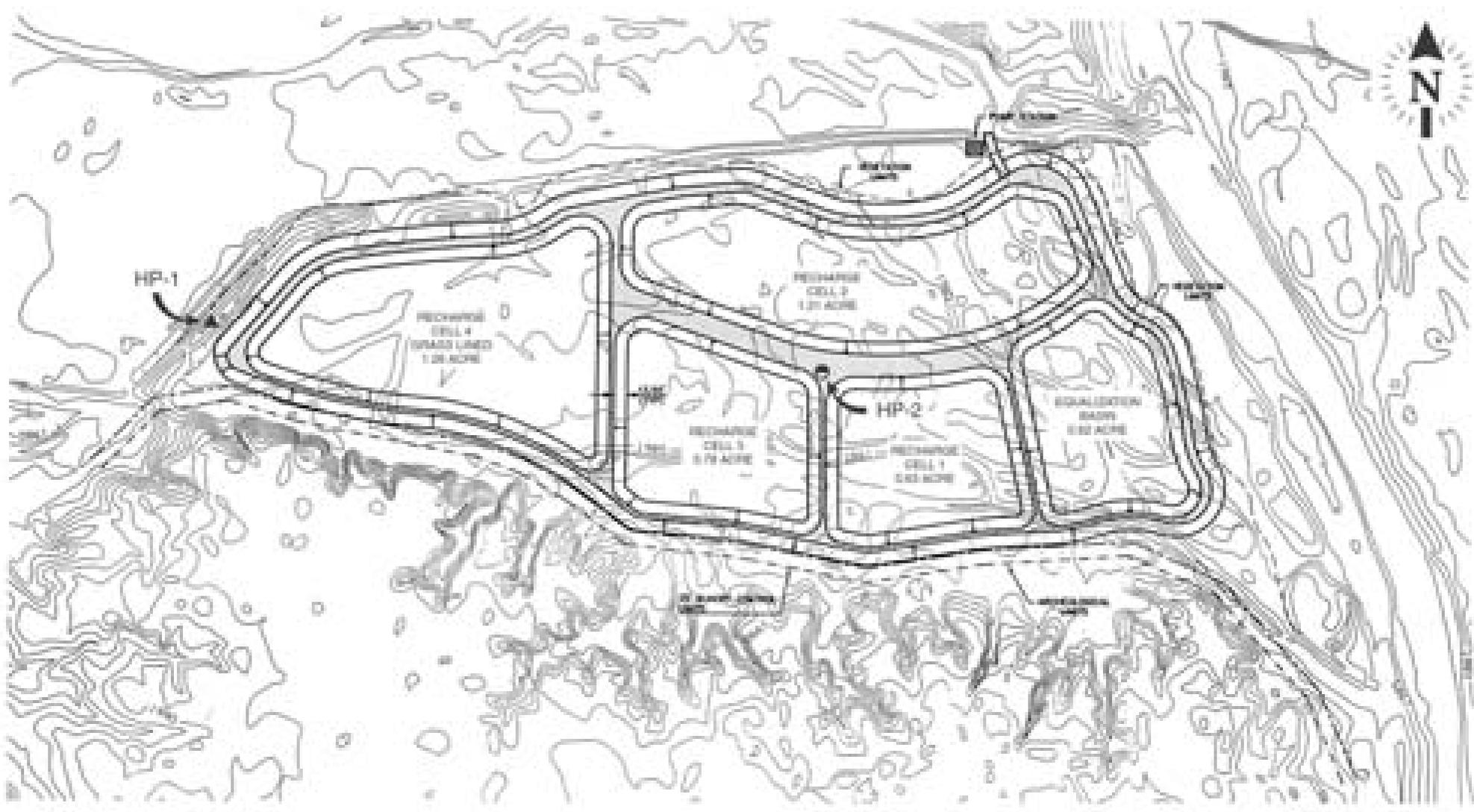
FIGURE 1
Location Map



SCALE IN FEET:



FIGURE 2
Facility Map



SCALE IN FEET:

TOTAL RECHARGE AREA = 3.88 ACRES
ESTIMATED RECHARGE VOLUME = 290 ACRE-FT/YR

LEGEND

- ▲ MONITOR WELL
- PIEZOMETER



Figure 3. Oxbow channel, March 2006



Figure 4. Wet well for the Project, March 2006



Figure 5. Submersible pumps for the Project, March 2006



Figure 6. Equalization basin, March 2006.

line, which feeds into each of the four recharge cells through motorized butterfly valves. A level sensor is installed at each cell to automatically open and close the valves based on pre-set water levels. The daily operator closes the valves manually, using an electronic switch, when the cells are scheduled for a drying cycle.

Deliveries to the Project are based on the daily cycle of discharges from the treatment plants to the Santa Cruz River. Peaks in water levels at this site normally occur in the late morning and early evening hours. Deliveries to the facility are impacted by storm water events in the Santa Cruz River that erode the earthen diversion structure used to divert flows into the oxbow channel. The diversion structure must be rebuilt in order to resume flows to the Project.

The Project consists of five constructed basins: one equalization basin and four recharge cells that total 4.5 acres (**Table 1**). Recharge is currently not calculated for the equalization basin, since the basin is used to store water for delivery to the recharge cells and as a settling pond for particulate materials. However, the basin is not lined, so infiltration does occur. Recharge is calculated for the four recharge cells, which have a total area of 3.88 acres. These cells were constructed using different configurations and landscapes to study the effects of these treatments on infiltration rates. As-built drawings showing the construction details and recharge components are provided in **Appendix B**.

Table 1. Current recharge basin configuration

Cell	Acreage	Basin (min/max)	Level	Characteristics
Equalization Basin	0.62	2.0 ft/5.0 ft		Settling basin; no recharge
1	0.63	3 in/12 in		Bare soil
2	1.21	3 in/12 in		Bare soil
3	0.78	3 in/12 in		Perimeter & side slope vegetation
4	1.26	3 in/12 in		Fully vegetated

The basins were not flooded during the large storm event on the Santa Cruz River on July 31, 2007, which had an estimate flood magnitude of 27,200 cubic feet per second at the Trico Road bridge (approximately 4.5 miles downstream of the Project). A drainage swale is located along the southern boundary of the project to protect the basins from local runoff.

3.3 Monitor Wells

Due to the Project’s limited area of impact, groundwater levels will only be measured for one on-site well (HP-1) and one off-site well (SC-10), as shown in **Table 2**. District staff will measure HP-1 (**Figure 7**) and SC-10 monthly using an electric sounder. A pressure transducer and data logger may



Figure 7. Monitoring well for the Project, HP-1.

be installed in HP-1 well to collect the data on a daily basis. Schematics, as-built diagrams and the authorized Notice of Intent to Drill for each well are provided in **Appendix C**.

District personnel measure water levels at one on-site piezometer on a monthly basis to determined perched groundwater conditions at the Project site (**Table 2**). The well, which has an approximate depth of 80 feet below land surface, has been mostly dry over the last four years. The schematic, as-built diagram and the authorized Notice of Intent to Drill for this piezometer well are provided in **Appendix C**.

Table 2. On-site and off-site monitoring wells

Monitor Point	ADWR Reg. #	Location	Ref. Pt. Elevation (ft.)	Well Depth (ft. bls)	Screened Interval (ft. bls)	Measuring Device	Dedicated Use	Pump
HP-1	55-574110	D(11-11) 33cad	1985.17	340	220-330	Sounder	Monitoring/Irrigation	Yes
HP-2	55-593607	D(11-11) 33cad	1986.75	80	70-80	Sounder	Monitoring	No
S-10	55-520129	D(11-11) 33bcb	1978.07	375	300-370	Sounder	Monitoring	Yes

3.4 Investigation of Recharge Operations

The average annual net recharge for the Project has been approximately 184 acre-feet since operations began in February 2003. This is about 30 percent of the maximum storage (600 af/yr) currently permitted for this facility. Modifications to the facility design are needed in order to make the Project more efficient.

A review of past recharge accounting has indicated that a fair amount of infiltration occurs within the Equalization Basin. This basin is not lined and has been occasionally maintained to clear weedy vegetation that is unwanted within the facility confines. District staff estimates that approximately 80 af/yr is incidentally recharged within this basin. In the future, we wish to operate and maintain this basin more frequently to increase recharge capacity for the Project.

In October 2006, the District conducted soil investigations during regular maintenance of the recharge cells. Trenches were excavated to depths of 10-13 feet in the eastern portion of Recharge Cell 2 and the northwestern portion of Recharge Cell 4. Soils were investigated by District staff to determine the presence and location of coarser-grained materials within the recharge cell bottoms. Results of the study indicated the presence of coarse-grained materials at about five feet below the bottom of Recharge Cell 2 and 7.5 feet below the bottom of Recharge Cell 4 (**Table 3**). These findings suggest that some modifications to the basin bottoms could significantly enhance recharge capacity at the facility.

Table 3. Pima County Materials Laboratory Analyses: Log of Pond Samples for 11/14/2006

Pond	Depth Below Bottom	Percent Passing - #40 Sieve	Percent Passing - #200 Sieve	Soil Classification
2	1'	94	34.4	Silty Fine Sand
2	4'	95	53.4	Fine Sandy Silt
2	5 - 6'	94	4.7	Fine Sand (Poorly Graded)
2	6 - 7'	47	1.5	Fine to Medium Sand
2	8 - 9'	38	2.4	Medium to Fine Sand
2	9 - 10'	26	0.8	Medium – Fine – Coarse Sand
2	12 - 13'	26	1.5	Medium to Fine Sand
4	2'	99	60.9	Fine Sandy Silt
4	2.5 - 3'	97	65.9	Fine Sandy Silt
4	6.5 - 7'	95	50.4	Fine Sandy Silt
4	7.5 - 8	24	5.9	Well Graded Medium and Fine Sand with Coarse Sand
4	9.5 - 10'	72	7.0	Fine Sand with Cobbles
4	10 - 11'	24	4.7	Well Graded Medium to Fine Sand with Cobbles
4	10.5 - 11'	46	16.8	Well Graded Fine to Medium Sand
4	12 - 12.5'	9	2.7	Medium to Coarse Sand

3.5 Modified Recharge Operations

Based on its investigations into the current operations of the Project, the District is seeking to modify the recharge facility to increase infiltration rates. The modifications will be performed in phases to spread capital costs over the course of several years.

If funding is available, the modifications would proceed as shown below:

<u>Description</u>	<u>Fiscal year</u>
Current conditions	2006-07
Trenches, dry wells & metering	2007-08
<u>Description</u>	<u>Fiscal year</u>
Excavation of Pond #2 & more dry wells	2008-09
Plantings and irrigation	2009-10

Water will be delivered to the Project in the same manner as described in Section 3.1. The District will continue to utilize the earthen diversion berm, oxbow channel, wet well structure, and submersible pumps to obtain water from the Santa Cruz River for recharge into the Project.

The Equalization Basin will now be included as a recharge component for the facility. This basin covers approximately 0.62 acres. It contains up to five feet of water and would be used to distribute effluent to the four recharge cells as well as to infiltrate water. The two submersible pumps that feed water into the Equalization Basin will be equipped with totalizing, electro-magnetic flow meters to ensure better accuracy and less interruption of water deliveries.¹ The basin will be regularly maintained, cleared of vegetation and scraped at least once a year during the normal down time for facility operations (probably during the monsoon season). Wet-dry cycles will be used as necessary.

Recharge Cells 1 through 4 will maintain their current size and shape, but the bottoms will be modified to gain access to coarser grained materials (**Figure 8**). Two trenches will be excavated in each of Recharge Cells 1, 3 and 4 to depths of about 12 feet. These trenches will range from 100-150 feet in length, about 3-4 feet in width, and be filled in with river rock material to allow for greater infiltration (**Figure 9**). A twenty-foot wide trench will be excavated down 5-7 feet throughout much of the length of Recharge Cell 2. The side slopes of the basin will be contoured up from the bottom of the trench to allow easy access for shorebirds and waterfowl. Riparian vegetation will be planted around the Equalization Basin and Recharge Cell 1 to increase cover for nesting migratory birds. Recharge Cell 4 will be cleared of some shrubby vegetation and be replanted with native grasses that are tolerant of periodic flooding.

¹ Water deliveries are currently measured using a Sigma 900 Flow meter installed in the inflow pipe to the Equalization Basin. Installation of the electro-magnet meters will allow for a more regular calibration schedule of the flow metering system, thus providing greater accuracy in the water delivery measurements. Location of the electro-magnet meters on the outside of the pipes will allow for less disruption of flows when calibration and maintenance is performed.

PROPOSED FACILITY PLAN for FUTURE PERMIT (2008)

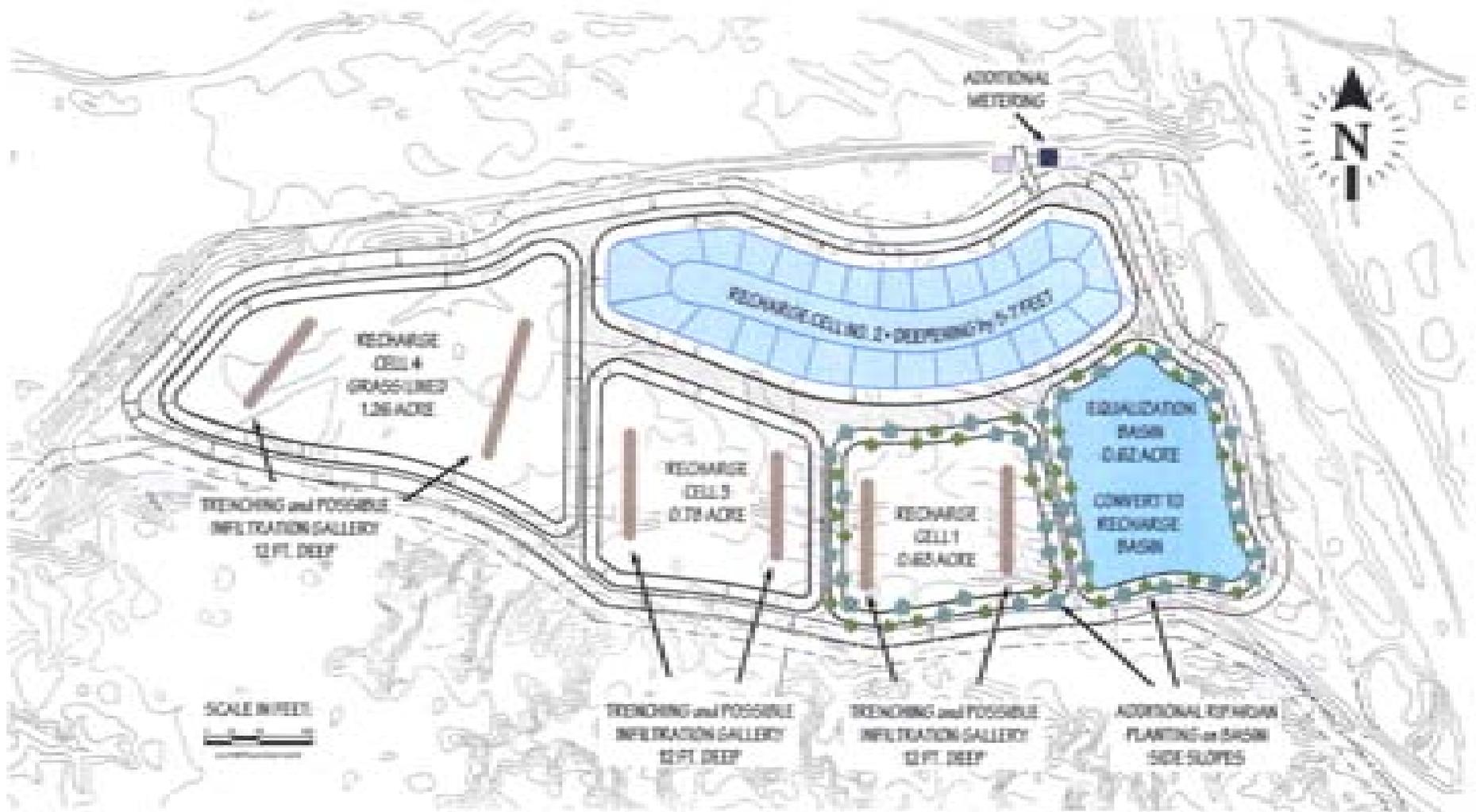


FIGURE 8. Proposed Facility Plan for Future Permit (2008)

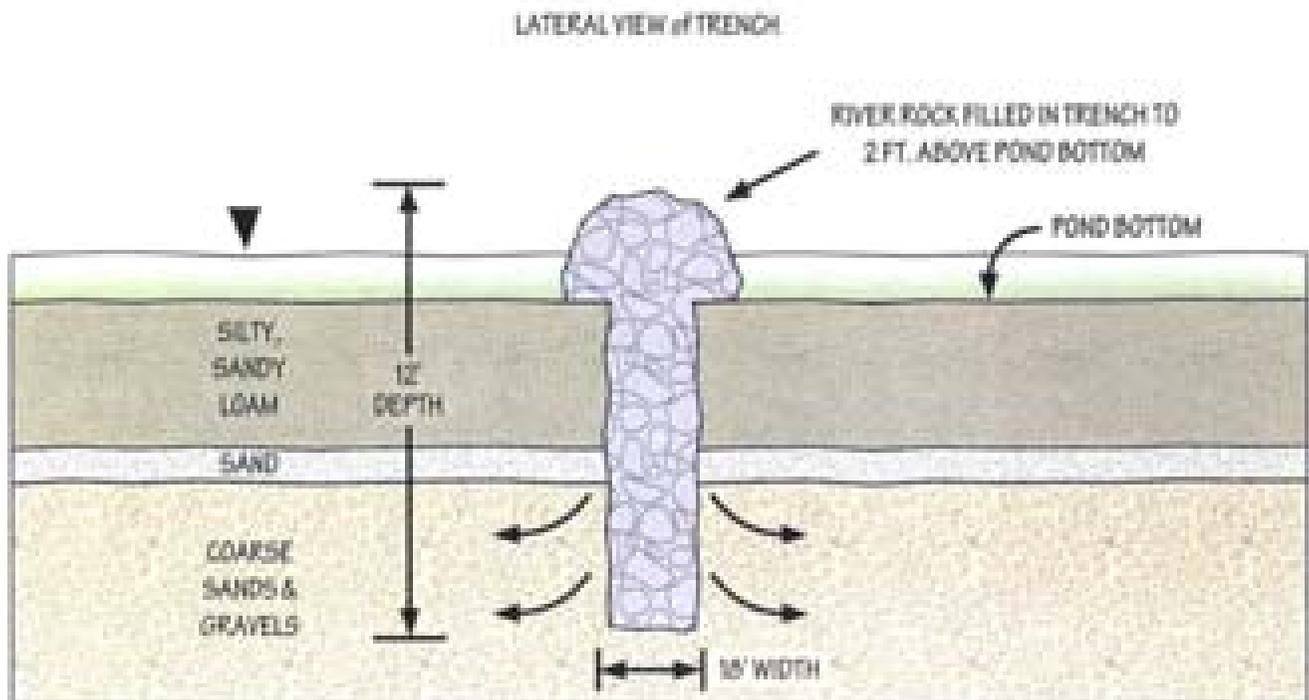
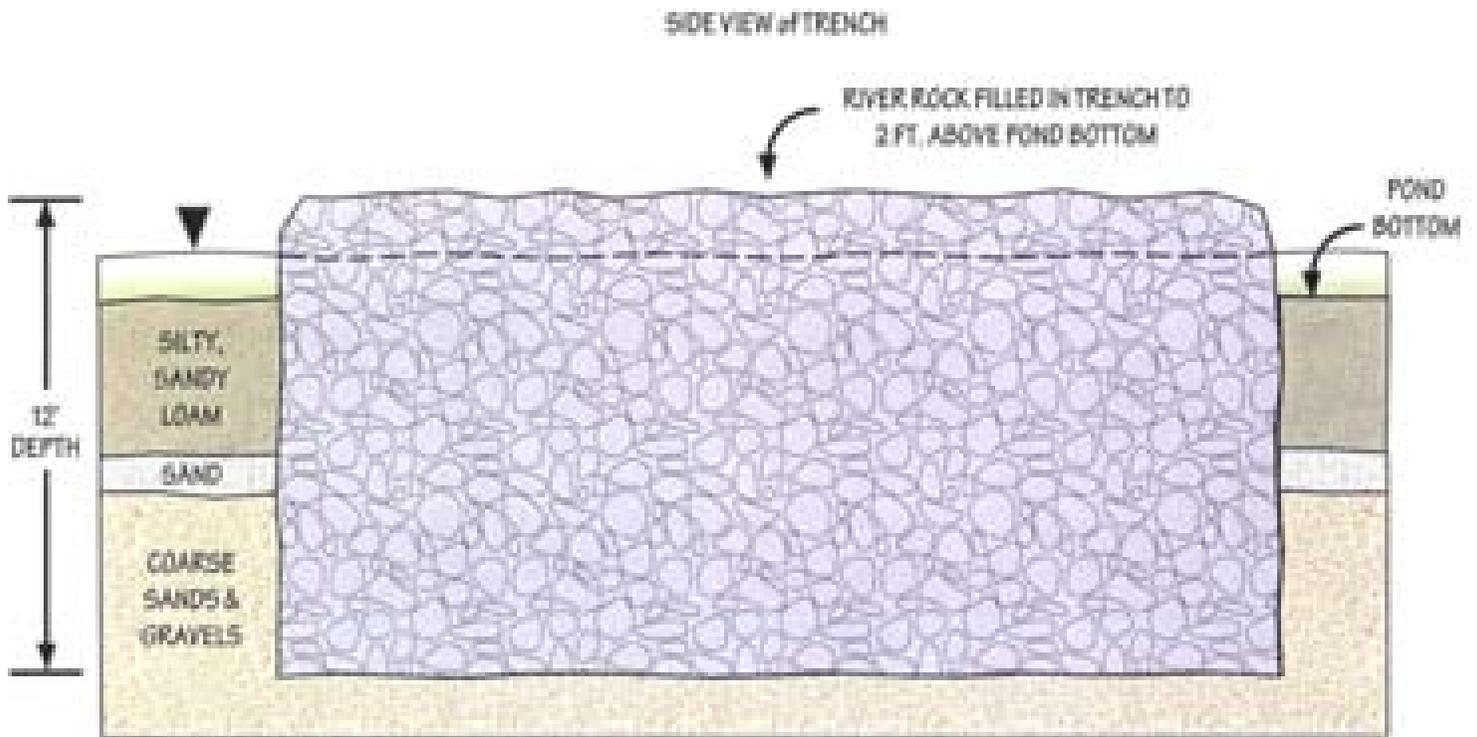


FIGURE 9. Conceptual Drawing of Recharge Enhancement Trenches

The Project, as modified, will consist of five recharge basins that total 4.5 acres (**Table 4**). Water levels in each of the cells will be maintained using the automated level sensors described in Section 3.1. Each of the recharge cells will continue to be metered and monitored separately to help District staff determine drying cycles and maintenance needs, but these would not be reported as part of the permit monitoring.

The operators relate a fair portion of the monitoring and maintenance costs for the Project to minor design flaws in the system and the lack of experience. These factors, along with increased storm activity, have also resulted in the low amount of recharge at the facility for the year. Modifications have been made to help correct the problems and enhance the facility’s recharge capacity.

A gravity-fed intake system, using a canal and weir structure, could be more cost effective than the current use of pumps to feed into equalization basin. Based on topography surrounding the facility, however, the oxbow channel would have to be significantly modified to allow effluent to flow freely into the equalization basin. The construction would also disturb a significant amount of riparian vegetation that currently exists along the oxbow channel. The advantage of the pump system is that it is already in place, requiring no more construction costs.

Table 4. Description of modified recharge basins.

Cell	Acreage	Basin Level (min/max)	Characteristics
Equalization Basin	0.62	2.0 ft/5.0 ft	Settling and recharge basin; side slopes planted with riparian vegetation
1	0.63	3 in/12 in	Perimeter & side slope vegetation; 2, 12-foot deep infiltration galleries in cell bottom
2	1.21	3 in/5-7 ft	Bare soil; 5-7 foot deep trench extending down the middle of the basin and sloping upward from the sides.
3	0.78	3 in/12 in	Perimeter & side slope vegetation; 2, 12-foot deep infiltration galleries in cell bottom
4	1.26	3 in/12 in	Perimeter vegetation; grass lined bottom; 2, 12-foot deep infiltration galleries in cell bottom

3.6 Description of source water and delivery system

As described in Section 3.2, the source water is diverted from the Santa Cruz River. The flows in the Santa Cruz River are variable in nature. Daily fluctuations are typically from about 50 to 80cfs, while average base flow fluctuations vary seasonally from about 55 to 75cfs.

The berm used to divert flow from the Santa Cruz River (**Figures 10 and 11**) is permitted under an individual Section 404 (**Appendix A.2**) to the District, but can also be operated as an agricultural diversion pursuant to a long-standing surface water right owned by others. The berm is re-constructed at least twice a year, generally after the monsoon and winter storm seasons. The average down time caused by reliance upon the berm has been four months per year. This time is used for

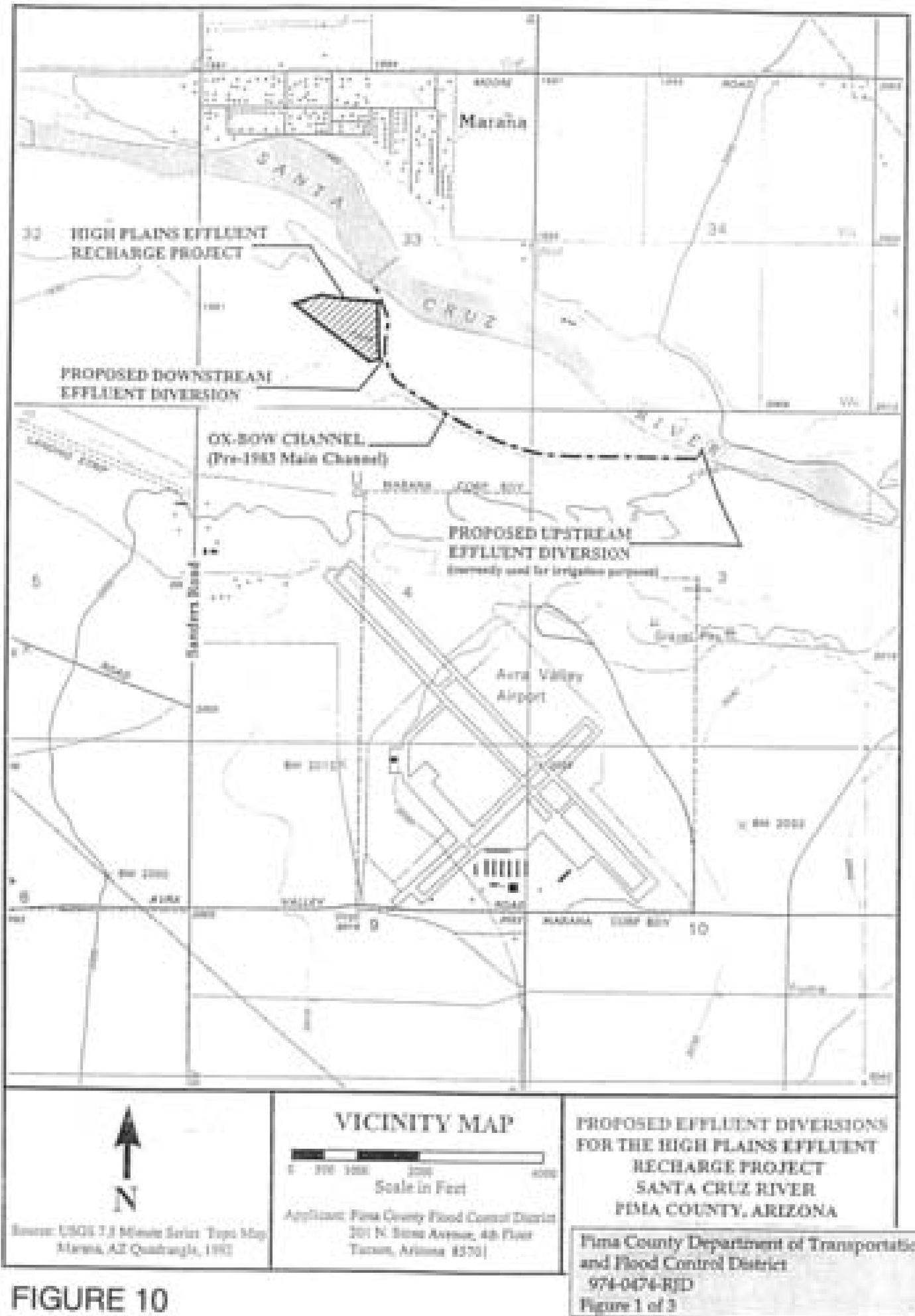
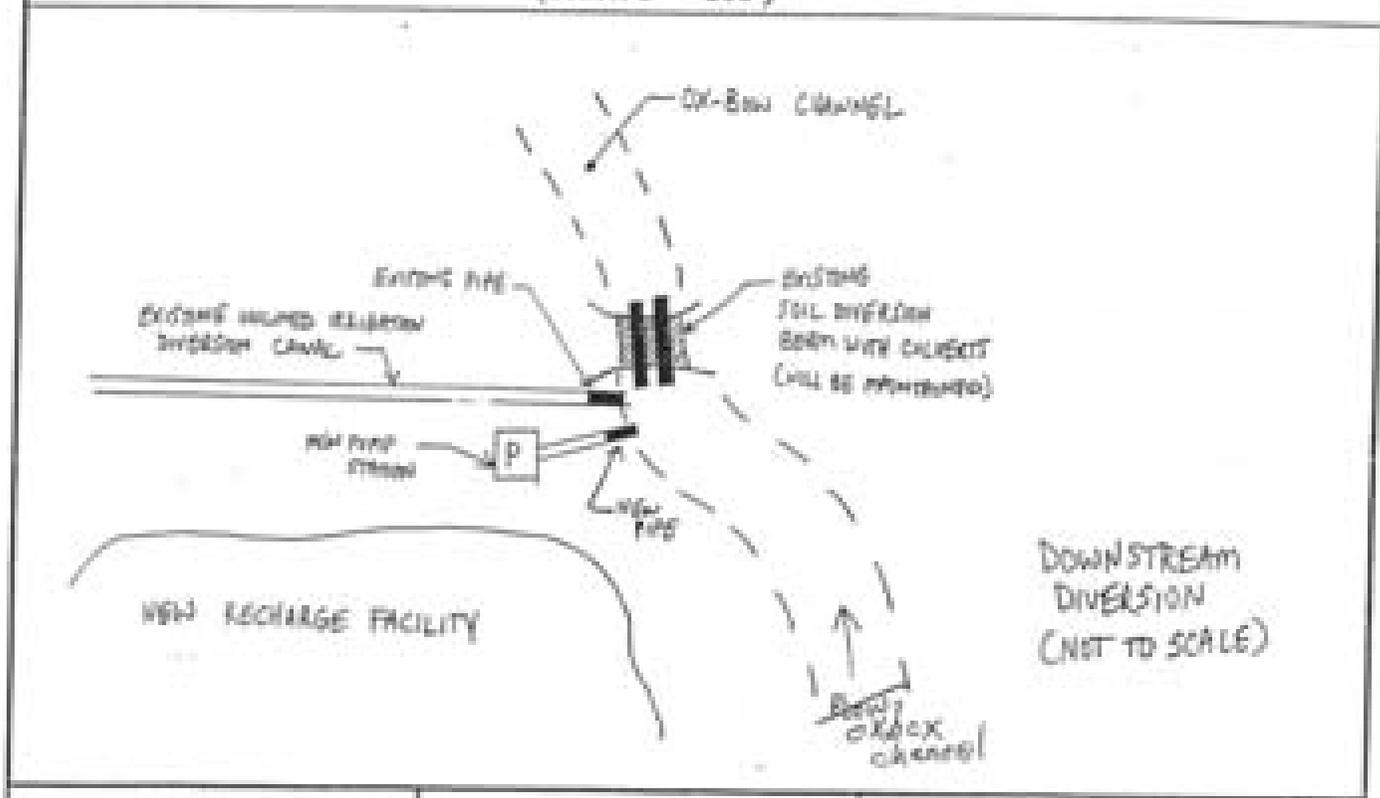
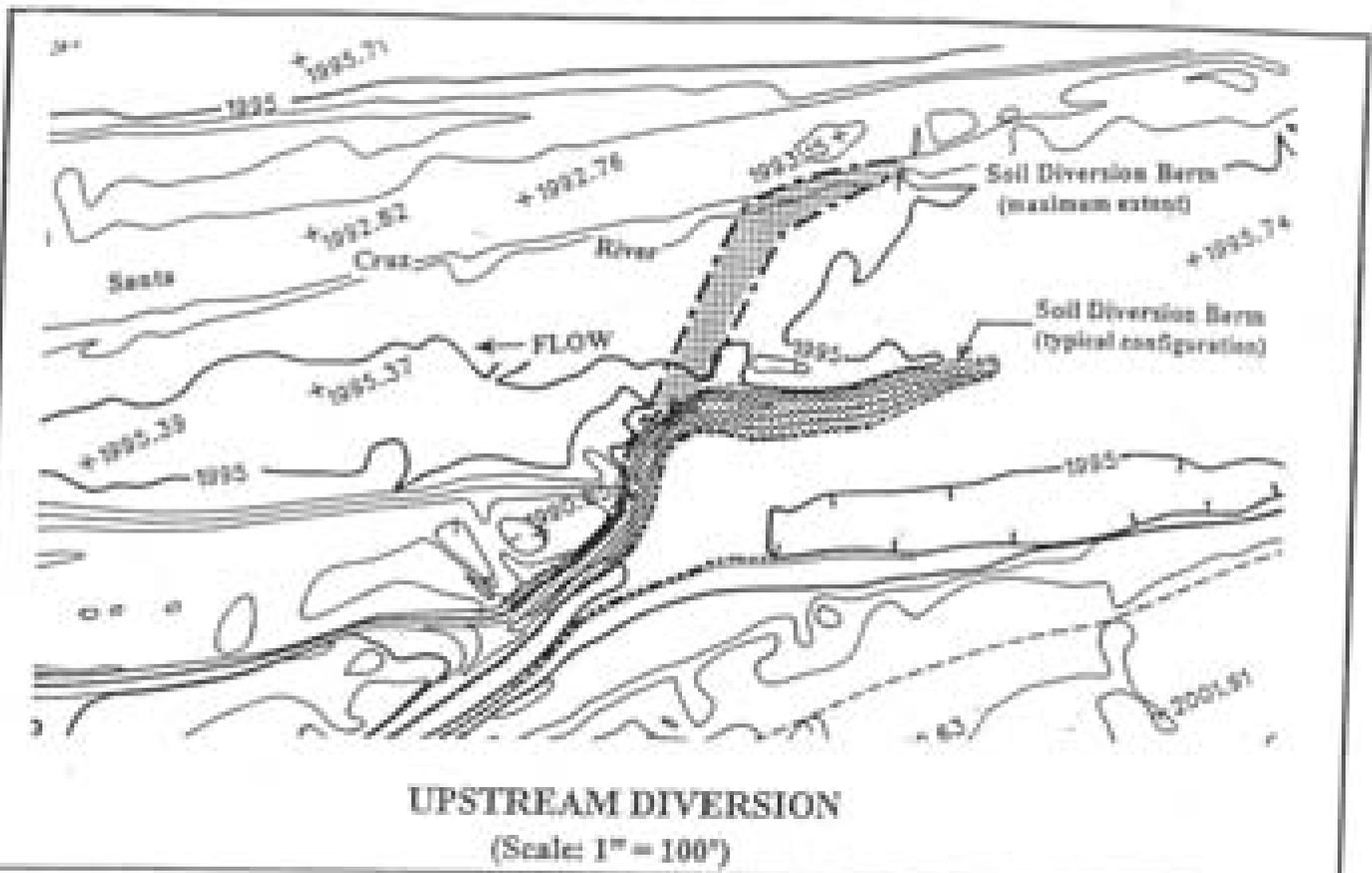


FIGURE 10



PLAN VIEWS

Applicant: Pima County Flood Control District
201 N. Stone Avenue, 4th Floor
Tucson, Arizona 85701

PROPOSED EFFLUENT DIVERSIONS FOR THE HIGH PLAINS EFFLUENT RECHARGE PROJECT SANTA CRUZ RIVER PIMA COUNTY, ARIZONA

Pima County Department of Transportation and Flood Control District
974-0474-R/D
Figure 2 of 3

FIGURE 11

facility maintenance. Water flowing in the diversion channel utilizes an abandoned channel of the Santa Cruz River (the “oxbow”) lined with riparian vegetation. The diversion berm and channel have proved capable of delivering water to the recharge project as well as to an adjacent pasture irrigation system outside the recharge facility.

The flows of the Santa Cruz River can include water that has differing legal characteristics, although the actual water composition is the same. The flows can be considered to be surface water or effluent. The ownership of the water in the Santa Cruz River is predominantly City of Tucson and U.S. Bureau of Reclamation, but Pima County, Metropolitan Domestic Water District and Cortaro-Marana Irrigation District also own water in the channel. In the future, Marana may own and convey effluent in the channel.

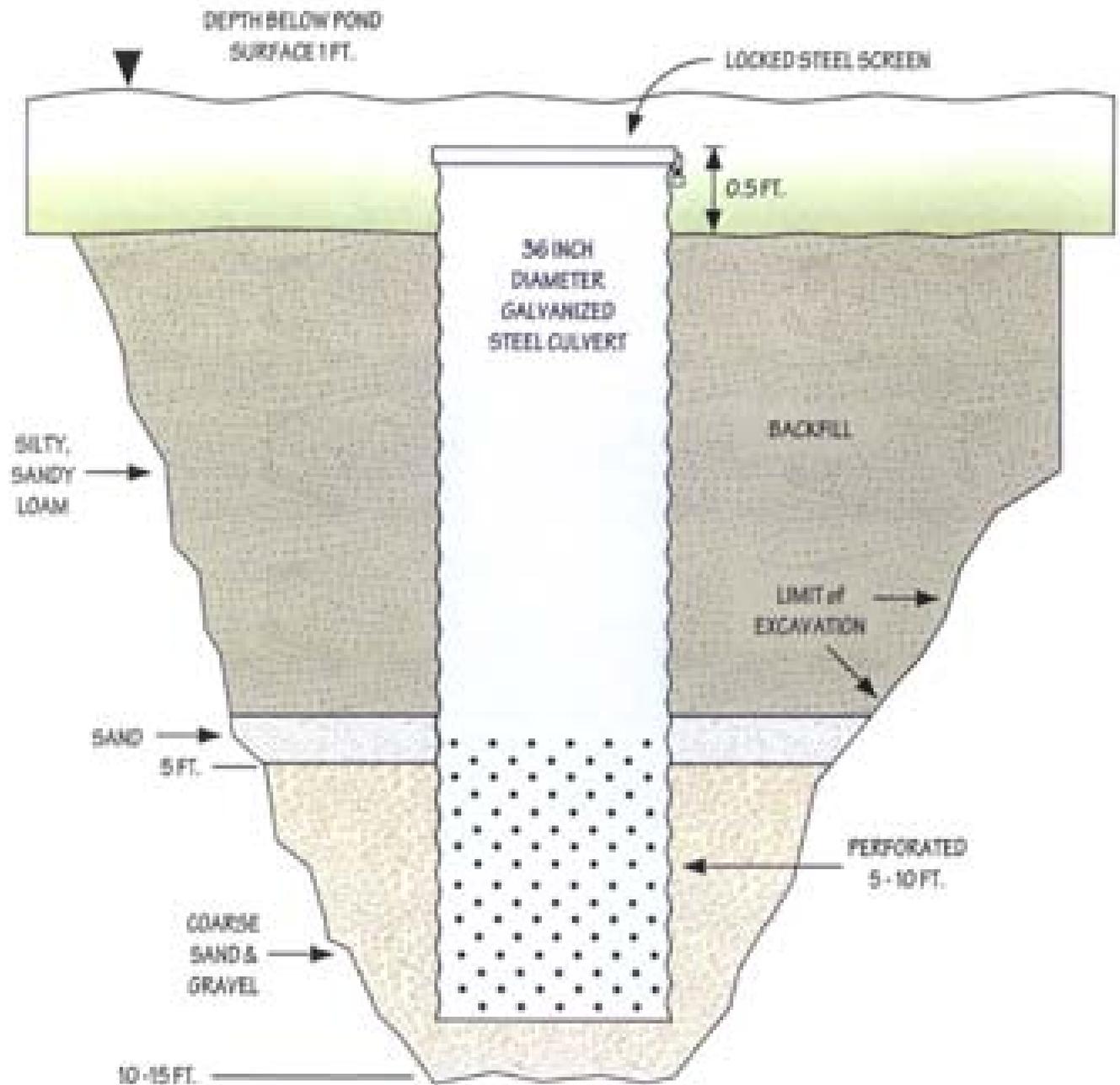
3.7 Design Contingencies

The District and Town of Marana would like to have design contingencies in place in case the proposed modifications become cost prohibitive or impracticable. We will proceed with additional cost estimates and preliminary and final designs of excavation of Cell #2, and trenching for Cells #1,3, and 4. However, we are requesting the flexibility to use two additional applications, if needed. The first contingency is use of up to four shallow dry wells in each of the recharge cells (**Figure 12**). The suggested dry well method is to auger permeable strata and allow the pond water to cascade over a screened casing top about one foot above pond bottom to avoid silting. Perforated 36-inch diameter culvert pipe in the permeable strata would be installed, from five feet below pond bottom to ten to fifteen feet below pond bottom. Culvert pipe above the permeable strata would not be perforated. Pea gravel is the suggested dry well fill material. A second contingency may be to construct a horizontal recharge dry well instead of excavating Cell #2, or as an alternative to the single dry wells proposed for the other three recharge cells. The design would be similar to the individual dry well; however, the dry wells would be connected with 100-150 foot of 36-inch slotted horizontal culvert pipe in permeable strata (**Figure 13**). We would notify ADWR if these contingencies were further considered for implementation.

The District may consider installing a pressure transducer in each of the basins to monitor water levels. Each pressure transducer would be connected to a transmitter that can send data remotely to an off-site location, the District’s Downtown office, where it can be downloaded into a computer database. With these systems in place, Project staff would have the capability to readily observe daily fluctuations in water levels, make more accurate calculations of infiltration rates, and better assess when maintenance is needed within the basins.

3.8 Multiple Purpose Benefits

Figure 14 displays where riparian vegetation was planted to increase habitat value of the site. Cottonwood poles were planted along the “oxbow” channel to take advantage of perennial streamflow and help increase high quality riparian habitat. Various upland tree and shrub species were planted along the eastern and northeastern boundaries of the recharge site to provide food and cover for wildlife. Riparian tree species were planted around both recharge Cells 3 and 4 to provide



Not to scale

FIGURE 12. Conceptual Drawing of Recharge Dry Well

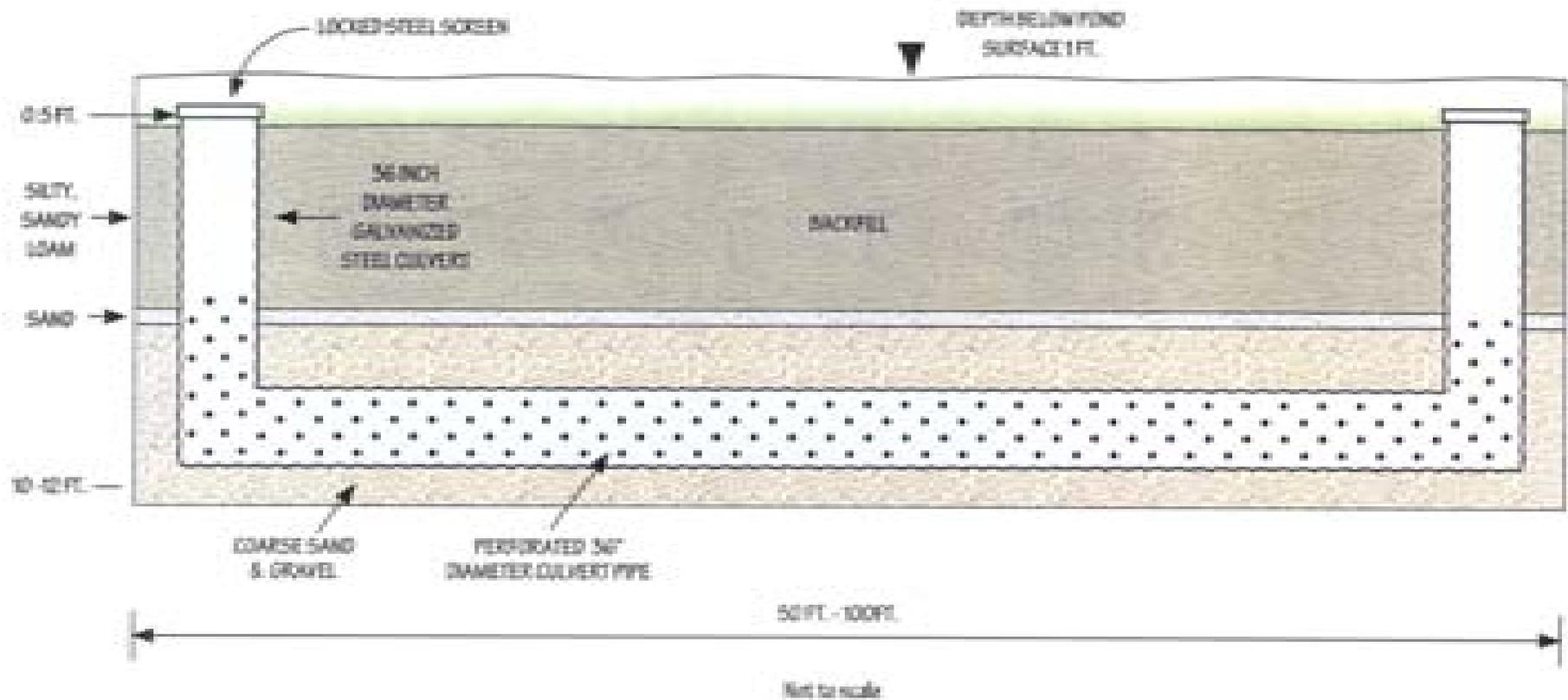
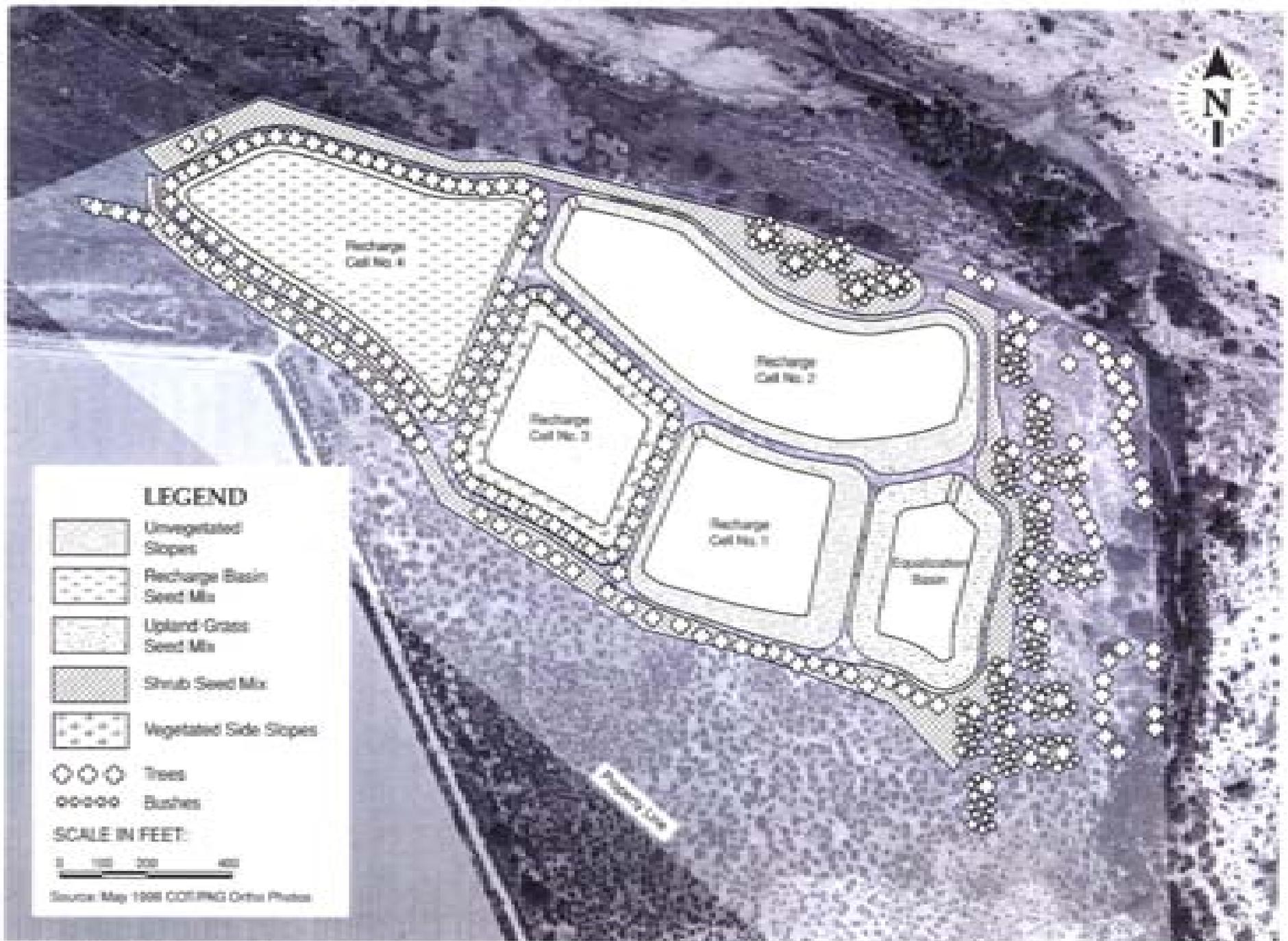


FIGURE 13. Conceptual Drawing of Horizontal Recharge Dry Well

FIGURE 14 Riparian Vegetation Establishment Plots



cover for nesting waterfowl and shorebirds. The swales along the southern boundary of the Project were planted with xero-riparian trees and shrubs to take advantage of local storm water runoff. The larger riparian habitat along the ox-bow channel, which leads up to the project site, contributes to the habitat conservation plan that Marana is preparing for U. S. Fish and Wildlife Service.

The Environmental Planning Group (EPG) has conducted biological studies since 2002. The greatest change at the facility has been the increase in vegetation within the recharge basin area as displayed in **Figures 15 and 16**. The vegetation, which is dominated mostly by saltbush, currently provides nesting and cover habitat for passerine bird species and has attracted predators such as Cooper's hawk (EPG, 2006). Bird species have also increased with the influx of water into the area, from a total of only six species observed in 2002 when the basins were dry to 20 species observed in 2006, which included such aquatic species as Mallard, Cinnamon teal, American coot, black-necked stilt, spotted sandpiper, great blue heron, greater yellowlegs, Wilson's phalarope, and red-winged and yellow-headed blackbirds. Butterfly species have also increased significantly, from 11 species in 2002 to 28 species in 2006. Reptile and amphibian species have remained low over the life of the Project, but EPG suggests that nocturnal surveys during the warm summer evenings could reveal a greater presence of additional species (EPG, 2006).

The habitat function has not affected maintenance access to the site; however, invasion of non-native vegetation has been a problem at the site from a maintenance standpoint. The most notable invaders are Bermuda grass, Russian thistle, and tamarisk. Efforts are made to control the weed populations, especially tamarisk and thistle.

The Project has been and will continue to be operated as a multi-use facility. Recharge is a very large and primary component of the facility and with the proposed modifications will be more effective in the future. Vegetation in the basin bottoms appears to have a negative effect on recharge, as observed by the low infiltration rates observed in Recharge Cell 4. This may be primarily due to the establishment of saltbush as the dominant species, which reduces the surface area of the basin and does not appear to break up the clogging layers effectively. Vegetative debris in the basin bottom also seems to be clogging up the bottom, thus reducing infiltration even more. Future operation of this basin will include the removal of patches of the saltbush and regular scraping of the basin bottoms to remove vegetative debris and the clogging soil layer. "Islands" of vegetation will be maintained to provide cover and nesting habitat for birds.

The losses to the riparian trees (portion of water as evapotranspiration used by the trees), grasses and shrubs planted in and adjacent to the recharge basins is estimated at five percent over the last four years of operation. The environmental, recreational and social benefits may outweigh the water consumptively lost to the riparian flora. At Gilbert, effluent losses from riparian vegetation evapotranspiration, approximately seven to eight percent is subtracted from the total amount of effluent for recovery credits (Anderson, 2004).



Figure 15. Desert willow planted along Recharge Cell 4, April 2004.



Figure 16. Saltbush planted north of Recharge Cell 2, April 2004.

4.0 GEOLOGY AND HYDROLOGY OF PROJECT AREA

The following information was described in detail in our first application (October, 1999). We have updated the data where applicable. In addition, we have provided ADWR with quarterly and annual reports since the beginning of recharge commencement in February 2003. We will reference these reports whenever applicable. **Appendix D** contains a copy of the 2006 Annual Report.

4.1 Geology

The High Plains site is located within the Avra Valley Sub-basin of the Tucson AMA, an alluvial basin within the Basin and Range Physiographic Province of southern Arizona. The alluvial deposits comprising the basin are the eroded remnants of the surrounding mountain ranges. The primary basin-fill deposits of interest at the site consist of (from youngest to oldest): Recent Alluvium (Quaternary), Fort Lowell Formation (Quaternary), and Tinaja beds (Tertiary). **Figure 17** provides a general geologic cross-section that extends through the High Plains site. The figure is based on soils information collected during the drilling program completed by Errol L. Montgomery & Associates (1997) as part of the Northwest Replenishment Project Feasibility Study.

Recent Alluvium

Recent Alluvium at the project site occurs from ground surface to a depth of about 54 feet based on soil samples collected at on-site Borehole C. The Recent Alluvium consists of an upper interval of mostly fine-to-medium grained materials to about the 10-foot depth, and a lower interval of mostly coarse-grained materials from about the 10 to 54 foot depth. The fine-to-medium grained materials represent floodplain deposits while the coarse-grained materials represent stream channel deposits. The upper interval materials consist primarily of alternating layers of silty sand and sandy silt. The lower interval materials consist primarily of alternating layers of gravely sand and sandy gravel and gravely silty-to-clayey sand.

Double ring infiltrometer testing was completed in the Recent Alluvium encountered in several on-site test pits before pond construction. A total of three tests were completed with durations of 240 minutes to 360 minutes, until it appeared that steady state conditions had been achieved. A single test in Test Pit 13 used treated effluent and was completed at a depth of 7.4 feet in a thin layer of silty sand overlying sandy gravel. This test yielded a steady state infiltration rate of 10.2 feet/day. The first test in Test Pit 14 used treated effluent and was completed at a depth of five feet in a relatively thick layer of sandy silt. The test yielded a steady state value of about 2.5 feet/day. The second test in Test Pit 14 used raw CAP water and was completed at a depth of 8.3 feet in a thin layer of fine sand overlying sandy gravel. A steady state infiltration rate of about nine feet/day was reported for this test.

Fort Lowell Formation

The contact between the Recent Alluvium and the underlying Fort Lowell Formation is identified mostly by increased iron oxide content, increased clay content, and by the presence of weathering

products. In Borehole C, this contact is reported to occur at a depth of about 54 feet below ground surface. In areas away from the river (beyond the extent of Recent Alluvium), the Fort Lowell Formation is exposed at ground surface. In general, the Fort Lowell Formation consists mostly of unconsolidated to poorly consolidated clayey, sandy gravel and clayey, gravely sand. In Borehole C, the Fort Lowell Formation consists of an upper interval of primarily sandy gravel from the 54 to 75 foot depths, and intermediate interval of primarily of silty and clayey sands and gravels from the 75 to 105 foot depth, and a lower interval of sandy gravel and gravely sand from the 105 to 150 foot depth (end of boring). Throughout most of the basin, the Fort Lowell Formation is 300 to 400 feet thick (Anderson, 1987). In the vicinity of the proposed project site, the Fort Lowell Formation is estimated to be about 250 to 275 feet thick.

Tinaja Beds

Underlying the Fort Lowell Formation are the Tinaja beds that are differentiated into three units: upper, middle, and lower. The upper Tinaja beds consist of unconsolidated to poorly cemented gravel to clayey silt; but in many locations, particularly in the uppermost part, the grain sizes are coarse and similar to those in the overlying Fort Lowell Formation. The middle Tinaja beds consist primarily of moderately cemented gypsiferous and anhydritic clayey silt and mudstone, but locally can contain cemented sands and gravels. The lower Tinaja beds consist of moderately to firmly cemented gravel and conglomerate to clayey silt and mudstone (CH2M HILL and others, 1988). In the vicinity of the High Plains site, the overall thickness of the Tinaja beds is estimated to exceed 1,500 feet (Environmental Resource Consultants, 1995).

4.2 Hydrogeology of Project Area

Water Bearing Units

In the vicinity of the High Plains site, the primary water-bearing unit used for groundwater production purposes is the upper Tinaja beds (the water table typically occurs below the base of the Fort Lowell Formation). In some areas where significant faulting has occurred, the upper Tinaja beds unconformably overlie the lower Tinaja beds (i.e., the middle Tinaja beds may be absent). In those areas, groundwater production also occurs from the lower Tinaja beds. Where present, the middle Tinaja beds are not known to yield large amounts of groundwater (CH2M Hill and others, 1988). Near the proposed project site, the thickness of the upper Tinaja beds is estimated to range from about 300 to 400 feet, the thickness of the middle Tinaja beds is estimated to exceed 500 feet and the thickness of the lower Tinaja beds may exceed 1,000 feet (Environmental Resource Consultants, 1995).

Due to regional CAP recharge activities, the water table is expected to rise into the Fort Lowell Formation. Based on recent observations of the depth to water at the Marana High plains site, it appears that the water table is now approximately 185 feet bls, almost saturating the lower portion of the Fort Lowell Formation. As noted above, in the vicinity of the proposed project site, the Fort Lowell Formation is estimated to be about 250 to 275 feet thick. Estimates of aquifer parameters from areas where the Fort Lowell Formation is saturated are provided below, as available. Where

adequate saturated thickness exists, the Fort Lowell Formation is the most productive part of the basin-fill aquifer system (CH2M Hill and others, 1988).

Transmissivity and Hydraulic Conductivity

A 19-hour pump test (followed by a 19-hour recovery period) was conducted in a new well (screened entirely within the upper Tinaja beds) at the nearby Avra Valley Pilot Recharge Project site (well D-12-11 03cbb), located about one mile southeast of the High Plains site. A transmissivity value of about 2,000 gallons per day per foot of aquifer (gpd/ft) was estimated from that test (Errol L. Montgomery & Associates, 1996c). Harding Lawson Associates (HLA) (1995) reports several additional transmissivity values from aquifer tests performed near the proposed project site in similar hydrogeologic settings (proximate to the Santa Cruz River channel): 200,000 gpd/ft (from a 24-hour test in well D-11-10 15aad; about 4-miles northwest, well screened in upper Tinaja beds); 184,000 gpd/ft (for a test of unknown duration in well D-11-10 23ddd; about 2.5 miles northwest, well screened in upper Tinaja beds); and 54,000 gpd/ft (from a 3.5-hour test in well D-11-10 27cdc; about four miles northwest, well screened in upper Tinaja beds and probably the lower Tinaja beds). Transmissivity values from this area that were used in the ADWR groundwater modeling study (Travers and Mock, 1984) range from about 50,000 to 100,000 gpd/ft.

Available data for the region show a wide range of transmissivity values. The relatively low value (2,000 gpd/ft) determined from the recent aquifer test in the well in D-12-11 03cbb appears to be anomalous and not indicative of the overall area. Based on the above information, the likely range of transmissivity values for the upper Tinaja beds in the vicinity of the proposed project is about 50,000 to 200,000 gpd/ft. Based on the three referenced aquifer tests yielding transmissivity values from the HLA report (1995), and using estimated saturated thickness from each test site (depth to bottom of the well screen minus the estimated depth to the static water table), estimated hydraulic conductivities for the upper Tinaja beds in this area range from about 200 to more than 1,000 gpd/ft². CH2M Hill and others (1988) report the following for the Fort Lowell Formation: transmissivities ranging from 20,000 to 1,000,000 gpd/ft, and hydraulic conductivities ranging from about 150 to 700 gpd/ft². For the purpose of the mounding analysis for the site, a conservative 125,000 gpd/ft will be used.

Specific Yield and Porosity

Long-term aquifer tests appropriate for measuring specific yield are not available in the vicinity of the proposed facility. Near the site, a U.S. Geological Survey numerical model used a range of 0.12 to 0.18 for specific yield (Errol L. Montgomery & Associates, 1995b). A specific yield value of about 0.10 was used for the area in the ADWR groundwater modeling study (Travers and Mock, 1984). For the proposed project site, a specific yield range of about 0.10 to 0.15 is considered representative for the near-water table geologic materials of the types described by work in the vicinity. Analyses of borehole geophysical logs were used to estimate porosity of the upper Tinaja beds as ranging from 0.24 to 0.35, and porosity of the Fort Lowell Formation as ranging from 0.26 to 0.34 (CH2M HILL and others, 1988). For the proposed project site, a porosity range of about 0.25 to

0.35 is considered representative for the near-water table geologic materials of the types described by work in the vicinity.

Groundwater Elevations

The groundwater elevations and contours shown on **Figure 18** are based on data collected in specific wells for October 2006. Direction of groundwater movement, as shown in this figure, is northerly to northwesterly and is reflective of the mound created by recharge from the Lower Santa Cruz CAP Replenishment Project. Depths to groundwater and related contours for the area as of October 2006 are depicted in **Figure 19**. The depth to groundwater at the project site during this period was approximately 184 feet below ground surface (ft bgs). This is a recovery of 12.6 feet since our last reporting in December 2003, a recovery of 4.2 feet per year.

The general direction of groundwater movement through the project area prior to recharge was from the southeast towards the northwest with an average flow gradient of about 0.0024 feet/foot (about 13 feet per mile). The gradient has now increased at the Project to about 0.005 feet/foot (26 feet per mile). The major natural controls on the groundwater flow directions and gradients are: (1) the occurrence of groundwater underflow from the Tucson Basin to Avra Valley southeast of the project site, occurrence of groundwater underflow from the central part of Avra Valley southwest of the project site, and underflow from Avra Valley to the Picacho Basin northwest of the project site; (2) hydraulic conductivity of the saturated basin-fill deposits in the vicinity of the project site; (3) the influence of the “Rillito Narrows,” a subsurface bedrock high.

Anthropogenic sources of recharge to the groundwater system include infiltration of effluent discharged into the Santa Cruz River from two upstream wastewater treatment plants and contributions from the Lower Santa Cruz CAP Replenishment and Avra Valley Recharge Projects. Currently, the Replenishment project is permitted for 50,000 af/yr of CAP recharge. Recharge and reduction in groundwater pumpage for agricultural irrigation has resulted in significant water level recovery in the area.

Water level measurements from 1999 to December 2006 in the vicinity of the Marana High Plains Facility revealed a significant rise in water level of approximately 9-10 ft/year (**Figure 20**). Water level in on-site well HP-1 has risen approximately 76 feet since construction in 1999. However, since early 2001, water levels have risen at a slower rate of 5-6 feet/year. This compares favorably with mounding estimates from the two up-gradient CAP recharge projects mentioned above. These offsite projects largely cause recovery of water levels at HP-1.

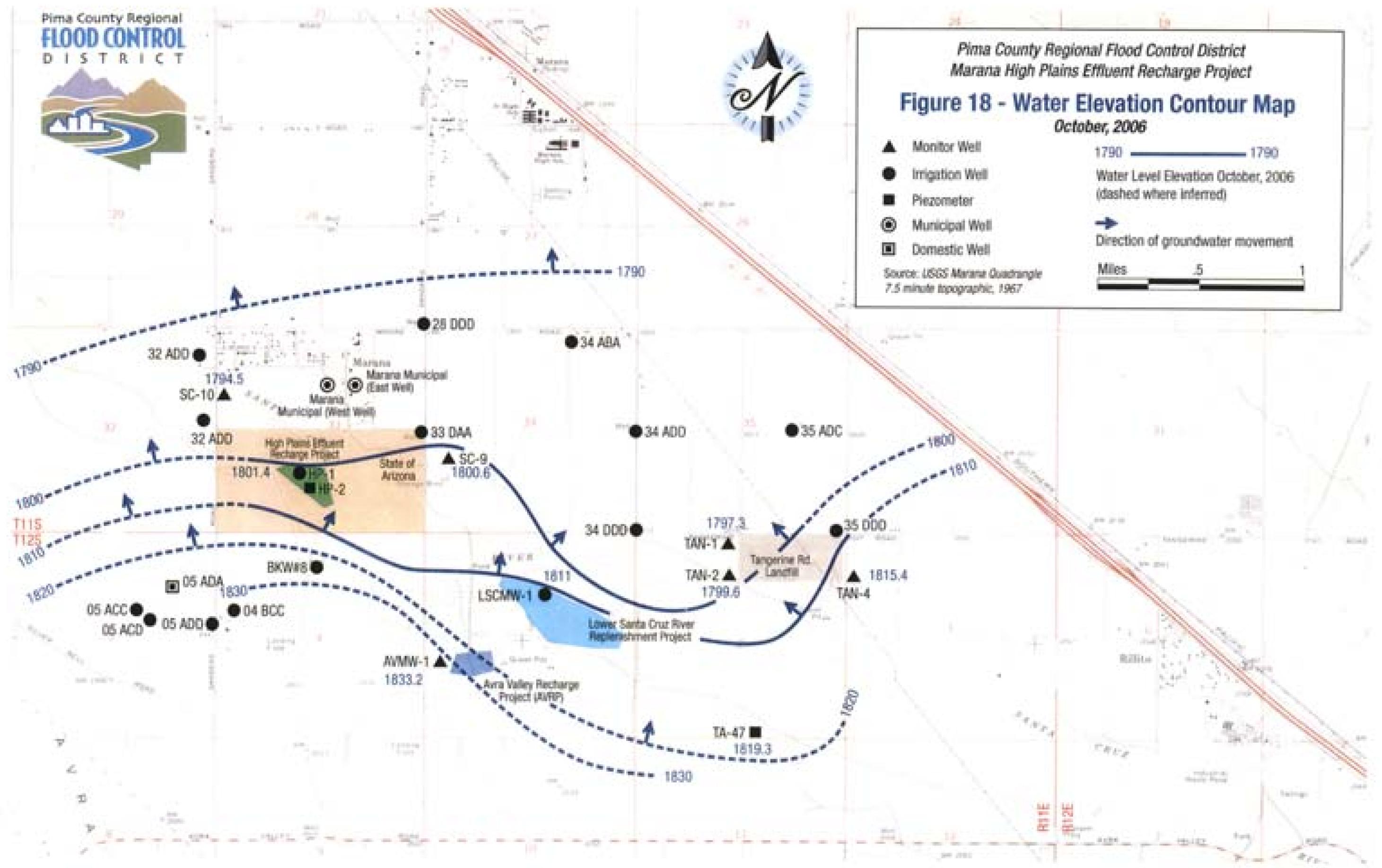
Well hydrographs are also provided for monitor wells near the Project site, including SC-9, SC-10 and AVMW-1 (**Appendix E**). Data for these wells covers from 1988 to the present with significant early data gaps for both wells. Despite the limited data, annual fluctuations are apparent in the wells with the lowest levels in the late summer and the highest levels in early spring. The observed fluctuations could be the result of high capacity production wells located to the north of the project.



Pima County Regional Flood Control District
Marana High Plains Effluent Recharge Project

Figure 18 - Water Elevation Contour Map
October, 2006

▲ Monitor Well	1790 ————— 1790
● Irrigation Well	Water Level Elevation October, 2006
■ Piezometer	(dashed where inferred)
⊙ Municipal Well	→ Direction of groundwater movement
□ Domestic Well	
Source: USGS Marana Quadrangle 7.5 minute topographic, 1967	
Miles 0 .5 1	





Pima County Regional Flood Control District
Marana High Plains Effluent Recharge Project

Figure 19 - Depth to Water Contour Map

October, 2006

- ▲ Monitor Well
- Irrigation Well
- Piezometer
- ⊙ Municipal Well
- Domestic Well

210 ————— 210
Depth to Water
(dashed where inferred)

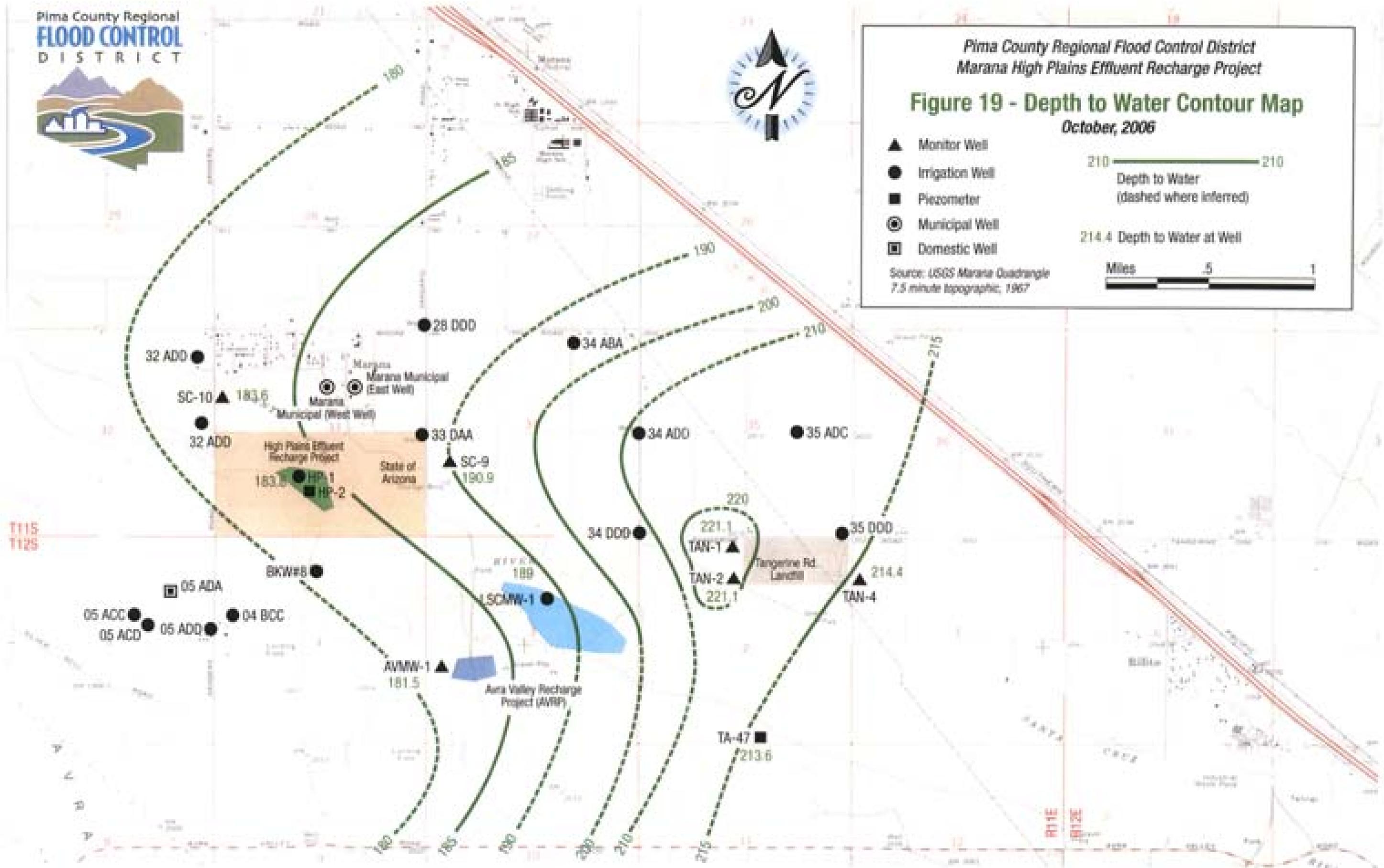
214.4 Depth to Water at Well

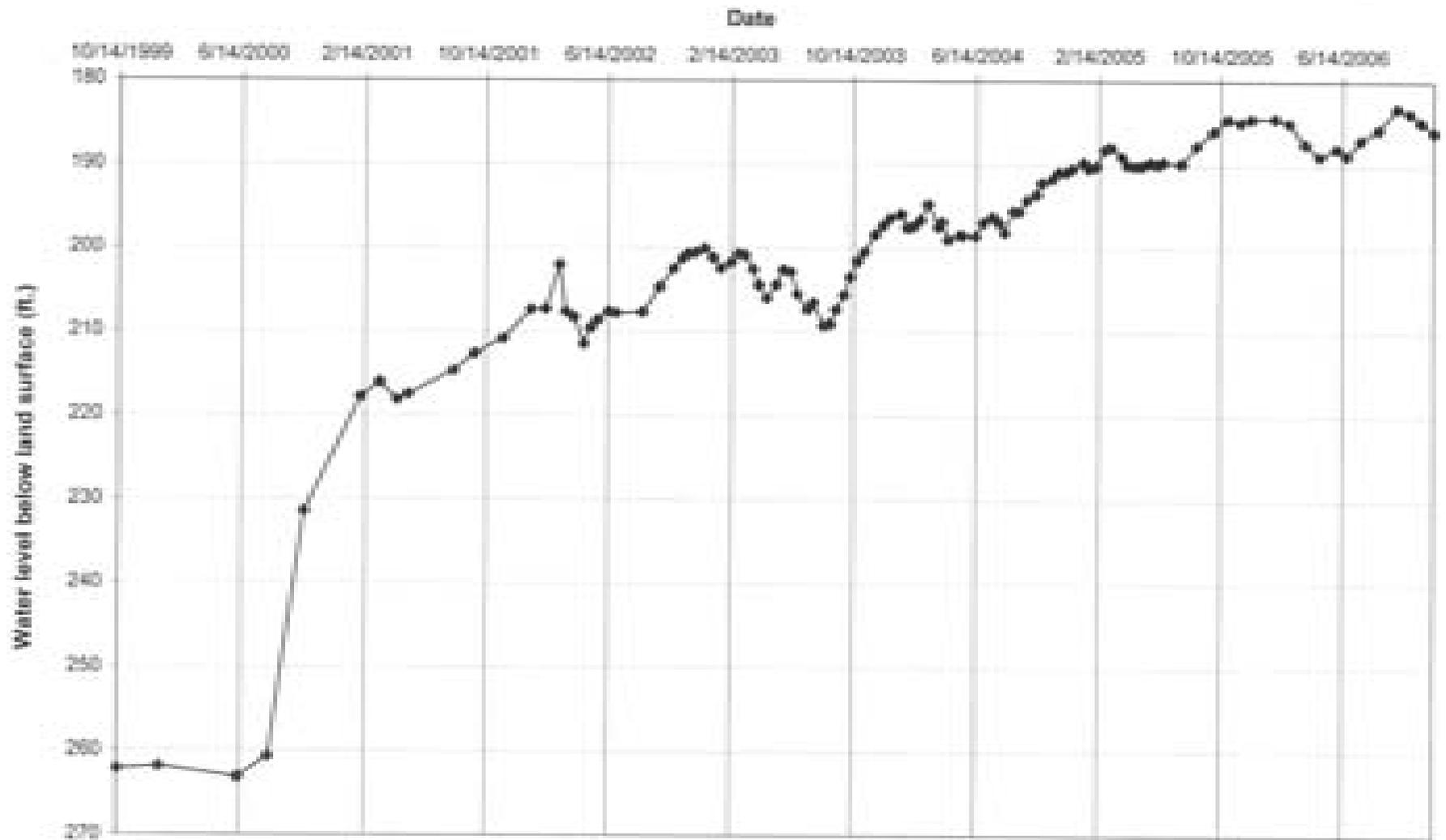
Source: USGS Marana Quadrangle
7.5 minute topographic, 1967

Miles 0 .5 1

T115
T128

R11E
R12E





◆ Depth to Water

FIGURE 20
DEPTH TO WATER HYDROGRAPH
ON-SITE MONITOR WELL HP-1
 D (11-11) 33 cad

Source: Pima County Flood Control District

5.0 UNREASONABLE HARM AND HYDROLOGIC FEASIBILITY ANALYSIS

5.1 Mounding Analysis

The extent of groundwater mounding resulting from the High Plains Project was estimated using a computer program known as Well& PIT (Molden, 1984; Sunada, 1985). The program uses Glover's method to solve mounding depth at a given distance from a recharge basin. A constant recharge rate of 0.6 ft/day was used in the model to account for the 600 acre-feet/yr of recharge during the twenty-year recharge period. A transmissivity of 125,000 gpd/ft (16,700 ft²/day) and a specific yield 0.18 were used in the simulation. The transmissivity value is consistent with other regional studies, and is probably a conservative value considering the proximity of the project to the river. Instantaneous breakthrough to the aquifer with no investment to the vadose zone was assumed.

The results of the analysis indicate a mound of about four feet directly under the basins and one foot elevation rise approximately 1.75 miles from the basins. **Figure 21** shows the maximum area of impact with contours of the four-foot, two-foot and one-foot maximum water-level rise as a result of the 20-year recharge operations a Marana High Plains at 600 AF/yr. A printout of the simulation results is provided in **Appendix F**.

The impacts produced by the High Plains project will be very small compared to those caused by the up-gradient Lower Santa Cruz River (LSC) Replenishment Project (increased from 30,000 AF/yr to 50,000 af/yr), Avra Valley Recharge Project (AVRP) and the Lower Santa Cruz Managed Recharge Project (Ina to Trico Road). The estimated magnitude of the groundwater elevation increase was presented by Errol L. Montgomery & Associates (EM&A) in a 2002 report that used the MODFLOW groundwater model to estimate the extent of the 1-foot groundwater elevation rise. Modeling results indicated that groundwater elevation at the Marana High Plains project site is expected to rise 100 to 130 feet over the 20-year proposed operational life of the AVRP and LSC Project (5-6.5 feet/yr). EM&A (2002b) also modeled (using MODFLOW) the impacts for the LSCMRP from Ina to Trico Roads. Their results indicated that the recovery in water levels beneath the Marana High Plains Recharge site, as a result of this project, was approximately 45-50 feet over the 20-year life of the project (2.25-2.5 ft/yr). These data are consistent with water level rises experienced at MHP monitor well HP-1 of 77 feet in the eight years the CAP facilities have been operating.

Water-level recoveries have already been documented as a result of these projects in the vicinity of the Marana High Plains site (see Section 4.2). The on-site monitor well (HP-1) has recovered from 201 feet bls in January 2003 to 186 feet bgs in March 2007, almost 15 feet in four years of facility operation. Based on the modeling predictions and actual site data, water levels are estimated to recover at the site at a rate of approximately 7.5-9.25 feet per year. Without any recovery, at the end of the 20-year permit period, the estimated water level at the on-site monitor well would be nearing 0-40 feet bgs. However, participants in the nearby storage projects are formulating recovery plans for the recharged CAP and effluent. In addition, the LSC Replenishment Project will have to cease recharge if water levels rise to near the bottom of the Tangerine Landfill. The High Plains permit is also subject to an alert level and prohibition level.



*Pima County Regional Flood Control District
Marana High Plains Effluent Recharge Project*

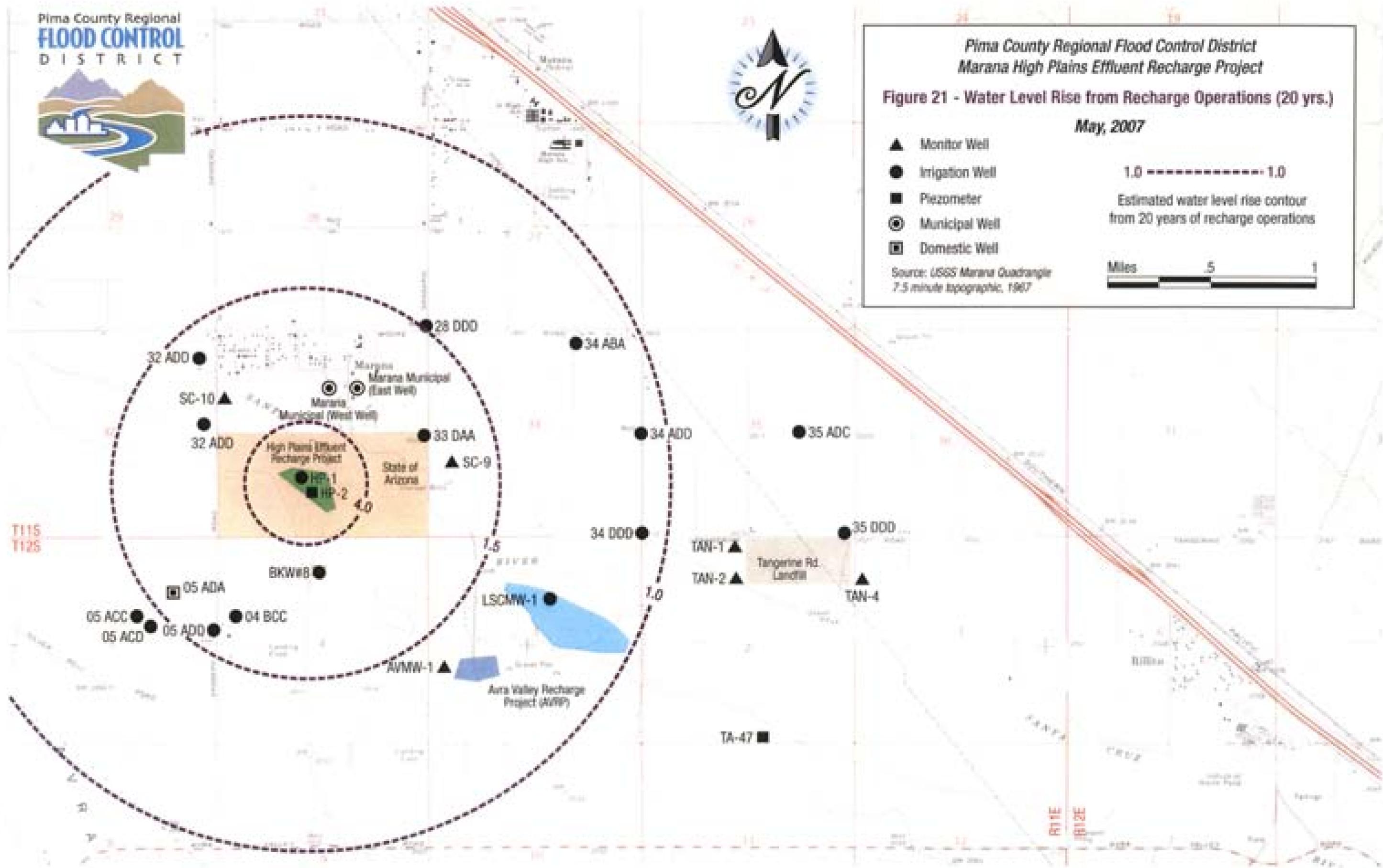
**Figure 21 - Water Level Rise from Recharge Operations (20 yrs.)
May, 2007**

- ▲ Monitor Well
- Irrigation Well
- Piezometer
- ⊙ Municipal Well
- ▣ Domestic Well

1.0 ----- 1.0
Estimated water level rise contour
from 20 years of recharge operations

Miles 5 1

Source: USGS Marana Quadrangle
7.5 minute topographic, 1967



5.2 Land and Water Use Inventory

Vicinity Wells

A large number of wells are located within a one-mile radius of the project site (**Table 5**). These wells are also depicted in both **Figures 18 and 19**, with relative depths to water and water level elevations where available.

Table 5. Inventory of wells within one-mile radius of Project

Location	ADWR Reg. #	Owner	Name	Type	Total Depth (ft)	Screened Interval (ft)	Cas e Dia. (in)	Pump Cap. (gpm)	Date Const.
D-11-11 28 DDD	55-604810	CMID	--	Production	768	326-584	20	2366	Jun-78
D-11-11 32 AAD	55-615767	ASLD	--	Production	430	--	8	--	1951
D-11-11 32 ADD	55-615768	ASLD	--	Production	440	192-395	12	--	Apr-49
D-11-11 33 ACA	55-632633	Honea Water Co.	East Well	Production	500	--	10	100	Apr-64
D-11-11 33 ACB	55-632634	Honea Water Co.	West Well	Production	503	--	10	100	Aug-70
D-11-11 33 ACD	55-552996	PCFCD	--	Exploratio n	150	--	--	--	Nov-95
D-11-11 33 BAC	55-530762	SW Gas Corp.	--	Cathodic Protection	228	--	--	--	Feb-91
D-11-11 33 BCB	55-520129	PCWWM	SC-10	Monitor	375	300-370	6	--	May-88
D-11-11 33 CAC	55-552995	PCFCD	--	Exploratio n	150	--	--	--	Nov-95
D-11-11 33 CAD	55-574110	PCFCD	HP-1	Monitor	340	220-330	6	35	Sep-99
D-11-11 33 CAD	55-593607	PCFCD	HP-2	Monitor	80	70-80	6	--	Sep-02
D-11-11 33 DAA	55-615769	ASLD	--	Production	440	220-400	12	--	1951
D-11-11 34 ABA	55-594508	CMID	--	Service Well	705	--	16	2000	Sep-03
D-11-11 34 CBC	55-520182	PCWWM	SC-09	Monitor	385	290-380	6	--	Jul-99
D-12-11 03 CBB	55-557544	CAWCD	AVMW -1	Monitor	405	239-390	6	22	Jun-96
D-12-11 04 ABA	55-552994	PCFCD	--	Exploratio n	150	--	--	--	Nov-95
D-12-11 04 BAD	55-621877	BKW Farms	BKW#8	Production	600	--	20	3000	1953
D-12-11 04 BCC	55-621866	BKW Farms	--	Production	450	--	8	22	1960
D-12-11 05 ACC	55-542843	Management & Training	--	Production	802	--	10	300	Mar-94
D-12-11 05 ACD	55-586194		--	Non-service	830	--	8	250	Jun-01
D-12-11 05 ADA	55-573800	Gee	--	Domestic	300	--	8	35	Mar-99
D-12-11 05 ADD	55-621899	BKW Farms	--	Production	400	--	--	35	--

Inventory of Structures, Land Uses Conditions and Facilities

In order to determine past land uses at and in the vicinity of the project site, District staff reviewed historic aerial photographs that covered the years 1949 to 2005. Land use at the project site and surrounding areas was almost exclusively farming during this time period, with portions of the area being switched to grazing primarily due to the occurrence of flooding which destroyed the croplands nearest to the river. The project site itself was switched from farming to grazing in the mid-1960s. Development in the area was primarily limited to the Honea Estates subdivision, which began in the early 1950s, and is located 1/4-mile north of the project site on the north bank of the Santa Cruz River. Available photographs do not indicate that the project site or adjacent areas were ever used for land filling or waste disposal purposes.

The former site land use before recharge was grazing. Current surrounding land uses are primarily farming and grazing. Farmland adjacent to the west is currently irrigated with effluent and land adjacent to the east is irrigated with CAP water. Some farmland southwest of the facility has not been in use since the Project operations began in February 2003. Additional recharge projects are proposed or under operation in the vicinity of the High Plains site. The Avra Valley Recharge Project is located approximately one mile to the southeast and was in operation in July 1996. The facility was permitted to recharge 8,300 acre-feet of CAP water during a two-year pilot period. The Lower Santa Cruz River Replenishment Project (LSC Project) is located approximately 1/4-mile to the southeast of the High Plains site. The facility began recharge operations in July 2000 and recharged a maximum of 30,000 acre-feet of CAP water per year. In 2003, the amount was increased to 50,000 af/yr for an estimated 20 years. **The High Plains Effluent Recharge Project is seeking to recharge 600 acre-feet of water per year for an additional twenty years.**

5.3 Water Quality

The Project's Aquifer Protection Permit (No. P-103195) requires water quality samples to be collected and analyzed on a monthly basis for nutrients (Nitrogen constituents) and on a quarterly basis for Total Metals and Volatile Organic Compounds (**Appendix A.3**). Samples are collected from the source water inflow and from Monitor Well HP-1. Nitrogen forms are monitored more frequently because of the high nitrogen content of effluent water. It was also thought that there was potential for recharge to increase the nitrogen content at the HP-1 monitor well at the start of operations through leaching of nearby agricultural soils, but there has been no evidence of nitrate flushing based on sampling over the past four years.

Table 6 summarizes the results from sampling performed to date along the oxbow channel near the Project's wet well (diversion structure). Samples were not taken during months when there were no flows in the oxbow channel. **Table 7** summarizes the results from samples taken at the facility's monitoring well, HP-1. Samples were not provided for the months of November 2003 and December 2003, since the well was inoperable due to blown fuses at the main control panel. No analytes have been reported above the alert levels set by the Aquifer Protection Permit for this facility since the beginning of operations.

5.4 Unreasonable Harm Analysis and Hydrologic Feasibility Conclusions

The hydrologic feasibility of recharging the proposed amount of water and not creating harm to land and water has been presented in this report and application. Over the past four years, over 853AF of

Table 6. Water quality analyses for samples taken near diversion structure (Source Water)

Constituent	Unit	Sample Date: Source Water																								
		2003												2004												
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Nutrients																										
Total Nitrogen*	mg/l	NE	36	35	34.73	30	36.7	20.6	NE	NE	33.1	NE	NE	NE	3.2	17.8	16	35	29.72	0.95	NE	19.4	25.7	26.7	22.36	
Nitrate-Nitrite as N	mg/l	NE	<5.0	<5.0	0.73	<1.10	0.7	0.6	NE	NE	1.1	NE	NE	NE	<0.5	0.8	<1.0	<1.0	0.72	<0.1	NE	1.4	2.7	4.7	0.36	
Total Kjeldahl Nitrogen (TKN)	mg/l	NE	36	35	34	30	36	20	NE	NE	32	NE	NE	NE	3.2	17	16	35	29	0.95	NE	18	23	22	22	
Metals (Total)																										
Arsenic	mg/l	NE	NE	<0.1	NE	<0.005	NE	NE	NE	NE	NE	NE	NE	NE	<0.005	NE	NE	NE	<0.1	NE	NE	NE	<0.1	NE	<0.1	NE
Barium	mg/l	NE	NE	<1.0	NE	<1.0	NE	NE	NE	NE	NE	NE	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	<1.0	NE	<1.0	NE
Cadmium	mg/l	NE	NE	<0.05	NE	<0.005	NE	NE	NE	NE	NE	NE	NE	NE	<0.005	NE	NE	NE	<0.05	NE	NE	NE	<0.05	NE	<0.05	NE
Chromium	mg/l	NE	NE	<0.1	NE	<0.01	NE	NE	NE	NE	NE	NE	NE	NE	<0.01	NE	NE	NE	<0.1	NE	NE	NE	<0.1	NE	<0.1	NE
Lead	mg/l	NE	NE	<0.15	NE	<0.005	NE	NE	NE	NE	NE	NE	NE	NE	<0.005	NE	NE	NE	<0.15	NE	NE	NE	<0.15	NE	<0.15	NE
Antimony	mg/l	NE	NE	<0.2	NE	<0.005	NE	NE	NE	NE	NE	NE	NE	NE	<0.005	NE	NE	NE	<0.2	NE	NE	NE	<0.2	NE	<0.2	NE
Beryllium	mg/l	NE	NE	<0.1	NE	<0.1	NE	NE	NE	NE	NE	NE	NE	NE	<0.002	NE	NE	NE	<0.1	NE	NE	NE	<0.1	NE	<0.1	NE
Nickel	mg/l	NE	NE	<0.1	NE	<0.1	NE	NE	NE	NE	NE	NE	NE	NE	<0.1	NE	NE	NE	<0.1	NE	NE	NE	<0.08	NE	<0.08	NE
Manganese	mg/l	NE	NE	<0.001	NE	<0.001	NE	NE	NE	NE	NE	NE	NE	NE	<0.001	NE	NE	NE	<0.001	NE	NE	NE	<0.001	NE	<0.001	NE
Selenium	mg/l	NE	NE	<0.1	NE	<0.005	NE	NE	NE	NE	NE	NE	NE	NE	<0.005	NE	NE	NE	<0.1	NE	NE	NE	<0.1	NE	<0.1	NE
Thallium	mg/l	NE	NE	<0.1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	<0.002	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Volatile Organic Compounds (VOCs)																										
Benzene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	NE	NE	NE	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	<0.0005	NE
Carbon Tetrachloride	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
<i>o</i> -Dichlorobenzene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	NE	NE	NE	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	<0.0005	NE
<i>para</i> -Dichlorobenzene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	NE	NE	NE	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	<0.0005	NE
1,2-Dichloroethane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
1,1-Dichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
<i>cis</i> -1,2-Dichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
<i>trans</i> -1,2-Dichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
1,2-Dichloropropane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
Ethylbenzene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
Monochloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
Styrene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	NE	NE	NE	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	<0.0005	NE
Tetrachloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
Toluene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
1,1,1-Trichloroethane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
1,1,2-Trichloroethane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
Trichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
Trihalomethanes (total THMs)	µg/l	NE	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
Vinyl Chloride	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE
Xylenes (total)	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	<0.5	NE

NE = No Event (No sample was taken)

NE = No Flow (No flow in the "box" channel at the diversion structure)

* Total Nitrogen = Nitrate-Nitrite as N + TKN (per Aquifer Protection Permit No. P-103195)

Table 6. Water quality analyses for samples taken near diversion structure (Source Water)

Constituent	Unit	Sample Date: Source Water																							
		2005												2006											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Nutrients																									
Total Nitrogen*	mg/l	NE	NE	24.54	32	35	21.2	NE	NE	NE	26	34	37.5	35.7	39	30	38	28	29	26	NE	NE	27	24	23
Nitrate-Nitrite as N	mg/l	NE	NE	0.54	<1.0	1	1.2	NE	NE	NE	2.1	1.8	2.3	1.7	1	1.4	0.8	1.9	1.8	3.9	NE	NE	1.7	1	3.8
Total Kjeldahl Nitrogen (TKN)	mg/l	NE	NE	28	32	34	29	NE	NE	NE	24	32	35	34	38	28	37	28	27	22	NE	NE	23	21	19
Metals (Total)																									
Arsenic	mg/l	NE	NE	<0.1	NE	<0.1	NE	NE	NE	NE	NE	0.0046	NE	NE	0.0017	NE	NE	NE	0.0058	NE	NE	NE	NE	NE	0.0042
Barium	mg/l	NE	NE	<1.0	NE	<1.0	NE	NE	NE	NE	NE	0.056	NE	NE	0.053	NE	NE	NE	0.071	NE	NE	NE	NE	NE	<0.001
Cadmium	mg/l	NE	NE	<0.05	NE	<0.05	NE	NE	NE	NE	NE	<0.001	NE	NE	<0.001	NE	NE	NE	<0.001	NE	NE	NE	NE	NE	<0.001
Chromium	mg/l	NE	NE	<0.1	NE	<0.1	NE	NE	NE	NE	NE	0.0011	NE	NE	0.0018	NE	NE	NE	0.0017	NE	NE	NE	NE	NE	0.0011
Lead	mg/l	NE	NE	<0.15	NE	<0.15	NE	NE	NE	NE	NE	<0.001	NE	NE	0.0012	NE	NE	NE	0.002	NE	NE	NE	NE	NE	0.0019
Antimony	mg/l	NE	NE	<0.2	NE	<0.2	NE	NE	NE	NE	NE	<0.001	NE	NE	<0.001	NE	NE	NE	<0.001	NE	NE	NE	NE	NE	<0.001
Beryllium	mg/l	NE	NE	<0.1	NE	<0.1	NE	NE	NE	NE	NE	<0.001	NE	NE	<0.001	NE	NE	NE	<0.001	NE	NE	NE	NE	NE	<0.001
Nickel	mg/l	NE	NE	<0.08	NE	<0.08	NE	NE	NE	NE	NE	0.0017	NE	NE	0.0036	NE	NE	NE	0.0046	NE	NE	NE	NE	NE	0.0048
Mercury	mg/l	NE	NE	<0.001	NE	<0.001	NE	NE	NE	NE	NE	<0.0002	NE	NE	<0.0002	NE	NE	NE	<0.0002	NE	NE	NE	NE	NE	<0.0002
Selenium	mg/l	NE	NE	<0.1	NE	<0.1	NE	NE	NE	NE	NE	<0.002	NE	NE	<0.002	NE	NE	NE	0.0053	NE	NE	NE	NE	NE	<0.002
Thallium	mg/l	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	<0.001	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Volatile Organic Compounds (VOCs)																									
Benzene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	NE	NE	NE	<0.001	NE	NE	<0.001	NE	NE	NE	<0.001	NE	NE	NE	NE	NE	<0.001
Carbon Tetrachloride	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
o-Dichlorobenzene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	NE	NE	NE	<0.001	NE	NE	<0.001	NE	NE	NE	<0.001	NE	NE	NE	NE	NE	<0.001
para-Dichlorobenzene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	NE	NE	NE	<0.001	NE	NE	<0.001	NE	NE	NE	<0.001	NE	NE	NE	NE	NE	<0.001
1,2-Dichloroethane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
1,1-Dichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
cis-1,2-Dichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
trans-1,2-Dichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
1,2-Dichloropropane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
Ethylbenzene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
Monochloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
Styrene	µg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
Tetrachloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
Toluene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
1,1,1-Trichloroethane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
1,1,2-Trichloroethane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
Trichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
Trihalomethanes (total THMs)	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
Vinyl Chloride	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	NE	NE	NE	<1.0
Xylenes (total)	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	NE	NE	NE	<2.0	NE	NE	<2.0	NE	NE	NE	<2.0	NE	NE	NE	NE	NE	<2.0

NE = No Event (No sample was taken)

NF = No Flow (No flow in the "inflow" channel at the diversion structure)

* Total Nitrogen = Nitrate-Nitrite as N + TKN (per Aquifer Protection Permit No. P-103195)

Table 7. Water quality analyses from samples taken at monitor well HP-1

Constituent	Unit	Sample Date: Monitor Well, HP-1																							
		2003												2004											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Nutrients																									
Total Nitrogen*	mg/l	NE	4.2	3.7	4.6	4.7	4.2	3.5	4.8	3.6	5.09	NE	NE	3.0	3.3	4.7	3.0	4.0	4.2	4.3	3.3	3.01	3.8	4.19	3.76
Nitrate-Nitrite as N	mg/l	NE	4.2	3.7	4.6	4.7	4.2	3.5	4.4	3.6	4.3	NE	NE	3.8	3.9	3.5	3.0	3.3	3.1	3.3	3.3	3.4	3.2	3.4	3.2
Total Kjeldahl Nitrogen (TKN)	mg/l	NE	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.79	NE	NE	1.2	1.6	1.2	<0.5	0.66	1.1	1.0	<0.5	0.53	0.6	0.79	0.56
Metals (Total)																									
Arsenic	mg/l	NE	NE	<0.005	NE	<0.005	NE	NE	<0.005	NE	NE	NE	NE	<0.005	NE	NE	NE	<0.005	NE	NE	<0.005	NE	NE	<0.1	NE
Barium	mg/l	NE	NE	<1.0	NE	<1.0	NE	NE	<1.0	NE	NE	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0	NE
Cadmium	mg/l	NE	NE	<0.005	NE	<0.005	NE	NE	<0.005	NE	NE	NE	NE	<0.005	NE	NE	NE	<0.005	NE	NE	<0.005	NE	NE	<0.005	NE
Chromium	mg/l	NE	NE	<0.01	NE	<0.01	NE	NE	<0.01	NE	NE	NE	NE	<0.01	NE	NE	NE	<0.01	NE	NE	<0.01	NE	NE	<0.01	NE
Lead	mg/l	NE	NE	0.01	NE	<0.005	NE	NE	0.008	NE	NE	NE	NE	0.0091	NE	NE	NE	0.0091	NE	NE	0.0097	NE	NE	<0.15	NE
Antimony	mg/l	NE	NE	<0.005	NE	<0.005	NE	NE	<0.005	NE	NE	NE	NE	<0.005	NE	NE	NE	<0.005	NE	NE	<0.005	NE	NE	<0.2	NE
Beryllium	mg/l	NE	NE	<0.1	NE	<0.1	NE	NE	<0.1	NE	NE	NE	NE	<0.002	NE	NE	NE	<0.002	NE	NE	<0.002	NE	NE	<1.0	NE
Nickel	mg/l	NE	NE	<0.1	NE	<0.1	NE	NE	<0.1	NE	NE	NE	NE	<0.1	NE	NE	NE	<0.1	NE	NE	<0.1	NE	NE	<0.08	NE
Mercury	mg/l	NE	NE	<0.001	NE	<0.001	NE	NE	<0.001	NE	NE	NE	NE	<0.001	NE	NE	NE	<0.001	NE	NE	<0.001	NE	NE	<0.001	NE
Selenium	mg/l	NE	NE	<0.005	NE	<0.005	NE	NE	<0.005	NE	NE	NE	NE	<0.005	NE	NE	NE	<0.005	NE	NE	<0.005	NE	NE	<0.1	NE
Thallium	mg/l	NE	NE	<0.002	NE	<0.002	NE	NE	<0.002	NE	NE	NE	NE	<0.002	NE	NE	NE	<0.002	NE	NE	<0.002	NE	NE	<0.1	NE
Volatile Organic Compounds (VOCs)																									
Benzene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	<0.0005	NE	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	NE	<0.0005	NE	NE	<0.0005	NE
Carbon Tetrachloride	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
o-Dichlorobenzene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	<0.0005	NE	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	NE	<0.0005	NE	NE	<0.0005	NE
para-Dichlorobenzene	mg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	<0.0005	NE	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	NE	<0.0005	NE	NE	<0.0005	NE
1,2-Dichloroethane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
1,1-Dichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
cis-1,2-Dichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
trans-1,2-Dichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
1,2-Dichloropropane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
Ethylbenzene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
Monochloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
Styrene	µg/l	NE	NE	<0.0005	NE	<0.0005	NE	NE	<0.0005	NE	NE	NE	NE	<0.0005	NE	NE	NE	<0.0005	NE	NE	<0.0005	NE	NE	<0.0005	NE
Tetrachloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
Toluene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
1,1,1-Trichloroethane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
1,1,2-Trichloroethane	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
Trichloroethylene	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
Trihalomethanes (total THMs)	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
Vinyl Chloride	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE
Xylenes (total)	µg/l	NE	NE	<0.5	NE	<0.5	NE	NE	<0.5	NE	NE	NE	NE	<0.5	NE	NE	NE	<0.5	NE	NE	<0.5	NE	NE	<0.5	NE

NE = No Event (No sample was taken)
 * Total Nitrogen is equal to Nitrate-Nitrite + TKN (per APF No. P-101191)

Table 7. Water quality analyses from samples taken at monitor well HP-1

Constituent	Unit	Sample Date: Source Water																							
		2005												2006											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Nutrients																									
Total Nitrogen*	mg/l	3.62	2.9	2.6	3.0	3.6	3.74	2.9	4.6	2.6	3.1	3.0	4.0	4.0	2.6	2.0	2.4	3.4	3.2	3.2	3.3	NE	3.0	2.7	2.3
Nitrate-Nitrite as N	mg/l	3.1	2.9	2.6	3.0	3.1	3.2	2.9	3.1	2.6	3.1	3.2	2.5	2.8	2.6	2.8	2.4	2.8	3.2	3.2	3.3	NE	2.8	2.7	2.3
Total Kjeldahl Nitrogen (TKN)	mg/l	0.52	-0.3	-0.3	-0.3	0.53	0.54	-0.3	1.5	-1.3	-1.3	1.8	1.5	2.0	-1.3	-1.3	-1.3	2.6	-1.3	-1.3	-1.3	-1.3	3.0	-1.3	-1.3
Metals (Total)																									
Arsenic	mg/l	NE	NE	-0.005	NE	-0.005	NE	NE	-0.005	NE	NE	0.0017	NE	NE	0.0013	NE	NE	NE	0.002	NE	NE	0.002	NE	NE	NE
Barium	mg/l	NE	NE	<1.0	NE	<1.0	NE	NE	<1.0	NE	NE	0.13	NE	NE	0.14	NE	NE	NE	0.17	NE	NE	0.15	NE	NE	NE
Cadmium	mg/l	NE	NE	-0.001	NE	-0.003	NE	NE	-0.003	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE
Chromium	mg/l	NE	NE	-0.03	NE	-0.03	NE	NE	-0.03	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE
Lead	mg/l	NE	NE	0.0057	NE	0.0055	NE	NE	0.0055	NE	NE	0.0064	NE	NE	0.0041	NE	NE	NE	0.0012	NE	NE	0.004	NE	NE	NE
Antimony	mg/l	NE	NE	-0.0048	NE	-0.0048	NE	NE	-0.0048	NE	NE	-0.003	NE	NE	-0.003	NE	NE	NE	-0.003	NE	NE	-0.003	NE	NE	NE
Beryllium	mg/l	NE	NE	-0.002	NE	-0.002	NE	NE	-0.002	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE
Nickel	mg/l	NE	NE	-0.08	NE	-0.08	NE	NE	-0.08	NE	NE	0.001	NE	NE	0.0013	NE	NE	NE	0.0036	NE	NE	0.011	NE	NE	NE
Mercury	mg/l	NE	NE	-0.001	NE	-0.001	NE	NE	-0.001	NE	NE	-0.0002	NE	NE	-0.0002	NE	NE	NE	-0.0002	NE	NE	-0.0002	NE	NE	NE
Selenium	mg/l	NE	NE	-0.005	NE	-0.005	NE	NE	-0.005	NE	NE	-0.002	NE	NE	-0.002	NE	NE	NE	0.0024	NE	NE	-0.002	NE	NE	NE
Thallium	mg/l	NE	NE	-0.0016	NE	-0.0016	NE	NE	-0.0016	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE
Organics																									
Benzene	ug/l	NE	NE	-0.0005	NE	-0.0005	NE	NE	-0.0005	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE	-0.001	NE	NE	-0.001	NE	NE	-0.001
Carbon Tetrachloride	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
cis-Dichlorobenzene	ug/l	NE	NE	-0.0005	NE	-0.0005	NE	NE	-0.0005	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE	-0.001	NE	NE	-0.001	NE	NE	-0.001
para-Dichlorobenzene	ug/l	NE	NE	-0.0005	NE	-0.0005	NE	NE	-0.0005	NE	NE	-0.001	NE	NE	-0.001	NE	NE	NE	-0.001	NE	NE	-0.001	NE	NE	-0.001
1,2-Dichloroethane	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
1,1-Dichloroethylene	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
cis-1,2-Dichloroethylene	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
trans-1,2-Dichloroethylene	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
1,2-Dichloropropane	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
Ethylbenzene	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
Monochloroethylene	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
Styrene	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
Tetrachloroethylene	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
Toluene	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
1,1,1-Trichloroethane	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
1,1,2-Trichloroethane	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
Trichloroethylene	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
Tribromoethanes (total THMs)	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
Vinyl Chloride	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<1.0	NE	NE	<1.0	NE	NE	NE	<1.0	NE	NE	<1.0	NE	NE	<1.0
Xylenes (total)	ug/l	NE	NE	-0.5	NE	-0.5	NE	NE	-0.5	NE	NE	<2.0	NE	NE	<2.0	NE	NE	NE	<2.0	NE	NE	<2.0	NE	NE	<2.0

NE = No Event (No sample was taken)
 * Total Nitrogen is equal to Nitrate-Nitrite + TKN (per APP No. P-101191)

water (treated effluent) diverted from the Santa Cruz River has been recharged at the Marana High Plains Recharge Facility (MHP). The regional aquifer at the Facility can accommodate an additional 600 AF/yr of effluent dominated water over the next 20 years. The depth to water at the Facility is approximately 184 feet bgs, and a mounding analysis has predicted a 20-year rise of approximately four feet beneath the facility and one foot no greater than 1.75 miles from the facility as a result of MHP recharge.

Additional water level rise due to other storage facilities in the vicinity is estimated at 7.25-9.0 feet/yr over the twenty-year period. Without recovery, the depth to water at MHP may approach near surface and will need to be carefully monitored, especially near the end of the twenty year period. This is not an unforeseen circumstance. Both the High Plains and LSC Replenishment Project were conceived at the same time, and both operate under alert levels and prohibition levels to ensure that the mounding will never rise to unsafe levels. At the Replenishment project, recharge will have to cease recharge if water levels rise to a certain distance from the bottom of the Tangerine Landfill.

Lack of recovery has contributed to the rising water levels, as well. Participants in the nearby storage projects are formulating recovery plans for the recharged CAP and effluent. In addition, the availability of CAP to recharge is likely to decline in the future. We urge ADWR to promulgate recovery of the recharged CAP and effluent from the other nearby recharge facilities to avoid impacts. However the MHP is a very small contributor to the recovery of water levels in the area.

Seasonal maintenance of the recharge basins will include semi-annual disking of all basins, avoiding removal of the riparian trees planted on the side slopes. This is a higher level of maintenance than was provided during the pilot period. Infiltration rates are measured using the volumetric method, as described in Section 6.1. Infiltration rates during operation will be improved over past amounts due to the proposed basin modifications, monitoring methods, and additional maintenance. Our experience from water-quality monitoring of the facility and downgradient monitor wells shows negligible impact to the receiving groundwater.

Unreasonable harm to the aquifer of land has been evaluated with no unreasonable harm anticipated. Potential causes of unreasonable harm include: 1) Use of treated effluent as source water creating poor quality groundwater, 2) Perching of recharge water in the vadose zone, 3) damage or malfunction of the facility of equipment, and 4) mobilization of harmful constituents from the vadose zone.

Groundwater and source water quality has been monitored in accordance with an Aquifer Protection Permit (APP) for the Facility. Contingencies have been addressed in the APP for the Facility. During the past two years, water quality monitoring has found no exceedances of the Alert Level set in the APP for any constituent analyzed. Contingencies have been addressed in the APP. The upstream wastewater treatment facilities have been discharging effluent for more than 20 years. The effluent has been naturally recharging the aquifer. The small amount of proposed recharge from this constructed facility should not impact the water quality and the amount recharged has not impacted the aquifer. No unreasonable harm is expected from use of treated effluent to recharge the regional aquifer, in the vicinity of the project. The mounding analysis has predicted a four-foot rise in the water table beneath the site and a one-foot rise in the regional water table as a result of the proposed

recharge. With the depth to water at the facility of 180-190 feet bgs, no unreasonable harm is expected from the water level rise. The on-site vadose zone well at MHP has detected negligible perching of recharged water. Based on the specific nature of the High Plains Effluent Recharge Project, and observations made at this site for four years and similar recharge projects regarding impacts to ambient water quality, it appears highly unlikely that the High Plains Project will change aquifer conditions.

The Facility is a hands-on project that is checked on a daily basis, monitored and inspected and water sampled by facility operators. Having Town of Marana as a co-permittee means that the facility is subject to the local jurisdiction's oversight, as well as the District's. The facility will not be subject to unreasonable harm by non-attendance.

The possibility of mobilization of harmful constituents from the vadose zone has been investigated. The facility location is not within or adjacent to suspected land use that could generate unreasonable harm to the aquifer. All the water quality data from the on-site monitor well has indicated no increase in potentially mobilized constituents.

6.0 OPERATIONAL MONITORING PLAN

6.1 Infiltration Rates in the Basins

Infiltration rates are calculated daily for each basin during operation of the recharge project using the “volumetric” method. The volumetric method utilizes flow and water level data taken from an area/velocity probe installed within each basin distribution system. Water level data, along with topography of the basin, is used to determine the aerial extent of water (wetted area) within the basin. An empirical equation allows conversion of the flow rate into each basin to be converted to volume over time. The volumetric method consists of dividing daily recharge volume, adjusted for evaporation losses, by daily wetted area of the basin.

6.2 Discharge Volume Monitoring

The volume of water discharged from the facility will be estimated using a simple water budget method that accounts for inflow at the point of diversion minus evaporation losses from the storage pond and recharge basins, and evapotranspiration losses from the riparian vegetation. Inflow to the facility will be measured using an electro-magnetic totalizing flow meter connected to the inflow pipe. Losses due to evaporation are calculated from the Cooley Method (1970) using the “Maximum Curve”, as approved by Arizona Department of Water Resources. Evapotranspiration losses (ET) in the vegetated basins are determined from the average monthly data reported by AZMET for the Marana Agricultural Station. The location of this station and details of how ET is determined by AZMET are provided in the 2006 Annual Monitoring Report (**Appendix D**). The location and method of losses due to evapotranspiration are calculated based on the area and type and age of vegetation on the floor of the basins. Planting around the recharge basins is emphasized by establishment of plants that are tolerant of desiccation once established. Plants on the margins or the outside of the basins are not considered in the transpiration estimates because they rely on water infiltrating into the basins during the pilot study. Supplemental irrigation is provided to these plants.

6.3 Basin Water Level Monitoring System

Each basin will be equipped with a standard staff gage for visual observation of water depth. The staff gage shall have an accuracy of a tenth of an inch. The basins may also be equipped to provide a continuous record of stage using pressure transducers having a measurement accuracy of 0.1%.

6.4 Use of On-Site Monitor Wells

Onsite groundwater monitoring is facilitated through the use of one monitor well (HP-1) and one piezometer (HP-2) at the locations shown in **Figure 2**. Monitor well HP-1 is located on the downgradient edge of the project site and serves as the facility point-of-compliance (POC) in accordance with APP requirements. The well is equipped with a dedicated pump that is used to provide low volumes of supplemental water to establish plants and to maintain them during times when effluent base flows are interrupted. The well pump does not produce more than 35 gpm. The

well may be equipped with a data logger, which can provide water level data on a daily basis. **Appendix C** provides a general construction detail for monitor well HP-1.

Piezometer HP-2 is located in the center of the cluster of recharge basins and is used to monitor possible shallow groundwater mounding resulting from the presence of a low permeability soil layer. Based on existing geologic data, there appears to be perched aquifer conditions at approximately 80 feet in depth. Soils at this depth, and extending to about the 100-foot depth, contain significantly more fine-grained materials than soils above and below this interval. Lithologic descriptions indicate that perching at the Fort Lowell - Recent Alluvium contact is unlikely. No evidence of perched aquifer conditions was noted at this depth during the drilling of Borehole C (**Figure 17**). HP-2 is not equipped with a dedicated pump, but is constructed to allow for the collection of bailed samples in the event that groundwater mounding in the interval does occur. The general construction detail for HP-2 is located in **Appendix C**.

The completion reports for the on-site monitoring wells have been submitted to ADWR and are also provided in **Appendix C**. The reports include construction and development methods, borehole logs, as-built construction diagrams and other relevant information concerning site-specific hydrogeologic conditions.

6.5 Groundwater Level Monitoring

Groundwater levels will be collected once a month from monitor wells HP-1 and HP-2, using a conductivity based water level indicator (sounder). The sounder has a maximum depth of 500 feet of cable, calibrated in one-foot increments, with an accuracy of 0.005 percent.

A water level data logger may be installed at HP-1 in the future to allow continuous recording of water levels on either a daily or weekly basis. The water level data logger device will include a pressure transducer that is specifically designed to be used in small diameter monitor wells and has a measuring accuracy of at least $\pm 0.1\%$. The device will be attached to a cable and lowered into the well, with the cable fixed at the wellhead. The pressure transducer will be removed from the well every six months for the purposes of calibration.

Regional elevation data is compiled from cooperative sources for wells SC-9, SC-10, AVMW-1 and other regional wells to estimate the regional groundwater flow direction and gradient. Water levels in SC-9 and SC-10 are measured with an electronic well sounder. Water levels in AVMW-1 are measured using a downhole pressure transducer connected by Teflon coated cable to an above ground data logger. An Aquistar pressure transducer, model PS9001, having a measuring range of 0 to 15 pounds per square inch will be used. The pressure transducer and the data logger will have a measuring accuracy of $\pm 0.1\%$. Groundwater level data for regional wells is available through an existing Memorandum of Understanding (MOU) between Central Arizona Water Conservation District (CAWCD), Pima County (Solid Waste and Wastewater Management), and Pima County Flood Control District provided in **Appendix G**. Available well construction diagrams and well logs for SC-9, SC-10 and AVMW-1 are provided in **Appendix H**.

6.6 Water Quality Monitoring

Water quality monitoring includes the analysis of samples collected from the on-site monitor well and from the source-water inflow near the pump station. Water quality monitoring is conducted on a monthly basis for nitrogen species and quarterly for all other constituents as shown in Tables 7 and 8. We propose to reduce the frequency of nitrogen sampling to once every three months (quarterly). Fecal and total coliform was analyzed during the initial sampling round and will also be analyzed during the final annual sampling round. In addition, the source water is monitored for temperature, conductivity, turbidity and dissolved oxygen on a monthly basis. This would be reduced to a quarterly basis under our new proposal. Groundwater quality data collected by others for monitor wells SC-9 and SC-10 as well as AVMW-1 may be used to monitor groundwater quality upgradient and downgradient of the facility. This data will also be provided through the existing MOU between Pima County and CAWCD, if needed.

6.6.1 Groundwater Sampling

Well Purging and Field Parameters

Monitor well HP-1 is purged using a dedicated submersible pump prior to compliance sampling. During purging, samples are collected from the discharge stream at the commencement of purging and after each subsequent evacuation volume. The samples are measured for the field parameters of pH, temperature, specific conductance, and total dissolved solids, with the values entered into a field activities logbook. Purging of the well continues until all the field parameters have stabilized to within 10 percent over three consecutive evacuation volumes. Purge and sample overflow water generated during sampling is discharged onsite. The volume of water (in gallons) contained in one "evacuation volume" is calculated using the following equation:

$$\text{One evacuation volume} = (TD-DTW) \pi (r^2)(7.48),$$

where:

- TD is equal to the depth of the well (in feet).
- DTW is equal to the depth of water in the well. This will be measured prior to the initiation of well evacuation procedures.
- π is equal to 3.14.
- r is equal to the inner radius (in feet) of the well casing.
- 7.48 is the conversion factor from cubic feet to gallons.

Groundwater Sampling Methods

Sample collection begins as soon as possible after well evacuation is complete. A purge water sample is collected at the conclusion of purging and evaluated visually for turbidity. This observation is recorded in the field notes. Samples are collected through a sampling spigot assembly attached to the pump discharge tube. Samples for volatile organic analyses are collected using methods to minimize potential volatilization. In order to minimize volatilization during sample collection, the container is angled to reduce disturbance of the sample as it enters the container. The

container is filled to slightly overflowing, forming a convex meniscus at the mouth of the container. The cap is placed upon the convex meniscus and screwed on tightly to seal the container. To check that the sample is air free, the container is inverted gently and the cap gently tapped. The absence of entrapped air indicates a successful seal. If air is encountered in the container, the entire sample is discarded and the water sample is re-collected in a new vial.

6.6.2 Source Water Sampling

Source-water samples are collected at the point of discharge into the facility (along the oxbow, near the facility's wet well structure). Samples are collected by dipping a long handled sampling cup directly into the flow stream and placing the sample aliquot into a sampling jug, which is equipped with a discharge spout. Once a sufficient amount of sample is collected in the sampling jug, individual sample containers are filled from the jug.

6.6.3 Sample Handling

Required containers, preservation methods, and holding times for the groundwater and source-water samples collected as part of compliance monitoring are consistent with laboratory requirements and current EPA guidelines. These requirements are summarized below:

Containers - The choice of sample container is based on the chemical constituents for which the samples are to be analyzed. Containers are supplied by the contract laboratory. Samples to be analyzed for VOCs are collected in 40 ml vials with Teflon-lined lids. Samples analyzed for dissolved metals and general inorganics are collected in one-liter glass or plastic bottles. Samples for organochlorine pesticides and chlorinated herbicides are collected in one liter, amber glass bottles. Trip blanks containing laboratory-grade, organic-free water are provided by the laboratory. A temperature blank is shipped in every cooler to record the temperature of the cooler upon receipt by the contract laboratory.

Preservation - Preservatives are added to sample containers by the contract laboratory prior to shipment of the bottles. Samples collected for nitrogen species are preserved with sulfuric acid to a pH of less than two. Samples collected for VOC analysis are preserved with hydrochloric acid to a pH of less than two.

Sample Labeling - The sample label includes the site name, sample location, date and time of collection, initials of the person who collected the sample, and a listing of the required analyses by name and method number. QC duplicate samples are labeled in a manner that does not indicate an association with their duplicate groundwater sample.

Sample Storage - All samples are placed on ice in a cooler at approximately 4°C immediately after being collected. Each set of two, VOC sample bottles is placed in a separate, sealed, plastic zip-lock bag. All sample bottles are placed in plastic bags and stored upright in the cooler.

Safety - Samples are collected using latex gloves to prevent exposure to possible biological contaminants associated with effluent. A mobile telephone is available onsite for communications in the event an emergency should arise.

Field Documentation - Field documentation includes chain-of-custody records and a field logbook as described below.

6.6.4 Chain-of-Custody Record

The chain-of-custody record is initiated by the person who collects the field sample. Whenever a sample is transferred to another responsible party (i.e., to the field supervisor for transporting to the laboratory), the receiving party must sign off for relinquishment of the chain-of-custody record. Likewise, the chain-of-custody is finally relinquished to the receiving agent in the laboratory after all transported samples are checked against the chain-of-custody record. An individual chain-of-custody record is prepared to accompany each batch of samples submitted.

6.6.5 Field Logbook

A bound field logbook is kept by the field hydrologist. This log contains a record of all field activities and measurements at the site. The pages are sequentially numbered and completed in indelible ink. All corrections or changes are marked out with a single line and the correction written immediately above or below it. At the end of the day, the person keeping the daily log signs and dates the book, marking through any blank space below his signature. Information recorded in the field logbook includes the following:

- Effluent inflow totalizer readings;
- Static water levels for each well, as measured using a manual sounding device;
- Calibration of water quality monitoring equipment;
- Purge volumes, field parameter measurements and ambient temperature & atmospherical conditions;
- Observations such as the presence of sheen, turbidity, and odor in groundwater and source-water samples;
- Documentation of decontamination procedures;
- Sample collection times; and
- Documentation of any problems encountered in the field and steps taken to mitigate those problems.

6.6.6 Field Quality Control Samples

In addition to internal laboratory evaluations of data quality and trip blanks, QC duplicates will be collected and analyzed as part of initial characterization and the ongoing monitoring program. Field quality control samples will be as follows:

Trip Blanks - Trip blanks are used when the samples collected will be analyzed for volatile organics. The trip blank is a laboratory-provided sample of organic-free water that is intended to accompany the samples from collection until arrival at the laboratory. Trip blanks are subjected to the same handling that all samples are and serve to indicate the potential for sample contamination due to

contaminated shipping containers, broken sample bottles, or storage procedures. Trip blanks are not opened in the field. When volatile organics are found in a trip blank, it indicates that contamination may have been introduced to investigative samples during sample handling, storage, or transportation. Trip blanks should be used to assess potential contamination sources, but their results should not be used for blank subtraction. Every cooler shipped with VOC samples shall have a trip blank included.

Quality Control Duplicate Samples - QC duplicate samples are used to measure the overall precision of the sampling and analytical process. Sample collection, handling and storage, shipment, preparation, and analyses are identical for both normal and QC duplicates. By comparing the results of the normal and QC duplicate samples, a measure of precision can be made that includes the effects of both samples and analytical variability. For this project, duplicates are submitted only for samples analyzed for nitrogen species at a rate of approximately 30%.

Equipment Blanks - It is not necessary to collect equipment blanks since all of the sampling equipment used for this project is dedicated to a particular sampling location for the duration of the project.

Decontamination Procedures - Sampling equipment which requires decontamination is limited to the long handled sampling cup and sample jug used for the source-water sampling, the sampling spigot used for monitor well sampling, and the probe and first few feet of the manual water level sounder. The equipment is decontaminated with an Alconox solution and double rinsed with distilled water before each sampling round.

Equipment Calibration - Field equipment used for this project will include a combination pH/conductivity/temperature meter and an automatic data logging device for continuous measurement of water levels. Conductivity and pH will be calibrated using fresh standard solutions. The data logger will be checked against a manual sounding device on no less than a monthly basis. Calibration information will be recorded in the field logbook.

6.6.7 Laboratory Analysis

All laboratory analysis will be performed by an Arizona Department of Health Services approved lab. Laboratory licensing information will be provided in the operational monitoring reports. A summary of the analytical methods used for testing water quality samples taken at the Project site is presented in **Table 8**.

Table 8. Summary of proposed analytical testing

Constituent*	Sampling Location**	Frequency &	EPA Method or Equivalent
Total Nitrogen = Nitrate as Nitrogen + Nitrite as Nitrogen + Total Kjeldahl Nitrogen	Quarterly for source water Quarterly for groundwater		300.0/351.1
Total Metals (Ar, Ba, Cd, Cr, Pb, Se, Hg)	Quarterly for source water Quarterly for groundwater		200 Series
Volatile Organic Compounds	Quarterly for source water Quarterly for groundwater		524.2

Notes: * Taken from ADEQ APP No. P-103195

** Source water at facility's wet well structure; groundwater at HP-1

In addition to the careful calibration of all laboratory instrumentation with standard solutions, a series of QC samples will be included in all analytical batches. Some QC checks are analyzed daily and others are analyzed once for every 20 samples of the same matrix. These QC checks are used to flag analyses that need to be re-run. The types of control samples used are: check standards, method blanks, method blank spikes, and matrix spikes. Corrective actions may be required if QC data falls outside of laboratory control limits. These limits are based on method requirements or in-house control charts, whichever is more stringent. A summary of quality control criteria is provided below:

Independent Check Standards - Independent check standards are mid-range standards prepared using a standard source independent of the calibration standard. A check standard is analyzed after each initial calibration. If the percent recovery of the check standard fails acceptance criteria, corrective action is taken prior to analysis of samples.

Method Blanks - Method blanks are designed to monitor the level of contamination introduced by reagents, extraction solvents, glassware, etc. They are prepared and processed in exactly the same manner as samples and spikes without the addition of standard solutions. At least one method blank is analyzed for every batch of samples analyzed for each sampling round. Corrective actions are taken if any target compounds are present at concentrations above the reported detection limit.

Method Blank Spikes - The method blank spike sample is designed to measure accuracy of extraction and analytical techniques and is not subject to undesirable matrix effects. Spikes are prepared in reagent water or clean soil and are treated as samples. A MBS is required daily or with every preparation batch. Laboratory-established control limits are used.

Matrix Spike Samples - A matrix spike (MS) sample is a sample spiked to monitor recovery of the analytes for a matrix type. Due to the high variability within matrix types and the necessity of batching samples from varied sources, MS information from one sample is not necessarily relevant to other samples in the same batch. MSs are prepared by spiking a portion of sample with a known amount of standard and then taking it through all steps of the analytical procedure. The spiked levels should be between five times the detection limit and the upper calibration point, or twice the concentration of the analyte in the sample, whichever is greater. One random, matrix-spiked sample

is prepared and analyzed for every analytical batch.

Out-of-range recovery may be a result of a matrix interference. The result of the MBS is often used to determine the reason behind the matrix spike failure. The matrix spike is not used to judge lab performance, but rather to determine the presence of interference due to matrix effects.

Matrix Spike Duplicates - Matrix spike duplicates (MSDs) are analyzed to monitor precision of the method. A separate portion of the control matrix sample is weighed, spiked, and analyzed in the same manner as the MS sample. One MSD is analyzed per analytical batch. The relative percent difference (RPD) between these replicates must fall within laboratory control limits unless the sample is non-homogeneous. If the RPD is out of limits, matrix inhomogeneity will be investigated. The laboratory QA/QC manager will make the final determination on the affect of matrix inhomogeneity on the RPD.

6.6.8 Quality Control Review

All laboratory analytical data and QA/QC data compiled as part of this project is carefully reviewed to determine if any inconsistencies exist and to determine if all quality control criteria have been met. A cation/anion balance will also be completed when appropriate. In the event that a QA/QC problem exists, the contract laboratory will immediately be contacted to mitigate the problem and, if necessary, initiate corrective actions. QA/QC problems, as well as their solutions, will be documented in the monitoring reports.

6.6.9 Reporting

Operational monitoring reports are submitted to ADEQ on a semi-annual basis. Information to be included is as follows:

- Hydrograph of static water levels in monitor well HP-1 as recorded by the data logger as well as tabulated water level data collected from piezometer HP-2 using a manual sounding device;
- Map showing regional water level contours. This map may not be updated semi-annually, depending when cooperative water level data is made available;
- Current and cumulative effluent inflow totalizer readings and the estimated volume of recharge since the last quarterly report and since the initiation of recharge activities;
- Summary of any sampling protocols or procedures which deviated from the accepted monitoring plan;
- Current and previous water quality data and a discussion of water quality changes or trends;
- Copies of original laboratory reports and chain-of-custody forms; and
- Discussion of field and laboratory QA/QC samples and data viability based on QA/QC criteria.

6.6.10 Contingency Plan

An exceedance of an aquifer water quality standard in the facility POC well will be evaluated by a comparison of upgradient and downgradient water quality in monitor wells SC-9 and SC-10, at a

minimum, and the analysis of ambient conditions in the POC well. An attempt will be made to schedule sampling at the facility POC well to coincide with sampling at SC-9 and SC-10 that is completed by Pima County Wastewater Management Department.

A sample will be collected from piezometer HP-2 (if water is present) at the next regularly scheduled date in the event that an exceedance is found in HP-1. If static water levels in either the piezometer or monitor well rise to 20 feet below land surface, inflow to the recharge facility will be halted. Pima County Flood Control will notify ADEQ and ADWR of the situation within 48 hours from the time of its detection.

In the unlikely event it is suspected that an exceedance has occurred due to on-site activities, the emergency response coordinator will immediately contact ADEQ to discuss the analytical results and determine best course of action. For this project, the emergency response coordinator will be as follows:

Thomas Helfrich, Manager
Water Resources Division
Pima County Regional Flood Control District
(520) 243-1800 (during business hours)
(520) 444-3637 (evenings and weekends)

7.0 DEMONSTRATION OF TECHNICAL AND FINANCIAL CAPABILITY

7.1 Authority

Arizona Revised Statutes §48-3603 authorizes Pima County Flood Control District (District) to enter into intergovernmental agreements and contracts to carry out the objects and purposes of the District. ARS §48-3603 parts 17 and 19 provide specifically that the District may enter into intergovernmental agreements with State, Federal and local jurisdictions to construct, operate and maintain recharge facilities.

7.2 Technical Capability

Operation and management of the proposed recharge project will be directed under the supervision of District staff. Compliance with the terms of the facility permit will be the joint responsibility of the District and the Town of Marana.

District/County Organization

Although Pima County Regional Flood Control District and Pima County are two separate legal entities, the County Board of Supervisors also sits as the District's Board. The District will operate the High Plains project, but in designing, constructing, and operating the Project, it will draw upon the expertise of the County's other Public Works Departments, such as Transportation, Wastewater Management, and Solid Waste. The District pays for services rendered by other Public Works Departments via an interdepartmental transfer of funds from the District to Pima County. The District and these other Public Works Departments report to the same County Administrator.

The District consists of various divisions. The Water Resources Division, led by Thomas Helfrich, has the primary responsibility for the facility. There were over 50 full-time equivalent personnel funded by the District in FY 2005-2006, mostly hydrologists, engineers, and administrators.

The District uses traditional as well as new and innovative approaches to reduce flood damage and loss, while seeking to maximize the benefits provided to the community through judicious management of the County's floodplain resources. Structural and nonstructural programs form the basis of the District's flood loss prevention plan. Structural programs include construction and maintenance of bridges, bank stabilization, levees, and regional storm water detention basins. The District has successfully completed many large multi-purpose construction projects in the past, including re-configuring Randolph Park to serve as a flood-control detention facility while maintaining golf course opportunities and preserving existing mature trees. Nonstructural programs include an effective and nationally recognized floodplain management ordinance, a flood-prone land acquisition program, a real-time flood-warning network, and river and basin management planning. In addition to managing floodplains and flood control projects, the District is involved in several complementary activities: 1) groundwater replenishment, 2) riparian habitat preservation and mitigation, and 3) river park development. For instance, the District has overseen design and

construction of the adjacent Lower Santa Cruz Replenishment Project, now operated by Central Arizona Project.

Support is provided to the District by the following divisions within the Department of Transportation: Maintenance Operations, Field Engineering, Transportation Engineering, and Technical Services. Support is also provided by Administrative Support Services (contracting and budgeting), the Pima County Attorney's Office, and other Public Works Departments. Wastewater Management Department, for instance, operates facilities that treat over 60 million gallons of sewage daily to federal and state standards, and runs a state-licensed laboratory. Through its various activities, the District and County have the staff to administer large construction projects, operate and maintain water works, and conform to water quality monitoring requirements.

Town of Marana Organization

The Town of Marana is governed by a seven-member Council that is responsible for establishing policy and procedures to be carried out by staff. The Town Manager is appointed by the Council as the Chief Executive Officer of the Town. As such, he/she is responsible for the day-to-day operations of the Town.

The Town Manager analyzes and supervises the functions, duties and activities of the various Departments, Boards, Commissions and services of the Town government and all employees thereof, and makes recommendations to the Council regarding the overall operation of the Town government. The departments reporting to the Town Manager are: Budget & Finance, Human Resources, Utilities, Engineering/Public Works, and Development Services.

The Town Council has directed staff to be certain the Town of Marana is the water provider within the Town boundaries and the Utility Department has plans for staffing to meet its demands to adequately handle the water issues. The Town currently is a member of the Central Arizona Groundwater Replenishment District (CAGRD) and has a Designation of Assured Water Supply for 100 years from the Arizona Department of Water Resources. The Town is very interested in helping to maintain the current levels in the regional aquifer.

7.3 Key Project Personnel

Project Director- Thomas Helfrich

Mr. Helfrich currently serves as Water Resources Division Manager for the Pima County Transportation and Flood Control District. For this project, he will provide input and expertise in the area of facility evaluation and water policy, and direct allocation of the Project financial resources. Mr. Helfrich has over 25 years of experience in the public works field with an emphasis on water resource policy, flood control improvements, riparian restoration projects and development of flood warning and meteorological stations.

Program Manager - Julia E. Fonseca

Ms. Fonseca is the District's Program Manager for the District's water resource activities. During her eighteen years at the District, she has conducted numerous investigations involving groundwater recharge, natural resource management, hydrology and hydraulics, water quality monitoring, and surface water rights. Ms. Fonseca was the project manager for the Rillito Recharge Project and the Lower Santa Cruz Replenishment Project. The Rillito project involved extensive monitoring of groundwater and surface-water quality, as well as hydrogeologic and design investigations. Her role in the Lower Santa Cruz Replenishment Project included overseeing feasibility, permitting and design. Ms. Fonseca has successfully overseen riparian restoration along Cienega Creek and the San Pedro River, and water-quality sampling along Rillito and Cienega Creeks.

Project Technical Advisor – Frank G. Postillion CGWP

Mr. Postillion has served as Technical Advisor for High Plains Effluent Recharge Project for the last year. For this project, he provides over 27 years experience and expertise in the area of artificial groundwater recharge and design and implementation, including sites in the Upper Santa Cruz River Basin, Salt River Basin, and California. Mr. Postillion has over 30 years of experience in the public works field and private sector with an emphasis on water resource evaluations, water supply, groundwater investigations, and groundwater contamination evaluations and remediation.

Project Manager – David Scalero

David Scalero has served as the Project Hydrologist for the High Plains Effluent Recharge Project for the last two years, overseeing all monitoring, maintenance, and operations. Mr. Scalero has over ten years experience on a variety of projects dealing with both surface and subsurface hydrology. Project experience includes surface water, ground water and sampling for hazardous and non-hazardous constituents, and the development of long term water quality and water quantity monitoring plans for both ground water and surface water related projects. He is Resource Manager for the Cienega Creek Preserve, having had extensive water level and water quality monitoring experience.

Town of Marana - Brad DeSpain

Mr. DeSpain will represent the Town of Marana (a co-applicant for this permit) in most issues concerning the High Plains Project. Mr. DeSpain will provide input and review of facility permits and design plans and will assist with issues specifically related to the project's location in the Town of Marana. Mr. DeSpain currently serves as Utility Director for the Town of Marana, and has spent many years in the area dealing with a wide variety of agricultural and natural resource management issues. He oversees the current contract of BKW Farms, who performs the daily monitoring and maintenance activities at the recharge facility. Doing business as Bridle Bit Inc., he recently took over the state land lease associated with the pasture irrigation adjacent to the recharge facility.

7.4 Financial Capability

The District has constructed the Marana High Plains Facility with funds for acquisition and

development from the Bureau of Reclamation, Arizona Water Protection Fund and by the District in the Capital Improvement Program. District activities are funded by a secondary tax levied on real property, which raised \$ 16.6M in Fiscal Year 2003-2004 with general obligation and district bonds, federal and state assistance, developer participation, earned interest and other miscellaneous revenues. Monies for FY 2003-2004 include funding for operations and maintenance (O &M) of the Facility. The total O&M cost for 2003 was \$27,953 and is detailed in Section 3.3 of this report. The Town of Marana has also provided in-kind assistance in the form of staffing and monthly payment to BKW Farms to monitor the Facility on a daily basis.

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APPENDIX A
REQUIRED PERMITS

APPENDIX A.1

**RIGHT-OF-WAY FROM
ARIZONA STATE LAND DEPARTMENT**

F. ANI RODRIGUEZ, RECORDER
RECORDED BY: CML
DEPUTY RECORDER
1951 ROAD



DOCKET: 11544
PAGE: 486
NO. OF PAGES: 10
SEQUENCE: 20011110153
DATE: 06/08/2001
TIME: 11:44
PICKUP
AMOUNT PAID \$ 0.00

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PIMA CO DEPT TRANSPORTATION
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STATE LAND DEPARTMENT STATE OF ARIZONA

RIGHT-OF-WAY (DEFINITE)

R/W No. 18-106504

RIGHT-OF-WAY effective May 3, 2001, by and between the State of Arizona, hereinafter called the Grantor, and

PIMA COUNTY FLOOD CONTROL DISTRICT

of Tucson, State of Arizona, hereinafter called the Grantee.

WITNESSETH; Grantor grants to Grantee a Right-of-Way on, over, through and across the State lands described on the supplement attached hereto and made a part hereof for the purpose of and subject to the payments, terms, conditions, reservations and exceptions hereinafter set forth, to all of which the Grantee agrees.

TO HAVE AND TO HOLD the same for the period ending May 2, 2011,

The purpose of this Right-of-Way is the location, construction, operation and maintenance of
effluent recharge basin project

Rental shall be payable in advance for the above mentioned period in such amount as determined to be due on the basis of appraisals made by the State Land Commissioner.

The application for this Right-of-Way, together with all maps and attachments thereto, are by this reference made a part hereof as if set forth in full herein.

EASEMENT CONDITIONS

1. Grantee shall not sublet or assign the Right-of-Way herein granted, or any part thereof, without the written consent of Grantor first obtained, nor shall Grantee grant any franchise, permit or other right-of-way on the lands described herein, or any part hereof.
2. Grantee will not permit any loss, nor commit or cause any waste in, to or upon said land; nor cut or remove nor allow to be cut or removed any timber or standing trees that may be upon said land, save and except only such as may be necessary for the authorized use herein.
3. Grantor excepts and reserves out of the grant hereby made, all oils, gases, coal, ores, limestone, minerals, fossils and fertilizers of every name and description that may be found in or upon the land herein described, or any part thereof.
4. Grantor reserves the right to execute Grants covering the land herein described for the purpose of agriculture, grazing, commercial, homesite and prospecting for, and the extraction of oil, gases, coal, ores, limestone, minerals, fossils and fertilizers.
5. Grantor reserves the right to grant easements and rights-of-way over and across the lands described, so long as the same do not interfere with the proper use of this Right-of-Way.
6. Grantor reserves the right to relinquish to the Federal Government the State's right or claim to any part of the land described herein, and thereupon this easement will be null and void insofar as it relates to the land the State has so relinquished.
7. If for any reason the State of Arizona does not have title to any of the land described herein, this easement shall be null and void insofar as it relates to the land to which the State has failed to receive title.
8. If the Grantee should fail to pay the rental when due, or fail to keep the covenants and agreements herein set forth, the State Land Commissioner, at his option, may cancel said easement or declare the same forfeited in the manner provided by law.
9. After any default has occurred, no structure, building or other equipment may be removed from the Right-of-Way without the written permission of the Grantor.
10. The State of Arizona shall be forever wholly absolved from any liability for damages which might result to the Grantee herein on account of this easement having been cancelled, forfeited, or terminated prior to the expiration of the full time for which it is issued.

11. Any lands included in this easement which are sold shall be subject to this easement, and rental shall be collected thereon until such time as the purchaser shall have completed his contract and secured patent to the land.
12. If the Grantee desires to place improvements on the land described herein, the approval of the State Land Commissioner must first be obtained.
13. The terms, conditions and covenants of this easement are subject to present laws relating to State lands, and the rights of both Grantor and Grantee hereunder are each and all subject to such modifications as may be consistent with such amendments, revisions or repeals of existing laws as may hereafter be made, and no provisions of this easement shall create any vested right in the Grantee herein.
14. Grantee agrees to indemnify, hold and save Grantor harmless against all loss, damage, liability, expense, costs and charges incident to or resulting in any way from any injuries to person or damage to property caused by or resulting from the use, condition, or occupation of the land.
15. With regard to the location, construction and maintenance of the Right-of-Way:
 - (a) Grantee shall ensure full compliance with the terms and conditions of this grant by its agents, employees and contractors (including sub-contractors of any tier), and the employees of each of them.
 - (b) Unless clearly inapplicable, the requirements and prohibitions imposed upon Grantee by these terms and conditions are also imposed upon Grantee's agents, employees, contractors, and sub-contractors, and the employees of each of them.
 - (c) Failure or refusal of Grantee's agents, employees, contractors, sub-contractors, or their employees to comply with these terms and conditions shall be deemed to be the failure or refusal of Grantee.
 - (d) Grantee shall require its agents, contractors or sub-contractors to include these terms and conditions in all contracts and sub-contracts which are entered into by any of them, together with a provision that the other contracting party, together with its agents, employees, contractors and sub-contractors, and the employees of each of them, shall likewise be bound to comply with these terms and conditions.
16. All access roads over State land outside the Right-of-Way must be applied for and authorized in accordance with applicable regulations.
17. No material may be removed by Grantee or its contractors without the written approval of the Commissioner.

18. Grantee shall promptly notify the Commissioner of the amount of flora, if any, which will be cut, removed, or destroyed in the construction and maintenance of the project and shall pay the State Land Department such sum of money as the Commissioner may determine to be the full value of the flora to be so cut, removed or destroyed. Grantee shall notify the State Land Department and the Arizona Department of Agriculture 30 days prior to any destruction or removal of native plants to allow salvage of those plants where possible.
19. Grantee shall conduct all construction and maintenance activities in a manner that will minimize disturbance to all land values including, but not limited to vegetation, drainage channels, and streambanks. Construction methods shall be designed to prevent degradation of soil conditions in areas where such degradation would result in detrimental erosion or subsidence. Grantee shall take such other soil and resource conservation and protection measures on the land under grant or permit as determined necessary by the State Land Department.
20. Grantee shall be required, upon completion of right-of-way construction, to make such rehabilitation measures on the State lands, including, but not limited to, restoration of the surface, revegetation, and fencing as determined necessary by the State Land Department.
21. Upon revocation or termination of the Right-of-Way, the Grantee shall remove all equipment or facilities and, so far as is reasonably possible, restore and/or rehabilitate the land to its original condition, to the satisfaction of the Commissioner.
22. Costs incurred by the Grantee in complying with restoration and rehabilitation requirements as determined by the State Land Department on State trust lands shall be borne by the Grantee.
23. Prior to surface disturbance, the Grantee hereof shall provide evidence of archaeological clearance to the Arizona State Land Department. Archaeological surveys and site mitigation must be conducted in accordance with rules and regulations promulgated by the Director, Arizona State Museum. In the event additional archaeological resources are detected by Grantee after receipt of archaeological clearance, all work shall cease and notification shall be given to the Director, Arizona State Museum.
24. THIS DOCUMENT is submitted for examination and shall have no binding effect on the parties unless and until executed by the Grantor (after execution by the Grantee), and a fully executed copy is delivered to the Grantee.
25. IN THE EVENT OF A DISPUTE between the parties to this Agreement, it is agreed to use arbitration to resolve the dispute but only to the extent required by A.R.S. §12-1518; and, in no event shall arbitration be employed to resolve a dispute

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which is otherwise subject to administrative review by the Department pursuant to statute or Department Administrative Rule.

26. Grantor reserves the right to relinquish to the United States pursuant to the U.S. Act of August 30, 1890, land needed for irrigation works in connection with a government reclamation project.

27. Notice of authority to cancel this contract:

This contract is subject to cancellation pursuant to A.R.S. § 38-511.

28. Native Plant Law:

If the removal of plants protected under the Arizona Native Plant Law is necessary to enjoy the privilege of this Document, the Grantee hereunder must previously acquire the written permission of the Arizona State Land Department and the Arizona Department of Agriculture to remove those plants.

29. The Department does not represent or warrant that access exists over other State lands which intervene respectively between the above Right-of-Way easement and the nearest public roadway.

30. Grantee shall adhere to all applicable rules, regulations, ordinances and building codes as promulgated by local jurisdiction and any applicable agencies.

31. Grantee shall not exclude from use of State of Arizona, its lessees or grantees, or the general public the right of ingress and egress over this roadway.

32. Grantee shall acquire any necessary permits from the Arizona Department of Transportation and/or the County Highway Department prior to construction.

Within 30 days of project completion, Grantee shall submit a completed certificate of construction. (Copy Attached)

ENVIRONMENTAL INDEMNITY

Grantee shall protect, defend, indemnify and hold harmless the Grantor from and against all liabilities, costs, charges and expenses, including attorneys' fees and court costs arising out of or related to the presence of or existence of any substance regulated under any applicable federal, state or local environmental laws, regulations, ordinances or amendments thereto because of: (a) any substance that came to be located on the Right-of-Way due to Grantee's use or occupancy of the lands by the Grantee before or after the issuance of the Right-of-Way; or (b) any release, threatened release or escape of any substance in, on, under or from said Right-of-Way that is caused, in whole or in part, by any conduct, actions or negligence of the Grantee, regardless of when such substance came to be located on the Right-of-Way.

For the purposes of this Right-of-Way, the term "regulated substances" shall include substances defined as "regulated substances", "hazardous waste", hazardous substances", "hazardous materials", "toxic substances" or "pesticides" in the Resource Conservation and Recovery Act, as amended by the Hazardous and Solid Waste Amendments of 1984, the Comprehensive Environmental Response, Compensation and Liability Act, the Hazardous Materials Transportation Act, the Toxic Substance Control Act, the Federal Insecticide, Fungicide and Rodenticide Act, the relevant local and state environmental laws, and the regulations, rules and ordinances adopted and publications promulgated pursuant to the local, state and federal laws. This indemnification shall include, without limitation, claims or damages arising out of any violations of applicable environmental laws, regulations, ordinances or subdivisions thereof, regardless of any real or alleged strict liability on the part of Grantor. This environmental indemnity shall survive the expiration or termination of this Right-of-Way and/or any transfer of all or any portion of the Premises and shall be governed by the laws of the State of Arizona.

In the event any such action or claim is brought or asserted against the Grantor, the Grantee shall have the right, subject to the right of the Grantor to make all final decisions with respect to Grantor's liability for claims or damages, (i) to participate with Grantor in the conduct of any further required cleanup, removal or remedial actions and/or negotiation and defense of any claim indemnifiable under this environmental indemnity provision, having reasonable regard to the continuing conduct of the operation/business located on the Premises and (ii) to participate with the Grantor in negotiating and finalizing any agreement or settlement with respect to any such claim or cleanup.

IN WITNESS HEREOF, the parties hereto have signed this Document effective the day and year set forth previously herein.

STATE OF ARIZONA, GRANTOR
Arizona State Land Commissioner

By: [Signature]
Date: 5/10/01

(SEAL)

PINAL COUNTY FLOOD CONTROL DISTRICT 5/10/01
GRANTEE Date

By: [Signature] SKLD A
Date

Real Property Division

201 N Stone Ste 600
Address

POsm AZ 85710
City State Zip

2000 07010000

HIGH PLAINS PROJECT

That portion of the Southeast quarter (SE ¼ & SW ¼) of Section 33, Township 11 South, Range 11 East Gila Salt River Base and Meridian, Pima County, Arizona. More particularly described as follows:

Commencing at the South quarter (S¼) corner of said section 33;

Thence, N 89°32'57" E along the South line of said section 33 a distance of 366.33 feet to a point;

Thence, departing said South line N 00° 27'03"W a distance of 617.83 feet to THE POINT OF BEGINNING;

Thence, N 49° 17' 34" W a distance of 1780.25 feet to a point;

Thence, N 67° 12' 26" E a distance of 370.05 feet to a point;

Thence, S 73° 17' 34" E a distance of 209.83 feet to a point;

Thence, N 81° 42' 27" E a distance of 32.99 feet to a point;

Thence, S 76° 47' 34" E a distance of 360.05 feet to a point;

Thence, S 69° 17' 34" E a distance of 126.17 feet to a point;

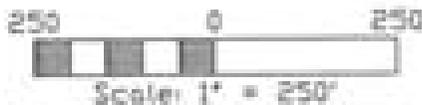
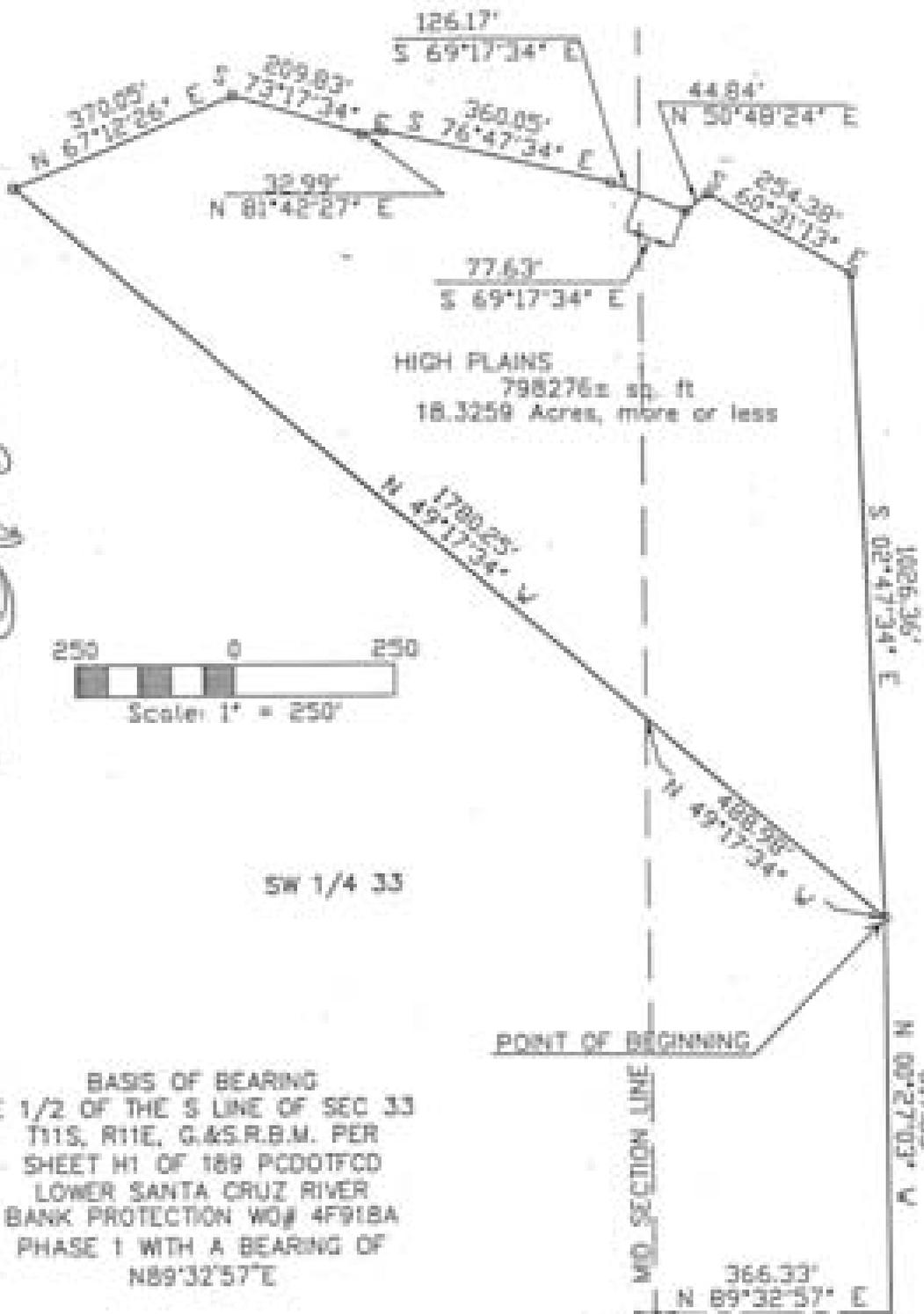
Thence, N 50° 48' 24" E a distance of 44.84 feet to a point;

Thence, S 60° 31' 13" E a distance of 254.38 feet to a point;

Thence, S 02° 47' 34" E a distance of 1026.36 feet to THE POINT OF BEGINNING;

Said parcel containing 798,276 sq. ft. or 18.3259 acres more or less.





BASIS OF BEARING
E 1/2 OF THE S LINE OF SEC 33
T11S, R11E, G.&S.R.B.M. PER
SHEET H1 OF 189 PCDOIFCD
LOWER SANTA CRUZ RIVER
BANK PROTECTION WQ# 4F918A
PHASE 1 WITH A BEARING OF
N89°32'57"E

COMMENCEMENT POINT
S 1/4 CORNER SEC 33
T11S, R11E, G.&S.R.B.M.
PIMA COUNTY, ARIZONA

EXHIBIT A

1 OF 1

ENTRANCO

DATE: 05/15/18
DRAWN: J. SHOOK
CHECKED: J. JAMES
APP. BY: J. JAMES

UT-040 000011

APPENDIX A.2

**SECTION 404 PERMIT FROM
U.S. ARMY CORPS OF ENGINEERS**

DEPARTMENT OF THE ARMY PERMIT

Permittee:

Dorothy C. Dolan
Pima County Department of Transportation and Flood Control District
201 North Stone Avenue, 3rd Floor
Tucson, Arizona 85701

Permit Number: 974-0474-RJD

Issuing Office: Los Angeles District

Note: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: To construct and maintain/reconstruct; 1) an upstream diversion structure with maximum dimensions of 300 feet long by 30 feet wide by 4 feet high, 2) a downstream diversion structure and intake pipe, and 3) if necessary, a channel to redirect effluent flows toward the upstream diversion structure. Additional details are shown in the enclosed figures.

Project Location: In Santa Cruz River at (Sections 3 and 4, T12S, R11E and Section 33, T11S, R11E), Marana, Pima County, Arizona.

Permit Conditions

General Conditions:

1. The time limit for completing the authorized activity ends on October 15, 2004. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the

If mosquitoes become a problem, the Pima County Health Department will be consulted regarding the use of larvicidal bacteria. Bat boxes will be added to the site due to their lack of utilization by bats at other sites in Pima County. Arizona Game and Fish Department (AGFD) believes that bats may not use the boxes because of excessive heat build-up in the boxes during the summer (Mayor and Council memorandum, March 6, 1997).

Potential Bird-Strike Hazard Issues

The Project area is less than 1 mile north of the nearest runway at the Avra Valley Airport. Birds can pose a safety threat to aircraft. Birds may congregate on runways, or birds may use the same airspace as airplanes. When aircraft collide with birds (bird strikes), considerable damage to aircraft can occur (Solomon, 1973). This recharge project is near an airport, vegetation will be increased slightly, and given that birds are attracted to fresh water for drinking, there is concern over the potential to increase bird strikes.

Pima County owns and operates the Avra Valley Airport (AVA). The Real Property Division (RPD) oversees airport planning, construction, maintenance, and operation. The PCFCD has fully informed the Pima County RPD about the Project. The RPD also reviewed an early version of this EA and provided comments. These comments have been incorporated, and the PCFCD continues to consult with the RPD to help assure the continued safe operation of the AVA. In response to comments on the draft EA, the PCFCD, in consultation with the RPD, the Federal Aviation Administration (FAA), and a consulting biologist, has prepared a bird-strike analysis and mitigation plan (Entranco, 1997). Because of many unknown variables, the potential change in bird-strike risk between existing conditions and the proposed action has not been quantitatively assessed. However, the information below summarizes key issues related to bird strike hazards.

The AVA is a general aviation airport with two paved runways. In 1996, there were an estimated 1,665 aircraft operations annually, composed of 71 percent local general aviation and 25 percent transient general aviation. Small amounts of air taxi and military flights comprise the remainder. The majority of aircraft operating from AVA are piston-engine powered. About 10 percent of the aircraft are turbine powered. There have been six reported bird-strike incidents at the airport during the period 1990-1997, resulting in minor property damage only (see Entranco, 1997). The airport has not taken wildlife control measures at this time.

The Water Resources Research Center (1996), University of Arizona, prepared a report for Reclamation that discussed the various risks of bird-strikes in the area. Most bird strikes do not result in loss of life but can result in considerable property damage (Burger, 1983). The 1996 study concluded that bird-strike risk is dependent upon many factors including type, size, altitude, flight phase, and flight path of the aircraft; and types, numbers, and behavior of birds present. Water at the end of runways is considered a risk factor. This proposed recharge project is not sited at the end of a runway but is beneath the flight path. Turbo powered aircraft and military aircraft are generally at highest risk for bird strikes. Most aircraft using the AVA do not fit into these categories. Birds most likely to be involved in collisions with airplanes are geese, ducks, gulls, shorebirds, owls and small-sized flocking species such as starlings, sparrows, swallows, and buntings. It was reported that gulls pose the most serious threat to aircraft (Murton and Wright, 1988).

Various birds already occur in the general area, in the existing riparian habitat, and in existing areas of open water (see Entranco, 1997). Existing habitat includes the Avra Valley recharge project, located 2000 feet north of the AVA, which began operation in August of 1996. Existing bird populations would include waterfowl, shorebirds, and birds attracted to agricultural fields. Very few gulls occur in the area. Existing bird populations fluctuate seasonally and may also

change when surrounding agricultural lands change cropping patterns. There is no indication at this point in time, that the existing Avra Valley recharge project, which is larger than the proposed project, significantly altered bird-strike risk. The proposed Project is not likely to significantly increase bird populations because the existing riparian area is not likely to expand, and because the Project is small. This proposed Project could, however, temporarily redistribute local, existing populations of waterfowl and shorebirds to the recharge basins.

Environmental enhancements associated with this Project are relatively small and local, and, therefore, are not expected to attract birds in large numbers. The intent of the enhancement included choosing vegetation that would attract neotropical birds like tanagers that do not pose a bird-strike hazard. The frequency of wet-dry cycling at this recharge project will likely discourage new resident bird populations at the recharge basins. Based on the bird-strike analysis (Entranco, 1997) and consultations with the FAA and RPD, monitoring and adaptive mitigation measures for potential bird-strike hazards were developed and are described in the following mitigation section. FAA reviewed these monitoring and adaptive mitigation measures and had no further comment. (See letter dated March 3, 1998, in Appendix C).

Monitoring and Adaptive Mitigation Measures for Potential Bird-Strike Hazard

The PCPCD will implement a bird mitigation program based on frequent bird monitoring observations of the project basins and grounds. The purpose of bird monitoring is not an attempt to prove or disprove an increase in bird numbers locally as a result of the Project. The purpose of bird monitoring will be to gather data upon which mitigation actions will be based.

Workers who visit the project site regularly will be trained twice yearly in a standardized data gathering method for making and recording bird-use observations. Birds observed will be classed into one of the FAA categories and identified to species if possible. Bird behavior (e.g., roosting, feeding, soaring, etc.) will also be recorded as a check-off on a standardized form. Data gathered will be compiled and summarized on a weekly basis by the PCPCD project manager to determine the number and types of birds using the site. During compilation, the data will be examined to assure that workers are using the standardized method and to insure that birds are assigned to the correct class.

Weekly data compilations (the action standard) will be filed with the RPD, who manage the airport. Quarterly reports on bird data, action taken, and results will be sent to FAA, the RPD, the AVA Fixed Base Operators and Central Arizona Water Conservation District. Bird observers will receive refresher training at least once each year, or if regular analysis of field data forms indicates poor performance. Near the end of the 2-year life of the pilot project, the project manager will discuss any plans for continuation of the project with the RPD and the AVA Fixed Base Operators.

Mitigation measures to deter bird use will be triggered at defined thresholds of bird type and numbers (Table 4). Each weekly data compilation will determine the mitigation action. Thus, mitigation actions will be implemented on a weekly basis, depending on the data gathered and the threshold action criteria (see below). Once implemented, a given mitigation action will be continued for at least a 2-week period to determine its effectiveness in reducing bird use. If, after 2 weeks of mitigation action, the numbers of a target bird group are not reduced to below the threshold, the next action level will be implemented. A given mitigation level will not be discontinued until the target bird numbers are below the action threshold. Should bird use reach higher action thresholds during the 2-week period, the next level of mitigation will be implemented as soon as it is triggered.

Action thresholds will vary seasonally in response to the more active runway at AVA and the seasonal nature of some bird occurrences (e.g., waterfowl and wading birds). This plan takes into account the active runway at AVA, given local wind conditions. Birds that do not pose a threat are not harassed. If birds are routinely (always) forced to move from the Project, despite the active runway at AVA, they may move to other locations that pose a greater hazard for the active runway, for example, the Avra Valley Recharge Project or nearby agricultural fields. Bird control efforts in the entire AVA area (e.g., this Project and the Avra Valley Recharge Project) need to be coordinated in such a way that birds are not frightened from one facility only to move to another, increasing the bird-strike threat there. Where possible, operational features of the project may be adjusted to mitigate bird use depending on the experimental observations of recharge rates and basin conditions.

Mitigation Level 1

Mitigation level 1 includes passive actions to discourage bird use. Most of these methods mimic natural enemies of birds, evoke avoidance responses, or are frightening to birds. These include models of predators (hawks, owls, mammals), wind-generated, moving scare devices (foil, scarecrows, etc.), and mechanical movement devices. Birds habituate rapidly to these methods, therefore, variation in their use and timing is important for maximum effect. These devices and methods do not require State or Federal permits.

Mitigation Level 2

Mitigation level 2 includes passive and active means of interfering with bird use of an area. Active measures include: physical barriers (e.g., wires strung across water or perches), removal of attractive features (e.g., perches, posts and etc.), and manipulating operational features of the project (e.g., basin wet/dry cycle) where feasible and consistent with the project goals. Level 2 measures may cause bird injury or fatalities, and, therefore, will require State and Federal permits for "take" of migratory birds. Migratory Bird Permits are issued on an annual basis from the Service and AGFD by application. Federal and State Permits will be acquired by the PCPCD, in advance, for all potential actions under this plan.

Mitigation Level 3

Mitigation level 3 includes level 2 measures and active means of frightening birds from an area. These may include: pyrotechnic devices, noise making devices, high-pressure water sprays, and disrupting lights and sounds at night. Included in this level are adjusting operational aspects of the project outside of the planned recharge mode, including adjusting wet/dry cycles and water depths, and drying out the basins. Level 3 measures may require State and Federal permits, as outlined above. Some of these measures (e.g., pyrotechnic devices) may conflict with local ordinance.

No Action

Under the No Action Alternative, the riparian area would continue as it is unless the existing diversion is removed. If this occurred, then the riparian area would eventually dry up. The habitat value of the surrounding area is not particularly high and would remain unchanged. The potential environmental benefits associated with this particular recharge design would not occur. Potential issues associated with bird strikes and mosquitoes would remain unchanged (i.e., there are now birds and mosquitoes in the area using the existing habitats).

Table 4. Mitigation action thresholds and mitigation level for the High Plains Effluent Recharge Project

THRESHOLDS		MITIGATION ACTION LEVEL	
BIRD TYPE	ACTION NUMBER	SUMMER (Runway 12 less active)	WINTER (Runway 12 more active)
Waterfowl	≤ 5	none	1
	> 5 < 12	none	2
	≤ 12	1	3
Wading Birds	≤ 10	none	1
	> 10 < 15	none	2
Blackbirds	≤ 20	none	1
	> 20 < 30	none	2
	> 30	1	3
Dove	< 20	none	none
	≥ 20 < 30	none	1
	≥ 30	1	2
Raptors	≤ 3	none	none
	> 3 < 5	none	2
	≥ 5	2	3

E. Endangered Species

Reclamation initiated informal Section 7 consultation on April 16, 1997. We received a list of threatened and endangered species on April 17, 1997. None of the species on the list, including southwestern willow flycatcher and cactus ferruginous pygmy-owl, were deemed likely to occur regularly within the project area based on habitat surveys and consultations with biologists (e.g., Rex Wahl, consulting biologist with onsite experience). The species listed in Table 1 are not likely to occur in the project area because there is no suitable habitat on or near the site; preferred and required habitat features for each species do not occur. This is partly due to grazing, habitat fragmentation, and hydrologic changes. Reclamation has concluded that the proposed action would have "no effect" on any threatened or endangered species or any critical habitat. The following paragraphs provide more detailed information on southwestern willow flycatcher and cactus ferruginous pygmy-owl.

above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification from this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished with the terms and conditions of your permit.

Special Conditions: See attached sheet.

Further Information:

1. **Congressional Authorities:** You have been authorized to undertake the activity described above pursuant to:

- () Section 10 of the River and Harbor Act of 1899 (33 U.S.C. 403).
- () Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

2. Limits of this authorization.

- a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
- b. This permit does not grant any property rights or exclusive privileges.
- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.
- e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

- a. You fail to comply with the terms and conditions of this permit.

- b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
- c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measure ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give you favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Dorothy C. Dolan
(PERMITTEE) DOROTHY C. DOLAN
PROJECT MANAGER, DEPUTY DIRECTOR

10-28-99
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Richard J. Schubel
Richard J. Schubel
Chief, Regulatory Branch
(for the District Engineer)

11-3-99
(DATE)

When the structures or work authorized by this permit are still in existence at the

time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

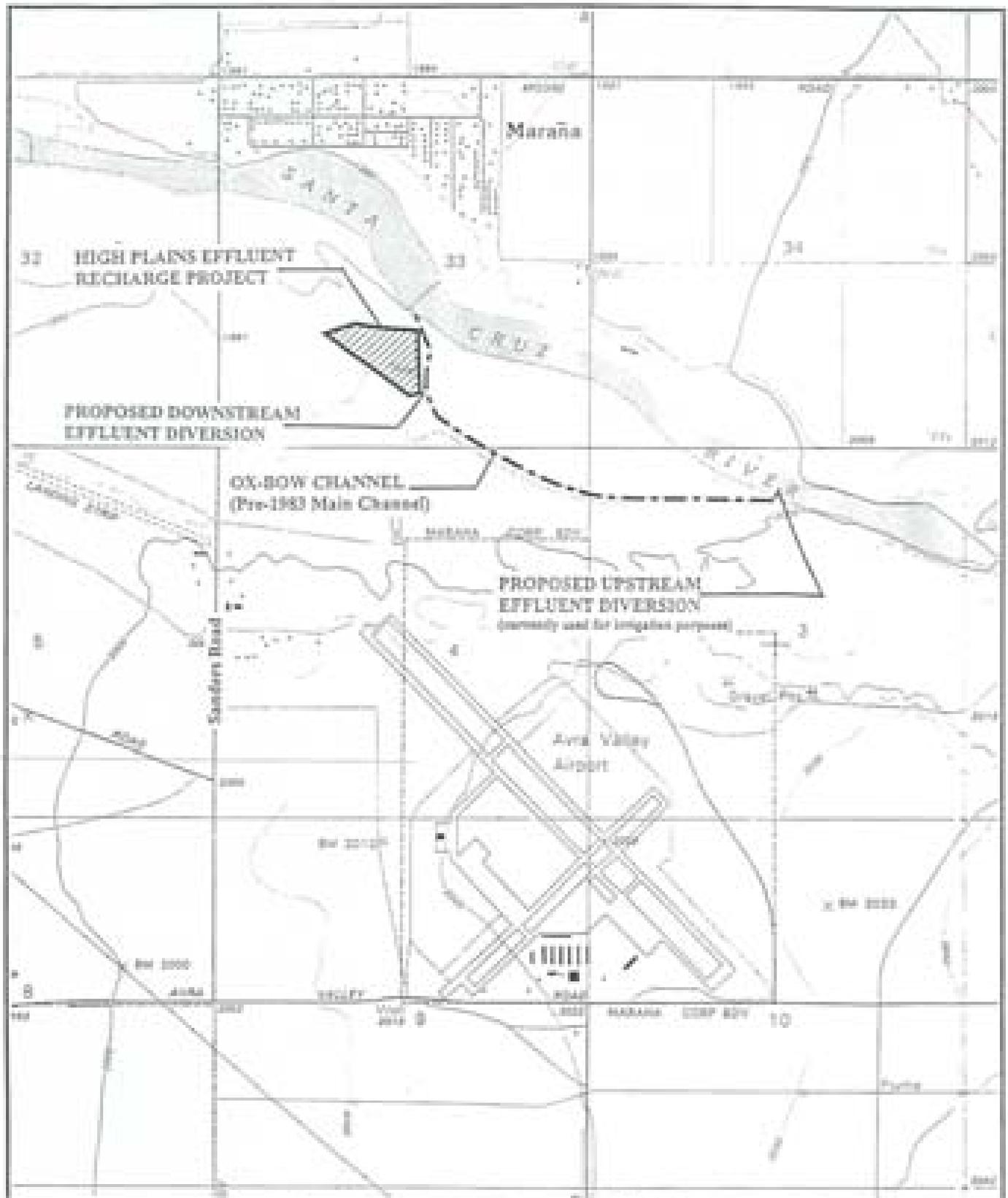
(DATE)

**SPECIAL CONDITIONS
PERMIT NO. 974-0474-RJD**

a. The permittee shall comply with all requirements and conditions in the state water quality certification that the Arizona Department of Environmental Quality signed on August 23, 1999. This certification demonstrates that the permittee has complied with Section 401(a) of the Clean Water Act. A copy of this letter is enclosed.

b. The permittee shall fence archeological site AZ AA:12:127 and confine all construction or other project activities to the floodplain east of the fence.

c. The permittee shall conduct monitoring and implement adaptive mitigation measures to control the bird-strike safety threat to aircraft using the Avra Valley Airport. The permittee shall follow the bird-strike safety measures mentioned in the enclosed pages 23-26 taken from the Marana High Plains Effluent Recharge Project, Final Environmental Assessment.



VICINITY MAP

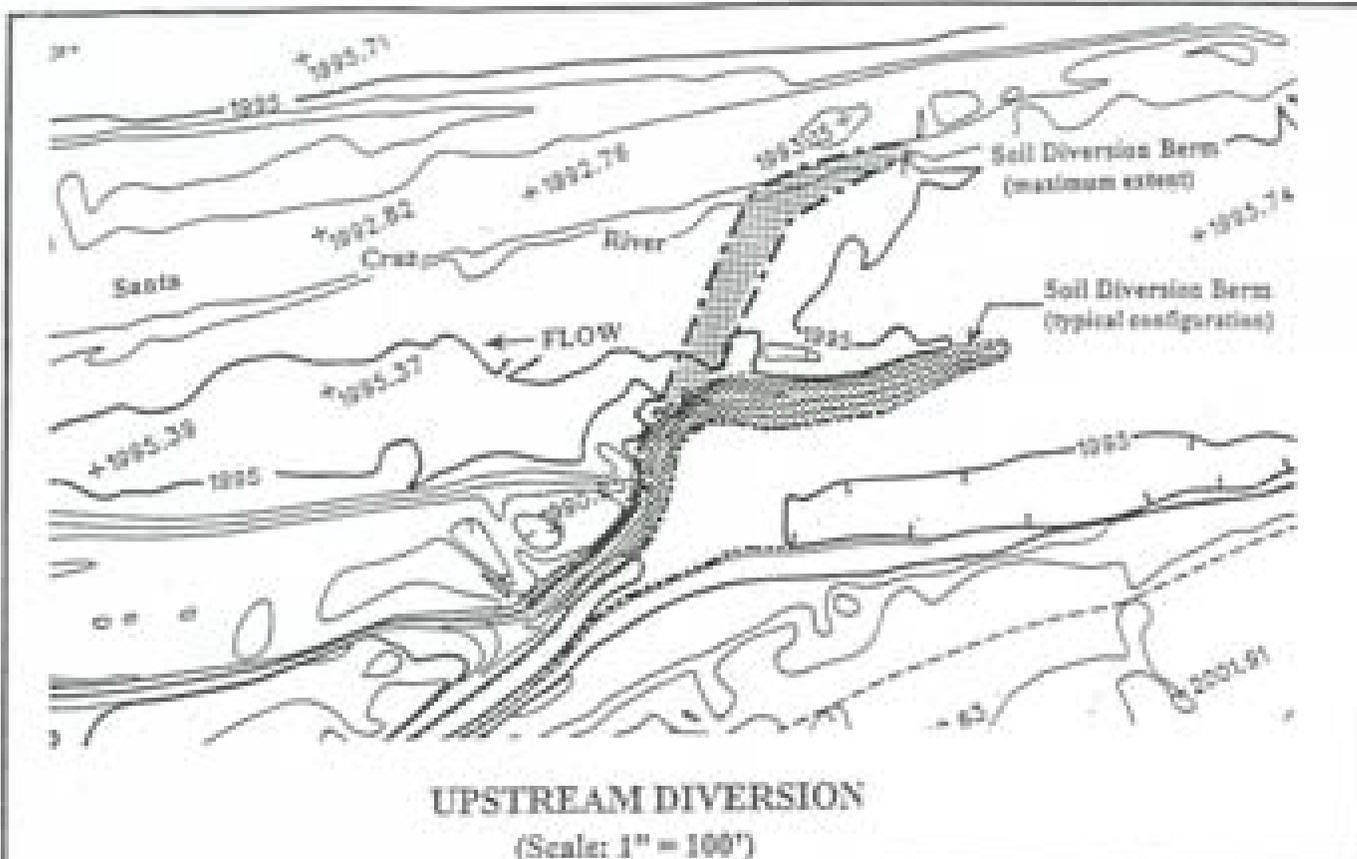


Applicant: Pima County Flood Control District
 201 N. Stone Avenue, 4th Floor
 Tucson, Arizona 85701

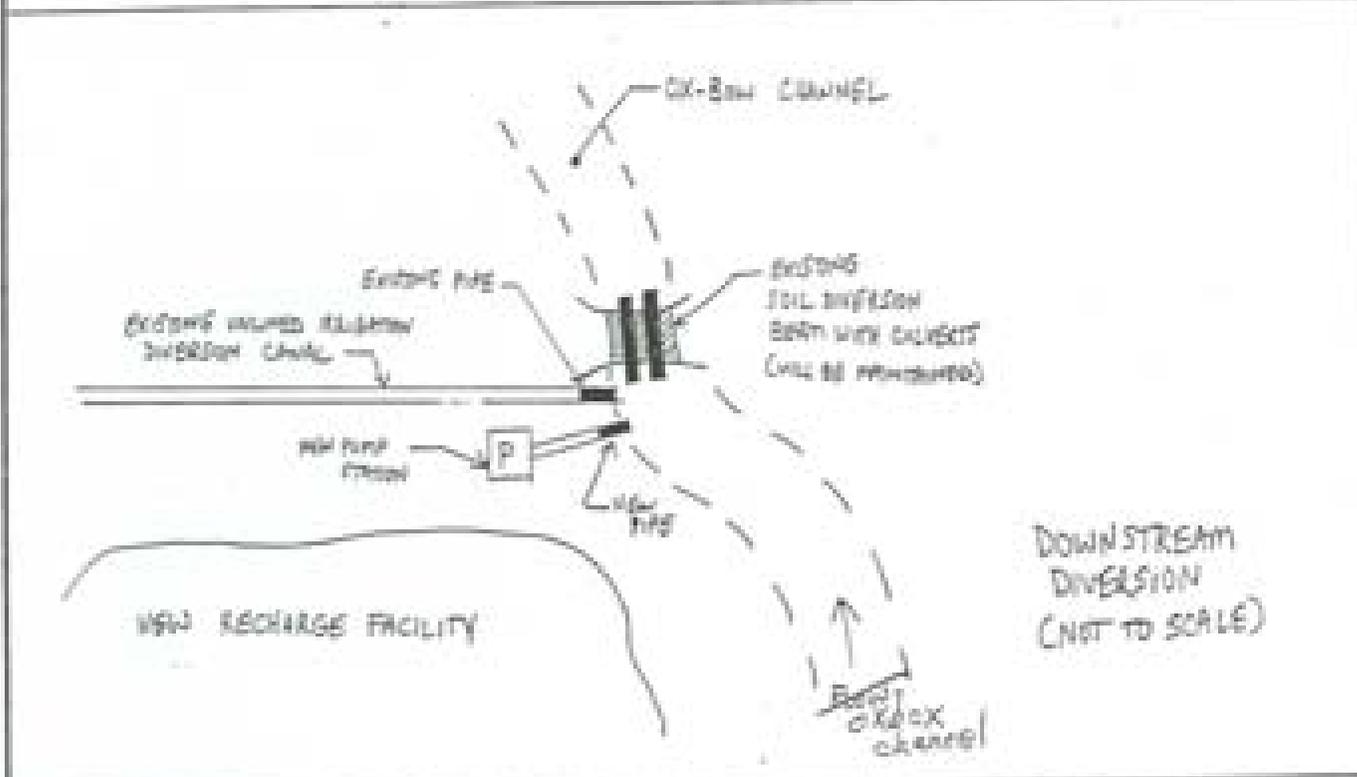
**PROPOSED EFFLUENT DIVERSIONS FOR THE HIGH PLAINS EFFLUENT RECHARGE PROJECT
 SANTA CRUZ RIVER
 PIMA COUNTY, ARIZONA**

Pima County Department of Transportation and Flood Control District
 974-0674-8310
 Figure 1 of 3

Source: USGS 7.5 Minute Series, Topo Map
 Marana, AZ Quadrangle, 1982



UPSTREAM DIVERSION
(Scale: 1" = 100')

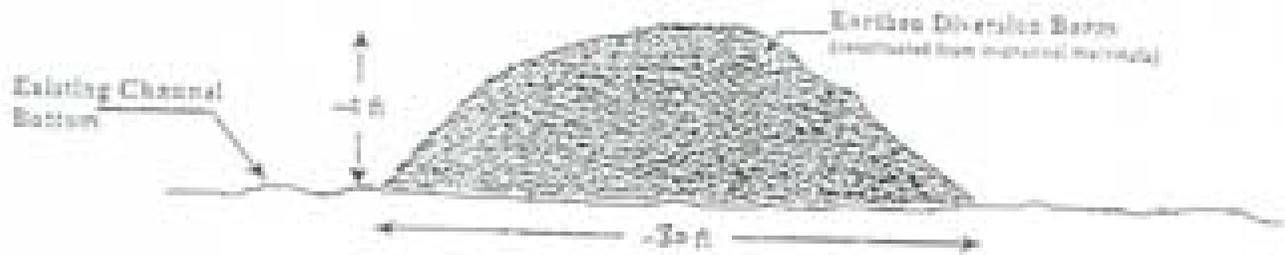


PLAN VIEWS

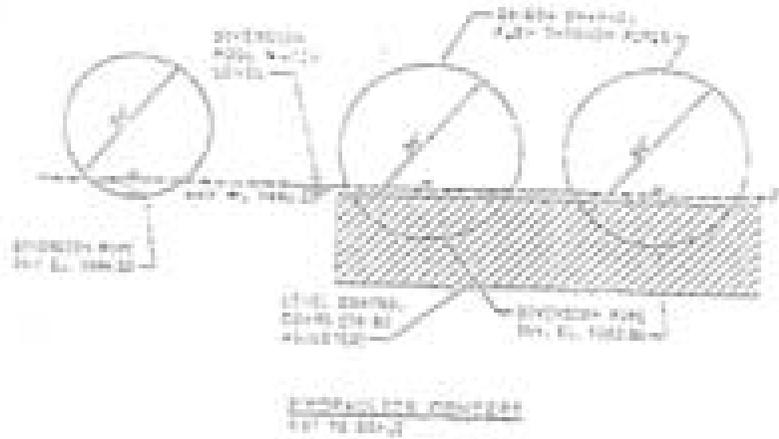
Applicant: Pima County Flood Control District
201 N. Stone Avenue, 4th Floor
Tucson, Arizona 85701

PROPOSED EFFLUENT DIVERSIONS FOR THE HIGH PLAINS EFFLUENT RECHARGE PROJECT
SANTA CRUZ RIVER
PIMA COUNTY, ARIZONA

Pima County Department of Transportation and Flood Control District
974-0474-RJD
Figure 2 of 3



UPSTREAM DIVERSION
(not to scale)



DOWNSTREAM DIVERSION
(not to scale)

CROSS-SECTIONAL VIEWS

Applicant: Pima County Flood Control District
201 N. Stone Avenue, 4th Floor
Tucson, Arizona 85721

PROPOSED EFFLUENT DIVERSIONS
FOR THE HIGH PLAINS EFFLUENT
RECHARGE PROJECT
SANTA CRUZ RIVER
PIMA COUNTY, ARIZONA

Pima County Department of Transportation
and Flood Control District
974-0474-RJD
Figure 3 of 3



DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
ARIZONA-NEVADA AREA OFFICE
3826 NORTH CENTRAL AVENUE, SUITE 808
PHOENIX, ARIZONA 85012-1828

REPLY TO:

October 25, 2004

Office of the Chief
Regulatory Branch

Mr. Frank Postillion, CGWP
Principal Hydrologist
Pima County Department of
Transportation and Flood Control
201 N. Stone Avenue, Fourth Floor
Tucson, Arizona 85701

File Number: 974-0474-RJD

Dear Mr. Postillion:

Reference is made to your request dated September 28, 2004 to amend Permit No. 974-0474-RJD which authorized you to construct the High Plains Effluent Discharge Project (Sections 3 and 4, T12S, R11E), Marana, Pima County, Arizona.

Under the provisions of 33 Code of Federal Regulation 325.6(d), the start date is to remain the same and the completion date is extended from October 15, 2004 to October 15, 2009.

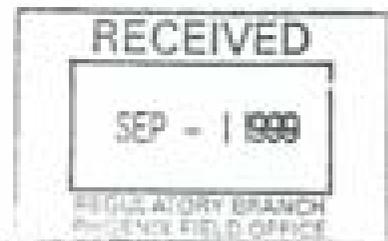
The terms and conditions of Permit No. 974-0474-RJD, except as changed herein, remain in full force and effect. You should contact the Arizona Department of Environmental Quality to ensure your Section 401 water quality certification has not expired. If this certification has expired, please provide us with a copy of the extension of time.

Sincerely,

Cindy Lester P.E.
Chief, Arizona Section
Regulatory Branch

624 444.1 00 154

Copy Furnished:
Mr. Andy Travers, ADEQ



ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Governor Jane Dee Hull Jacqueline E. Schafer, Director

August 23, 1999

FPPDU99-0062

Applicant: Pima County Department of Transportation and Flood Control District
Ann. Julia Fonseca
201 North Stone Avenue, 4th Floor
Tucson, AZ 85701

Subject: Water Quality Certification, State of Arizona for: Marana High Plains Effluent Recharge Project (Santa Cruz River Effluent Diversion)
ADEQ 401/404 File No. 103195
US ACOE Public Notice/Application No. 974-0474-RJD
(Section 3 & 4, T12S, R11E, and Section 33, T11S, R11E), Marana, Pima County.

Dear Ms. Fonseca:

The Arizona Department of Environmental Quality (ADEQ), Water Quality Division has reviewed information on the Pima County Department of Transportation and Flood Control District's (PCFCD) "Marana Highplains Effluent Recharge Project" submitted for water quality certification pursuant to Sections 401 and 404 of the federal Clean Water Act. Section A describes the activities to be certified, the references listed in Section B were used as the basis for certification. The review has determined that when the applicant adheres to Conditions C.1 through C.9 listed in Section C, the certified activities should comply with State surface water quality standards.

Subject to the conditions in Section C, this letter certifies that the activities in the Marana Highplains Effluent Recharge Project located in the Santa Cruz River within Pima County, should not have a negative impact to the chemical, physical or biological integrity of the Santa Cruz River.

A. DESCRIPTION OF ACTIVITIES TO BE CERTIFIED

1. The activities are located in the channel of the Santa Cruz River (Sections 3 and 4, T12S, R11E and Section 33, T11S, R11E). The project purpose is to divert effluent flows from

the Santa Cruz River into an off-channel groundwater recharge project (Figure 1 attached). The project is a cooperative effort between the Pima County Department of Transportation and Flood Control District, Bureau of Reclamation and the Town of Marana.

2. The activities to be certified for the effluent recharge project located in the channel of the Santa Cruz River include:
 - a. Reconstruction and maintenance of an existing upstream irrigation diversion structure (approximately 300 feet long, 30 feet wide and 4 feet high). A maximum of 2000 cubic yards of river bed material will be relocated during reconstruction of the upstream diversion structure. The structure will not exceed one half the width of the existing Santa Cruz River channel cross-section (Sheet 1 attached). Periodic grading may be required to redirect flow toward the stream diversion structure.
 - b. Periodic maintenance/reconstruction of an existing downstream diversion structure (approximately 20 feet long, 10 feet wide and 4 feet high) located along the oxbow channel approximately 1.1 miles downstream for the upstream diversion structure (Sheet 1 attached).
 - c. Construction of a pump station outlet from the oxbow channel upgradient of the downstream diversion structure to lift water to the recharge project (Sheet 1 attached).
3. The applicant has applied to the U.S. ACOE for a permit pursuant to Section 404 of the Clean Water Act to allow the disturbance of less than 1 acre of jurisdictional waters of the United States.
4. The scope of activities herein is limited to dredge and fill activities within Waters of the U.S., associated with construction/reconstruction and maintenance of upstream and downstream diversion structures.

B. BASIS FOR CONDITIONAL STATE 401 WATER QUALITY CERTIFICATION

1. State of Arizona, Water Quality Standards for Surface Waters, Arizona Administrative Code (A.A.C.) Title 18, Chapter 11, Section 108, Narrative Water Quality Standards, Section 109 Numeric Water Quality Standards, Appendix A. Designated Uses include: Aquatic & Wildlife effluent dependent water (A&Wedw) and Partial Body Contact (PBC) (A.A.C. R-18-11-104, Appendix B.)
2. U.S. Army Corps of Engineers Public Notice/Application No. 974-0474-RJD Comment period April 27 to May 27, 1998 and received by ADEQ on November 23, 1998.

3. ADEQ Water Quality Division Form 404-015 (401 Certification Application), sign date October 5, 1998, received in ADEQ October 8, 1998 from Ms. Julia Fonseca PCFCD. Additional documents submitted include, in part the following:
 - a. Applicant's Responses to Arizona Water Quality Policy for Protecting Water Quality During Facility Construction.
 - b. In response to ADEQ request, site location map, 404 jurisdictional map and incomplete public notice were received in ADEQ on November 10, 1998. A complete public notice was received November 23, 1998.
 - c. PCFCD memorandum to Kurt Harris, ADEQ, from Salek Shafiqullah dated March 23, 1999, and received in ADEQ March 26, 1999.
 - d. PCFCD letter to Kurt Harris, from Salek Shafiqullah dated March 23, 1999, received in ADEQ March 26, 1999.
 - e. PCFCD letter to Kurt Harris, from Salek Shafiqullah dated March 23, 1999, received in ADEQ by fax March 23, 1999.
 - f. PCFCD letter to Kurt Harris, from Salek Shafiqullah dated April 23, 1999, received in ADEQ April 27, 1999.

C. CONDITIONS FOR STATE 401 WATER QUALITY CERTIFICATION

This State Water Quality Certification is issued by the Arizona Department of Environmental Quality (ADEQ) under the authority of Section 401(a) of the federal Clean Water Act (33 U.S.C. §1251 et seq.). The conditions listed below apply to the Section 404 Permit issued by the U.S. Army Corps of Engineers (U.S. ACOE). The 404 Permittee shall follow these conditions in developing the project permitted under ACOE 404 Permit No. 974-0474-RJD. These conditions are enforceable by the U.S. Environmental Protection Agency. Civil penalties up to a maximum of \$25,000 per day of violation may be levied if these certification conditions are violated. Criminal penalties may also be levied if a person knowingly violates any provision of the federal Clean Water Act.

1. General Conditions

- a. This certification is only for the activities described in Section A and is valid for the same period as the U.S. ACOE 404 permit. If project construction has not been started by the time specified in the U.S. ACOE 404 Permit, the applicant shall notify as follows:

Arizona Department of Environmental Quality
Water Quality Division, Federal Permits and Program Development
Unit, Attention: Surface Water Quality 401 Certification
File No. 103195, U.S. ACOE PN# 974-0474-RJD
3033 North Central Avenue, Phoenix, Arizona 85012

ADEQ will have the option of extending, modifying or denying this Certification.

- b. The applicant shall provide a copy of these State 401 Water Quality Certification Conditions to all appropriate contractors and subcontractors. The applicant shall also post a copy of these conditions in a water resistant location at the construction site where it may be seen by the workers.
- c. There shall be no substantive changes/modifications in the activities and analysis identified in Sections A and B or the implementation of those plans which might affect surface water quality. If a substantive change/modification is necessary, notice and supporting information shall first be submitted to and approved by ADEQ. Failure of the applicant to receive ADEQ approval for any substantive change/modification prior to initiating the change/modification may result in a revocation of this Certification. Correspondence to ADEQ shall be addressed per Condition C.1.a. above.
- d. This certification is void if the construction is not consistent with the activities described in Section A.
- e. When the project is completed ADEQ shall be notified by the applicant or designee of completion within 30 days after project completion. Notification shall be addressed to ADEQ per Condition C.1.a. above.
- f. Swimming (Full Body Contact) will not be permitted in any of the water conveyance facilities and signs enforcing this swimming ban will be posted and be visible from all accessible shore locations.
- g. Boats with internal combustion engines will not be permitted on any water conveyance facilities except by properly trained project employees. Boats and motors shall be approved by the PCFCD for an emergency or special maintenance/monitoring activities.

- h. The Pima County Department of Transportation and Flood Control District is responsible for the construction and maintenance of the project and any adverse cumulative impacts that it may cause, except as provided by A.R.S. 545-898.01.

2. Necessary Permits

- a. Water used for dust suppression, if used shall not contain contaminants that would violate Surface Water Quality Standards.
- b. If dewatering operations are needed, this water shall not be discharged into a Water of the U.S. without proper permits, including but not limited to a National Pollutant Discharge Elimination System (N.P.D.E.S.) permit.

3. Erosion Protection Measures

- a. Erosion control and/or other bank protection features (silt fences, straw bales, or mulching) shall be used to minimize erosion and soil loss where appropriate. Denuded areas shall be revegetated as soon as possible with native plants and seed as long as the establishment of vegetation does not inhibit or impede flows or interfere with the operation of the recharge project.
- b. Temporary erosion and sediment control measures shall be installed before construction and pre-operation practices, and shall be maintained as necessary during construction and pre-operational periods.
- c. All pipe outlets related to these activities certified shall be designed to control erosion.

4. Chemicals and Chemical Handling

- a. The applicant shall use designated areas for chemical and petroleum storage, solid waste containment and equipment washing. These designated areas shall all be located outside of the watercourse above the ordinary highwater mark.
- b. The applicant shall have a spill containment plan and an equipment maintenance plan available on site at all times.

- c. Any pollutant material produced on-site by construction activity shall be properly disposed of.

5. Contaminated Soils and Materials

- a. Debris (such as soil, silt, sand, rubbish, cement, asphalt, oil or petroleum products, organic materials, tires or batteries) derived from construction activities shall not be deposited at any site where it may be washed into waters of the U.S. After completion of this project the Santa Cruz River and associated channels shall be left in an environmentally acceptable condition with all trash and non-native materials removed from those reaches of the watercourse in which the project took place.
- b. The applicant shall take necessary steps to ensure that contaminated materials are not used for the activities herein certified. Materials obtained from agricultural, mining, aggregate crushed rock plants, or other potentially contaminated areas shall be properly inspected to ensure that they do not contain contaminants that might cause a violation of a State surface water quality standards.

6. Conditions Related to Flow

- a. No activities herein certified shall be performed during a flood event. When flow is present in the construction area, dikes will be constructed to divert flow around the construction activity. Diversion dikes required during the certified construction activities should be constructed utilizing accepted best management practices, such as described in the attached Installation of Dikes in Small Streams.
- b. Temporary culverted crossings shall be adequately sized to handle the expected flow and properly set with end sections splash pads, or headwalls that dissipate water energy to control erosion at the outlets. Culverted crossings must be capable of passing the flow with not over 12 inches of water over the road. The culverted crossing shall be constructed to accommodate the overtopping of the road and armored to prevent erosion of the road fill. See attached Installation of Stream Crossings, best management practices for the placement of culverts.

7. *Runoff*

Runoff, seepage and/or infiltration from embankments, headwalls and other alterations of the natural environment shall not cause a violation of Water Quality Standards.

8. *Construction Related Activities*

- a. Construction materials, including concrete, asphalt, excavated fill and piping, shall consist of materials that do not leach significant pollutants into surface waters.
- b. Activities shall be conducted and monitored to ensure that pollution from concrete formation and equipment washing does not drain into the Santa Cruz River.
- c. The jurisdictional waters of the U.S. shall be promptly cleared of all false work, pilings, debris or other obstructions placed therein or resulting from construction operations.
- d. Construction procedures must be consistent with the Arizona Department of Environmental Quality Policy for Protecting Water Quality During Facility Construction (attached).

9. *Standard Issues*

Any discharge occurring as a result of activities certified in the Santa Cruz River shall not cause a violation of Surface Water Quality Standards. Applicability of this condition is as defined in section R-18-11-102 of A.C.C. Title 18, Chapter 11, Article 1 - Water Quality Standards for Surface Water.

ADEQ CWA 401 Water Quality Certification of these activities to operate under the terms of the ACOE Individual Permit under the referenced article, does not affect or modify in any way the obligations or liability of any person for any damages, injury, or loss, resulting from an impacted area discharge. The Department may modify or withdraw its determination if the information relied upon is inaccurate or not implemented as proposed. If in the future, the Department determines that the terms and conditions of the Certification have been violated, or discharges from the activities have caused or contributed a violation to the surface water quality standards, the Director may revoke the Certification. This certification is not intended to waive any other federal, state or local laws.

Thank you for your cooperation and efforts to protect Arizona's finite and precious water resources. If you have any questions about this Letter of Certification, please call Andy Cajero-Travers at (602) 207-4502 or toll free within Arizona at 1(800) 234-5677, ext. 4502.

Sincerely,

Authorized ADEQ Signature: Michele Robertson

Michele Robertson, Water Permits Section Manager
Water Quality Division

MIR:ACT:act

Enclosures: The Arizona Department of Environmental Quality Policy for Protecting Water Quality During Facility Construction (1 page)
Figure 1 Vicinity Map (1 page)
Plan View (1 page)
Installation of Dikes in Small Streams (1 page)
Installation of Stream Crossings (1 page)

cc: Corps of Engineers Regulatory Branch - Phoenix, AZ (RE: 974-0474-RJD)
Pima County Department of Transportation and Flood Control District Attn: Salek Shafiqullah

THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY POLICY FOR PROTECTING WATER QUALITY DURING FACILITY CONSTRUCTION

Appropriate items as listed below should be included in specifications for construction and related activities in or near watercourses. Adherence to the cited procedures should assure compliance with Water Quality Standards for Navigable Waters, A.A.C. R.18-11-1. Specifications should require the person responsible for the activity to submit a program for effective control of water pollution to the person in charge of the project which includes procedures for protecting water from pollution with fuels, oils, lubricants, calcium chloride, silt, cement, asphalt, tires, batteries and other harmful materials, and for conducting and scheduling operations so as to avoid or minimize siltng of the water.

SPECIFIC PROCEDURES FOR PREVENTING WATER POLLUTION MAY INCLUDE:

1. Provision for temporary pollution control measures such as dikes, berms, ditches, diversions, silt fences and the application of straw and seed, to be functional prior to land disturbing activities.
2. Erosion control measures including minimizing clearing and grubbing and limiting exposure of erodible surface to 750,000 square feet for each construction phase or location.
3. Construction of footings in water by sheet pile cofferdam method and pumping water from within the dam to settling ponds before returning it to the watercourse.
4. Isolation of the construction area by dikes and/or berms.
5. Erection of barriers, covers, shields and other protective devices as necessary to prevent any construction materials, equipment or accessories/pollutants from falling or being thrown into a watercourse.
6. Construction of drainage facilities with armoring when necessary to control erosion and sedimentation.
7. Provision of an adequate means, such as a bypass channel, to carry a stream free from mud and silt around operations which remove material from beneath a flowing stream.
8. A requirement for the transportation of materials across live streams to be conducted without muddying the stream. Mechanized equipment should not be operated in stream channels of live streams except as may be necessary to construct crossings or barriers and (2) for channel modifications.
9. A requirement for wash water from aggregate washing or other operations containing mud or silt to be treated by filtration or retention in a settling pond, or ponds, adequate to prevent water from transporting sediment into streams or watercourses.
10. A requirement for oily or greasy or substances originating from the contractor's operations not be placed where they will later enter a stream or watercourse.
11. Provisions for Portland cement or fresh Portland cement concrete not be allowed to enter flowing water of streams.
12. A requirement to return the flow of streams as nearly as possible to a meandering thread without creating a possible future bank erosion problem when operations are completed.
13. A requirement that material derived from roadway work should not be deposited in a stream or watercourse where it could be washed away by stream flows.

The person responsible for the activity should monitor for turbidity every day in which there is a disturbance of the bed of the waterway. Monitoring should be performed not greater than 300 feet downstream from the construction or related operations and 100 feet upstream.

APPENDIX A.3

**AQUIFER PROTECTION PERMIT FROM
ARIZONA DEPARTMENT OF
ENVIRONMENTAL QUALITY**

STATE OF ARIZONA

AQUIFER PROTECTION PERMIT NO. P-103195

PART I

AUTHORIZATION TO DISCHARGE POLLUTANTS IN A MANNER SUCH THAT CURRENT AND REASONABLY FORESEEABLE FUTURE USES OF THE AQUIFER ARE PROTECTED

In compliance with the provisions of Arizona Revised Statutes (A.R.S.) Title 49, Chapter 2, Articles 1, 2 and 3; Arizona Administrative Code (A.A.C.) Title 18, Chapter 9, Article 1; A.A.C. Title 18, Chapter 11, Article 4; and conditions set forth in this permit:

Facility Name: Marana High Plains Effluent Recharge Project

Owner and Operator:

Pima County Flood Control District
201 North Stone Avenue, Third Floor
Tucson, Arizona 85701-1207

is authorized to operate the Marana High Plains Effluent Recharge Project, an underground storage facility, in the Town of Marana, Pima County, Arizona, over groundwater of the Tucson Active Management Area (AMA) in Township 11 S, Range 11 E, Section 33, Gila and Salt River Base Line and Meridian at:

Latitude 32° 25' 45" North
Longitude 111° 13' 30" West

This permit shall become effective on the date of the Water Quality Division Director's signature and shall be valid for the life of the facility (operational, closure, and post-closure periods), provided that the facility is constructed, operated, and maintained pursuant to all of the conditions of this permit, according to the design and operational information documented or referenced in PARTS I, II, III, IV, V, VI, and VII of this Permit, and such that Aquifer Water Quality Standards are not violated.



Karl L. Smith, Director
Water Quality Division
Arizona Department of Environmental Quality
Signed this 17 day of June, 2000

PART II. SPECIFIC CONDITIONS

A. Discharge Limitations

1. The permittee is authorized to operate an underground storage facility for recharging a maximum of 1,200 acre feet of effluent per year, or an average daily flow of 1.07 million gallons per day. Effluent from Pima County's Roger Road and Ina Road wastewater treatment plants (RWTPs) is discharged into the Santa Cruz River, and a portion of the effluent is diverted from the Santa Cruz River and recharged using five infiltration basins. The permittee shall conduct source water inflow (discharge) and groundwater monitoring for selected constituents with Aquifer Water Quality Standards, including all nitrogen forms. The facility shall be designed, operated and maintained according to plans on file with this permit at ADEQ, and in such a manner that Aquifer Water Quality Standards at the applicable point of compliance will not be violated.
2. The materials authorized to be recharged at the underground storage facility are typical household sewage and pre-treated commercial wastewater and shall not include motor oil, gasoline, paints, varnishes, hazardous wastes, solvents, pesticides, fertilizers or other materials not generally associated with toilet flushing, food preparation, laundry facilities and personal hygiene.
3. Specific discharge limitations are specified in PART IV, TABLE I.

B. Monitoring Requirements

1. Discharge Monitoring

Discharges into the effluent infiltration basins shall be monitored according to PART IV, TABLE I.

Discharge monitoring shall be performed at:

Identification	Latitude	Longitude
Existing Diversion Structure	32° 25' 43" North	111° 13' 30" West

2. Groundwater Monitoring

a. Point of Compliance

The non-hazardous point of compliance is well (D-11-11)33 located at the northwest property boundary and down gradient of the infiltration basins at:

Identification	Latitude	Longitude
Point of Compliance	32° 25' 46" North	111° 13' 40" West

The Director may designate additional points of compliance if information on groundwater gradients indicates the need.

b. Monitoring Well Locations

Groundwater monitoring is required and will be conducted at the POC well (D-11-11)33cat.

c. Compliance Monitoring

Groundwater monitoring may also be required as defined in Contingency Plan Requirements Part II.C.

3. Operational Monitoring

a. Pre-operational QA/QC Requirements

At least 30 days prior to operating the facility, the operator shall inspect the facility to verify that all components function as designed. The permittee shall provide written certification to Water Quality Compliance that inspection of all components was performed and indicate the results of inspection.

4. Sampling Protocols

a. Discharge Monitoring System

Sample collection, preservation, and holding times shall be consistent with the most recent ADEQ Quality Assurance Project Plan and /or procedures described in EPA 40 CFR PART 136.

b. Groundwater Monitoring

Sample collection, preservation, and holding times shall be consistent with the most recent ADEQ Quality Assurance Project Plan and /or procedures described in EPA 40 CFR PART 136.

- (1) Static water levels shall be measured and recorded prior to sampling. Wells shall be purged of at least three borehole volumes (as calculated using the static water level) or until indicator parameters (pH, temperature, conductivity) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well should be allowed to recover to

80% of the original borehole volume, or for 24 hours, whichever is shorter, prior to sampling. If after 24 hours there is not sufficient water for sampling, the well will be recorded as dry for the monitoring event. An explanation for reduced pumping volumes, a record of the volume pumped, and modified sampling procedures shall be reported on the Self-Monitoring Report Form (SMRF).

5. Installation and Maintenance of Monitoring Equipment

a. Discharge Monitoring Equipment

The permittee shall provide monitoring or sampling access, ports, or devices at the facility for all monitoring required in this permit.

b. Groundwater Monitoring Equipment

Any groundwater monitoring wells, if required by this permit, shall be installed and maintained according to plans approved by ADEQ Water Permits Section, so that proper groundwater samples can be collected. Should additional groundwater wells be determined necessary, the construction details shall be submitted to ADEQ Water Permit Section for approval.

6. Monitoring Records

The following information associated with each sample, inspection or measurement and the name of each individual who performed the sampling or measurement should be included in the monitoring records:

- a. Date, time and exact place of sampling, inspection, or measurement and the name of each individual who performed the sampling or measurement.
- b. Procedures used to collect the sample or make the measurement.
- c. Date on which sample analysis was completed.
- d. Name of each individual and laboratory who performed the analysis.
- e. Analytical techniques or methods used to perform the sampling and analysis, laboratory detection limit for each test method performed, analytical variance for each parameter analyzed.
- f. Chain of custody records.
- g. Any field notes relating to the information described in subparagraphs a through f above.

C. Contingency Requirements

1. General ALDL and AQL Contingencies

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a. Alert Level (AL), Discharge Limit (DL), or Aquifer Quality Limit (AQL)

Exceedance

- (1) The permittee shall notify the Department at the address specified in PART II.F.1 within five days of becoming aware of the exceedance of an AL, DL, or AQL.
- (2) Verification sampling shall be conducted within five days of becoming aware that any AL, DL, or AQL has been exceeded.
- (3) Within five days of receiving the results of verification sampling from the laboratory, the permittee shall notify the Department of the results regardless of whether the results are positive or negative. Results shall be sent to the address indicated in PART II.F.1.
 - (a) If the results of verification sampling indicate that an AL, DL, or AQL has not been exceeded, the permittee shall assume that no exceedance has occurred. Unless the permittee is otherwise instructed by the Department, no further action is required until the next scheduled monitoring round.
 - (b) If the results verify that an AL, DL, or AQL has been exceeded, the permittee shall, within 30 days of receiving the laboratory results verifying that an AL, DL, or AQL has been exceeded, submit to ADEQ Water Quality Compliance, either (i) or (ii) of the following:
 - (i) a written report which includes the documentation specified in PART II.F.3.b. Upon approval by the Department, the permittee shall initiate actions necessary to mitigate the impacts of an exceedance. At a minimum, the actions specified shall include provisions for more frequent sampling until constituent concentration is below the AL, DL, or AQL for two consecutive samples. The report shall indicate if any additional parameters are to be tested.
 - (ii) a demonstration that the AL, DL, or AQL exceedance resulted from error(s) in sampling, analysis, or statistical evaluation.
- (4) In the event of an AL, DL, or AQL exceedance, the Department may require additional monitoring, studies, or remedial activities beyond those specified in this permit. In addition, if the permittee submits a demonstration that the AL, DL, or AQL exceedance was due to error(s) in sampling, analysis, or statistical evaluation, and this demonstration is not accepted by the ADEQ, the Department may require that

the permittee submit the documentation included in PART II.F.3.b.

- (3) In the event that an AL, DL, or AQL is exceeded for four consecutive months, the Director may require that groundwater monitoring wells be installed. At that time a well location list and parameter monitoring table will be added to this permit based on the AL, DL, or AQL exceedance data.

2. **Accidental Discharge**

- a. The permittee shall correct any failure that results in the violation of permit conditions and take the following actions:

- (1) Within 30 days of a spill that might cause the exceedance of an AQL, or might cause imminent and substantial endangerment to public health or the environment, the permittee shall submit a written report that includes the documentation required in PART II.F.3.b to ADEQ Water Quality Compliance.
- (2) Upon review of the above required report, the Department may require additional monitoring and/or actions.

- b. **Spills**

In the event of any accidental spill or unauthorized discharge of suspected hazardous or toxic materials on the facility site the related area shall be promptly isolated and attempts to identify the material shall be made. Information on persons that may have been exposed to the material will be recorded. A qualified contractor shall remove and dispose of the material according to applicable federal, state and city regulations.

- c. **Emergency Response**

- (1) The permittee shall provide for emergency response on a 24-hour basis in the event that a condition arises which results in imminent and substantial endangerment to public health or the environment. Emergency response shall include the following:
 - (a) designation of an emergency response coordinator who shall notify ADEQ Water Quality Compliance, and activate any necessary contingency in the event of an emergency, and
 - (b) procedures, personnel and equipment to be used to assure appropriate mitigation of unauthorized discharges
 - (c) the permittee shall notify ADEQ Water Quality Compliance of the person(s), address(es) and phone number(s) to be contacted in the event of an

the permittee submit the documentation included in PART II.F.3.b.

- (3) In the event that an AL, DL, or AQL is exceeded for four consecutive months, the Director may require that groundwater monitoring wells be installed. At that time a well location list and parameter monitoring table will be added to this permit based on the AL, DL, or AQL, exceedance data.

2. Accidental Discharge

- a. The permittee shall correct any failure that results in the violation of permit conditions and take the following actions:

- (1) Within 30 days of a spill that might cause the exceedance of an AQL, or might cause imminent and substantial endangerment to public health or the environment, the permittee shall submit a written report that includes the documentation required in PART II.F.3.b to ADEQ Water Quality Compliance.
- (2) Upon review of the above required report, the Department may require additional monitoring and/or actions.

b. Spills

In the event of any accidental spill or unauthorized discharge of suspected hazardous or toxic materials on the facility site the related area shall be promptly isolated and attempts to identify the material shall be made. Information on persons that may have been exposed to the material will be recorded. A qualified contractor shall remove and dispose of the material according to applicable federal, state and city regulations.

c. Emergency Response

- (1) The permittee shall provide for emergency response on a 24-hour basis in the event that a condition arises which results in imminent and substantial endangerment to public health or the environment. Emergency response shall include the following:
- (a) designation of an emergency response coordinator who shall notify ADEQ Water Quality Compliance, and activate any necessary contingency in the event of an emergency, and
- (b) procedures, personnel and equipment to be used to assure appropriate mitigation of unauthorized discharges
- (c) the permittee shall notify ADEQ Water Quality Compliance of the person(s), address(es) and phone number(s) to be contacted in the event of an

emergency, and shall inform ADEQ immediately if any of these change.

- (2) The emergency response coordinator shall notify ADEQ Water Quality Compliance immediately in the event that emergency response measures are taken.

D. Closure

1. The permittee shall notify ADEQ Water Quality Compliance of any intent to cease, without intent to resume, any activity for which the facility was designed. Within 90 days of such a notification, the permittee shall submit a closure plan, subject to approval by ADEQ Water Permits Section, which eliminates, to the greatest extent practicable, any reasonable probability of 1) further discharge to the facility, and 2) an exceedance of Aquifer Water Quality Standards at the applicable point of compliance. The plan shall describe all of the following details:
 - a. The approximate quantities and the chemical, biological, and physical characteristics of the materials to be removed from the facility.
 - b. The destination of the materials to be removed from the facility and an indication that placement of the materials at that destination is approved.
 - c. The approximate quantities and the chemical, biological, and physical characteristics of the materials that will remain at the facility.
 - d. The methods to be used to treat any materials remaining at the facility.
 - e. The methods to be used to control the discharge of pollutants from the facility.
 - f. Any limitations on future land or water uses created as a result of the facility's operations or closure activities.
 - g. The methods to be used to secure the facility.
 - h. An estimate of the cost of closure.
 - i. A schedule for implementation of the closure plan and the submission of a post-closure plan.
2. Upon completion of closure activities, the permittee shall give written notice to ADEQ Water Quality Compliance, indicating that the approved closure plan has been implemented fully, and shall provide proof of the inclusion in the deed to the property of complete information about any materials buried or discharged at the facility and any limitations on future land or water uses created as a result of the facility's operations or closure activities.

E. Post-Closure

1. Post-closure requirements by ADEQ Water Permits Section, will be based on the review of facility closure activities.

2. If submittal of a closure plan is required, the post-closure plan shall ensure that any reasonable probability of further discharge from the facility, and of exceeding Aquifer Water Quality Standards at the applicable points of compliance, are eliminated to the greatest extent practicable. The post-closure plan shall describe all of the following:
 - a. The duration of the post-closure care.
 - b. The monitoring procedures to be implemented by the permittee, including monitoring frequency, type and location.
 - c. A description of the operating and maintenance procedures to be implemented for aquifer quality protection devices such as liners, treatment systems, pump-back systems and monitoring wells.
 - d. A schedule and description of physical inspections to be conducted at the facility following closure.
 - e. An estimate of the cost of post-closure maintenance and monitoring.
 - f. A description of limitations on future land or water uses, or both, at the facility site as a result of facility operations.
3. The permittee shall provide written notification to ADHQP Water Permits Section when the post-closure activities have been completed.

F. Reporting Requirements

1. **Submittal Address**

Signed copies of all reports required herein shall be submitted to the Department at the following address:

Arizona Department of Environmental Quality
Water Quality Compliance
3033 N. Central Avenue
Phoenix, Arizona 85012
Phone Number: (602) 207-4688
2. **Monitoring Reporting**
 - a. The permittee shall complete the SMRF provided by the Department to reflect facility inspection requirements designated in PART IV, TABLE II and submit to ADEQ Water Quality Compliance quarterly along with other reports required by this permit. Facility inspection reporting on the SMRF shall be submitted no less frequently than quarterly, regardless of operational status.
 - b. PART IV, TABLE I contains the frequency for reporting results from discharge monitoring requirements. Results shall be submitted in the

AQUIFER PROTECTION PERMIT

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SMDP. Monitoring methods shall be recorded and any deviations from the methods and frequencies prescribed in this permit shall be reported.

- a. The permittee shall complete the SMDPs, to be supplied by the Department, to the extent that the information reported may be entered on the form. The results of all monitoring required by this permit shall be submitted in such a format as to allow direct comparison with the limitations and requirements of the permit.

3. Permit Violation or Alert Level Exceedance Reporting

- a. The permittee shall notify ADEQ Water Quality Compliance within five days of becoming aware of a violation of any permit condition or an Alert Level having been exceeded.
- b. The permittee shall submit a written report within 30 days after becoming aware of the violation of a permit condition or of an Alert Level having been exceeded. The report shall document all of the following:
 - (1) A description of the violation and its cause.
 - (2) The period of violation, including exact date(s) and time(s), if known, and the anticipated time period during which the violation is expected to continue.
 - (3) Any action taken or planned to mitigate the effects of the violation, or to eliminate or prevent recurrence of the violation.
 - (4) Any monitoring activity or other information which indicates that any pollutants would be reasonably expected to cause a violation of an Aquifer Water Quality Standard.
 - (5) Any malfunction or failure of pollution control devices or other equipment or process.

4. **Modification Reporting**

- a. All requests for permit modifications shall be done in accordance with PART VI.H.3., unless otherwise specified in this permit.
- b. Requests for a major modification to a facility shall be submitted at least 180 calendar days before making the major modification.

5. **Operational Reporting**

- a. The permittee shall report operational conditions listed in PART IV, TABLE III in the SMRF quarterly. If none of the conditions occur, the report shall say "no event" for a particular reporting period. If the facility is not in operation, the permittee shall indicate that fact in the SMRF.
- b. The permittee shall submit data required in PART IV, TABLES I through II regardless of the operating status of the facility unless otherwise approved by the Department or allowed in this permit.

6. **Self-Monitoring Reports**

The Self-Monitoring Report shall include: Copies of laboratory analysis forms, documentation on sampling date and time, name of sampler, static water level prior to sampling, sampling method, purging volume, indicator parameters, analytical method, method detection limit, date of analysis, preservation and transportation procedures, and analytical facility. Data shall be compiled on standardized forms which allow comparison with past reports.

7. **Submittal of Sampling Reports**

Reports of samples taken will be submitted to ADEQ within 28 days after the end of each quarter. The following schedule will be used.

Samples taken during quarter beginning	Quarterly Report due by
Jan	Apr 28
Apr	Jul 28
Jul	Oct 28
Oct	Jan 28

PART III OTHER CONDITIONS

A. Analytical Methodology

The water samples shall be analyzed using any EPA approved methods or Arizona State approved methods as long as the detection limits are equal to or lower than the Alert Levels, Discharge Limits or Aquifer Quality Limits in PART IV, TABLES I, & II. The analysis shall be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure & Certification. For results to be considered valid, all analytical work shall meet quality control standards specified in the approved methods. A list of certified laboratories can be obtained at the address listed below:

Arizona Department of Health Services
Office of Laboratory Licensure & Certification
3443 North Central Avenue
Phoenix, Arizona 85012
Phone Number: (602) 255-3454

B. Environmental Laboratory Contact

Upon submittal of the samples to a state-certified laboratory for analysis, a copy of the signed permit shall be forwarded to the laboratory for reference.

PART IV. TABLES

TABLE I

SOURCE WATER INFLOW (INFLUENT) MONITORING

Sampling Point Number	Identification	Latitude	Longitude
1	Existing Diversion Structure	32° 25' 43" N	111° 13' 30" W

Parameter	AL	DU ¹	UNITS	Sampling Frequency	Reporting Frequency
Flow	N/A	Reserved ²	MGD	Daily	Quarterly
Flow	N/A	1.07	MGD ³	Calculated Annually	Annually

Nutrients:

Total Nitrogen ⁴	Reserved	Reserved	mg/l	Monthly	Quarterly
Nitrate-Nitrite as N	Reserved	Reserved	mg/l	Monthly	Quarterly
Total Kjeldahl Nitrogen (TKN)	Reserved	Reserved	mg/l	Monthly	Quarterly

-
- ¹ All discharge limits are in mg/l except flow, which is in million gallons per day (MGD).
 - ² Monitoring required, but no limits have been established at this time.
 - ³ Flow of 1.07 MGD is calculated annually and is based on the average daily flow for that year.
 - ⁴ Total Nitrogen is equal to Nitrate-Nitrite-N plus TKN.

Metals (Total):

Arsenic	Reserved	Reserved	mg/l	Quarterly	Quarterly
Barium	Reserved	Reserved	mg/l	Quarterly	Quarterly
Cadmium	Reserved	Reserved	mg/l	Quarterly	Quarterly
Chromium	Reserved	Reserved	mg/l	Quarterly	Quarterly
Lead	Reserved	Reserved	mg/l	Quarterly	Quarterly
Antimony	Reserved	Reserved	mg/l	Quarterly	Quarterly
Geryllium	Reserved	Reserved	mg/l	Quarterly	Quarterly
Nickel	Reserved	Reserved	mg/l	Quarterly	Quarterly
Mercury	Reserved	Reserved	mg/l	Quarterly	Quarterly
Selenium	Reserved	Reserved	mg/l	Quarterly	Quarterly

Volatile Organic Compounds (VOCs):

Benzene	Reserved	Reserved	mg/l	Quarterly	Quarterly
Carbon tetrachloride	Reserved	Reserved	mg/l	Quarterly	Quarterly
o-Dichlorobenzene	Reserved	Reserved	mg/l	Quarterly	Quarterly
para-Dichlorobenzene	Reserved	Reserved	mg/l	Quarterly	Quarterly
1,2-Dichloroethane	Reserved	Reserved	mg/l	Quarterly	Quarterly
1,1-Dichloroethylene	Reserved	Reserved	mg/l	Quarterly	Quarterly
cis-1,2-Dichloroethylene	Reserved	Reserved	mg/l	Quarterly	Quarterly
trans-1,2-Dichloroethylene	Reserved	Reserved	mg/l	Quarterly	Quarterly
1,2-Dichloropropane	Reserved	Reserved	mg/l	Quarterly	Quarterly
Ethylbenzene	Reserved	Reserved	mg/l	Quarterly	Quarterly
Monochlorobenzene	Reserved	Reserved	mg/l	Quarterly	Quarterly
Styrene	Reserved	Reserved	mg/l	Quarterly	Quarterly
Tetrahaloethylene	Reserved	Reserved	mg/l	Quarterly	Quarterly
Toluene	Reserved	Reserved	mg/l	Quarterly	Quarterly
1,1,1-Trichloroethane	Reserved	Reserved	mg/l	Quarterly	Quarterly
1,1,2-Trichloroethane	Reserved	Reserved	mg/l	Quarterly	Quarterly
Trichloroethylene	Reserved	Reserved	mg/l	Quarterly	Quarterly
Vinyl Chloride	Reserved	Reserved	mg/l	Quarterly	Quarterly
Xylenes (Total)	Reserved	Reserved	mg/l	Quarterly	Quarterly

TABLE II
GROUNDWATER MONITORING

Sampling Point Number	Identification	Latitude	Longitude
3	POC Well (D-11-11)33sec	32° 29' 46" N	111° 13' 40" W

Parameter	AL	AQL ¹	UNIT	Sampling Frequency	Reporting Frequency
Depth to water	Reserved	Reserved	feet	Monthly	Quarterly

Nutrients:

Total Nitrogen	8.0	10	mg/l	Monthly	Quarterly
Nitrate-Nitrite as N	8.0	10	mg/l	Monthly	Quarterly
Total Kjeldahl Nitrogen (TKN)	Reserved ¹	Reserved	mg/l	Monthly	Quarterly

Metals (Totals):

Arsenic	0.04	0.05	mg/l	Quarterly	Quarterly
Barium	1.60	2.0	mg/l	Quarterly	Quarterly
Cadmium	0.004	0.005	mg/l	Quarterly	Quarterly
Chromium	0.08	0.10	mg/l	Quarterly	Quarterly
Lead	0.04	0.05	mg/l	Quarterly	Quarterly
Mercury	0.0016	0.002	mg/l	Quarterly	Quarterly
Antimony	0.0048	0.006	mg/l	Quarterly	Quarterly
Beryllium	0.0032	0.004	mg/l	Quarterly	Quarterly
Nickel	0.08	0.1	mg/l	Quarterly	Quarterly
Thallium	0.0016	0.002	mg/l	Quarterly	Quarterly
Selenium	0.04	0.05	mg/l	Quarterly	Quarterly

¹ All values cited are maximum allowable values unless otherwise indicated. All AQLs are in mg/l, except depth to water, which is in feet.

Volatile Organic Compounds (VOCs):

Benzene	0.004	0.005	mg/l	Quarterly	Quarterly
Carbon tetrachloride	0.004	0.005	mg/l	Quarterly	Quarterly
o-Dichlorobenzene	0.48	0.6	mg/l	Quarterly	Quarterly
para-Dichlorobenzene	0.06	0.075	mg/l	Quarterly	Quarterly
1,2-Dichloroethane	0.004	0.005	mg/l	Quarterly	Quarterly
1,1-Dichloroethylene	0.0056	0.007	mg/l	Quarterly	Quarterly
cis-1,2-Dichloroethylene	0.056	0.07	mg/l	Quarterly	Quarterly
trans-1,2-Dichloroethylene	0.08	0.1	mg/l	Quarterly	Quarterly
1,2-Dichloropropane	0.004	0.005	mg/l	Quarterly	Quarterly
Ethylbenzene	0.56	0.7	mg/l	Quarterly	Quarterly
Monochlorobenzene	0.08	0.1	mg/l	Quarterly	Quarterly
Styrene	0.08	0.1	mg/l	Quarterly	Quarterly
Tetrachloroethylene	0.004	0.005	mg/l	Quarterly	Quarterly
Toluene	0.8	1.0	mg/l	Quarterly	Quarterly
1,1,1-Trichloroethane	0.16	0.20	mg/l	Quarterly	Quarterly
1,1,2-Trichloroethane	0.004	0.005	mg/l	Quarterly	Quarterly
Trichloroethylene	0.004	0.005	mg/l	Quarterly	Quarterly
Trihalomethanes (total THMs)	0.08	0.10	mg/l	Quarterly	Quarterly
Vinyl Chloride	0.0016	0.002	mg/l	Quarterly	Quarterly
Xylenes (Total)	8.0	10.0	mg/l	Quarterly	Quarterly

TABLE III
FACILITY INSPECTION

Parameter	Performance Levels	Inspection Frequency
Diversion Inake Structure Integrity	Good Working Condition	Weekly
Pump Integrity	Good Working Condition	Weekly
Basin Integrity	Infiltration Rates	Quarterly

PART V. REFERENCES: PERTINENT INFORMATION

A. References

The terms and conditions set forth in this permit have been developed based upon the information contained in the following:

1. Field Inspection Form(s) dated: N/A
2. Permit Application dated: April 4, 1997
3. Aquifer Impact Review dated: June 30, 1997
4. Plan Review File Number: 103195
5. Letter of Intent dated: July 14, 1997
6. Amendments to above No. 2 dated: May 15, 1997
7. Public Notice dated: September 3, 1997
8. Public Hearing comments, correspondence and any additional supplemental information contained in the permit file.
9. Other

B. Facility Information

1. Facility Contact Person: Ms. Dorothy C. Dolan, P.E.
2. Address: Pima County Flood Control District
201 North Stone Avenue
Tucson, Arizona 85701
3. Office Telephone Number: (520) 740-6458

The Department shall be notified within 30 days of the change in facility contact person.
4. Emergency Response Coordinator: Mr. Thomas Helfrich
5. Emergency Telephone Number: (520) 218-2669 (Pager)

The Department shall be notified immediately of the change in emergency response coordinator.
6. Landowner of Facility Site: State Land Department
1616 W. Adams
Phoenix AZ 85007

PART VI Preservation of Rights

This permit shall not be construed to abridge or alter causes or action or remedies under the common law or statutory law, criminal or civil, nor shall any provision of this permit, or any act done by virtue of this permit, be construed so as to stop any person, this State or any political subdivision of this State, or owners of land having groundwater or surface water rights or otherwise, from exercising their rights or, under the common law or statutory law, from suppressing nuisances or preventing injury due to discharges.

B. Monitoring Requirements

The permittee shall conduct any monitoring activity necessary to assure compliance with any permit condition, with Aquifer Water Quality Standards, and with A.R.S. §§ 49-241 through 49-251:

1. The permittee shall install, use and maintain all monitoring equipment in acceptable condition or provide alternate methods approved by the Department, and
2. The permittee is required to conduct monitoring of a type and frequency sufficient to yield data which are representative of the monitored activity and approved by the Department.

C. Reporting of Bankruptcy or Environmental Enforcement

The permittee shall notify the ADEQ Aquifer Protection Permit Compliance within five (5) days after the occurrence of either:

1. The filing of bankruptcy by the permittee; or
2. the entry of any order or judgment against the permittee for the enforcement of any environmental protection statute and in which monetary damages or civil penalties are imposed.

D. Site Examination

1. Upon presentation of credentials, the Department may, if reasonably necessary, inspect the facility, any activity used for the generation, storage, treatment, collection or disposal of any waste or pollutant at the facility, and the location where records or documents related to the facility are kept. The Department may exercise this authority only for the purpose of ensuring compliance with A.R.S. § 49, Chapter 2, A.A.C. §18-9-101 through 130 and this permit, or to verify that information submitted in a permit application or documented in a permit, including any permit conditions, is accurate.
2. The Department may:
 - a. Obtain samples;
 - b. analyze, or require to be analyzed, any samples, either on-site or at another location;

- c. take photographs;
- d. inspect equipment, activities, facilities and monitoring equipment or methods of monitoring; or
- e. inspect and copy any records that are required to be maintained for the facility.

- 3. Any pertinent information required by the permit shall be available for on-site inspection during normal business hours. The owner or operator of the property shall be afforded the opportunity to accompany a Department inspector. Split samples, receipts and copies of photographs will be provided to the facility owner or operator if the owner or operator requests them at the time the sample(s) is (are) obtained or the photograph(s) is (are) taken as the case may be. A copy of the results of any analyses of samples, monitoring, or testing shall be furnished promptly to the owner or operator.
- 4. Inspections shall be conducted pursuant to the appropriate provisions of the Arizona Revised Statutes.

E. Proper Operation

- 1. The permittee shall operate the facility to ensure that pollutants discharged will in no event cause or contribute to a violation of aquifer water quality standards at the applicable point of compliance for the facility, or that no pollutants discharged will further degrade any aquifer in which the aquifer quality standard for a pollutant was already exceeded prior to operation of the facility at the applicable point of compliance.

F. Technical and Financial Capability

- 1. The permittee shall maintain the technical and financial capability necessary to fully carry out the terms of this permit.
- 2. Any bond, insurance policy or trust fund provided as a demonstration of financial capability in the permit application (R18-9-108.8 c.iii.) shall be in effect prior to any activity authorized by this permit and remain in effect for the duration of the permit.

G. Other Rules and Laws

The issuance of this permit does not waive any federal, state, county or local government rules, regulations or permits applicable to this facility.

H. Permit Actions

- 1. This permit may be modified, transferred, renewed or revoked under the rules of the Department. The filing of a request by the permittee for a permit action does not stay any existing permit condition.
- 2. The Director shall issue a public notice of all proposed permit actions pursuant to R18-9-124.

3. Permit Modification

- a. Request for modification of a permit shall be made in writing by the permittee, the Department, or any affected person, and shall identify the specific item(s) to be considered for modification and the facts and reasons which justify the request.
- b. The permittee may be required to submit additional information pursuant to A.A.C. R18-9-108, including an updated permit application.
- c. The Director may modify an individual Aquifer Protection Permit if the Director determines any one or more of the following:
 - (1) That material and substantial alterations or additions to a permitted facility justify a change in permit conditions,
 - (2) that the discharge from the facility violates or could reasonably be expected to violate any Aquifer Water Quality Standard,
 - (3) that rule or statutory changes have occurred, such as to require a change in the permit, and/or
 - (4) that there has been a change of an applicable point of compliance.
- d. With written concurrence of the permittee, the Department may make minor modifications to a permit for any of the following reasons without giving public notice or conducting a public hearing:
 - (1) To correct typographical errors,
 - (2) increase the frequency of monitoring or reporting;
 - (3) change an interim compliance date in a compliance schedule if the permittee can show just cause and that the new date does not interfere with the attainment of a final compliance date requirement;
 - (4) change construction requirements, if the alteration complies with the requirements of these rules and provides equal or better performance, or
 - (5) replace monitoring equipment, including wells, if such replacement results in equal or greater monitoring effectiveness.

4. Permit Transfer

- a. The Director may transfer an individual Aquifer Protection Permit if the Director determines that the proposed transferee will comply with A.R.S. §§ 49-241 through 49-251 and A.A.C. Chapter 9, Article 1. The permittee is responsible for complying with permit conditions, A.R.S. §§ 49-241 through 49-251 and A.A.C. Chapter 9, Article 1, regardless of

whether the permittee has sold or otherwise disposed of the facility, until the Director transfers the permit.

- b. The proposed transferor and the transferee shall notify the Department prior to any change in the owner or operator of the facility. Information required in A.A.C. R18-9-108.A.1,2,3 and 6; B.7,8 and 9; and D. shall be submitted for or by the transferee prior to transfer of the permit.
- c. The Director shall issue public notice of all permit transfers.

5. Permit Revocation and Suspension

The Director may suspend or revoke this permit for any of the following reasons:

- a. Noncompliance by the permittee with any applicable provision of § 49, Chapter 2, Article 3 or the Arizona Revised Statutes, A.A.C. Title 18, Chapter 9, Article 1 or permit conditions,
- b. the permittee's misrepresentation or omission of any fact, information or data related to the permit application or permit,
- c. the Director determines that the permitted activity is causing or may cause a violation of any Aquifer Water Quality Standard, or
- d. a permitted discharge has the potential to cause or will cause imminent and substantial endangerment to public health or the environment.

1. Confidentiality of Information

1. Any information submitted to or obtained by the Department pursuant to A.R.S. § 49-243 may be available to the public unless it is designated confidential. Information or a particular part of the information shall be considered confidential upon either:

- a. a showing, satisfactory to the Director, by any person that the information, or a particular part of the information, if made public, would divulge the trade secrets of the person; or
- b. a determination by the attorney general that disclosure of the information or a particular part of the information would be detrimental to an ongoing criminal investigation or to an ongoing or contemplated civil enforcement action under A.R.S. § 49, Chapter 2 in Superior Court.

2. Information may be designated "confidential" only if it meets the following criteria:

- a. A confidentiality claim has been made at the time the information was submitted or obtained;
- b. the facility owner or operator has shown that reasonable measures have been taken to protect the confidentiality of the information and intends to continue to take such measures;

AQUIFER PROTECTION PERMIT
PERMIT NUMBER P-100195
Page 22 of 23

- c. the information is not, and has not been, reasonably obtainable without the facility owner or operator's consent by persons other than governmental bodies by use of legitimate means, other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding;
 - d. no statute or rule specifically requires disclosure of the information; and
 - e. the facility owner or operator has shown that disclosure of the information is likely to cause harm to its competitive position.
- 3. Financial information required in the permit or permit application will be held confidential. Notwithstanding, the Director may disclose any records, reports or information obtained from any person in regard to this permit, including records, reports or information obtained by the Director or Department employees, to:
 - a. Other state employees concerned with administering A.R.S. § 49, Chapter 2, or if the records, reports or information are relevant to any administrative or judicial proceeding under that chapter; and/or
 - b. employees of the United States Environmental Protection Agency, if such information is necessary or required to administer and implement or comply with the Clean Water Act, and Safe Drinking Water Act, CERCLA or provisions and regulations relating to those acts.
- 4. Claims of confidentiality for the following information shall be denied:
 - a. The name and address of any permit applicant or permittee;
 - b. the chemical constituents, concentrations and amounts of any pollutant discharge; or
- 5. the existence or level of a concentration of a pollutant in drinking water or in the environment.

7. Violations; Enforcement

Any person who owns or operates a facility contrary to the provisions of A.R.S. § 49, Chapter 2, who violates the conditions specified in the A.A.C. § 18, Chapter 9, Article 1, or this permit, is subject to the enforcement actions prescribed in A.R.S. § 49, Chapter 2, Article 4 or the Arizona Revised Statutes.

PART VII. AQUIFER WATER QUALITY STANDARDS

A. General Standards Applicable to all Aquifers

1. A discharge shall not cause the concentration of a pollutant in an aquifer to exceed at an applicable point of compliance any one of the maximum concentrations prescribed in A.A.C. R18-11-406, unless a higher Aquifer Quality Limit has been established for this permit.
2. A discharge shall not cause a pollutant to be present in an aquifer classified for drinking water protected use in a concentration which endangers human health.
3. A discharge shall not cause a violation of a surface water quality standard established for a navigable water of the State.
4. A discharge shall not cause a pollutant to be present in an aquifer which impairs existing or reasonably foreseeable uses of water in an aquifer.

APPENIDIX B

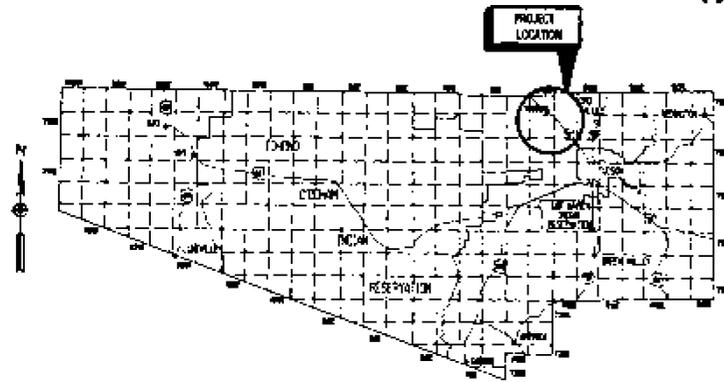
AS-BUILTS FOR PROJECT FACILITY

MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

W.O. NO. 4FLSCE
C.I.P. NO. FC-97-003

GENERAL DESCRIPTION OF PROJECT:

CONSTRUCT RECHARGE BASINS (TOTALING 3.00 ACRES)
FOR TREATED EFFLUENT FROM SANTA CRUZ RIVER.
PROJECT INCLUDES PUMPING AND DISTRIBUTION
SYSTEM, LANDSCAPING, ACCESS ROAD AND OTHER WORK.



LOCATION MAP

33 T15 R11E
SECTION TOWNSHIP RANGE

0.4 SQUARE M.
PIMA COUNTY ARIZONA

GENERAL NOTES

Project Location

The project site is located in Marana, along the southern bank of the Santa Cruz River. The site is located in Section 33, Township 11 South, Range 11 East, Gila and Salt River Base Meridian, Pima County, Arizona.

Scope of Work

The project involves the construction of four recharge basins, an equalization basin, an inlet pump station, pressure and gravity distribution piping, access road, and the required appurtenances to complete the construction.

Access During Construction

Access to the site will be from Sanders Road along the acquired easement for the project. The legal description for the easement is included in the special provisions under Appendix A-Legal Descriptions.

Maintenance and Protection of Traffic

Maintenance and protection of traffic shall include providing adequate motor vehicle, pedestrian, equestrian and livestock barriers to limit and control access to the construction site. The contractor shall provide traffic control devices and flagmen, as directed by the Engineer when construction traffic is crossing or accessing Sanders Road.

Existing Vegetation

Existing vegetation outside the clearing and grubbing limits shall remain undisturbed. Vegetation distributed by the contractor outside the project limits shall be repaired and/or replaced at the contractor's expense.

Contract Time

The contract time for this project shall be 125 Working days from issuance of the notice to proceed.

Construction Survey

Construction survey and layout will be performed by Pima County staff.

Utility Protection

The contractor shall verify elevation and locations of all utilities prior to commencing work. Repair and/or replacement of any damage utilities shall be at the contractor's expense. The contractor shall contact Blue Stain Center (1-800-STAKE-IT) two full working days prior to any construction.

Hazardous Materials

If hazardous materials are encountered all work shall stop in that area and the area shall be taped off. Further investigation and clean up will be performed by Pima County. No adjustment in the bid price will be made to the contract documents and no monetary compensation to the contractor will be made for any and all contractor's damages. The contractor will be compensated for time only.

Water

The contractor shall obtain water for dust control and compaction from a suitable source. No additional payments will be made for water. Water in the ox-bow channel is an acceptable source provided the contractor can document the applicable permits.

Excess Material

The contractor shall be responsible for the disposal of all excess material. Disposal site and grading plans to be provided by Pima County.

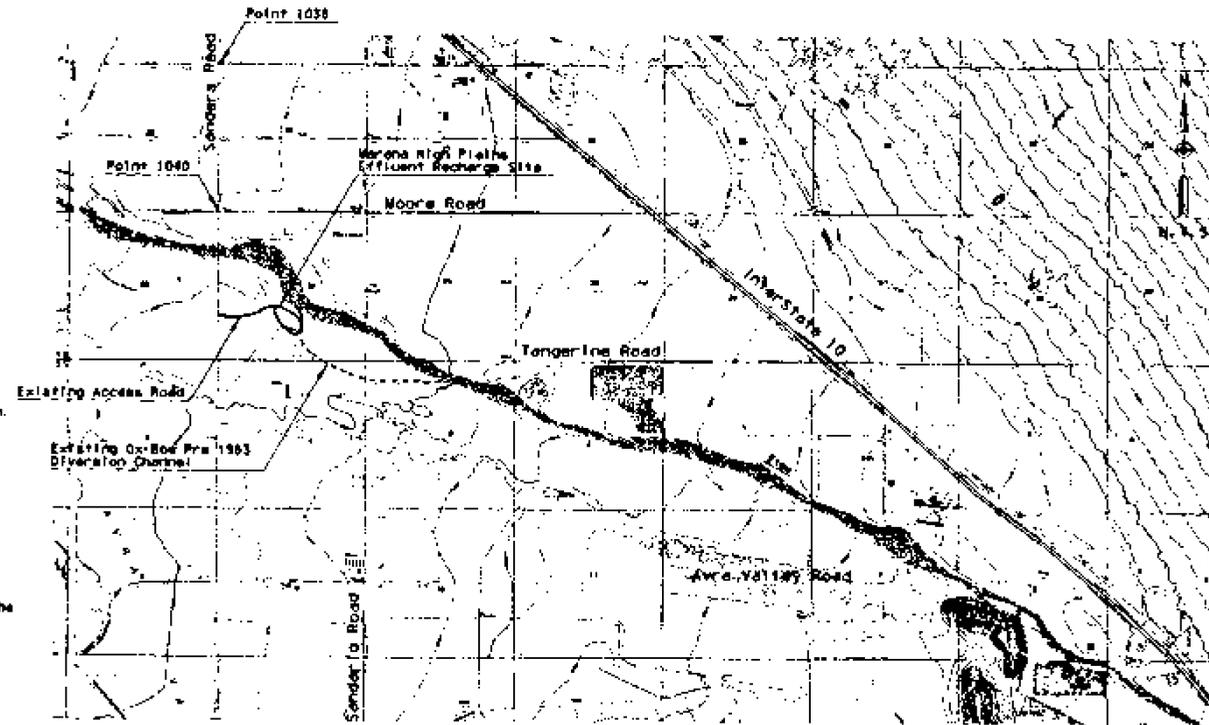
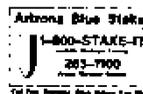
Dewatering

It is the contractor's responsibility to allow for surface water flow at the time of project construction. The contractor shall not impound or block surface flows during construction, this includes flow to the Honas Irrigation ditch that lies along the northern boundary of the site.

The contractor is advised that treated effluent flows adjacent to the site and will be used as part of this project. The contractor shall take the necessary precautions suggested by Risk Management while working in and around this treated effluent. Personnel shall not ingest the water, shall wear protective clothing while working in and/or around the effluent, and shall wash hands before eating. No measurement or direct payment will be made for channelizing surface water or for dewatering required during the course of construction, including all permits. All cost for channelizing and dewatering shall be considered incidental to the contract and included in the cost of the bid items requiring dewatering or channelizing.

Archaeological Features

An archaeological evaluation has been conducted and the limits of archaeological features found has been denoted on the plans. The area designated archaeological features shall not be disturbed. Should artifacts or human remains be uncovered in the designated construction site, the immediate area shall be taped off and further investigated by Pima County. The work is subject to delay in that location pursuant to ARS 41-844. While an examination takes place, however, no adjustment in the bid price will be made to the contractor documents and no monetary compensation to the contractor will be made for any and all contractor's damages and claims due to work shut down. The contractor will be compensated for time only.



VICINITY MAP

GENERAL NOTES

Federal Funds

The project will receive federal funds and shall meet all federal guidelines on wages, EEO, DBE, and ADA requirements, including the Davis-Bacon Wage Rate Act. See bid documents for details.

Contract Administration

Prior to submittal of contract administration documents, examples of which are listed below, the contractor shall review all documentation for accuracy and compliance with the contract. Any variance from the plans and specifications shall be clearly noted and subject to approval by the Engineer. A contractor's transmittal letter shall accompany all submittals and shall include certification as to accuracy and compliance with the plans and specifications.

Contract administration submittals shall include, but are not limited to, the following examples: escrow agreements; subcontracts; purchase orders; certified payrolls for contractor and subcontractors; training preconstruction information; proof of apprenticeship; weekly individual training reports; rental equipment invoices; material invoices showing all unit prices; pay estimates; affidavit of certification of payments to disadvantaged business enterprise firms; requested lien releases; and consent from surety.

A monthly meeting may be scheduled with the contractor at the discretion of the Engineer to discuss and resolve any problems associated with contract administration submittals. The monthly meeting shall be held at the Field Engineering Building at 1313 South Mission Road. Meetings shall continue on an accelerated basis after project construction completion until all contract administration issues are resolved.

Submittals that are not certified, or incomplete, will be returned to the contractor unprocessed for proper resubmittal and may result in payment delays, or partial payment, as deemed appropriate by the engineer.

Disadvantage Business Enterprise Goal

The percentage of participation by Disadvantaged Business Enterprises on this project will be determined by appropriate Pima County personnel.

State Land

The contractor and sub-contractors are hereby instructed to read and follow all terms and conditions of the Arizona State Land Department's Easement and Special Land Use Permit as provided in Appendix A, of the specifications when the contractor and sub-contractors are working within State Land.

Erosion Control Measures

The contractor shall remove and dispose of erosion control measures as directed by the Engineer after completion and acceptance of the Landscape Establishment Period. Subsequent removal and disposal will be incidental to the respective work item and no additional payment will be made.

Reference Documents

Complete the work in accordance with the requirements of the following documents which are incorporated into this contract by reference:

Standard Specifications for Public Improvements, 1994 Edition, Pima County/City of Tucson, referred to as "Standard Specifications"

Standard Details for Public Improvements, 1994 Edition, Pima County/City of Tucson, referred to as "Standard Details".

BASIS OF BEARING

BASIS OF BEARING IS THE WESTERN SECTION LINE OF TOWNSHIP 11 SOUTH; RANGE 11 EAST; SECTION 33 AS DESCRIBED BELOW

POINT 1040

N 521329.8470
E 910629.3290
DESCRIPTION 1040 FOUND 2 3/4" BCSM IN CASING
T-11-S R-11-E WEST 1/4 SECTION OF SECTION 33.

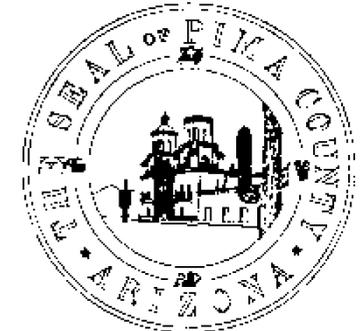
POINT 1038

N 524091.1480
E 910582.8430
DESCRIPTION 1038 FOUND BRASS CAP
T-11-S R-11-E NORTHWEST CORNER OF SECTION 33

BEARING BETWEEN POINT 1038 AND 1040 IS 307°00'30"E WITH A DISTANCE OF 2541.71'

BASIS OF ELEVATION

POINT 1040 ELEVATION 1875.83
HORIZONTAL DATUM IS ARIZONA
COORDINATE SYSTEM, 1983
CENTRAL ZONE, 1982 HARN
ADJUSTMENT
VERTICAL DATUM IS NAVD83



PIMA COUNTY
BOARD OF SUPERVISORS

SHAWN MORGAN, CHAIR
PAUL BRALVA
DAN EKLSTROM
MIKE BOYD
RAYMOND CANNON

PROJECT IS WITHIN SUPERVISOR DISTRICT #3

SHEET INDEX

SHEET NO.	DESCRIPTION	DRAWING NO.	SHEET NO.	DESCRIPTION	DRAWING NO.
1	COVER	G-1	9	TYPICAL DETAILS AND PUMP STATION AREA	T-1
2	HYDRAULIC PROFILE & PROCESS FLOW DIAGRAM	G-2	20	TYPICAL DETAILS	T-2
3	FENCE CONTROL AND LEGAL DESCRIPTIONS	G-3	21	TYPICAL DETAILS FENCE	T-3
4	INDEX SHEET	G-4	22	TYPICAL DETAILS FENCE	T-4
5	GRADING AREA A-1	G-5	23	STORMWATER POLLUTION PREVENTION PLAN AND DETAILS	SWP-1
6	GRADING AREA A-2	G-6	24	STORMWATER POLLUTION PREVENTION CHECKLIST	SWP-2
7	GRADING AREA A-3	G-7	25	LANDSCAPING	L-1
8	GRADING AREA A-4	G-8	26	LANDSCAPING	L-2
9	GRADING AREA A-5	G-9	27	LANDSCAPING	L-3
10	GRADING AREA A-6	G-10	28	LANDSCAPING	L-4
11	YARD PILING AREA A-1	G-11	29	LANDSCAPING	L-5
12	YARD PILING AREA A-2	G-12	30	LANDSCAPING	L-6
13	YARD PILING AREA A-3	G-13	31	LANDSCAPING	L-7
14	BASIN CROSS SECTIONS	G-14	32	LANDSCAPING	L-8
15	BASIN CROSS SECTIONS	G-15	33	LANDSCAPING	L-9
16	PUMP STATION PLAN AND SECTIONS	M-1	34	ELECTRICAL	E-1
17	RECHARGE INFLUENT METERING	M-2	35	ELECTRICAL	E-2
18	EQUALIZATION BASIN INFLUENT AND EFFLUENT STRUCTURE	M-3	36	ELECTRICAL	E-3

PIMA COUNTY DEPARTMENT OF TRANSPORTATION
AND FLOOD CONTROL DISTRICT

301 N. STONE AVE. TUCSON, ARIZONA 85701
BROOKS KEENAL, P.E. CHIEF ENGINEER

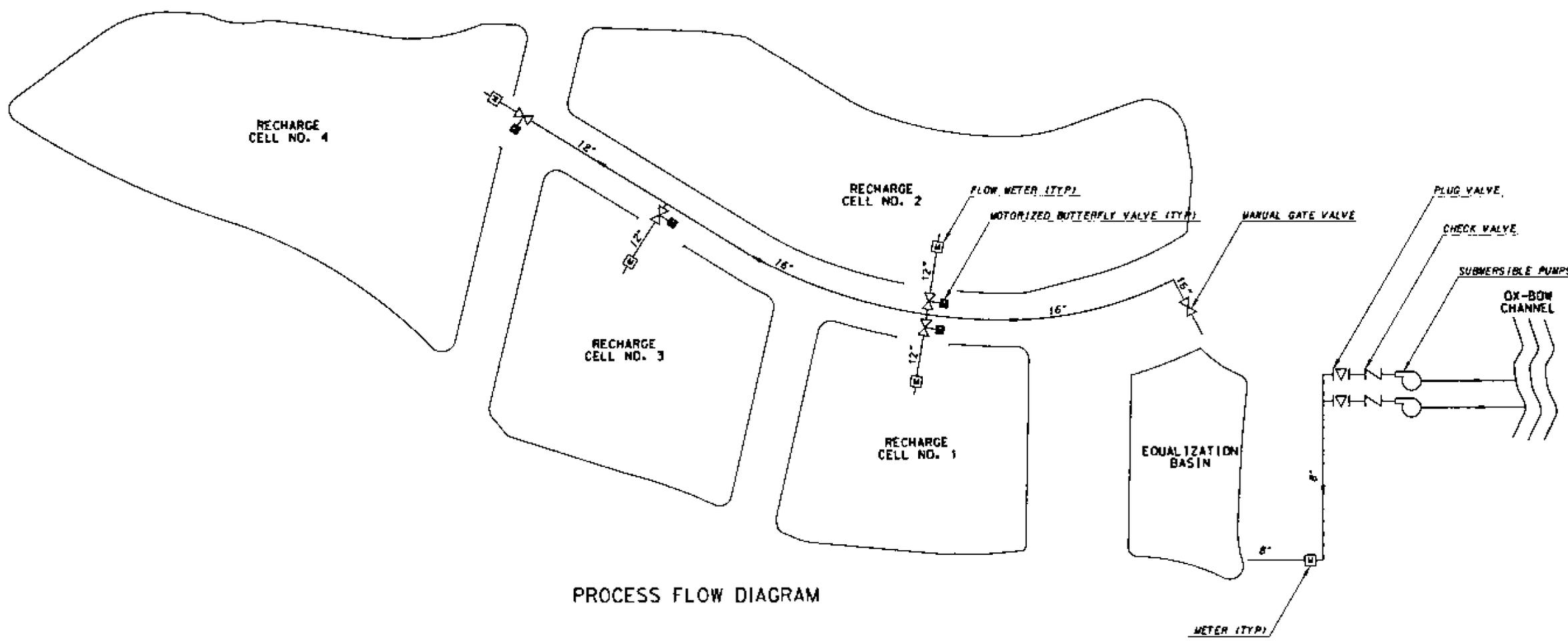
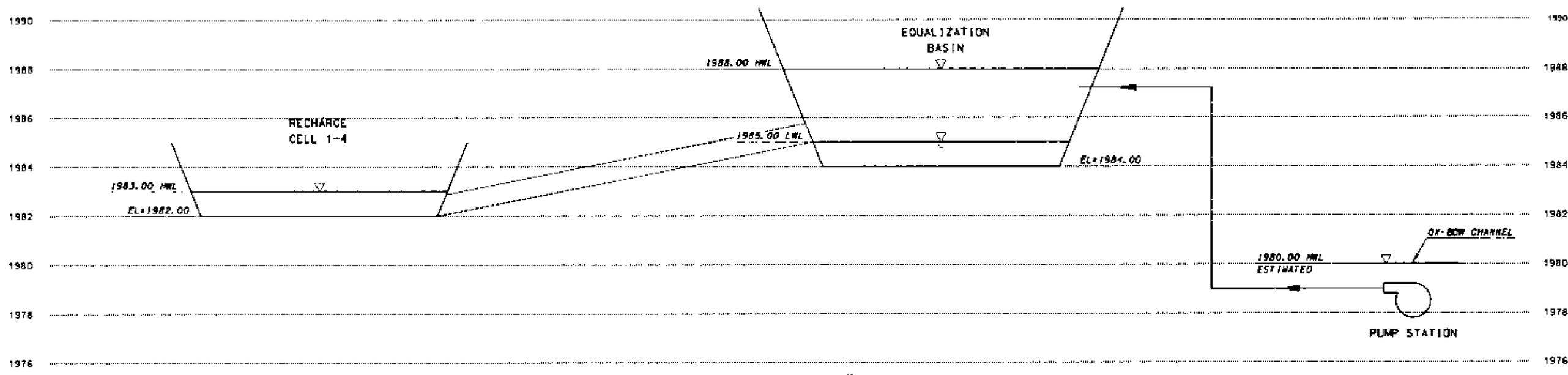
NO.	REVISIONS	ENGINEER	DATE



REVIEWED BY	ENGINEER	DATE
MR. FLOOD CONTROL DIST.	Jason C. Bethke	11/14/00
MR. TRANSPORTATION DIST.		
MR. FIELD OPER.		
MR. FLOOD PLAN.		
MR. PUMP DIST.		

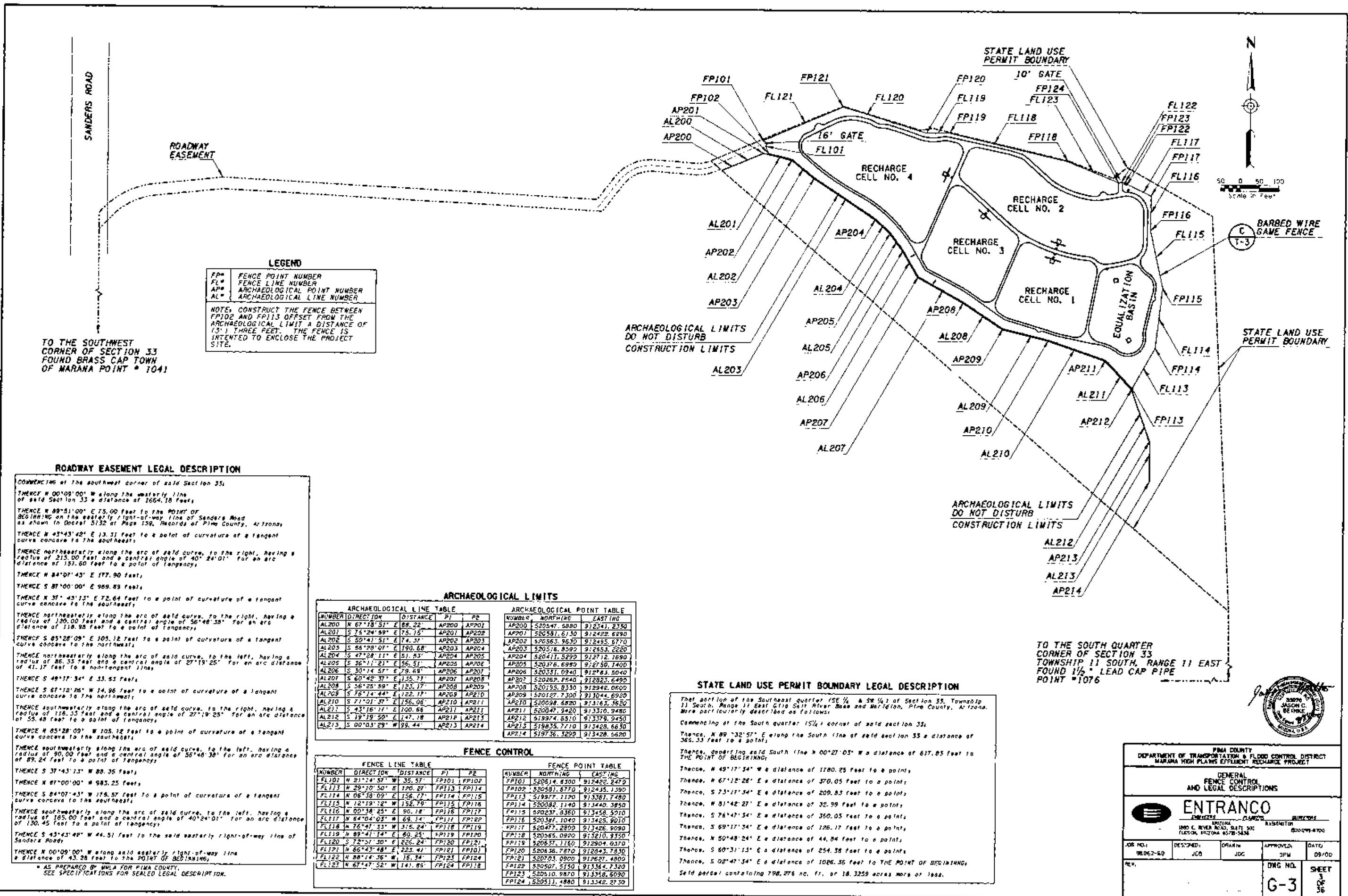
WORK ORDER NO. 4FLSCE

SHEET NO. 1 OF 36



PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT				
GENERAL HYDRAULIC PROFILE & PROCESS FLOW DIAGRAM				
ENTRANCO				
<small> ARIZONA PUNAZON WASHINGTON 1800 E. RIVER ROAD, SUITE 300 62049-8700 TUCSON, ARIZONA 85718-7638 </small>				
JOB NO. 91062-60	DESIGNED JCB	DRAWN JGG	APPROVED BPM	DATE 08/00
REV.			PRG NO. G-2	SHEET 2 OF 36

16/08/00, 07/25/00



LEGEND

FP# FENCE POINT NUMBER
 FL# FENCE LINE NUMBER
 AP# ARCHAEOLOGICAL POINT NUMBER
 AL# ARCHAEOLOGICAL LINE NUMBER

NOTE: CONSTRUCT THE FENCE BETWEEN FP102 AND FP113 OFFSET FROM THE ARCHAEOLOGICAL LIMIT A DISTANCE OF (3') THREE FEET. THE FENCE IS INTENDED TO ENCLOSE THE PROJECT SITE.

TO THE SOUTHWEST CORNER OF SECTION 33 FOUND BRASS CAP TOWN OF MARANA POINT # 1041

TO THE SOUTH QUARTER CORNER OF SECTION 33 TOWNSHIP 11 SOUTH, RANGE 11 EAST FOUND 1/2" LEAD CAP PIPE POINT #1076

ROADWAY EASEMENT LEGAL DESCRIPTION

COMMENCING at the southwest corner of said Section 33;

THENCE N 00°09'00" W along the westerly line of said Section 33 a distance of 1664.18 feet;

THENCE N 89°51'00" E 75.00 feet to the POINT OF BEGINNING on the easterly right-of-way line of Sanders Road as shown in Decret 5132 of Page 159, Records of Pima County, Arizona;

THENCE N 43°43'42" E 13.31 feet to a point of curvature of a tangent curve concave to the southeast;

THENCE northwesterly along the arc of said curve, to the right, having a radius of 215.00 feet and a central angle of 40°24'07" for an arc distance of 153.60 feet to a point of tangency;

THENCE N 84°07'43" E 177.90 feet;

THENCE S 87°00'00" E 969.83 feet;

THENCE N 37°43'13" E 72.64 feet to a point of curvature of a tangent curve concave to the southeast;

THENCE northwesterly along the arc of said curve, to the right, having a radius of 120.00 feet and a central angle of 56°48'38" for an arc distance of 118.98 feet to a point of tangency;

THENCE S 85°28'09" E 105.12 feet to a point of curvature of a tangent curve concave to the northwest;

THENCE northwesterly along the arc of said curve, to the left, having a radius of 85.33 feet and a central angle of 27°19'25" for an arc distance of 41.17 feet to a non-tangent line;

THENCE S 49°17'34" E 33.53 feet;

THENCE S 67°12'06" W 14.96 feet to a point of curvature of a tangent curve concave to the northwest;

THENCE southwesterly along the arc of said curve, to the right, having a radius of 116.53 feet and a central angle of 27°19'25" for an arc distance of 55.48 feet to a point of tangency;

THENCE S 85°28'09" W 105.12 feet to a point of curvature of a tangent curve concave to the southeast;

THENCE southwesterly along the arc of said curve, to the left, having a radius of 90.00 feet and a central angle of 56°48'38" for an arc distance of 89.24 feet to a point of tangency;

THENCE S 37°43'13" W 88.35 feet;

THENCE N 87°00'00" W 983.25 feet;

THENCE S 84°07'43" W 176.57 feet to a point of curvature of a tangent curve concave to the southeast;

THENCE southwesterly along the arc of said curve, to the left, having a radius of 185.00 feet and a central angle of 40°24'07" for an arc distance of 130.45 feet to a point of tangency;

THENCE S 43°43'42" W 44.51 feet to the said westerly right-of-way line of Sanders Road;

THENCE N 00°09'00" W along said easterly right-of-way line a distance of 43.28 feet to the POINT OF BEGINNING;

AS PREPARED BY MULA FOR PIMA COUNTY. SEE SPECIFICATIONS FOR SEALED LEGAL DESCRIPTION.

ARCHAEOLOGICAL LIMITS

ARCHAEOLOGICAL LINE TABLE				ARCHAEOLOGICAL POINT TABLE			
NUMBER	DIRECTION	DISTANCE	P1	P2	NUMBER	NORTHING	EASTING
AL200	N 67°18'51" E	88.32	AP200	AP201	AP200	520547.5880	912341.2330
AL201	S 74°24'59" E	74.15	AP201	AP202	AP201	520531.6130	912428.6290
AL202	S 50°14'51" E	74.37	AP202	AP203	AP202	520563.9630	912495.6770
AL203	S 84°19'07" E	190.68	AP203	AP204	AP203	520518.8590	912553.2220
AL204	S 47°28'11" E	51.83	AP204	AP205	AP204	520411.5290	912712.1690
AL205	S 36°11'21" E	56.51	AP205	AP206	AP205	520376.6990	912750.1400
AL206	S 30°14'57" E	79.69	AP206	AP207	AP206	520331.0940	912783.5040
AL207	S 60°42'37" E	115.77	AP207	AP208	AP207	520269.2640	912823.6490
AL208	S 56°25'59" E	123.17	AP208	AP209	AP208	520195.8330	912848.0600
AL209	S 76°14'44" E	122.17	AP209	AP210	AP209	520127.7300	913044.6920
AL210	S 71°01'37" E	156.06	AP210	AP211	AP210	520098.4820	913163.3620
AL211	S 43°16'17" E	100.66	AP211	AP212	AP211	520047.9420	913310.9480
AL212	S 19°19'50" E	147.18	AP212	AP213	AP212	519974.6510	913379.9430
AL213	S 00°03'29" W	99.44	AP213	AP214	AP213	519835.7710	913428.6630
			AP214		AP214	519736.5290	913428.6620

FENCE CONTROL

FENCE LINE TABLE				FENCE POINT TABLE			
NUMBER	DIRECTION	DISTANCE	P1	P2	NUMBER	NORTHING	EASTING
FL101	N 21°24'57" W	35.57	FP101	FP102	FP101	520614.4300	912482.2470
FL113	N 29°20'50" E	120.87	FP113	FP114	FP102	520581.6770	912435.1390
FL114	N 08°38'09" E	156.77	FP114	FP115	FP113	519977.1120	913381.7480
FL115	N 12°19'32" W	152.79	FP115	FP116	FP114	520032.1140	913440.3850
FL116	N 00°34'25" E	96.18	FP116	FP117	FP115	520037.6360	913458.5010
FL117	N 64°04'03" W	69.14	FP117	FP118	FP116	520387.1040	913426.9090
FL118	N 76°41'13" W	315.24	FP118	FP119	FP117	520477.2890	913210.9350
FL119	N 89°41'14" E	60.25	FP119	FP120	FP118	520565.0990	913210.9350
FL120	S 72°51'30" E	826.24	FP120	FP121	FP119	520637.1160	912904.6370
FL121	N 66°43'48" E	223.41	FP121	FP122	FP120	520636.7870	912843.7830
FL122	N 88°14'36" W	16.34	FP122	FP123	FP121	520703.0800	912627.4800
FL123	N 67°47'52" W	141.85	FP123	FP124	FP122	520507.5750	913364.7320
			FP124		FP123	520510.9870	913358.6090
					FP124	520511.4880	913348.2730

STATE LAND USE PERMIT BOUNDARY LEGAL DESCRIPTION

That portion of the Southeast quarter (SE 1/4 & SW 1/4) of Section 33, Township 11 South, Range 11 East Gila Salt River Base and Meridian, Pima County, Arizona, more particularly described as follows:

Commencing at the South quarter (SE 1/4) corner of said section 33;

Thence, N 89°32'57" E along the South line of said section 33 a distance of 365.33 feet to a point;

Thence, south along said South line a distance of 617.85 feet to the POINT OF BEGINNING;

Thence, N 49°17'34" W a distance of 1780.25 feet to a point;

Thence, N 67°12'28" E a distance of 370.05 feet to a point;

Thence, S 73°17'34" E a distance of 209.83 feet to a point;

Thence, N 01°42'27" E a distance of 32.99 feet to a point;

Thence, S 76°47'34" E a distance of 350.05 feet to a point;

Thence, S 69°17'34" E a distance of 126.17 feet to a point;

Thence, N 50°48'24" E a distance of 44.84 feet to a point;

Thence, S 60°31'13" E a distance of 254.38 feet to a point;

Thence, S 02°47'34" E a distance of 1026.56 feet to the POINT OF BEGINNING;

Said parcel containing 798.276 ac. fr. or 18.3259 acres more or less.

PIMA COUNTY
 DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
 MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

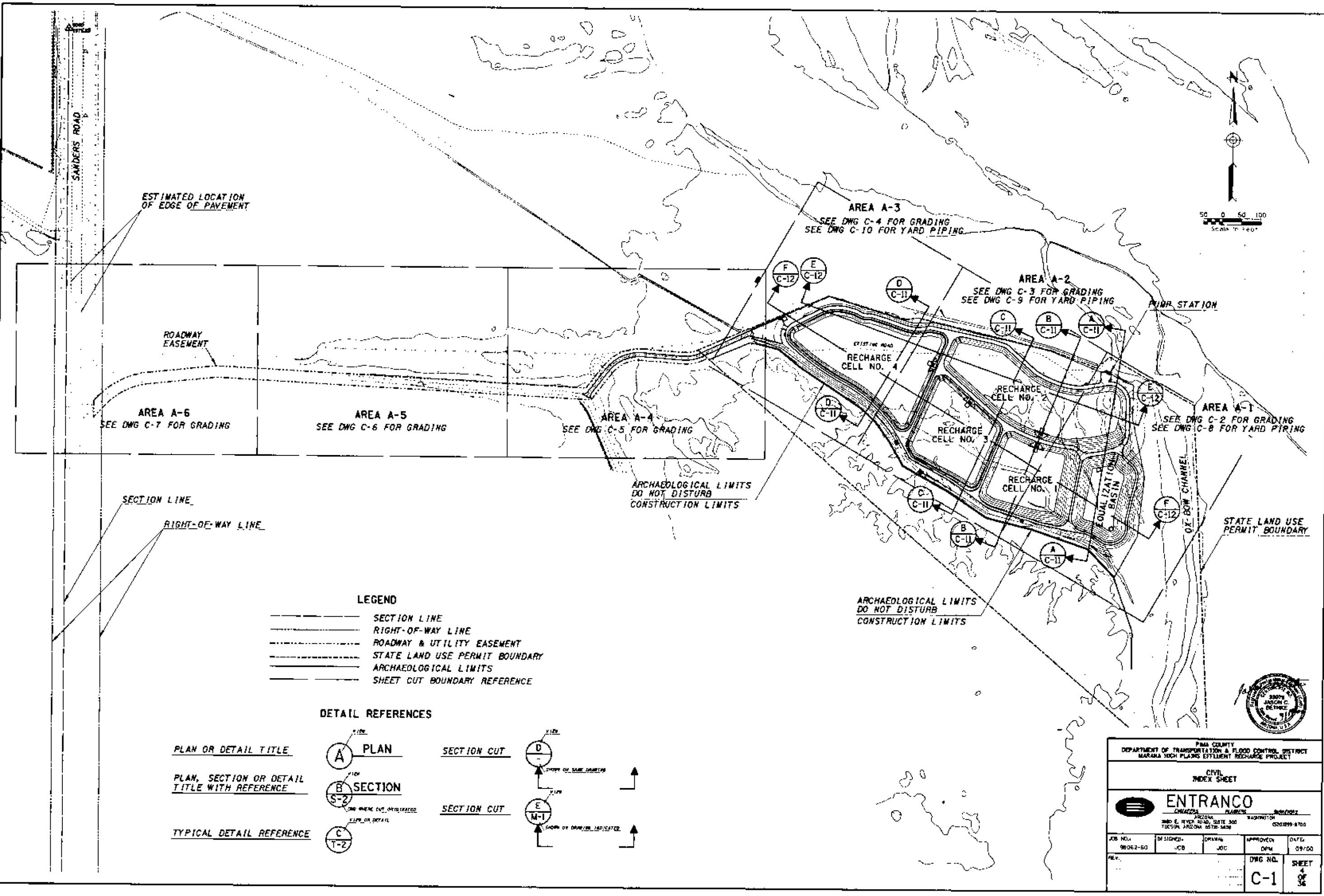
GENERAL FENCE CONTROL AND LEGAL DESCRIPTIONS

ENTRANCO
 ENGINEERS - CLAUDIOS - SURVEYORS

1800 C. RIVER ROAD, SUITE 300
 TUCSON, ARIZONA 85718-3438

JOB NO. 98062-60	DESIGNED: JCB	DRAWN: JDC	APPROVED: JPM	DATE: 09/00
REV.			DWG. NO. G-3	SHEET 3 OF 36

MAPPROL000 02/26/00



ESTIMATED LOCATION OF EDGE OF PAVEMENT

ROADWAY EASEMENT

AREA A-6
SEE DWG C-7 FOR GRADING

AREA A-5
SEE DWG C-6 FOR GRADING

AREA A-4
SEE DWG C-5 FOR GRADING

AREA A-3
SEE DWG C-4 FOR GRADING
SEE DWG C-10 FOR YARD PIPING

AREA A-2
SEE DWG C-3 FOR GRADING
SEE DWG C-9 FOR YARD PIPING

AREA A-1
SEE DWG C-2 FOR GRADING
SEE DWG C-8 FOR YARD PIPING

ARCHAEOLOGICAL LIMITS
DO NOT DISTURB
CONSTRUCTION LIMITS

ARCHAEOLOGICAL LIMITS
DO NOT DISTURB
CONSTRUCTION LIMITS

STATE LAND USE PERMIT BOUNDARY

SECTION LINE

RIGHT-OF-WAY LINE

LEGEND

- SECTION LINE
- RIGHT-OF-WAY LINE
- ROADWAY & UTILITY EASEMENT
- STATE LAND USE PERMIT BOUNDARY
- ARCHAEOLOGICAL LIMITS
- SHEET CUT BOUNDARY REFERENCE

DETAIL REFERENCES

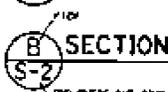
PLAN OR DETAIL TITLE



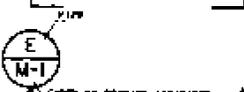
SECTION CUT



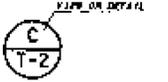
PLAN, SECTION OR DETAIL TITLE WITH REFERENCE



SECTION CUT



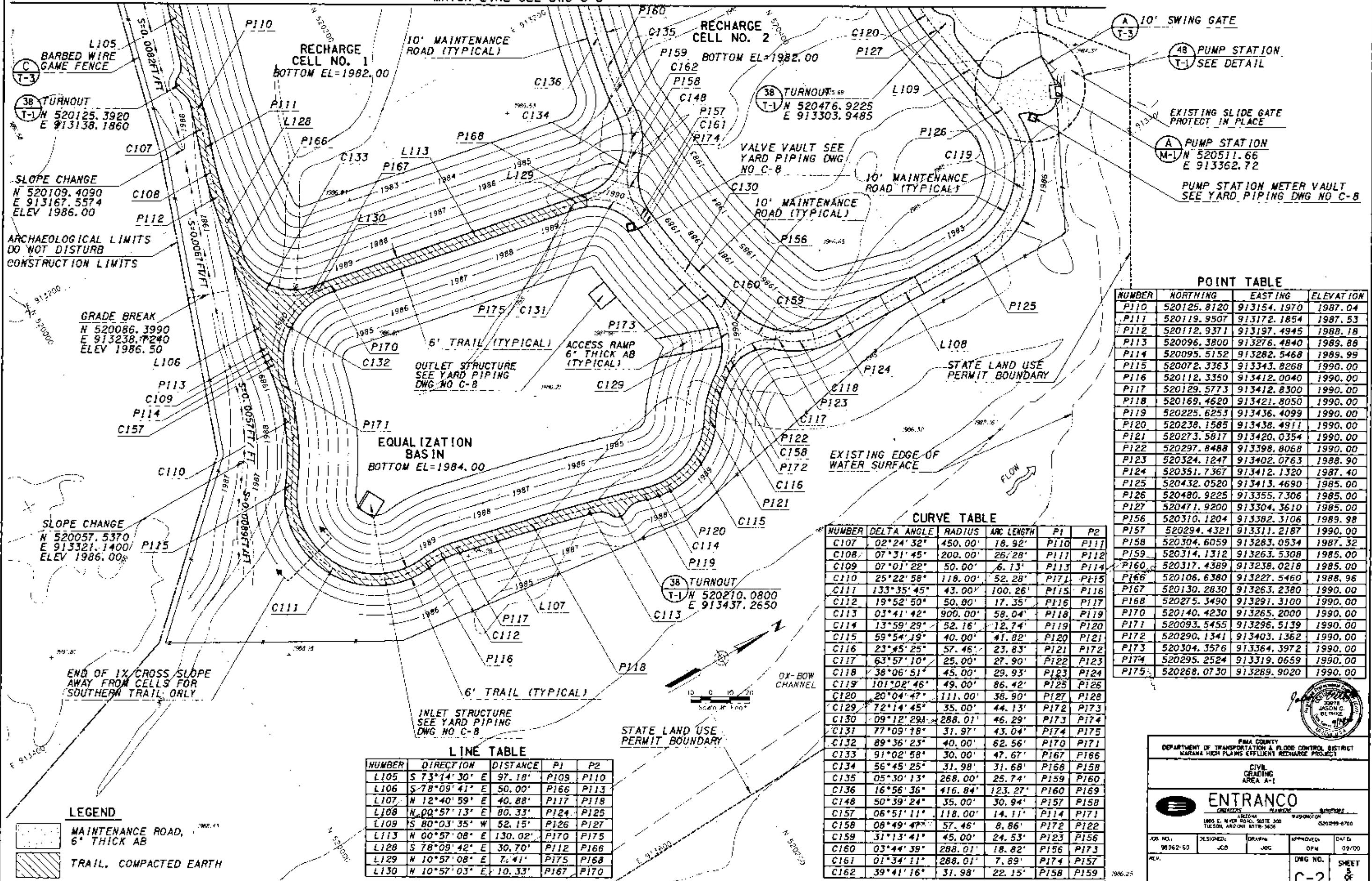
TYPICAL DETAIL REFERENCE



PIMA COUNTY
 DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
 MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
 CIVIL INDEX SHEET
ENTRANCO
 CHANDLER, ARIZONA
 3800 E. RIVER BLVD. SUITE 500
 TUCSON, ARIZONA 85718
 (520) 899-8700
 JOB NO. 98062-50
 DESIGNED: JCB
 DRAWN: JJC
 APPROVED: DPM
 DATE: 09/00
 DWG NO. C-1
 SHEET 4 OF 36

MAPR1902.DWG 02/25/00

MATCH LINE SEE DWG C-3



POINT TABLE

NUMBER	NORTHING	EASTING	ELEVATION
P110	520125.8120	913154.1970	1987.04
P111	520119.9507	913172.1854	1987.53
P112	520112.9371	913197.4945	1988.18
P113	520096.3800	913276.4840	1989.88
P114	520095.5152	913282.5468	1989.99
P115	520072.3363	913343.8268	1990.00
P116	520112.3350	913412.0040	1990.00
P117	520129.5773	913412.8300	1990.00
P118	520169.4620	913421.8050	1990.00
P119	520225.8253	913436.4099	1990.00
P120	520238.1585	913438.4911	1990.00
P121	520273.5817	913420.0354	1990.00
P122	520297.8488	913398.8068	1990.00
P123	520324.1247	913402.0763	1988.90
P124	520351.7367	913412.1320	1987.40
P125	520432.0520	913413.4690	1985.00
P126	520480.9225	913355.7306	1985.00
P127	520471.9200	913304.3610	1985.00
P156	520310.1204	913382.3106	1989.98
P157	520294.4321	913311.2187	1990.00
P158	520304.6059	913283.0534	1987.32
P159	520314.1312	913263.5308	1985.00
P160	520317.4389	913238.0218	1985.00
P166	520106.6380	913227.5460	1988.96
P167	520130.2830	913263.2380	1990.00
P168	520275.3490	913291.3100	1990.00
P170	520140.4230	913265.2000	1990.00
P171	520093.5455	913296.5139	1990.00
P172	520290.1341	913403.1362	1990.00
P173	520304.3576	913364.3972	1990.00
P174	520295.2524	913319.0659	1990.00
P175	520268.0730	913289.9020	1990.00

CURVE TABLE

NUMBER	DELTA ANGLE	RADIUS	ARC LENGTH	P1	P2
C107	02°24'32"	450.00'	18.92'	P110	P111
C108	07°31'45"	200.00'	26.28'	P111	P112
C109	07°01'22"	50.00'	6.13'	P113	P114
C110	25°22'58"	118.00'	52.28'	P117	P115
C111	133°35'45"	43.00'	100.26'	P115	P116
C112	19°52'50"	50.00'	17.35'	P116	P117
C113	03°41'42"	900.00'	58.04'	P118	P119
C114	13°59'29"	52.16'	12.74'	P119	P120
C115	59°54'19"	40.00'	41.82'	P120	P121
C116	23°45'25"	57.46'	23.83'	P121	P172
C117	63°57'10"	25.00'	27.90'	P122	P123
C118	38°06'51"	45.00'	29.93'	P123	P124
C119	101°02'46"	49.00'	86.42'	P125	P126
C120	20°04'47"	111.00'	38.90'	P127	P128
C129	72°14'45"	35.00'	44.13'	P172	P173
C130	09°12'29"	288.01'	46.29'	P173	P174
C131	77°09'18"	31.97'	43.04'	P174	P175
C132	89°36'23"	40.00'	62.56'	P170	P171
C133	91°02'58"	30.00'	47.67'	P167	P166
C134	56°45'25"	31.98'	31.68'	P168	P158
C135	05°30'13"	268.00'	25.74'	P159	P160
C136	16°56'36"	416.84'	123.27'	P160	P169
C148	50°39'24"	35.00'	30.94'	P157	P158
C157	06°51'11"	118.00'	14.11'	P114	P171
C158	08°49'47"	57.46'	8.86'	P172	P122
C159	31°13'41"	45.00'	24.53'	P123	P156
C160	03°44'39"	288.01'	18.82'	P156	P173
C161	01°34'11"	288.01'	7.89'	P174	P157
C162	39°41'16"	31.98'	22.15'	P158	P159

LINE TABLE

NUMBER	DIRECTION	DISTANCE	P1	P2
L105	S 73°14'30" E	97.18'	P109	P110
L106	S 78°09'41" E	50.00'	P166	P113
L107	N 12°40'59" E	40.88'	P117	P118
L108	N 00°57'13" E	80.33'	P124	P125
L109	S 80°03'35" W	52.15'	P126	P127
L113	N 00°57'08" E	130.02'	P170	P175
L128	S 78°09'42" E	30.70'	P112	P166
L129	N 10°57'08" E	7.41'	P175	P168
L130	N 10°57'03" E	10.33'	P167	P170

LEGEND

- MAINTENANCE ROAD, 6" THICK AB
- TRAIL, COMPACTED EARTH



FLORIDA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
MIRAMIA HIGH PLAINS EFFLUENT RECHARGE PROJECT

CIVIL GRADING AREA A-1

ENTRANCO
CONSULTANTS

1885 E. NIVER ROAD, SUITE 300
TUCSON, ARIZONA 85718-3655

WORK NO. 98062-50
DESIGNED BY JCB
DRAWN BY JCB
APPROVED BY OPM
DATE 09/00

DWG NO. C-2
SHEET 5 OF 36

APPD 03.DGN 02/25/00

MATCH LINE SEE DWG C-4

P136

POINT TABLE

NUMBER	NORTHING	EASTING	ELEVATION
P103	520325.4701	912821.4365	1985.00
P104	520286.7040	912843.3860	1985.00
P105	520281.7261	912848.5231	1985.00
P106	520239.7130	912927.9640	1985.00
P107	520218.8206	912962.1315	1985.73
P108	520163.5030	913041.2010	1986.41
P109	520153.8333	913061.1448	1986.53
P128	520471.9872	913265.6593	1985.00
P129	520502.5236	913181.8582	1985.00
P130	520515.9182	913163.3004	1985.00
P131	520573.4980	913098.7600	1985.00
P132	520579.6925	913087.8034	1985.00
P133	520587.9420	913061.4440	1985.00
P134	520588.8702	913057.8757	1985.00
P135	520622.4780	912901.5850	1985.00
P136	520622.5001	912884.8698	1985.00
P140	520361.6201	912799.6402	1985.00
P141	520366.3581	912848.4476	1985.00
P142	520487.6807	912900.7792	1985.00
P143	520543.7266	912927.1350	1985.00
P144	520577.2850	912941.6100	1985.00
P145	520618.4130	912920.4890	1985.00
P146	520328.8540	912832.2720	1985.00
P147	520303.9630	912833.6200	1985.00
P148	520200.9980	912987.6060	1986.08
P149	520213.6170	913028.3120	1985.00
P150	520340.6690	913082.1100	1985.00
P151	520353.0914	913088.9076	1985.00
P152	520383.5445	913077.4701	1985.00
P153	520498.9870	912946.4460	1985.00
P154	520588.0540	912946.2550	1985.00
P155	520605.5850	912980.1450	1985.00
P161	520366.4258	913103.5868	1985.00
P162	520398.7660	913058.7807	1985.00
P163	520509.4590	912934.7090	1985.30
P164	520202.0169	913024.4921	1985.00
P165	520168.5560	913033.9780	1986.38
P169	520356.6345	913121.6254	1985.00

LEGEND

- MAINTENANCE ROAD, 6" THICK AB
- TRAIL, COMPACTED EARTH P103 C154
- HEADWALL & RIPRAP SEE YARD PIPING DWG NO. C-9

ARCHAEOLOGICAL LIMITS DO NOT DISTURB CONSTRUCTION LIMITS

SEE SHEET C-9 FOR YARD PIPING BERM DETAIL

HEADWALL & RIPRAP SEE YARD PIPING DWG C-9

BARB WIRE GAME FENCE

SLOPE CHANGE N 520211.4460 E 912935.8400 ELEV 1984.00

6' TRAIL PROVIDE 1X SLOPE AWAY FROM CELLS FOR THE SOUTHERN TRAIL ONLY

SLOPE CHANGE N 520140.5260 E 913049.1670 ELEV 1985.00

RECHARGE CELL NO. 4 BOTTOM EL=1982.00

INLET STRUCTURE SEE YARD PIPING DWG NO C-9

STATE LAND USE PERMIT BOUNDARY CONSTRUCTION LIMITS

INLET STRUCTURE SEE YARD PIPING DWG NO C-9

RECHARGE CELL NO. 2 BOTTOM EL=1982.00

ACCESS RAMP 6" THICK AB

STATE LAND USE PERMIT BOUNDARY CONSTRUCTION LIMITS

EXISTING IRRIGATION CANAL PROTECT IN PLACE

INLET STRUCTURE SEE YARD PIPING DWG NO C-9

MONITORING WELL (HP-2) (BY OTHERS)

RECHARGE CELL NO. 1 BOTTOM EL=1982.00

INLET STRUCTURE SEE YARD PIPING DWG NO C-9

CURVE TABLE

NUMBER	DELTA ANGLE	RADIUS	ARC LENGTH	P1	P2
C103	87°39'27"	362.00'	174.74'	P102	P140
C104	32°35'54"	12.73'	7.24'	P104	P105
C105	07°03'54"	325.00'	40.07'	P106	P107
C106	18°13'08"	70.00'	22.26'	P108	P109
C120	20°04'47"	111.00'	38.90'	P127	P128
C121	19°45'53"	259.84'	89.64'	P128	P129
C122	11°50'05"	111.00'	22.93'	P129	P130
C123	24°13'06"	30.00'	12.68'	P131	P132
C124	05°17'02"	40.00'	3.69'	P133	P134
C125	24°07'13"	40.00'	16.84'	P135	P136
C126	31°59'30"	111.00'	61.98'	P136	P137
C136	16°56'36"	416.84'	123.27'	P160	P169
C137	66°31'34"	30.00'	34.83'	P151	P169
C138	08°41'35"	93.42'	14.17'	P150	P161
C139	76°47'10"	28.00'	37.52'	P164	P165
C140	102°10'11"	28.00'	49.93'	P148	P149
C141	65°39'49"	30.00'	34.38'	P151	P152
C142	116°03'42"	27.73'	56.17'	P142	P153
C143	52°51'50"	28.00'	25.83'	P146	P147
C144	71°35'40"	30.00'	37.49'	P143	P163
C145	78°58'34"	30.00'	41.35'	P154	P155
C146	100°48'31"	30.00'	52.78'	P144	P145
C147	122°14'43"	28.00'	59.74'	P140	P141
C149	06°40'48"	268.00'	31.25'	P161	P152
C154	06°41'06"	362.00'	42.24'	P140	P103
C155	05°09'17"	268.00'	24.11'	P152	P162
C156	02°49'17"	416.84'	20.53'	P169	P161

RECHARGE CELL NO. 3 BOTTOM EL=1982.00

6' TRAIL (TYPICAL)

RECHARGE CELL NO. 1 BOTTOM EL=1982.00

INLET STRUCTURE SEE YARD PIPING DWG NO C-9

LINE TABLE

NUMBER	DIRECTION	DISTANCE	P1	P2
L102	S 29°31'56" E	24.72'	P103	P147
L103	S 62°07'43" E	89.87'	P105	P106
L104	S 55°01'24" E	56.59'	P148	P165
L105	S 73°14'28" E	97.18'	P109	P110
L110	N 48°15'41" W	86.49'	P130	P131
L111	N 72°37'24" W	27.62'	P132	P133
L112	N 77°51'51" W	79.51'	P134	P155
L114	N 22°33'57" E	137.59'	P149	P150
L115	N 48°15'42" W	150.54'	P162	P153
L116	N 23°19'56" E	132.13'	P141	P142
L117	N 25°11'06" E	61.92'	P142	P143
L118	N 23°20'00" E	36.56'	P143	P144
L119	S 29°31'43" E	19.84'	P147	P104
L120	S 55°01'27" E	31.09'	P107	P148
L121	S 55°01'28" E	8.82'	P165	P108
L122	N 77°51'52" W	61.02'	P155	P145
L123	N 77°51'51" W	19.34'	P145	P135
L124	N 23°19'52" E	40.84'	P146	P141
L125	N 23°20'18" E	11.73'	P144	P154
L126	N 48°15'36" W	15.73'	P153	P163
L127	N 22°33'49" E	12.56'	P164	P149



PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

CIVIL GRADING AREA A-2

ENTRANCO

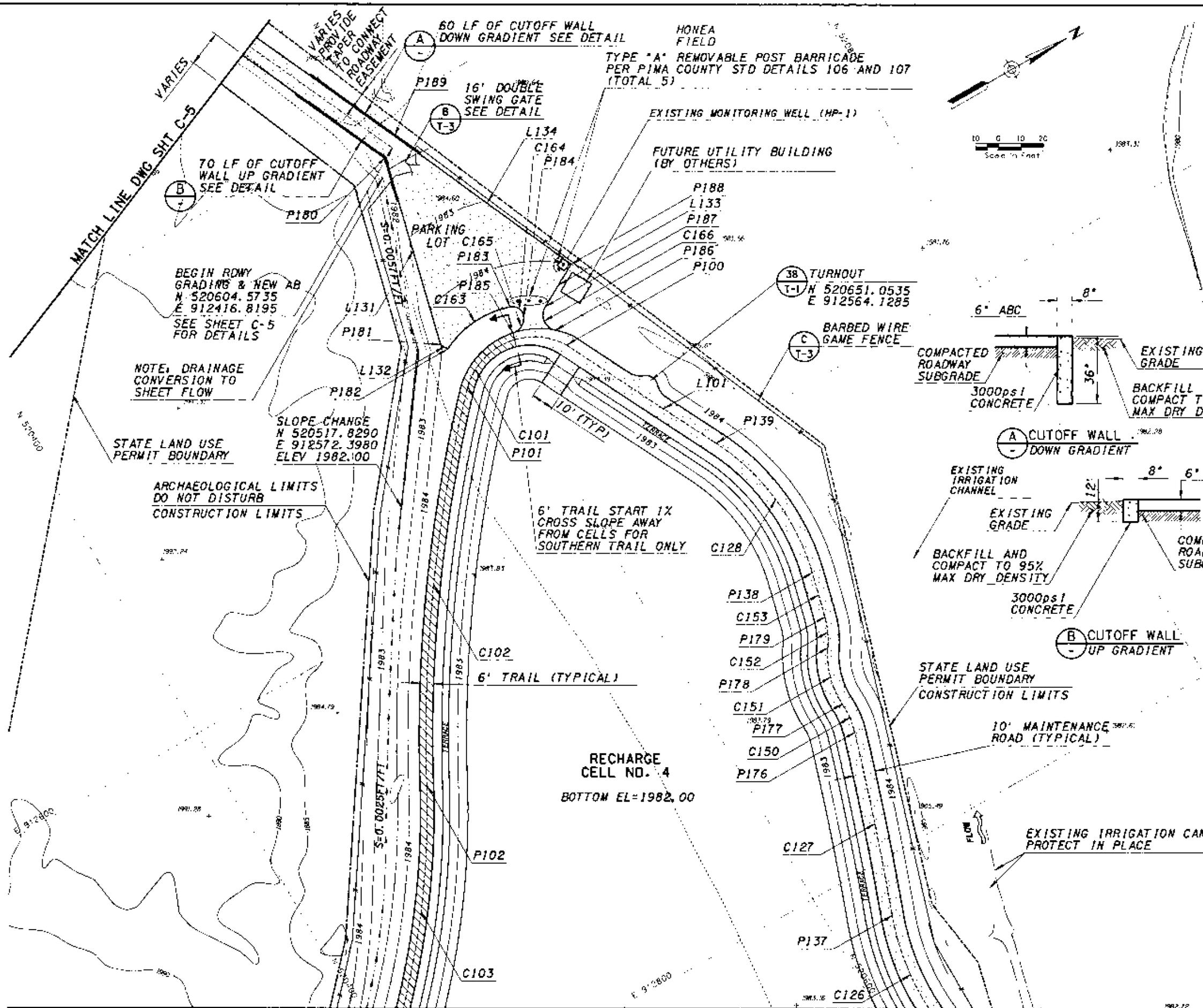
1900 E. RIVER ROAD, SUITE 300 TUCSON, ARIZONA 85718-5838

JOB NO.	DESIGNED	DRAWN	APPROVED	DATE
98092-60	JCB	JOC	DPM	09/00

DWG NO. C-3 SHEET 6 OF 36

MATCH LINE SEE DWG C-2

MAPPER: J. B. B. 02/25/00



LINE TABLE

NUMBER	DIRECTION	DISTANCE	P1	P2
L101	S 63°13'27" W	74.28'	P139	P100
L131	S 76°24'57" E	87.03'	P180	P181
L132	N 62°38'57" E	3.72'	P181	P182
L133	N 28°55'34" W	21.94'	P187	P188
L134	S 66°00'29" W	94.47'	P188	P189

CURVE TABLE

NUMBER	DELTA ANGLE	RADIUS	ARC LENGTH	P1	P2
C101	117°40'16"	30.49'	62.62'	P100	P101
C102	15°14'18"	662.00'	176.07'	P101	P102
C103	27°39'27"	362.00'	174.74'	P102	P140
C126	31°59'30"	111.00'	61.98'	P136	P137
C127	03°27'44"	1376.62'	83.18'	P137	P176
C128	40°02'18"	104.58'	73.08'	P138	P139
C150	19°56'46"	40.00'	13.92'	P176	P177
C151	37°40'10"	40.00'	26.30'	P177	P178
C152	19°56'45"	40.00'	13.92'	P178	P179
C153	00°50'55"	1376.62'	20.39'	P179	P183
C163	45°52'43"	43.00'	34.43'	P182	P183
C164	99°40'16"	5.00'	8.70'	P184	P184
C165	73°18'48"	7.00'	8.96'	P184	P185
C166	109°41'36"	7.00'	13.40'	P186	P187

POINT TABLE

NUMBER	NORTHING	EASTING	ELEVATION
P100	520630.3080	912536.3330	1985.00
P101	520578.8520	912527.6563	1985.00
P102	520476.8321	912670.5163	1985.00
P137	520626.7795	912823.8437	1985.00
P138	520671.9247	912673.7898	1985.00
P139	520663.7725	912602.6517	1985.00
P176	520652.8616	912744.8680	1985.00
P177	520654.4483	912731.1044	1985.00
P178	520661.3232	912706.2090	1985.00
P179	520667.0245	912693.5817	1985.00
P180	520600.0160	912418.8480	1982.00
P181	520579.5760	912503.4400	1984.00
P182	520581.2840	912506.7410	1984.17
P183	520614.7030	912504.7580	1984.62
P184	520617.5220	912511.2610	1984.81
P185	520609.9750	912514.8540	1985.00
P186	520626.8820	912523.2060	1985.00
P187	520628.1230	912511.8270	1984.66
P188	520647.5420	912501.0960	1984.00
P189	520609.1310	912414.7910	1981.73

- LEGEND**
- MAINTENANCE ROAD, 6" THICK AB
 - TRAIL, COMPACTED EARTH



PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

CIVIL GRADING
AREA A-3

ENTRANCO
INCORPORATED
1800 E. RIVER ROAD, SUITE 200
TUCSON, ARIZONA 85726-5838

JOB NO.	DESIGNED	DRAWN	APPROVED	DATE
98067-50	JCB	JDC	DPW	09/00

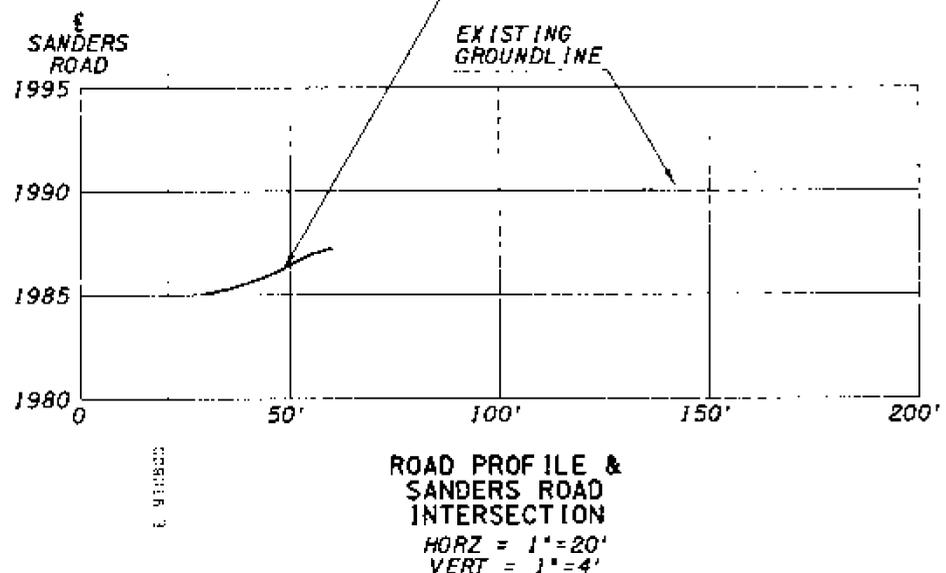
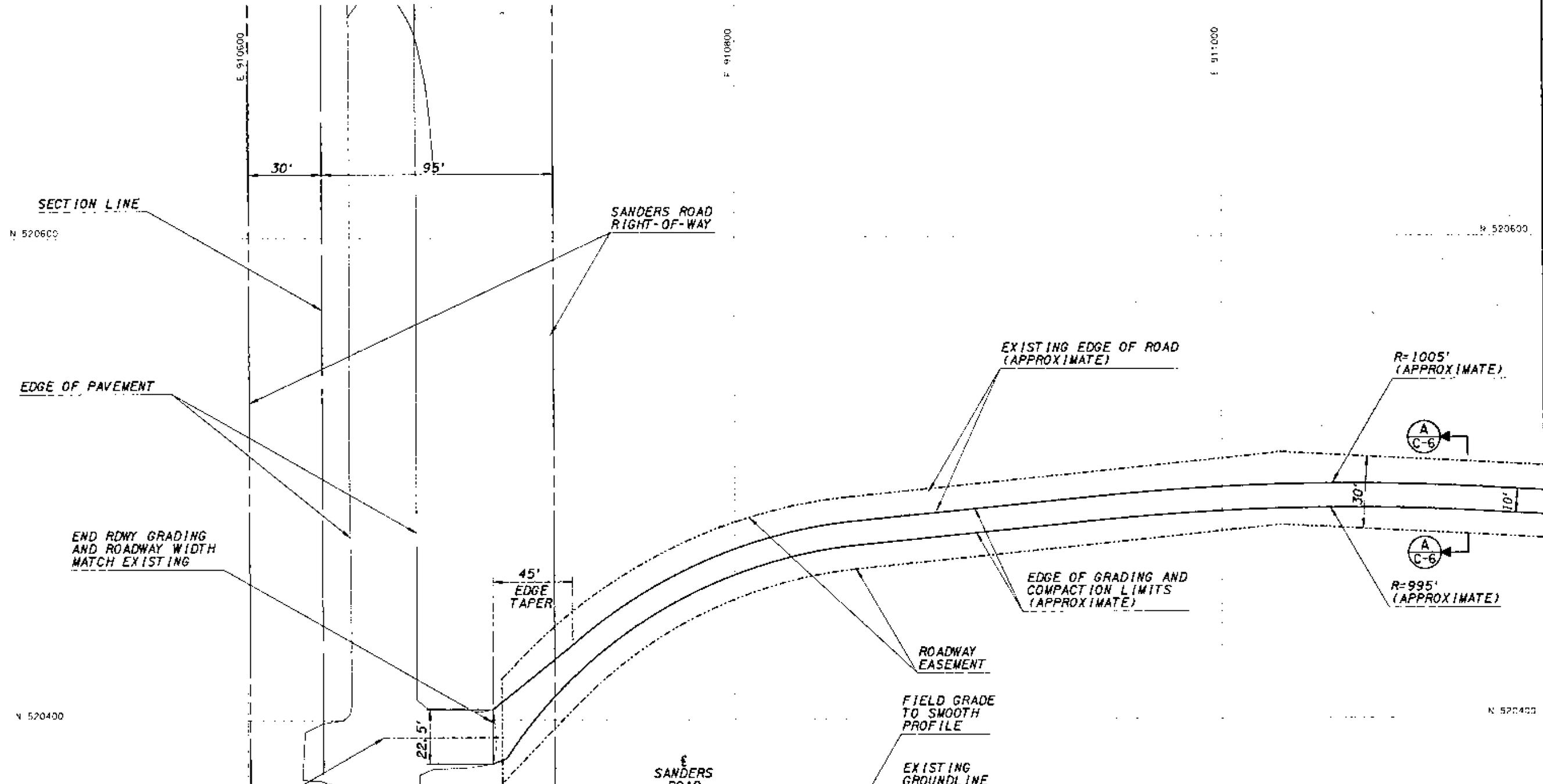
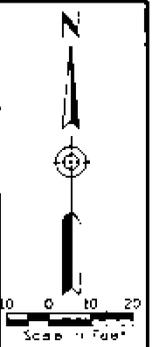
REV. _____

DRG. NO. **C-4**

SHEET **7** OF **36**

18069-01.DWG 02/25/00

MATCH LINE DWG SHT C-3



MATCH LINE SEE DWG C-6



PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT REDUCTION PROJECT				
CIVIL GRADING AREA A-5				
ENTRANCO CORPORATION 1980 E. RIVER ROAD, SUITE 200 TUCSON, ARIZONA 85726-5820				
JOB NO. 98062-60	DESIGNED JCB	DRAWN JDC	APPROVED OPW	DATE 09/00
REV.			DWG NO. C-7	SHEET 10 OF 36

MAPRPL05.DWG 02/25/00

MATCH LINE SEE DWG C-9

RECHARGE CELL NO. 1
 BOTTOM EL=1982.00
 N 520304.7029
 E 913262.8293
 INV=1982.00

16' GATE VALVE & VALVE BOX 4' x 4' x 5'
 PRECAST WATER METER VAULT
 W/FABRICATED STEEL COVER-
 TRAFFIC RATED (PRECAST MFG CO.
 WMV-334 W/FSC-T OR EQUAL)
 N 520287.5190
 E 913314.6250

(B) 4' x 4' x 6" CONCRETE
 CUT-OFF WALL
 M-3

N 520284.3160
 E 913324.2820
 45° BEND
 INV=1983.50

RECHARGE CELL NO. 2
 BOTTOM EL=1982.00
 N 520450.5020
 E 913407.7750
 45° BEND
 INV=1981.50

(E) 24" HDPE STILLING WELL
 FIELD LOCATE PER
 ENGINEERS DIRECTION
 M-2

(A) PUMP STATION
 M-1
 N 520511.6350
 E 913362.7155

(AB) PUMP STATION
 T-1
 SEE DETAIL

(205) 8" DIP FORCE MAIN
 T-2

(D) PUMP STATION METER
 M-2
 N 520492.3262
 E 913367.3199
 INV=1980.75

STATE LAND USE
 PERMIT BOUNDARY

ARCHAEOLOGICAL LIMITS
 DO NOT DISTURB
 CONSTRUCTION LIMITS

ENERGY DISSIPATION CURB

(B) OUTLET STRUCTURE
 M-3
 N 520257.4900
 E 913337.7430
 INV=1985.00

EQUALIZATION BASIN
 BOTTOM EL=1984.00

4" PVC PIPE

(C) BARBED WIRE
 GAME FENCE
 T-3

N 520281.5600
 E 913404.9610
 45° BEND
 INV=1982.85

N 520255.7150
 E 913429.9590
 45° BEND
 INV=1983.04

RESTRAINED LENGTHS ARE
 FOR HORIZONTAL BENDS
 CALCULATE VERTICAL
 RESTRAINT PER SPECS.

PIPE SIZE	BEND TYPE	RESTRAINED LENGTH
6"	90°	16'
6"	TEE	35'
8"	11.25°	5'
8"	22.5°	5'
8"	45°	10'
8"	90°	25'

YARD PIPING NOTES:

ALL PIPE BEDDING SHALL CONFORM
 TO STANDARD DETAILS WWM 104 AND
 WWM 105. RIGID PIPE SHALL BE
 CONSTRUCTED WITH TYPE 3 BEDDING.
 FLEXIBLE PIPE SHALL BE CONSTRUCTED
 WITH CRUSHED STONE BEDDING.

N 520126.1160
 E 913408.3300
 45° BEND
 INV=1983.76

(A) 4' x 4' x 6" CONCRETE
 CUT-OFF WALL
 M-3

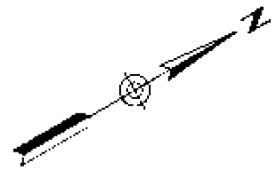
N 520223.6500
 E 913429.4250
 11.25° BEND
 INV=1983.22

(205) 8" PVC FORCE MAIN
 T-2

OX-BOW CHANNEL

(A) INLET STRUCTURE
 M-3
 N 520102.7020
 E 913371.9940
 INV=1984.00

STATE LAND USE
 PERMIT BOUNDARY



Scale: 1" = 10' Feet



PIMA COUNTY
 DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
 MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

CIVIL
 YARD PIPING
 AREA A-1

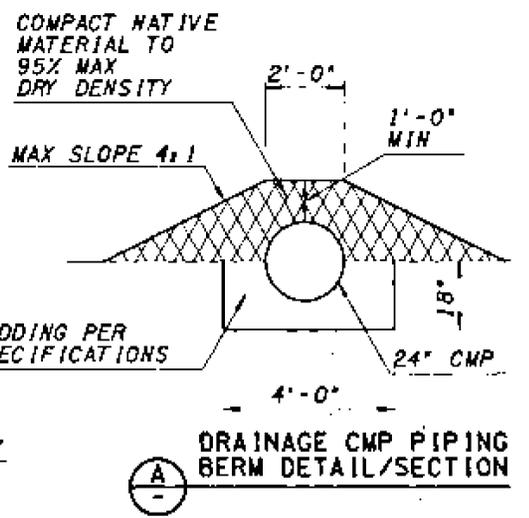
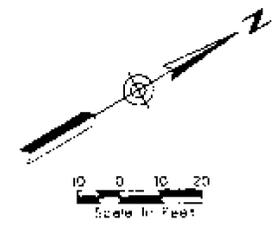
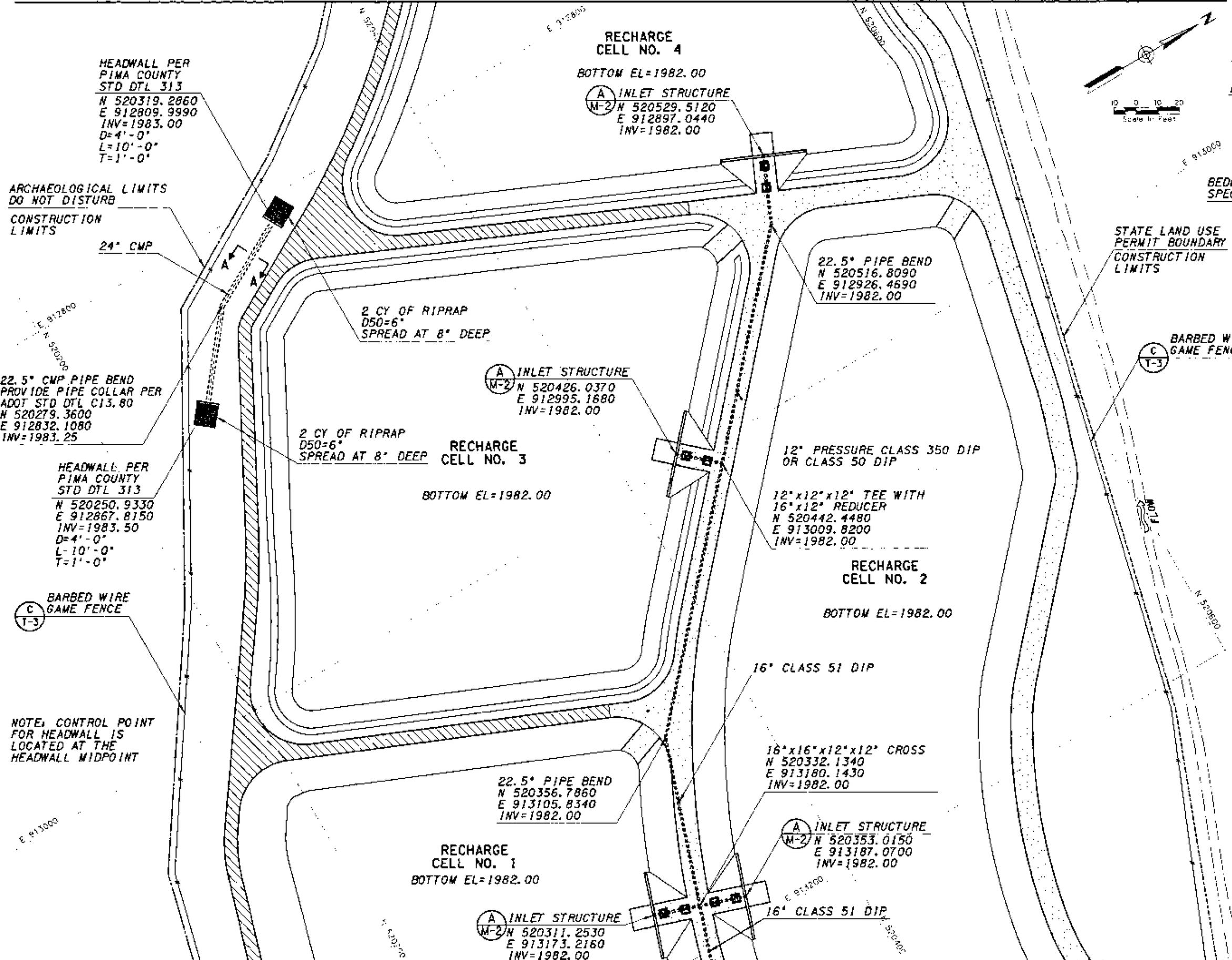
ENTRANCO
 ENGINEERS ARCHITECTS SURVEYORS

1100 E. MUIR ROAD, SUITE 300
 TUCSON, ARIZONA 85710-5626
 (520) 299-4700

JOB NO. 98052-60	DESIGNED JCB	DRAWN JCB	APPROVED DPH	DATE 09/00
REV.	DWG NO. C-8	SHEET 11 OF 36		

MAPPROL.DWG 02/25/00

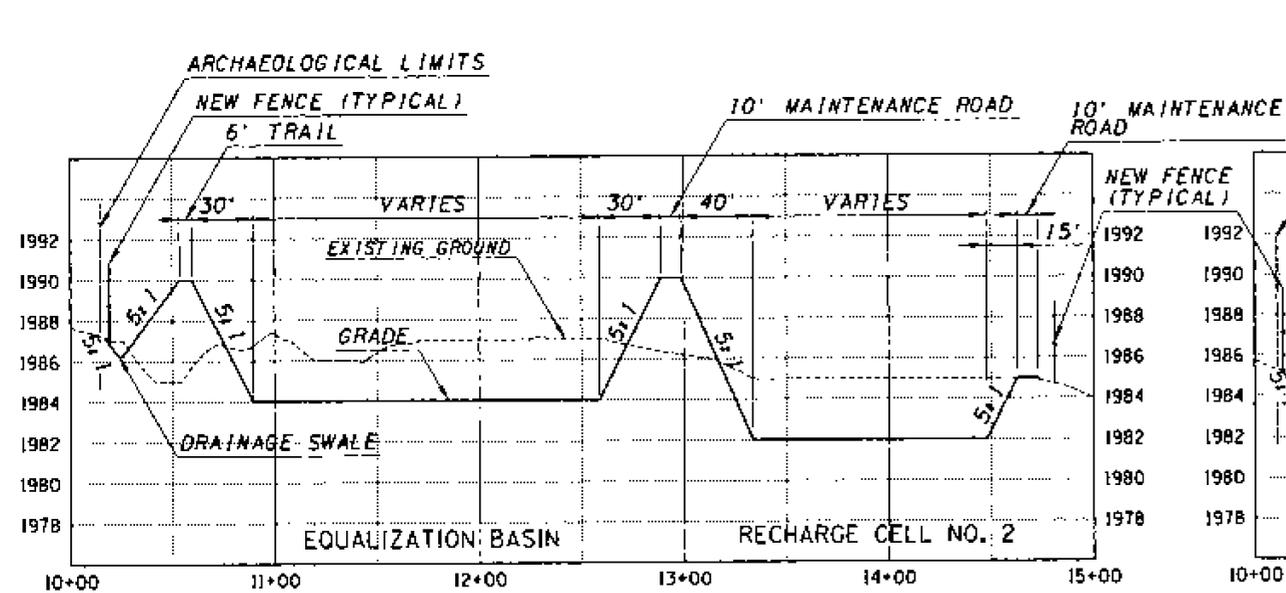
MATCH LINE SEE DWG C-10



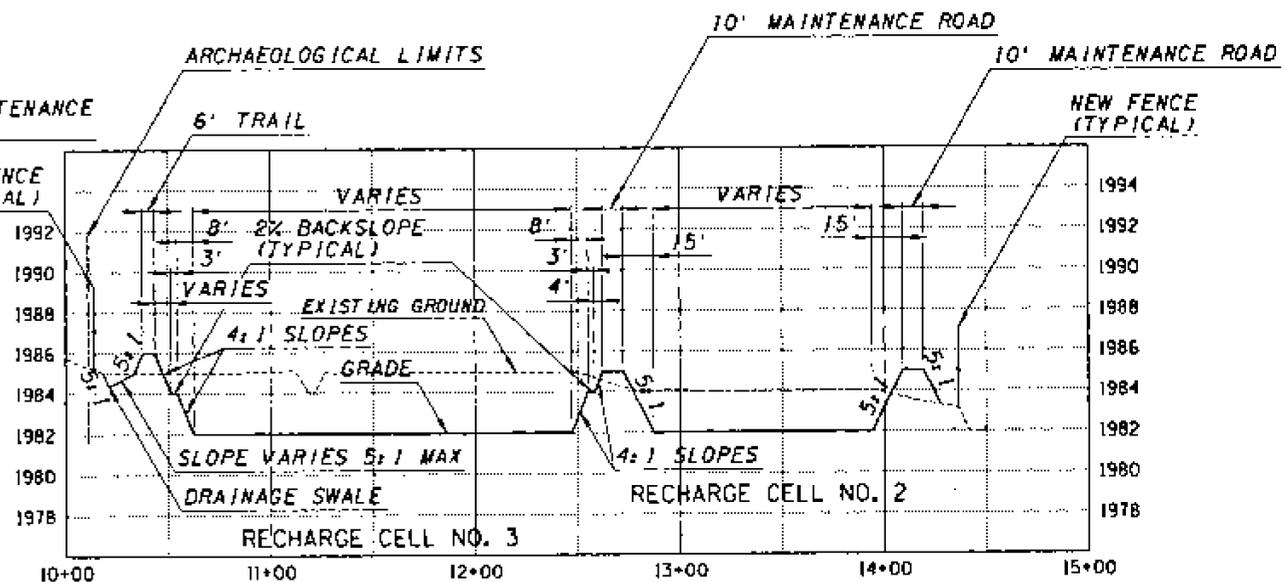
PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT				
CIVIL YARD PIPING AREA A-2				
ENTRANCO				
1800 E. RIVER ROAD, SUITE 300 FLORAL, ARIZONA 85719-5434				
JOB NO. 00052-60	DESIGNED JCB	DRAWN JCB	APPROVED DPM	DATE 09/00
REV.			DWG NO. C-9	SHEET 12 OF 36

MATCH LINE SEE DWG C-8

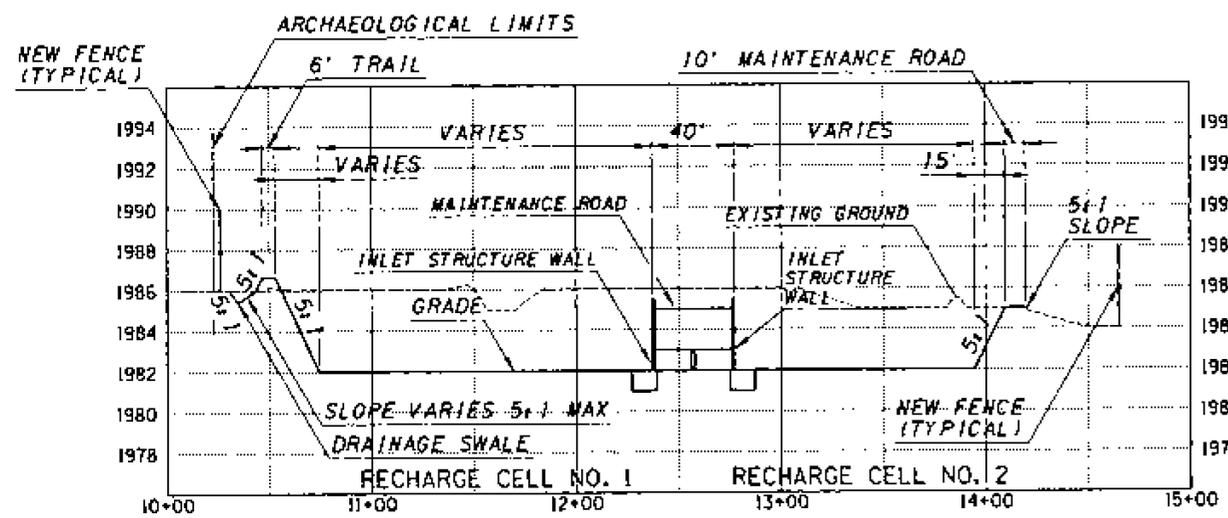
MAPPER: GLODIA 02/25/95



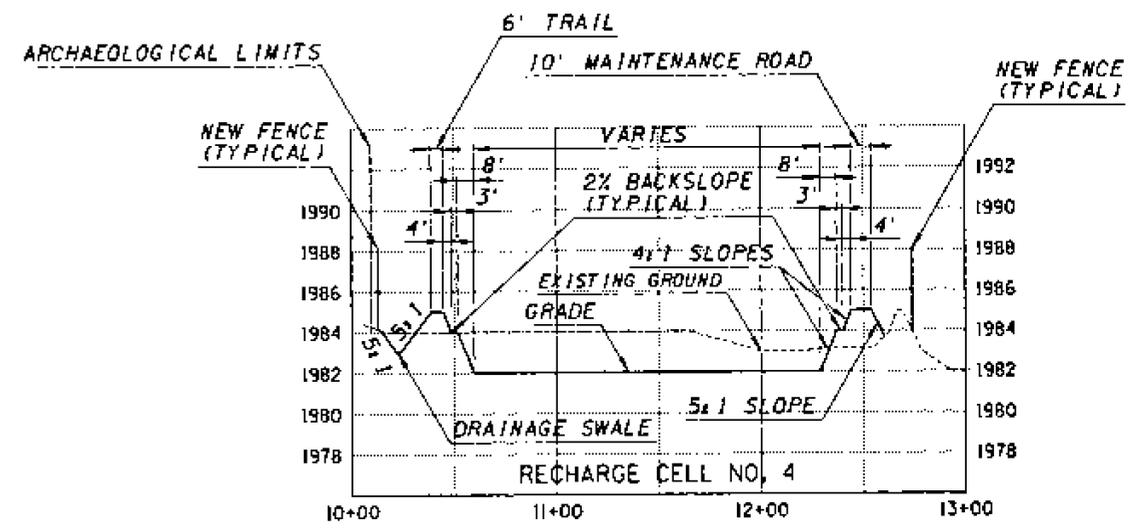
(A) CROSS SECTION
 VERTICAL SCALE: 1"=40'
 HORIZONTAL SCALE: 1"=4'



(C) CROSS SECTION
 VERTICAL SCALE: 1"=40'
 HORIZONTAL SCALE: 1"=4'

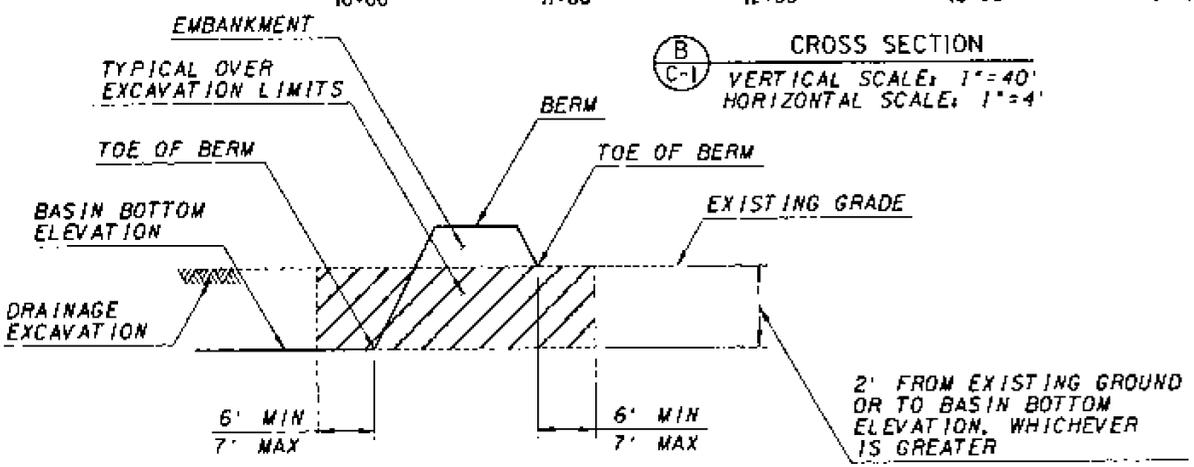


(B) CROSS SECTION
 VERTICAL SCALE: 1"=40'
 HORIZONTAL SCALE: 1"=4'



(D) CROSS SECTION
 VERTICAL SCALE: 1"=40'
 HORIZONTAL SCALE: 1"=4'

APPROXIMATE EARTHWORK QUANTITIES
 OVER EXCAVATION 13,000 CY
 EMBANKMENT 24,000 CY
 DRAINAGE EXCAVATION 20,400 CY
 * QUANTITIES ARE APPROXIMATE AND THE CONTRACTOR IS RESPONSIBLE FOR EARTHWORK QUANTITY VERIFICATION.



(E) TYPICAL OVER EXCAVATION DETAIL
 VERTICAL SCALE: 1"=20'
 HORIZONTAL SCALE: 1"=2'

NOTE:
 OVER EXCAVATION LIMITS ARE SPECIFIED IN SECTION 203 AND SHOWN IN THE TYPICAL OVER EXCAVATION DETAIL ON THIS SHEET SEE SPECIFICATIONS SECTION 203.

NOTE:
 DRAINAGE EXCAVATION AND EMBANKMENT CAN OVERLAY OVER EXCAVATION. PAYMENT SHALL BE MADE FOR DRAINAGE EXCAVATION ONLY, PER SPECIFICATIONS.



PIMA COUNTY
 DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
 MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

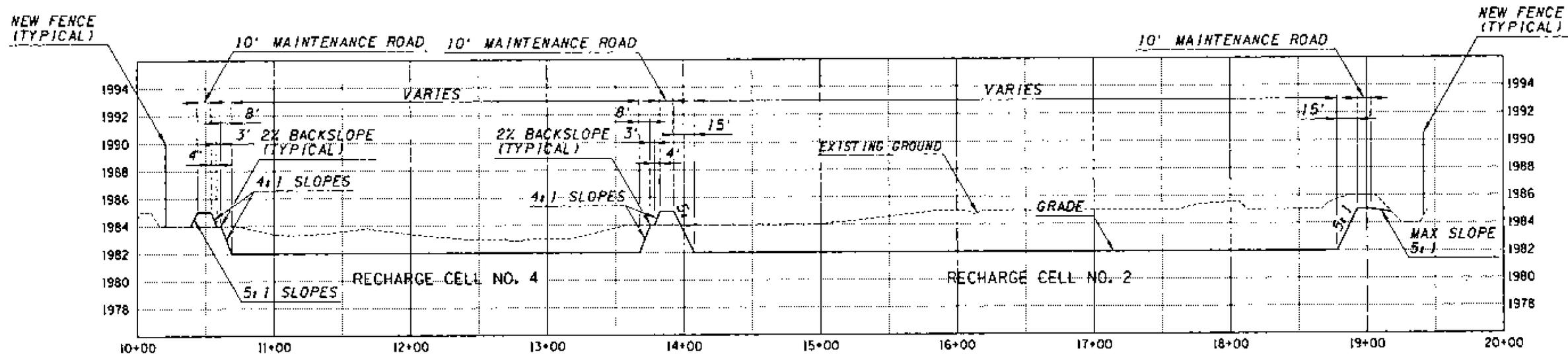
CIVIL
 BASIN CROSS SECTIONS

ENTRANCO
 CIVIL ENGINEERS ARCHITECTS

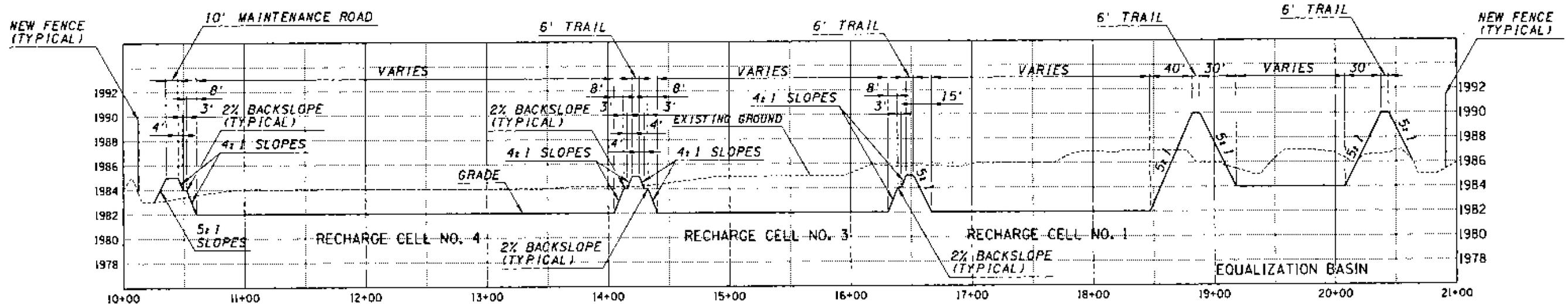
1940 E. RIVER ROAD, SUITE 300
 TUCSON, ARIZONA 85718-5626

JOB NO. 98062-60	DESIGNED: JEB	DRAWN: JOC	APPROVED: DPM	DATE: 09/00
REV.			DWG. NO. C-11	SHEET 14 OF 16

MAR98001.DWG 02/25/00



(E) CROSS SECTION
(C-1) VERTICAL SCALE: 1"=40'
 HORIZONTAL SCALE: 1"=4'



(F) CROSS SECTION
(C-1) VERTICAL SCALE: 1"=40'
 HORIZONTAL SCALE: 1"=4'

NOTE:
 OVER EXCAVATION LIMITS ARE SPECIFIED IN SECTION 203 AND SHOWN IN THE TYPICAL OVER EXCAVATION DETAIL ON SHEET C-11 SEE SPECIFICATIONS SECTION 203.

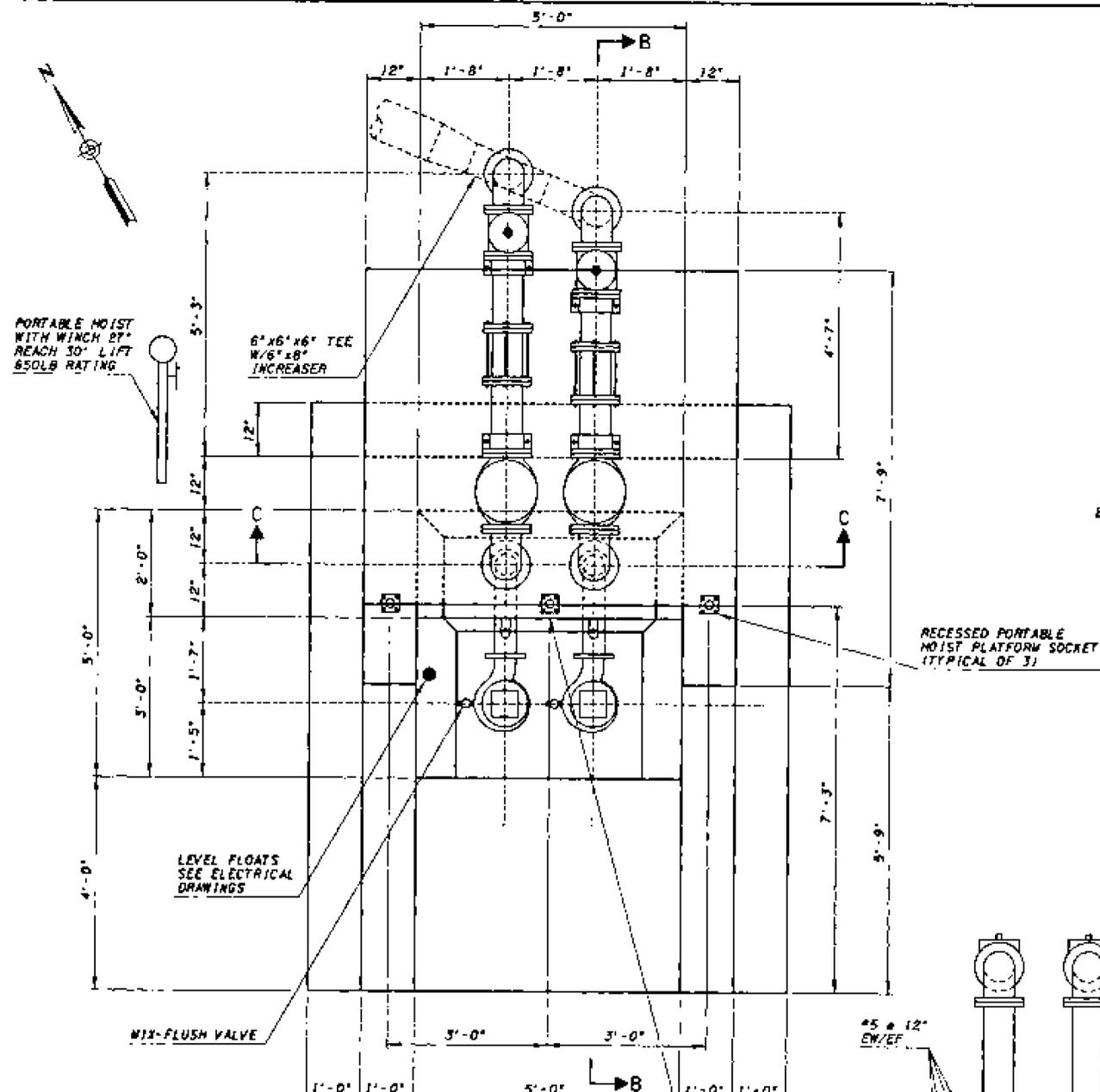


PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARIANA HIGH PLAINS EFFLUENT RECHARGE PROJECT				
CIVIL BASIN CROSS SECTIONS				
ENTRANCO CORPORATION 1800 E. RIVER ROAD, SUITE 200 TUESON, ARIZONA 85723-5626				
JOB NO. 98062-6D	DESIGNED BY JCB	DRAWN BY JJC	APPROVED BY DPM	GATE 09/00
REV:			DWG NO. C-12	SHEET 15 OF 36

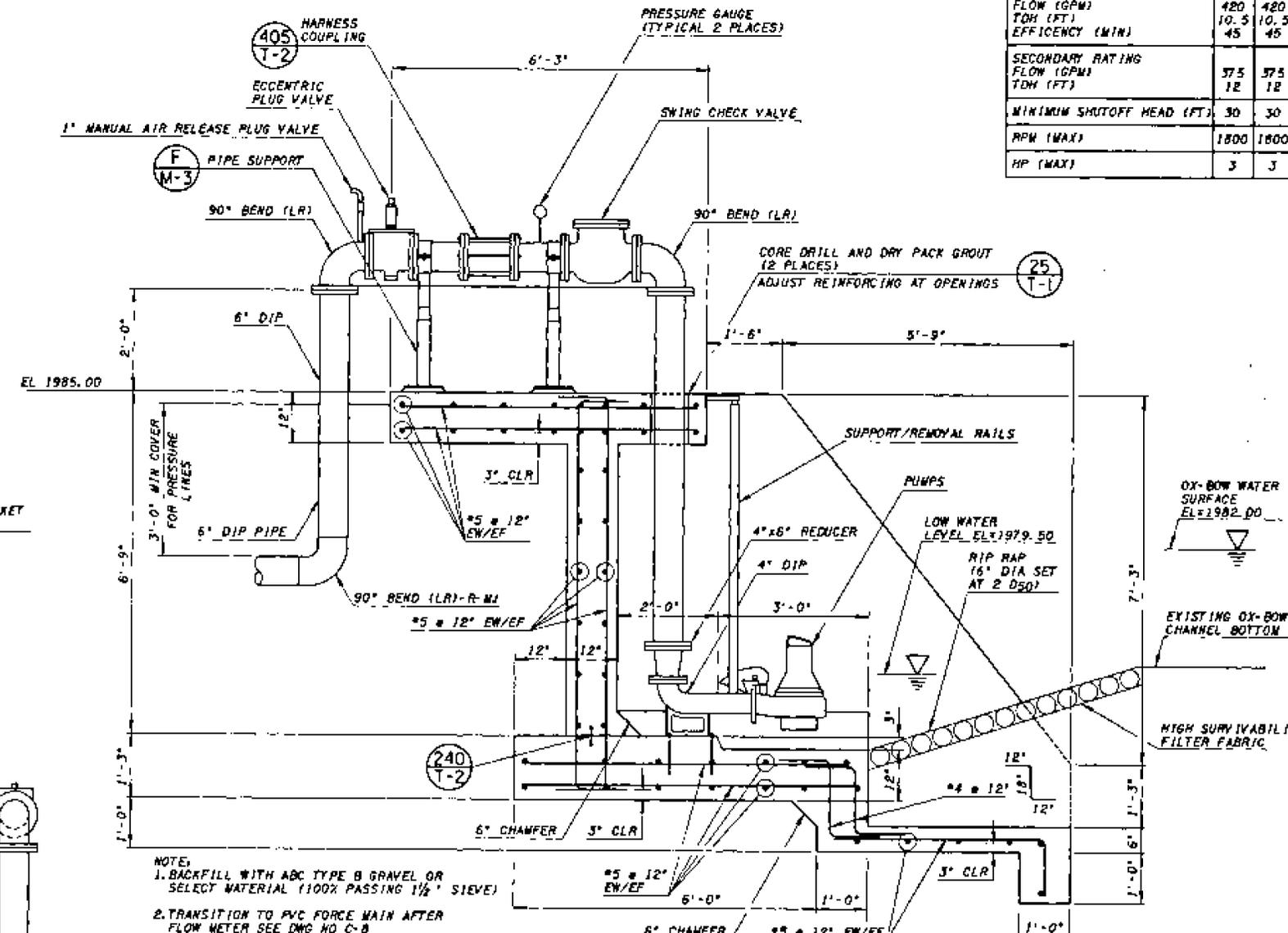
MARIANA.DWG 02/26/00

PUMP DATA

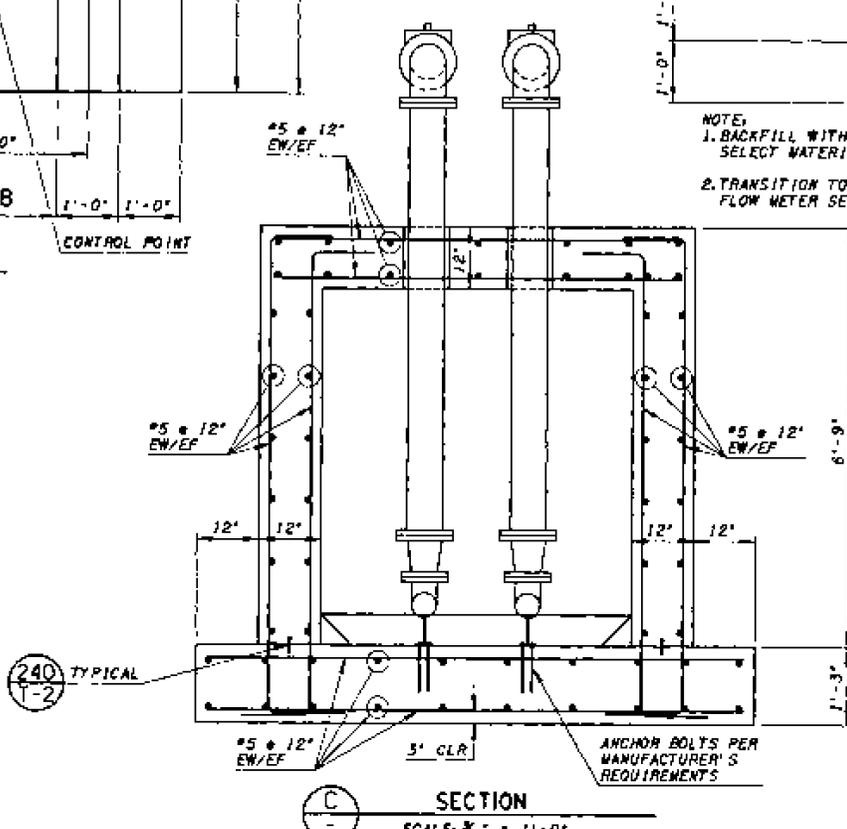
	P1	P2
PRIMARY RATING		
FLOW (GPM)	420	420
TDH (FT)	10.5	10.5
EFFICIENCY (MIN)	45	45
SECONDARY RATING		
FLOW (GPM)	375	375
TDH (FT)	12	12
MINIMUM SHUTOFF HEAD (FT)	30	30
RPM (MAX)	1800	1800
HP (MAX)	3	3



A PLAN-PUMP STATION
SCALE: 1/4" = 1'-0"



B SECTION
SCALE: 1/4" = 1'-0"



C SECTION
SCALE: 1/4" = 1'-0"

NOTES:
1. BACKFILL WITH ABC TYPE B GRAVEL OR SELECT MATERIAL (100% PASSING 1/8" SIEVE)
2. TRANSITION TO PVC FORCE MAIN AFTER FLOW METER SEE DWG NO. C-8

VALVE SCHEDULE

VALVE TYPE	SIZE (IN)	NO. REQ'D	JOINT TYPE	OPERATOR TYPE	PAINT/COATINGS	REMARKS
PLUG VALVE	6"	2	FLANGE	HAND	EPOXY LINED PAINT	LEVER/HANDWHEEL
SWING CHECK VALVE	6"	2	FLANGE	-	EPOXY LINED PAINT	
GATE VALVE	16"	1	MECHANICAL	HAND	EPOXY LINED PAINT	NUT/RISING STEM
BUTTERFLY VALVE	12"	4	MECHANICAL	ELECTRIC	EPOXY LINED PAINT	MANUAL NUT OPERATOR
AIR RELEASE PLUG VALVE	1"	2	THREAD	HAND	EPOXY LINED PAINT	MANUAL



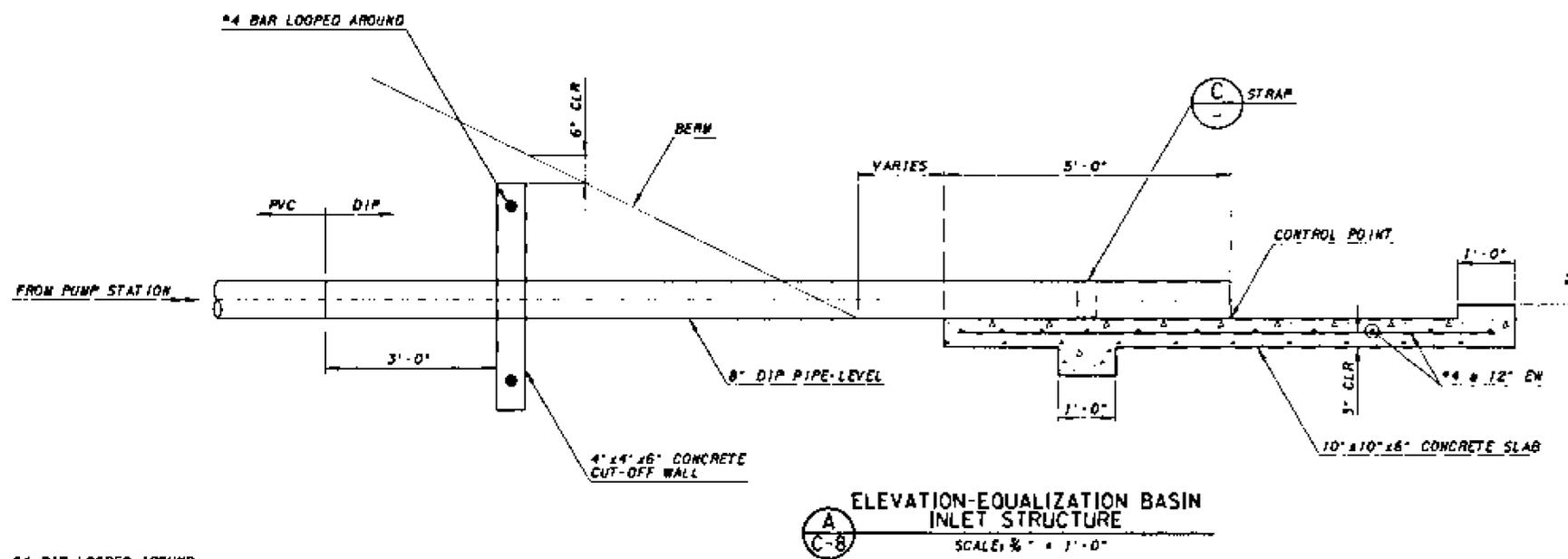
PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

MECHANICAL PUMP STATION PLAN AND SECTIONS

ENTRANCO
DESIGNERS PLANNERS ENGINEERS
3500 N. RIVER ROAD, SUITE 300
TUCSON, ARIZONA 85718-5426

JOB NO. S8052-60	DESIGNED BY JCS	DRAWN BY JCG	APPROVED BY DPN	DATE 05/00
REV. _____			DWG NO. M-1	SHEET 16 OF 36

MMPR02.DWG 02/26/00

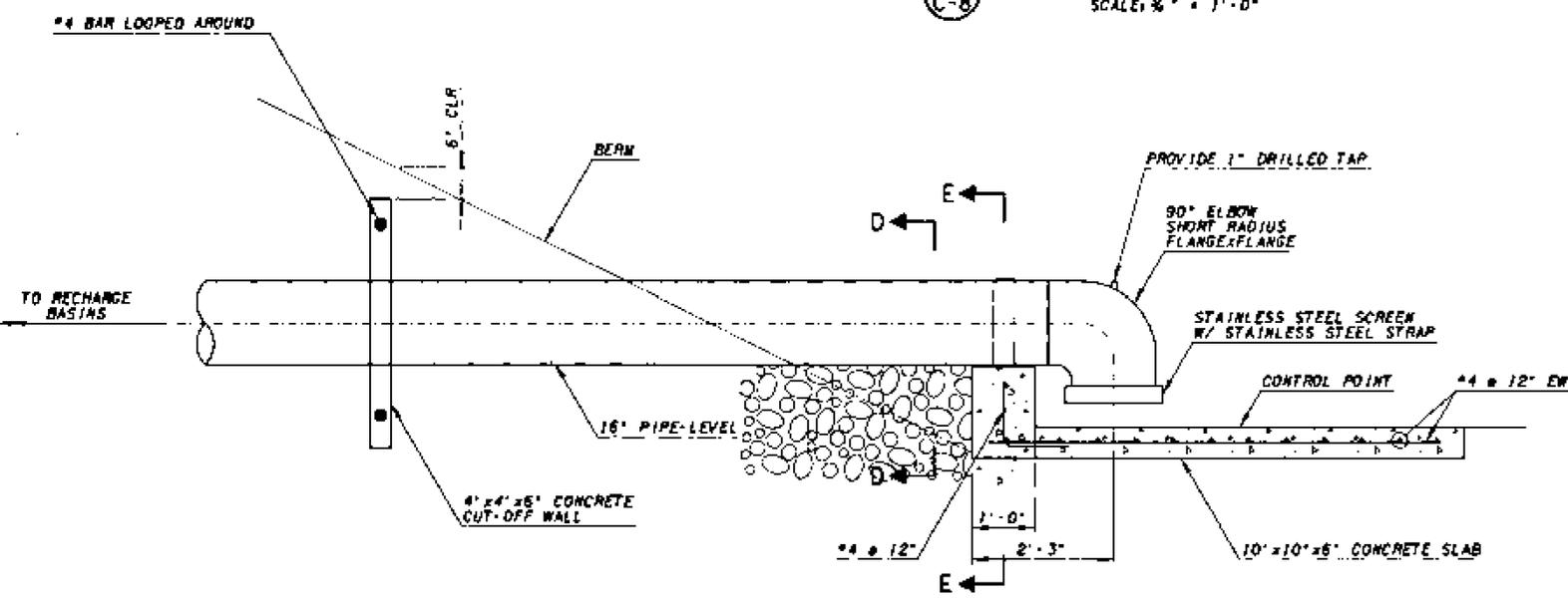


ELEVATION-EQUALIZATION BASIN INLET STRUCTURE
 SCALE: 1/4" = 1'-0"

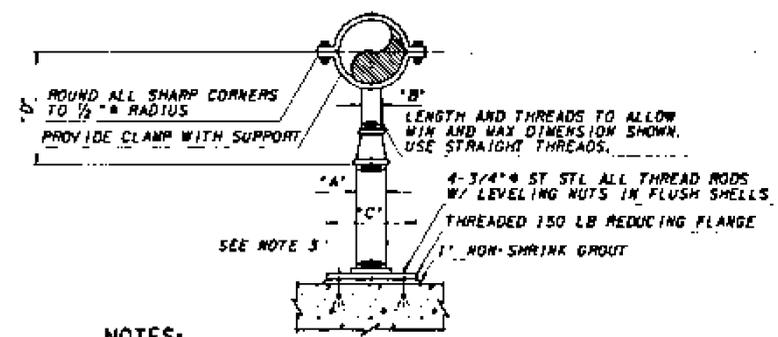
ADJUSTABLE PIPE SADDLE SUPPORT SCHEDULE
 DIMENSIONS IN INCHES

PIPE SIZE	"A"	"B"	"C"	"D"	
				MINIMUM	MAXIMUM
2 1/2	2 1/2	1 1/2	9	8	13
3	2 1/2	1 1/2	9	8 1/2	13 1/2
3 1/2	2 1/2	1 1/2	9	8 1/2	13 1/2
4	3	2 1/2	9	9 1/2	14
6	3	2 1/2	9	10 1/2	15 1/2
8	3	2 1/2	9	11 1/2	16 1/2
10	3	2 1/2	9	13 1/2	18 1/2
12	3	2 1/2	9	15	19 1/2
14	4	3	11	16 1/2	20 1/2
16	4	3	11	17 1/2	22 1/2
18	6	3 1/2	13 1/2	19 1/2	24
20	6	3 1/2	13 1/2	21	25 1/2
24	6	4	13 1/2	23 1/2	28 1/2
30	6	4	13 1/2	27	31 1/2
32	6	4	13 1/2	28 1/2	32 1/2
36	6	4	13 1/2	30 1/2	34 1/2

* USE 2 1/2" SUPPORTS FOR PIPES LESS THAN 2 1/2"

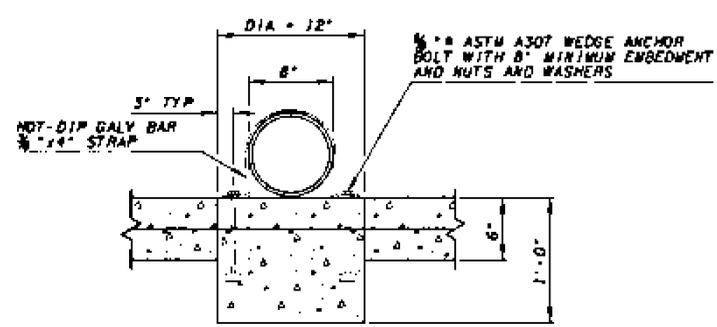


ELEVATION-EQUALIZATION BASIN OUTLET STRUCTURE
 SCALE: 1/4" = 1'-0"

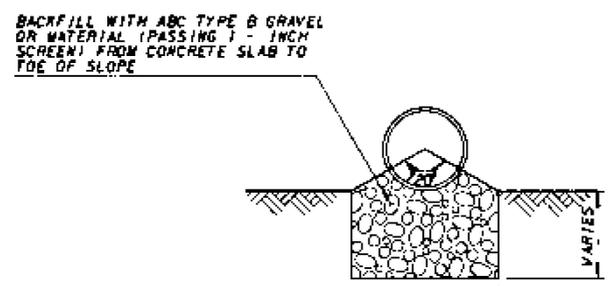


- NOTES:**
1. HOT-DIP GALVANIZED AFTER FABRICATION.
 2. PIPE SHALL BE SCHEDULE 40.
 3. CHEMICAL ANCHORS MAY BE SUBSTITUTED FOR FLUSH SHELLS AND ALL THREAD RODS.

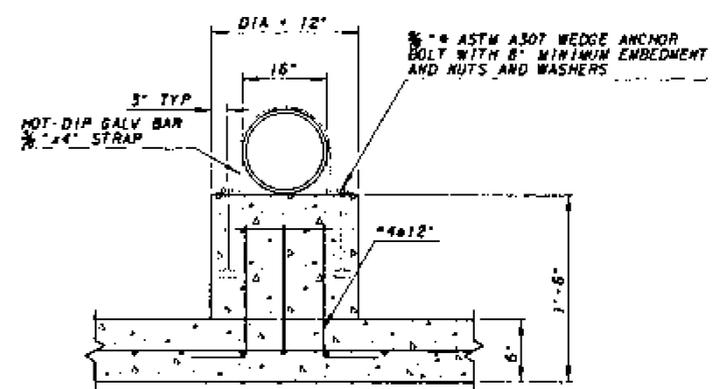
F PIPE SUPPORT
 NTS



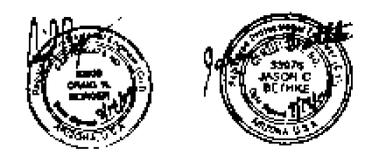
C DETAIL-STRAP
 NTS



D RIP RAP PAD
 NTS



E CONCRETE OUTLET PAD
 NTS



PIMA COUNTY
 DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
 SARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

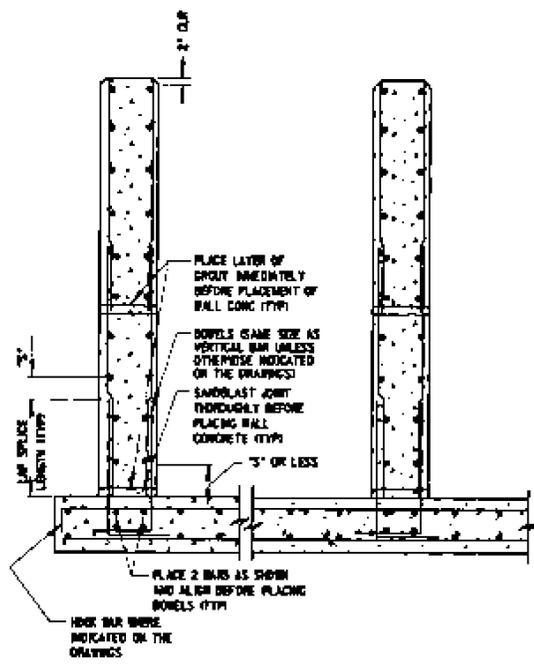
MECHANICAL
 EQUALIZATION BASIN
 INFLUENT AND EFFLUENT STRUCTURE

ENTRANCO
 ENGINEERS PLANNERS ARCHITECTS

1980 E. NEWEN ROAD, SUITE 200
 TUCSON, ARIZONA 85719-9226

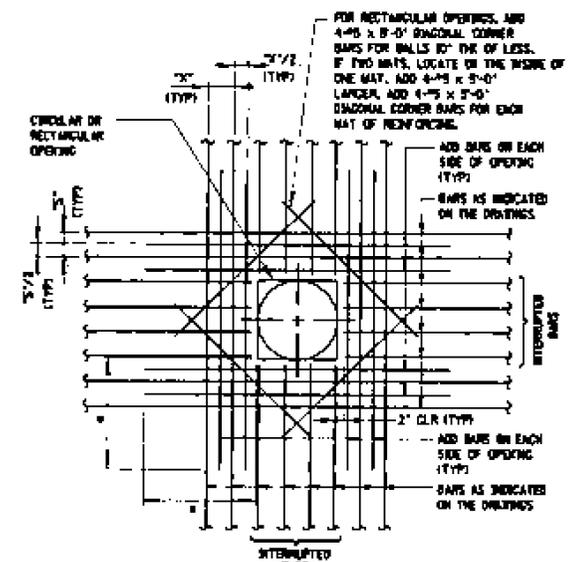
JOB NO. 98062-60	DESIGNED JCS	DRAWN JCS	APPROVED DFM	DATE 05/00
REV.			DRG. NO. M-3	SHEET 18 OF 36

BARRETTA.DSN 02/26/00



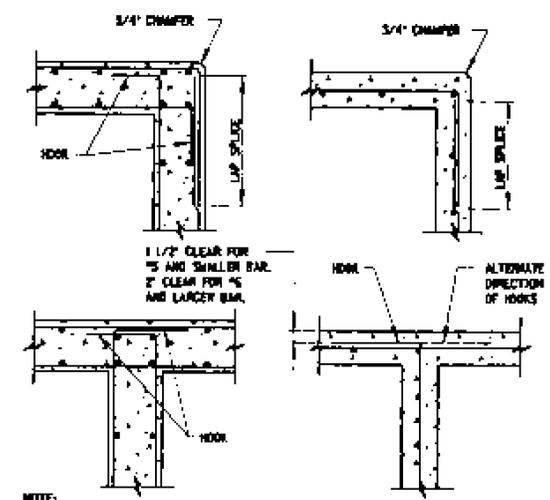
NOTE:
1. 5" = BAR SPACING INDICATED ON THE DRAWINGS.

23 WALL AND SLAB JOINTS WITHOUT WATERSTOP
TYP



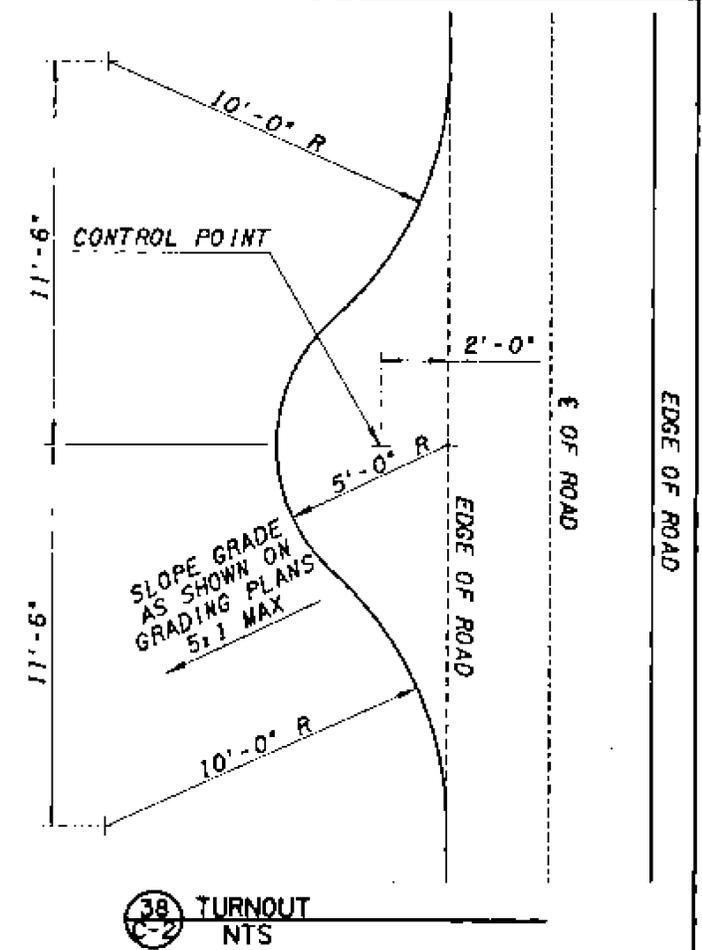
NOTES:
1. AREA OF ADD BARS AT EACH EDGE OF OPENING IN EACH DIRECTION SHALL MATCH 1/2 THE CROSS SECTIONAL AREA OF THE INTERRUPTED BARS.
2. PROVIDE STANDARD HOOKS ON BARS IF STRAIGHT EXTENSION PAST THE OPENING CANNOT BE ACHIEVED.
3. PLACE AND BARS IN SAME PLANES AS INDICATED REINFORCING.
4. PLACE #5 DIAGONAL BARS UNDER INDICATED REINFORCING.
5. 1' LONGER OF OPENING DIMENSION MEASURED PERPENDICULAR TO ADD BARS OR #4 BAR DIA WITH EXTENSION.

25 ADDITIONAL REINFORCING AT OPENINGS IN CONCRETE SLABS OR WALLS
TYP

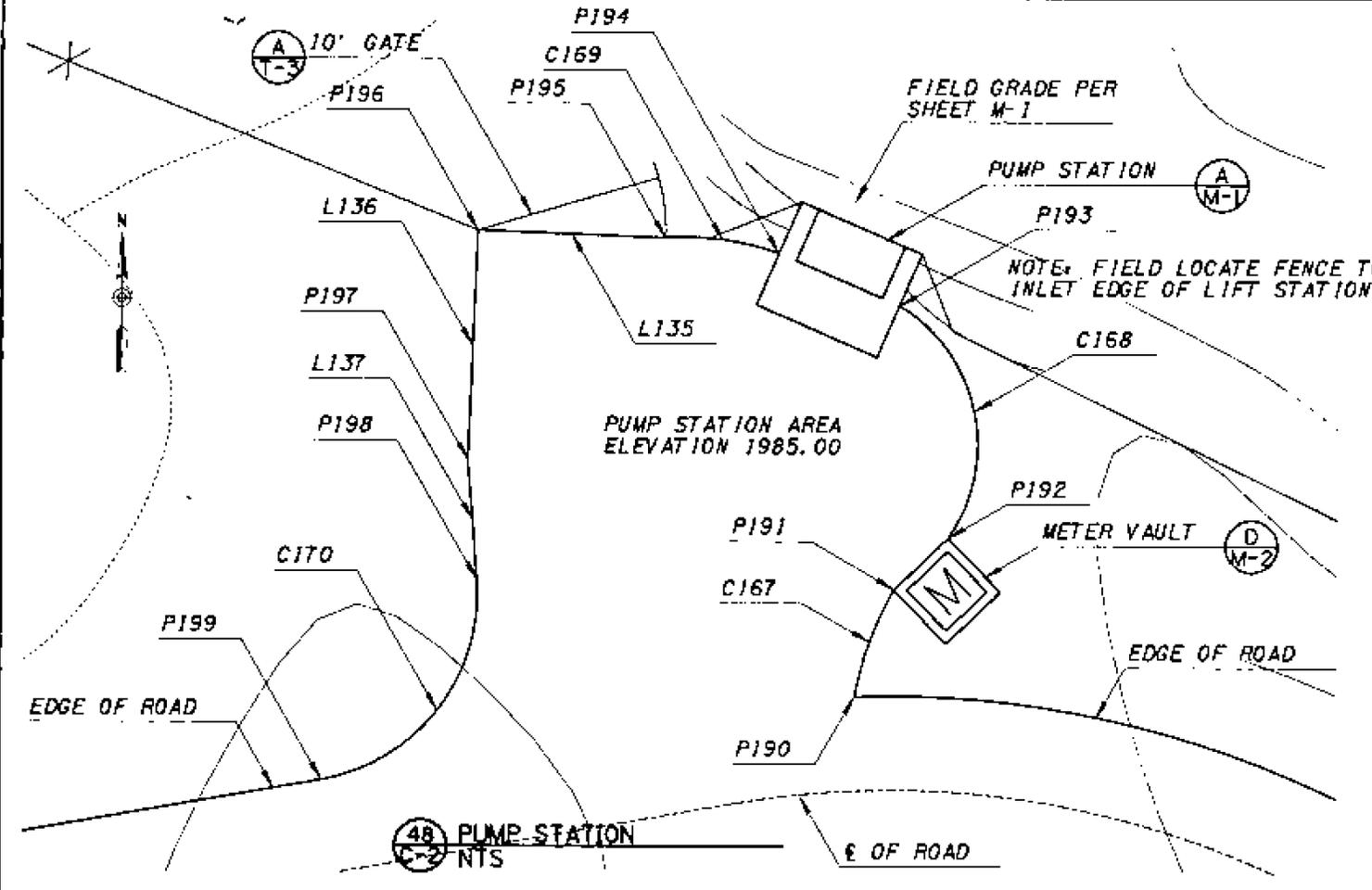


NOTE:
1. ALL HOOKS SHALL BE 5D TO DEGREE HOOKS.

26 REINFORCEMENT AT CORNERS AND JUNCTIONS
TYP



38 TURNOUT NTS



48 PUMP STATION NTS

LINE TABLE

NUMBER	DIRECTION	DISTANCE	P1	P2
L135	N 87°44'10" W	10.00'	P195	P196
L136	S 02°15'53" W	12.27'	P196	P197
L137	S 04°32'16" E	6.41'	P197	P198

CURVE TABLE

NUMBER	DELTA ANGLE	RADIUS	ARC LENGTH	P1	P2
C167	19°04'35"	18.31'	6.10'	P190	P191
C168	93°40'31"	8.66'	14.16'	P192	P193
C169	23°48'39"	14.80'	6.15'	P194	P195
C170	84°35'59"	10.00'	14.77'	P198	P199

POINT TABLE

NUMBER	NORTHING	EASTING	ELEVATION
P190	520486.6700	913362.4240	1985.00
P191	520492.3760	913364.4900	1985.00
P192	520495.1550	913367.3680	1985.00
P193	520507.2127	913365.1982	1985.00
P194	520510.3000	913358.3110	1985.00
P195	520511.0970	913352.2550	1985.00
P196	520511.4920	913342.2630	1985.00
P197	520499.2280	913341.7780	1985.00
P198	520492.8400	913342.2846	1985.00
P199	520482.1984	913334.0424	1985.00



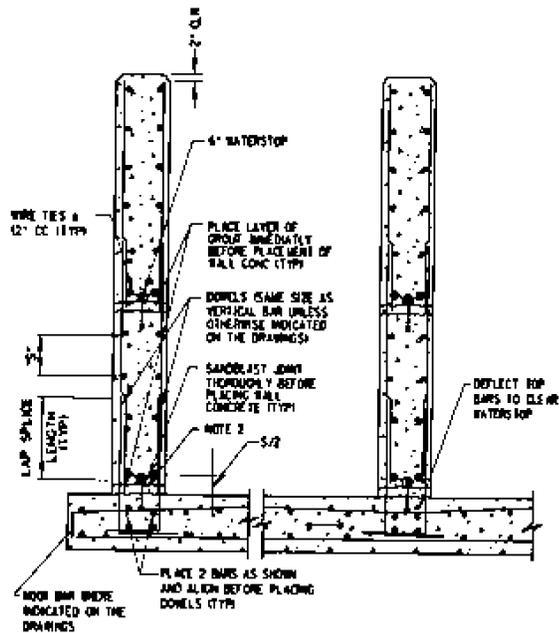
PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

TYPICAL DETAILS AND PUMP STATION AREA

ENTRANCO
CHANDLER PLANNING SERVICES
ARIZONA WASHINGTON
800 E. RIVER ROAD, SUITE 300 TUCSON, ARIZONA 85718-9436 (520)299-8700

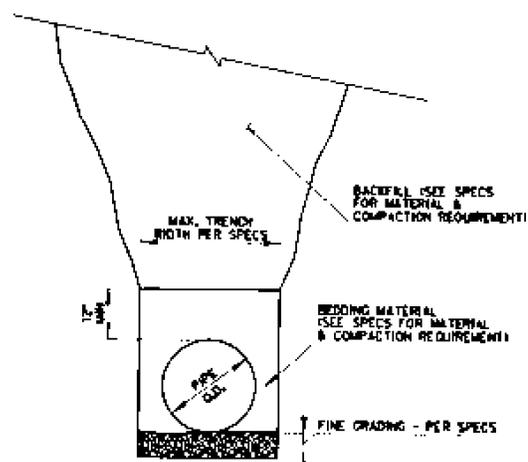
JOB NO. 90052-50	DESIGNED JCB	DRAWN JOC	APPROVED OPM	DATE 08/99
REV.			DWG NO. T-1	SHEET 19 OF 36

S:\P1\10\100N 02/26/00

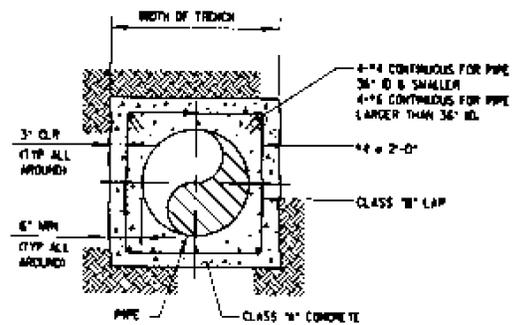


- NOTES:
1. "S" = BAR SPACING INDICATED ON THE DRAWINGS
 2. SWELLING STRIP MAY BE SUBSTITUTED FOR 4" WATERSTOP AND STAIRER WALL, WEATHER PERMITTING OR WHERE SWELLING STRIP IS PROTECTED FROM RAIN.

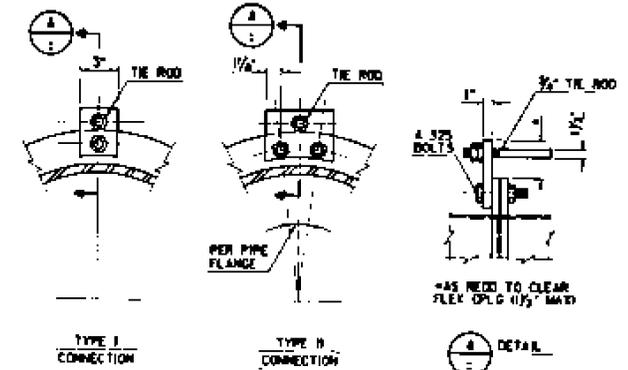
240 TYP WALL AND SLAB JOINTS WITH WATERSTOP
USE ON ALL WATER & EARTH BEARING WALLS



205 TYP PIPE INSTALLATION

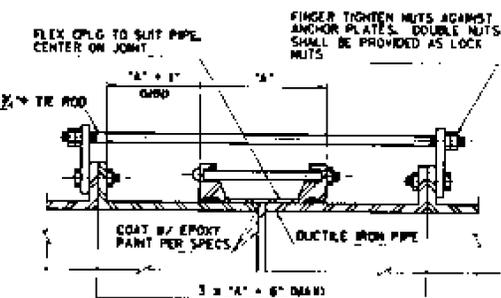


231 TYP CONCRETE ENCASEMENT OF PIPE



- NOTES:
1. ALL EXPOSED FLEXIBLE COUPLINGS SHALL HAVE TIE RODS UNLESS SPECIFICALLY INDICATED OTHERWISE ON THE DRAWINGS.
 2. PIPE THRUST SHALL BE BASED ON TEST PRESSURE. PIPE THRUST = 0.7854 x D x D TEST PRESSURE, WHERE D IS PIPE OD.
 3. MINIMUM TIE ROD YIELD 48,000 PSI.
 4. FOR THRUSTS GREATER THAN 30,000 POUNDS, ADD ONE 1/2" DIAMETER ROD FOR EVERY 6,000 POUNDS INCREASE IN THRUST.
 5. CONTRACTOR MAY USE ONE INCH DIAMETER ROD FOR THRUSTS GREATER THAN 30,000 POUNDS, NUMBER OF ONE INCH RODS = NUMBER OF 1/2" INCH RODS x CLASS 25 ROUNDED UP TO THE NEXT LARGER NUMBER.
 6. ALL ROD CONNECTIONS SHALL BE TYPE II FOR THRUSTS GREATER THAN 30,000 POUNDS.
 7. GRIND ALL CORNERS SMOOTH.

405 TYP DUCTILE IRON PIPE FLEXIBLE COUPLING TIE DOWN 1 OF 2

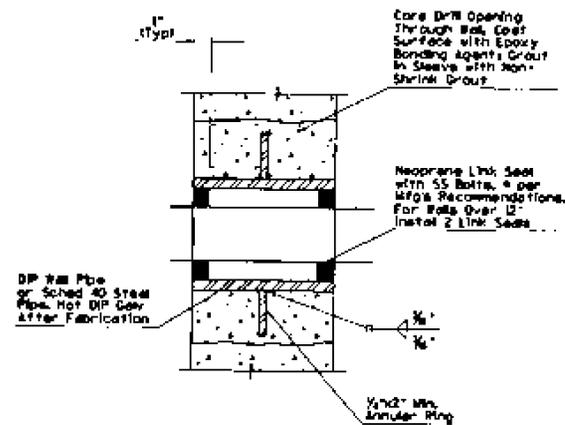


ROD SCHEDULE FOR DIP

PIPE THRUST, SEE NOTE 2, SHEET 1 OF CONNECTION	TYPE	NO. RODS
0-6,000*	I	2
6,000-12,000*	II	2
12,000-18,000*	II	3
18,000-24,000*	II	4
24,000-30,000*	II	5

- NOTES:
1. REFER TO NOTES ON 1 OF 2

405 TYP DUCTILE IRON PIPE FLEXIBLE COUPLING TIE DOWN 2 OF 2



425 TYP SLEEVE THROUGH WALLS

1. CONSTRUCTION SPECIFICATION-PIMA COUNTY/CITY OF TUCSON STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, 1994 EDITION.
2. DESIGN SPECIFICATIONS-ASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 16TH EDITION 1996 AND THE 1997 INTERIM SPECIFICATIONS.
3. ALL CONCRETE SHALL BE CLASS "S" UNLESS NOTED OTHERWISE.
4. REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A615. ALL REINFORCING SHALL BE FURNISHED AS GRADE 60.
5. ALL BENDS AND HOOKS SHALL MEET THE REQUIREMENTS OF ASHTO ARTICLE 6.23. ALL BEND DIMENSIONS FOR REINFORCING STEEL SHALL BE TO CENTER OF BARS UNLESS NOTED OTHERWISE.
6. ALL REINFORCING STEEL SHALL HAVE 2 INCH CLEAR COVER UNLESS NOTED OTHERWISE.
7. ALL MECHANICAL SPLICES SHALL CONFORM TO THE REQUIREMENTS FOR MECHANICAL CONNECTIONS IN SECTION 605-3.01 OF THE STANDARD SPECIFICATIONS.
8. STRESSES:
CONCRETE $f_c = 3000$ PSI
GRADE 60 REINFORCING STEEL $f_y = 24,000$ PSI
9. CHAMFER ALL EXPOSED CORNERS 1/4" UNLESS NOTED OTHERWISE.
10. ALL WALL REINFORCEMENT AT CORNERS OR JUNCTIONS OF WALLS SHALL BE CONTINUOUS. LAPSPICES OR TERMINATED IN STANDARD 90 DEGREE HOOK. LAP SPLICES SHALL CONFORM WITH NOTE 13.
11. KEYWAYS AND WATER STOP SHALL END 3" BELOW THE TOP OF WALLS UNLESS THERE IS A SLAB ON TOP OF THE WALL. IN THIS CASE IT SHALL END AT THE BOTTOM OF THE SLAB. IN JOINTS WHERE WATERSTOP TERMINATES AT ADJOINING SLAB OF WALL, WATER STOP SHALL BE EMBEDDED IN ADJOINING SLAB OR WALL A MINIMUM OF 6".
12. WATER STOP SHALL BE PLACED IN ALL CONSTRUCTION, CONTRACTION, AND EXPANSION JOINTS IN ALL WATERBEARING SLABS AND WALLS UNLESS OTHERWISE INDICATED ON THE DRAWINGS, AND IN ALL WALLS AND SLABS SUBJECT TO GROUNDWATER. WATERSTOP IN THIS WALLS SHALL BE CARRIED INTO SLABS AND SHALL BE SPLICED WITH THE WATERSTOP IN THE SLABS.
13. LAP SPLICES
 - A. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, THE LENGTH OF THE LAP SPLICE SHALL BE CLASS "S" WHEN NO MORE THAN 1/2 THE BARS ARE LAP SPLICED WITHIN THE FABRICATED LENGTH AND CLASS "B" WHEN MORE THAN 1/2 THE BARS ARE LAP SPLICED WITHIN THE FABRICATED LENGTH.
 - B. VALUES TABULATED BELOW FOR SPLICES ARE APPLICABLE ONLY WHEN THE COVER IS EQUAL TO ONE BAR DIAMETER OR MORE.
 - C. WHEN MULTIPLE BARS ARE SPLICED AT THE SAME SECTION THE CLEAR BAR SPACING IS THE MINIMUM CLEAR DISTANCE BETWEEN THE BARS OUTSIDE THE SPLICE LENGTH LESS ONE BAR DIAMETER.
 - D. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, THE BARS AT A LAP SPLICE SHALL BE IN CONTACT WITH EACH OTHER.
 - E. FOLLOWING TABULATED VALUES ARE CALCULATED FOR:
 $f_y = 60,000$ PSI
 $f_c = 3,500$ PSI
 - F. TOP BARS ARE ALL HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.

500 TYP REINFORCED CONCRETE NOTES

REINFORCING BAR LAP SPLICE

BAR NO.	MINIMUM CLEAR BAR SPACING CLEAR DIA.	LAP SPLICE LENGTH (INCHES)			
		TOP BARS	CLASS "B"	CLASS "S"	CLASS "B"
REQUIREMENT FOR WALLS AND SLABS *					
4	MORE THAN 2	20	26	15	20
5	MORE THAN 2	25	32	19	25
6	MORE THAN 2	31	42	25	33
	5	30	39	23	30
7	MORE THAN 2	44	58	34	44
	5	36	46	27	36
8	MORE THAN 2	58	75	45	58
	5	46	60	36	46
9	MORE THAN 2	73	95	56	73
	5	59	76	48	59
10	MORE THAN 2	94	122	72	94
	5	75	98	58	75
11	MORE THAN 2	115	150	88	115
	5	92	120	71	92



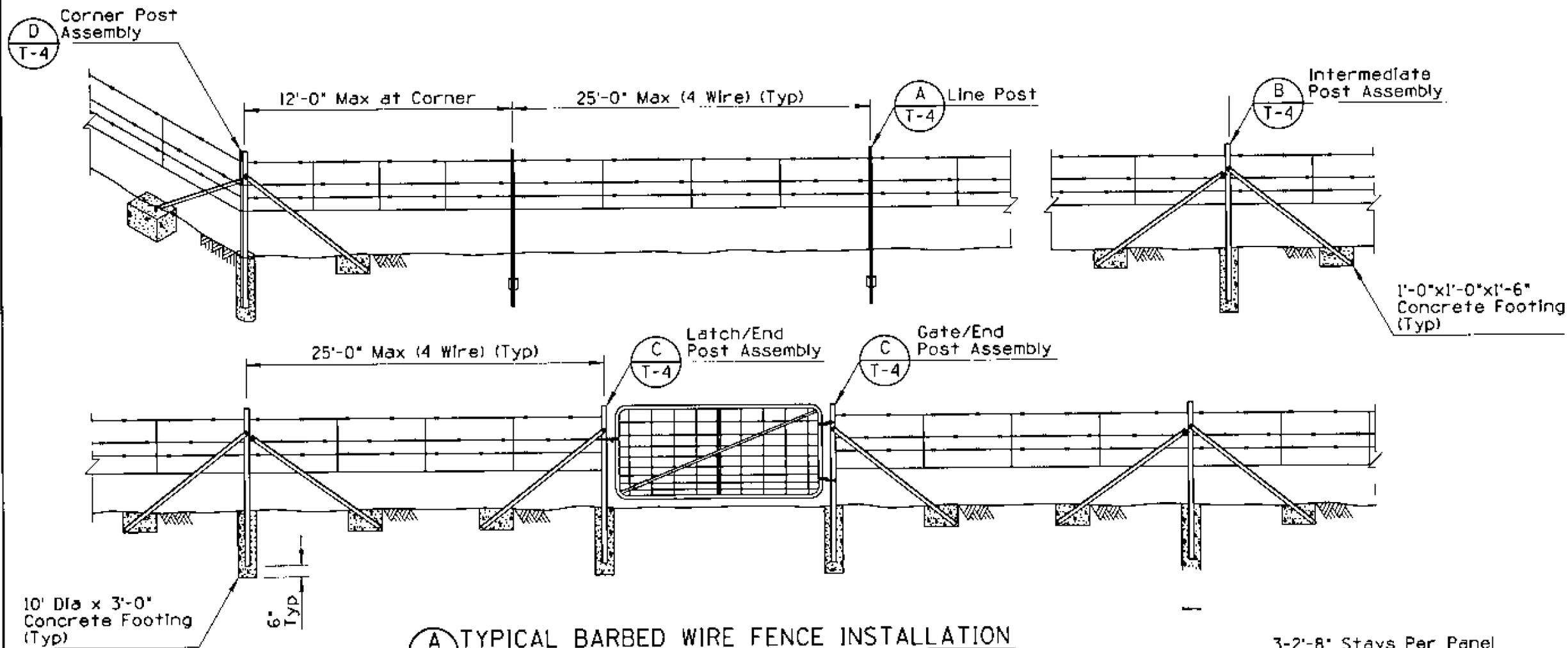
PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

TYPICAL DETAILS

ENTRANCO
DESIGNERS ARCHITECTS ENGINEERS

1900 E. RIVER ROAD, SUITE 300 WASHINGTON ARIZONA 85629-4700

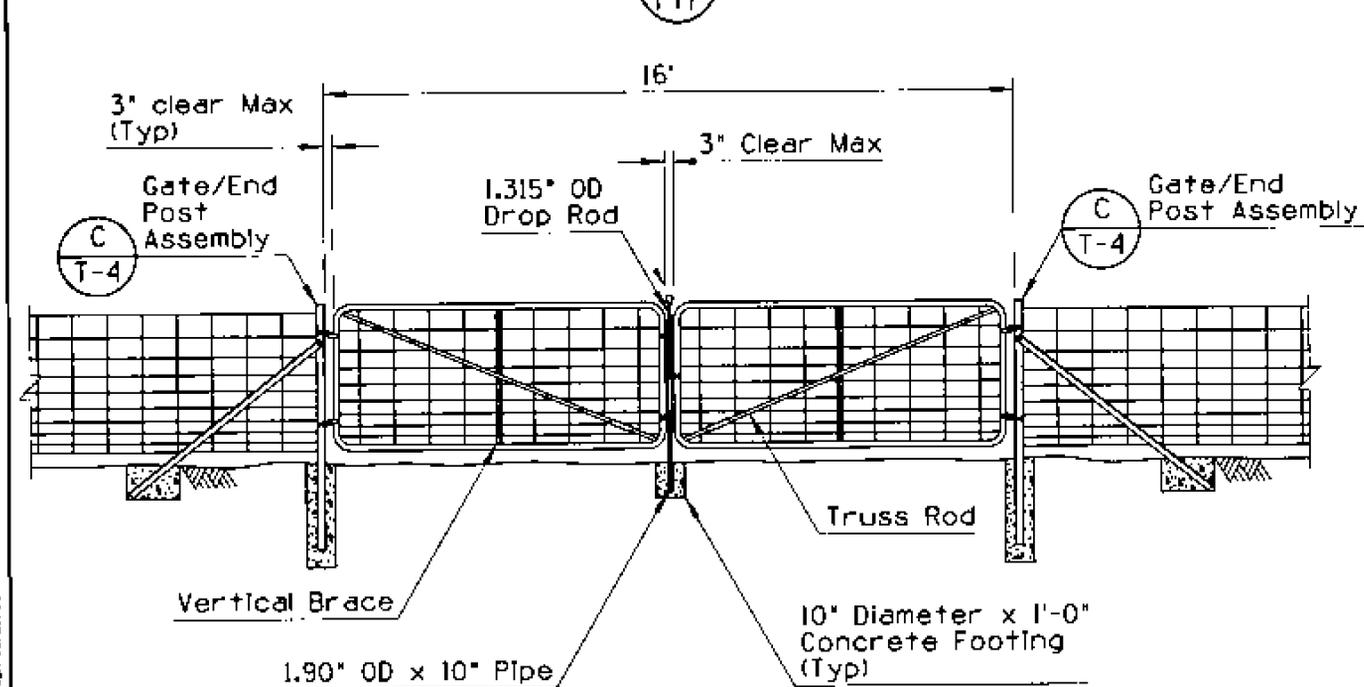
JOB NO. 98062-ED	DESIGNED BY JCB	DRAWN BY JDC	APPROVED BY DPH	DATE 08/99
REV.			DWG NO. T-2	SHEET 20 OF 36



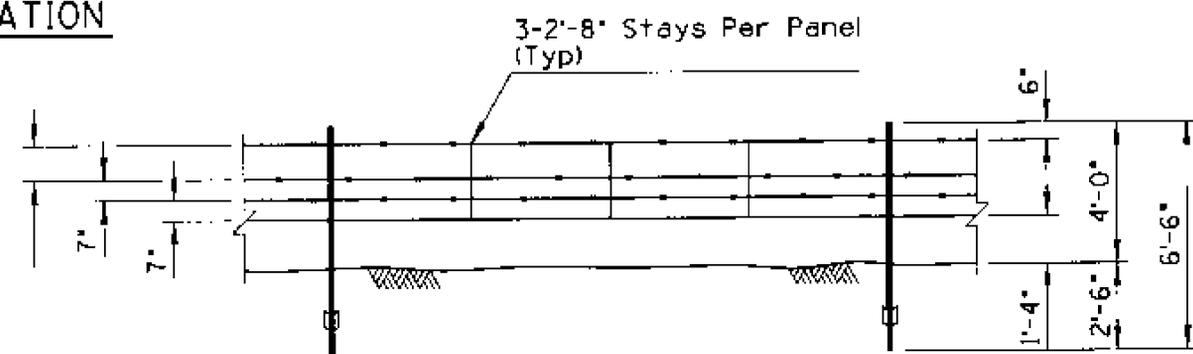
A TYPICAL BARBED WIRE FENCE INSTALLATION

10' Dia x 3'-0"
Concrete Footing
(Typ)

6"
Typ



B BARBED WIRE GAME FENCE (GF)



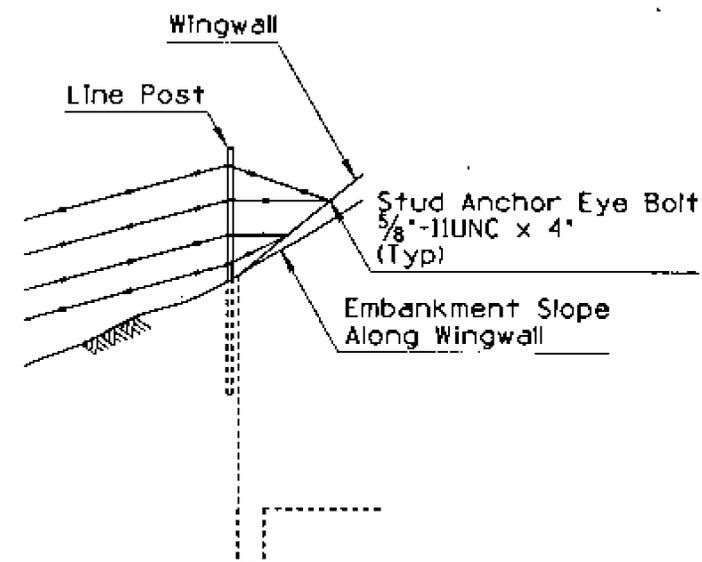
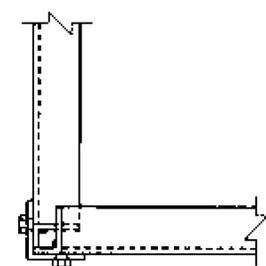
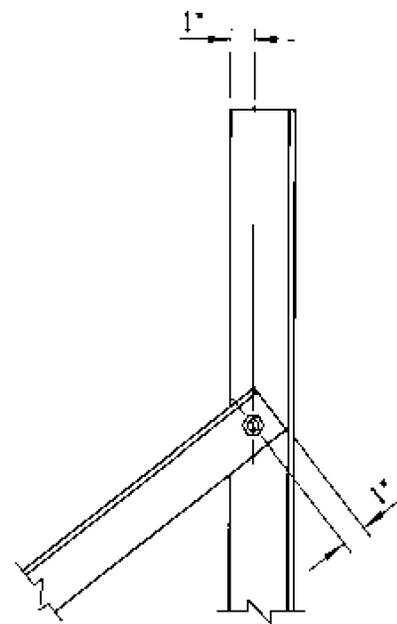
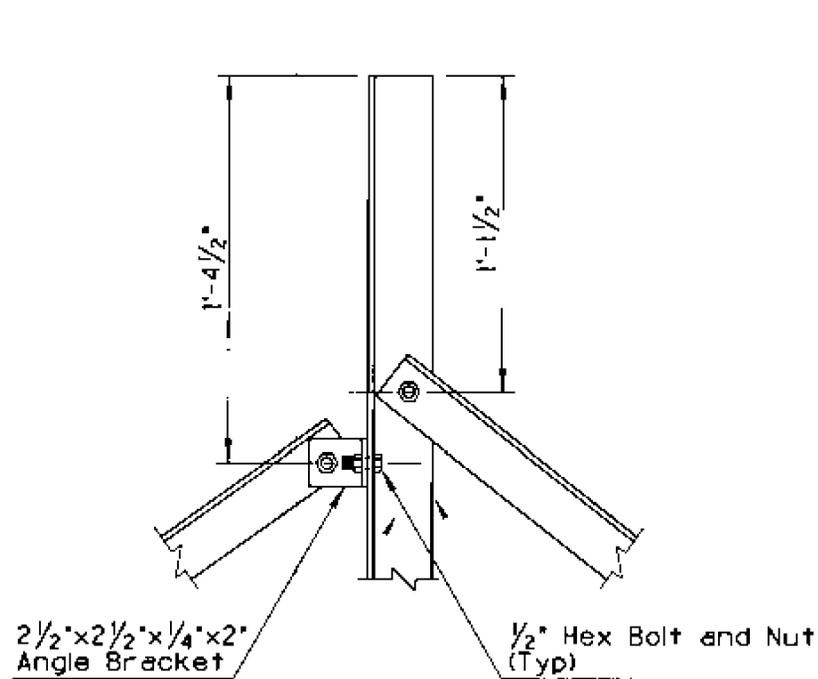
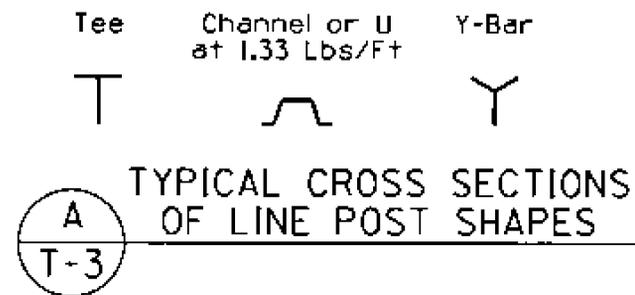
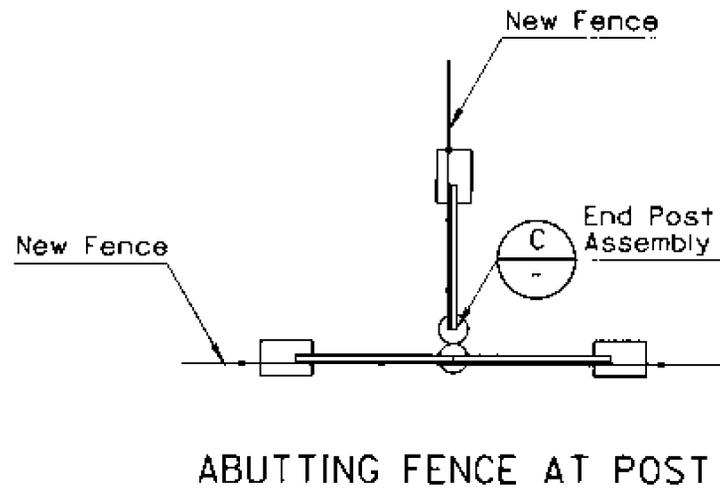
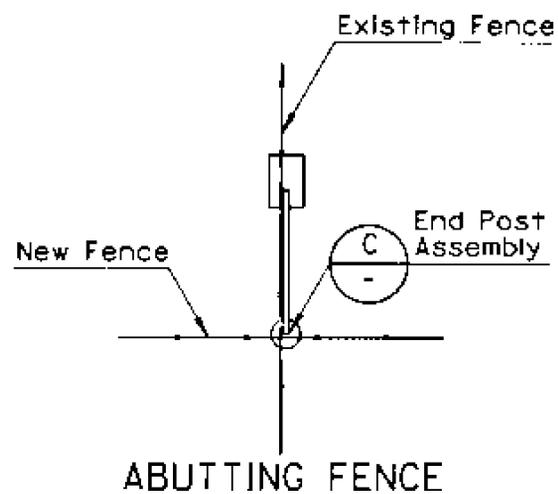
C BARBED WIRE GAME FENCE (GF)

GENERAL NOTES

1. Intermediate Post Assemblies shall be located as shown and at intervals not to exceed 650', or midway between all braced posts.
2. For game fence the bottom wire shall be barbless.
3. The stays on game fence shall have their ends turned up, to prevent injuries to game.



PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT				
TYPICAL DETAILS FENCE				
ENTRANCO				
1880 E. RIVER ROAD, SUITE 300 TUCSON, ARIZONA 85719-5436				
JOB NO. 88062-60	DESIGNED BY JOB	DRAWN BY JOB	APPROVED BY DPW	DATE 09/00
REV.			DWG NO. T-3	SHEET 21 OF 36



GENERAL NOTES

1. Post assemblies shall consist of an upright angle 2 1/2 x 2 1/2 x 1/4 at 4.10 lbs/ft, and brace angles 2 x 2 x 1/4 at 3.19 lbs/ft.



PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT				
TYPICAL DETAILS FENCE				
ENTRANCO <small>CONCRETE PAVING</small> <small>1800 E. RIVER ROAD, SUITE 300 TUCSON, ARIZONA 85718-5636</small>				
JOB NO. 95062-60	DESIGNED JCB	DRAWN JCB	APPROVED OPW	DATE 08/00
REV.			DWG NO. T-4	SHEET 22 OF 36

EXISTING IRRIGATION CANAL

EXISTING FENCE

PUMP STATION

Scale in Feet
0 50 100



EXISTING ROAD
RECHARGE CELL NO. 4

RECHARGE CELL NO. 2

RECHARGE CELL NO. 3

RECHARGE CELL NO. 1

EQUALIZATION BASIN

SILT FENCE

OX-BOW CHANNEL

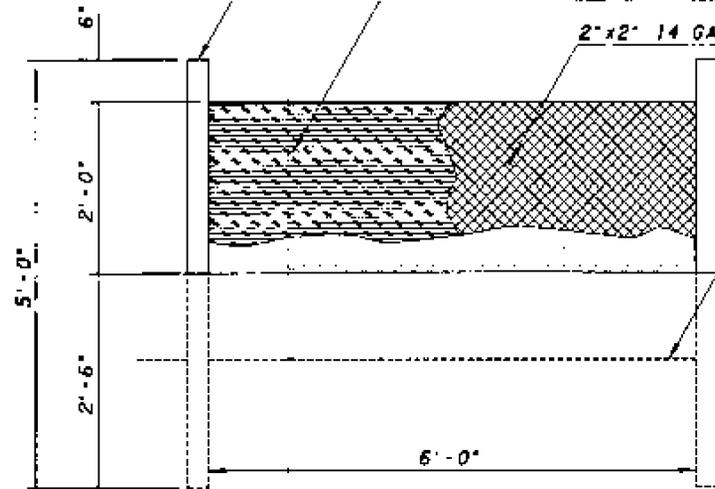
PLACE STRAW BALE BARRIER TYPE 2 IN DRAINAGE SWALE EVERY 100 FEET

2"x4" WOOD POST (ALTERNATE: STEEL FENCE POST)

HIGH SURVIVABILITY FILTER FABRIC MATERIAL 60" WIDE ROLLS. USE STAPLES OR WIRE RINGS TO ATTACH FABRIC TO WIRE

2"x2" 14 GA WIRE FABRIC OR EQUIVALENT

BURY BOTTOM OF FILTER MATERIAL IN 8"x12" TRENCH



ELEVATION

HIGH SURVIVABILITY FILTER FABRIC

2"x2" 14 GA. WIRE FABRIC OR EQUIVALENT

PROVIDE EARTH MATERIAL IN TRENCH AND ON BOTH SIDES OF HIGH SURVIVABILITY FILTER FABRIC ON THE SURFACE

2"x4" WOOD POST (ALTERNATE: STEEL FENCE POSTS)

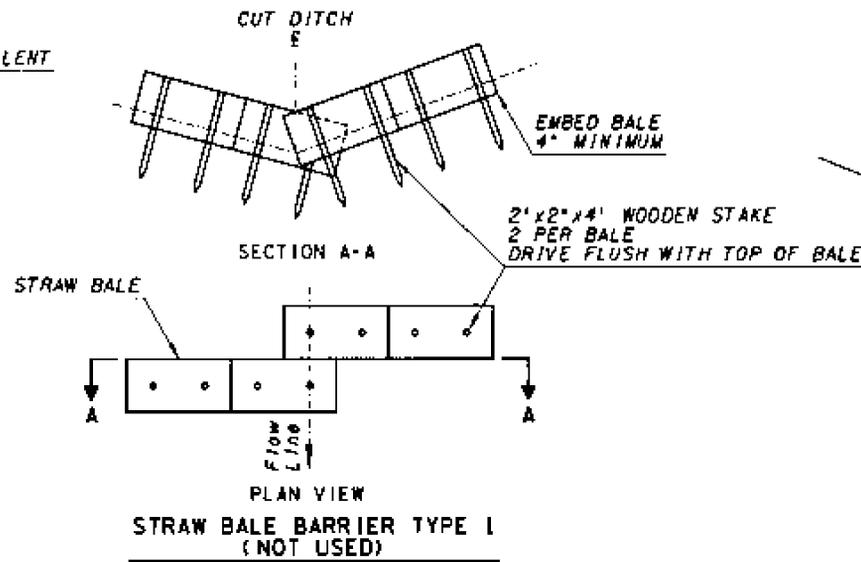
SECTION

SILT FENCE

CUT DITCH

EMBED BALE 4" MINIMUM

2"x2"x4" WOODEN STAKE 2 PER BALE DRIVE FLUSH WITH TOP OF BALE



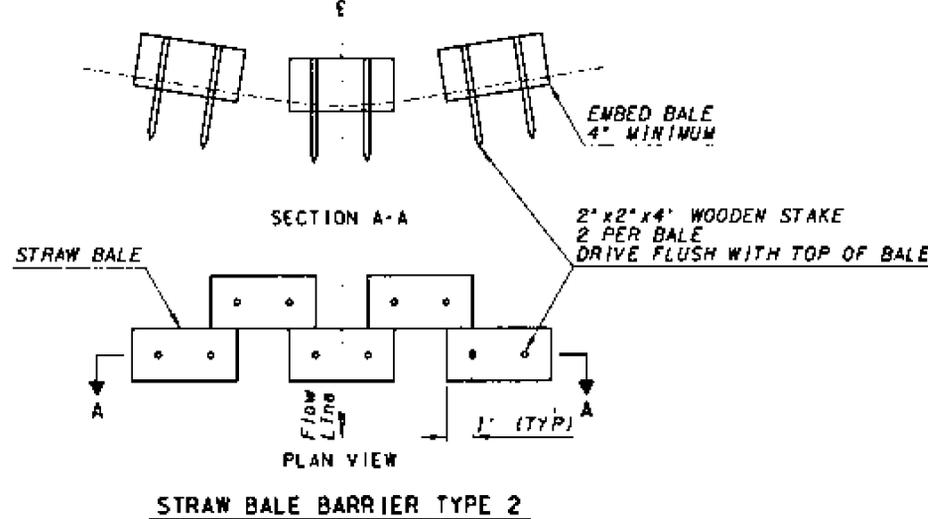
PLAN VIEW

STRAW BALE BARRIER TYPE 1 (NOT USED)

SWALE

EMBED BALE 4" MINIMUM

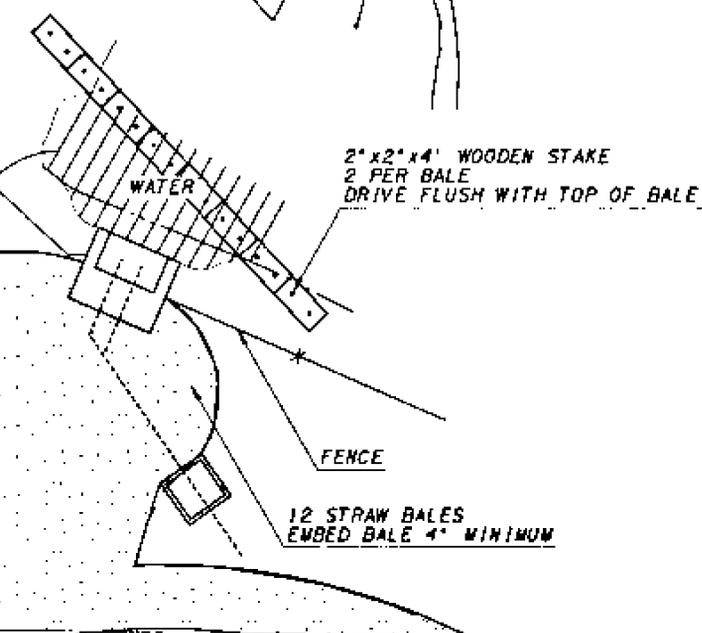
2"x2"x4" WOODEN STAKE 2 PER BALE DRIVE FLUSH WITH TOP OF BALE



SECTION A-A

PLAN VIEW

STRAW BALE BARRIER TYPE 2



2"x2"x4" WOODEN STAKE 2 PER BALE DRIVE FLUSH WITH TOP OF BALE

FENCE

12 STRAW BALES EMBED BALE 4" MINIMUM

LIFT STATION STRAW BALE DETAIL



PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARIANA HIGH PLAINS EFFLUENT RECHARGE PROJECT				
CIVIL STORMWATER POLLUTION PREVENTION PLAN AND DETAILS				
ENTRANCO INCORPORATED 1800 N. RIVER ROAD, SUITE 300 TUSSON, ARIZONA 85718-5438				
JOB NO. SR062-60	DESIGNED BY JCB	DRAWN BY JJC	APPROVED BY DPM	DATE 09/00
REV.	DWG NO. SWP-1		SHEET 23 OF 36	

DATE PLOTTED: 02/26/00

PART 1. (TO BE COMPLETED BY DESIGN ENGINEER)

I. Project Description
 Marana High Plains Effluent Recharge Project
 W.O. 4FLSCE

A. Pima County Flood Control District
 201 N. Stone Avenue
 Tucson, Arizona 85701

B. Project Number 4FLSCE

C. Project Location: South bank of the Santa Cruz River near Sanders Road. Town of Marana and Pima County. Township 11 South, Range 11 East, Section 33

D. Project Description: Construct Recharge Basins (totaling 3.88 acres) for treated effluent from Santa Cruz River. Project includes pumping and distribution system, landscaping, access road and other work.

II. Site Conditions

A. Total Area of Site 19.4749 Ac

B. Total Area of Disturbance 8.4417 Ac

C. Runoff Coefficient
 Pre-construction 0.030 to 0.040
 Post-construction 0.030 to 0.040

D. Soil type: Grabe-Gla-Pima Association
 Deep soil of the floodplain-hydrologic soil Group-B

E. Receiving Water-Santa Cruz River.

F. Status of Listed Endangered or Threatened Species or Critical Habitat

Bureau of Reclamation Initiated Informal Section 7 consultation on April 16, 1997. We received a list of threatened and endangered species on April 17, 1997. None of the species on the list, including southwest willow flycatcher and cactus ferruginous pygmy-owl, were deemed likely to occur regularly within the project area based on habitat surveys and consultations with biologists. The Bureau of Reclamation has concluded that the proposed action would have "no effect" on any threatened or endangered species or any critical habitat. Final Environmental Assessment Marana High Plains Effluent Recharge Project, April 1998.

III. PRESERVATION OF EXISTING VEGETATION:

In accordance with the specifications, existing vegetation will be preserved. Clearing limits shall be confined to areas that require grading. Existing vegetation outside the boundaries of the cleared area shall be protected from damage by construction activities. Existing trees within the area to be cleared shall be preserved and protected whenever possible.

IV. PERMIT REQUIREMENTS:

A copy of the general permit may be found in the project specifications.

V. SOIL STABILIZATION MEASURES:

A. All disturbed soil, which will not be paved, torrapped or otherwise covered to prevent erosion with the exception of the channel bottoms, will be revegetated and/or landscaped in accordance with the plans and specifications.

B. Scheduling of revegetation can be found in part 2.

VI. CONTROL MEASURES:

A. Temporary Erosion and Sediment Controls (Refer to the SWPPP site plans)

- ___ Erosion Control Matting
- ___ Temporary Diversion Ditches
- ___ Pipe Slope Drains
- ___ Check Dams
- ___ Cut To Fill Slope Transition
- ___ Rock Inlet/Outlet Protection
- Straw Bale Barriers
- Silt Fence
- ___ Catch Basin Inlet Protection
- ___ Protection of Native Vegetation.

B. Permanent Erosion and Sediment Controls (Refer to the Project Plans and Specifications)

- ___ Crown Ditch/Dike
- Rock Inlet/Outlet Protection
- ___ Erosion Control Matting
- ___ Rock Riprap Channel Lining
- ___ Sediment Basin
- ___ Embankment Curb
- ___ Spillways and Downdrains
- ___ Minibenching
- ___ Shalcrete Channel Lining
- ___ Salt Cement Channel Lining
- Revegetation

C. Storm Water Management

- ___ Detention/Retention Basins
- ___ Flow Attenuation Devices

VII. MAINTENANCE AND INSPECTIONS

A. Maintenance

All erosion, sediment and pollutant control measures and other protective measures must be maintained in effective operating condition. Repairs or maintenance shall be performed before the next anticipated storm event or if this is not possible, as soon as practicable.

B. Inspections

1. Frequency: Monthly during seasonal erod periods, every two weeks in rainy season and within 24 hours of rainfall of 0.5 inches or greater.
2. Inspections shall cover all disturbed areas and areas used for storage. Installed control measures, discharge locations and locations where vehicles enter and exit site.
3. Inspection check lists shall be completed by inspector, signed by Brooks A. Keenan, and kept on file.
4. Plans revisions shall be made within 7 days of the inspection.
5. Repairs, if necessary, shall be implemented before the next storm.

VIII. COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

The SWPPP has been prepared in accordance with the requirements of the NPDES General Permits For Storm Water Discharge From Construction Activities as published in the Federal Register Feb. 17, 1998.

- ___ Plan is consistent with other state and local waste disposal, sanitary sewer or septic regulations
- ___ No other federal, state or local regulations apply
- Other applicable regulations: (MCA, 401, Grading, Floodplain, etc.)

IX. REQUIREMENT FOR PROTECTION OF LISTED ENDANGERED AND THREATENED SPECIES AND CRITICAL HABITAT

NOT APPLICABLE

X. POLLUTION PREVENTION PLAN CERTIFICATION:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violators."

Signed: Brooks A. Keenan Date: 11/2/2000
 Brooks A. Keenan, Director

PART 2. (TO BE COMPLETED BY ENGINEERING AND THE CONTRACTOR)

I. SCHEDULE OF MAJOR ACTIVITIES:

A. Project Schedule Start _____ End _____

B. Construction Sequencing Schedule: SEE ATTACHED SHEET (S)

II. INVENTORY OF POLLUTANTS:

The materials or substances checked below are expected to be onsite during construction:

Concrete	Flux
Paints	Asphalt
Pesticides	Fertilizers
Cement	Lime
	Oil

III. POLLUTION CONTROL MEASURES:

A. No solid materials shall be discharged to waters of US

B. Off-site vehicle tracking of sediments and the generation of dust shall be minimized

C. Construction materials shall be stored in such a manner as to reduce the release of pollutant discharges, by berming, enclosing or other methods

D. BMP's (ADOT Erosion and Pollution Control Manual)

- ___ *9 Solid Waste Management
- ___ *10 Equipment Maintenance Procedures
- ___ *11 Designated Washout Area
- ___ *12 Stabilized Construction Entrance
- ___ *13 Protected Chemical and Material Storage Area

IV. SPILL PREVENTION AND RESPONSE:

A. SPILL PREVENTION:

The procedures outlined in the Best Management Practices listed under Pollution Control Measures will be followed to prevent and contain spills of hazardous materials. These preventative actions include BMP's on equipment maintenance and proper handling, storage and disposal of chemicals and materials. All manufacturer's recommendations for usage, clean-up and disposal shall be followed.

B. SPILL RESPONSE:

In the event of any accidental spill of chemicals or hazardous materials, the Contractor shall contact PCDDT Inspector and Yellow Company procedures for the cleanup and reporting of spills and releases. If a reportable quantity is discharged PCDDT will contact the National Response Center and document the spill to the EPA.

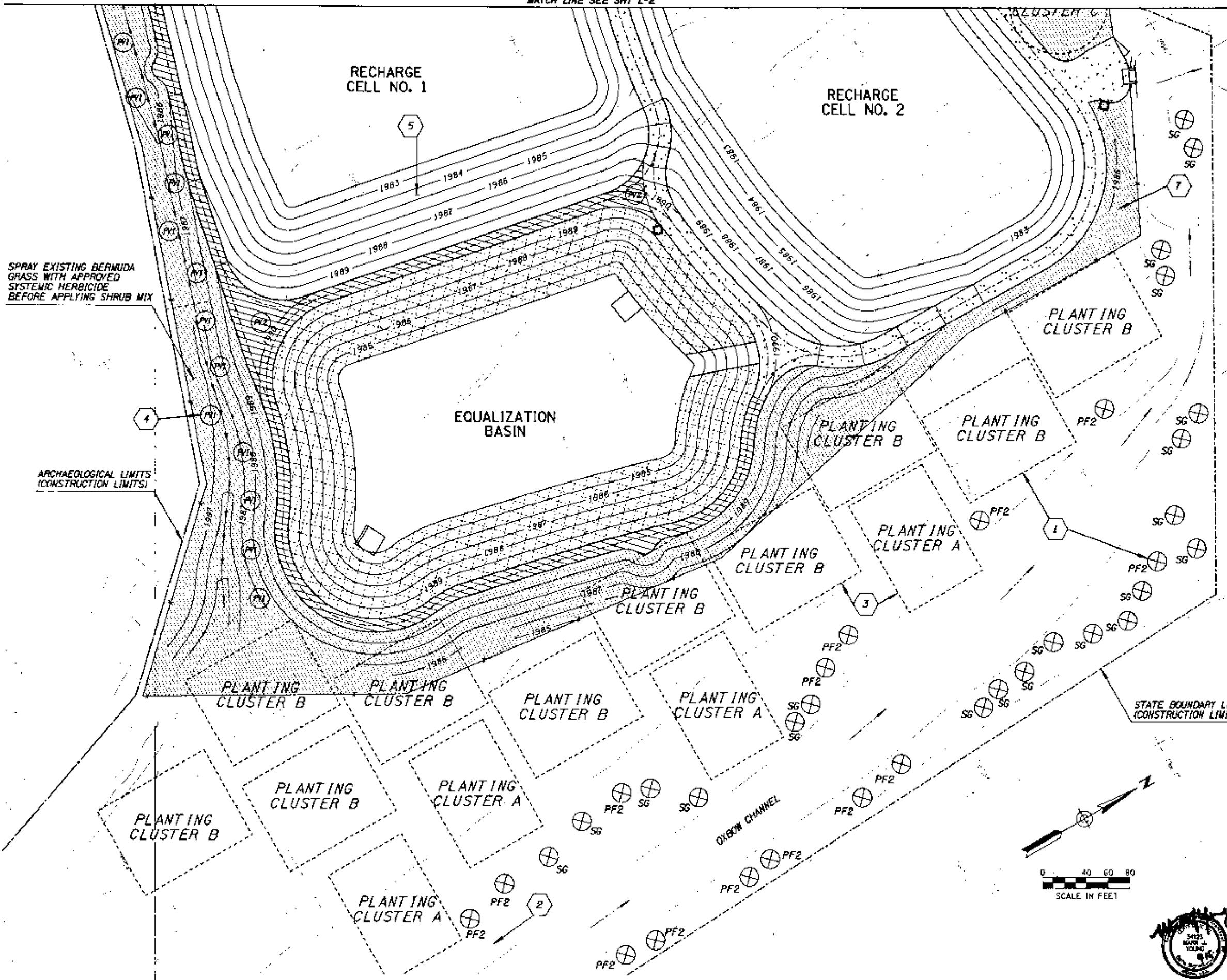


PIMA COUNTY
 DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
 MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

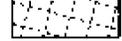
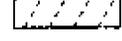
CIVIL
 STORMWATER POLLUTION PREVENTION PLAN
 CHECK LIST

ENTRANCO
 CONSULTING ENGINEERS
 1100 S. RIVER ROAD, SUITE 200 TUCSON, ARIZONA 85719-1924
 TUCSON, ARIZONA 85719-1924

JOB NO. 90067-50	DESIGNED: JCB	DRAWN: JCB	APPROVED: DPM	DATE: 09/00
REV. _____			DWG. NO. SWP-2	SHEET 24 OF 36



LEGEND

-  MAINTENANCE ROAD
6" THICK AB
-  TRAIL
COMPACTED EARTH
-  UPLAND GRASS SEED MIX
SEE SHEET L-7
-  SHRUB SEED MIX
SEE SHEET L-7
-  RECHARGE BASIN SEED MIX
SEE SHEET L-7
-  CONTAINER PLANTING
SEE SHEET L-7
-  POLE PLANTING
-  BENCH
(SUPPLIED BY THE COUNTY)

PLANTING NOTES

- 1 ADJUST INDIVIDUAL PLANT LOCATIONS AS NECESSARY TO ACCOUNT FOR SITE VARIABILITY (TYPICAL)
- 2 CONTINUE PLANTING ALONG WEST-SIDE OXBOW CHANNEL. ADDITIONAL (10) SALIX GOODINGII (19) POPULUS FREMONTII
- 3 SEE SHEET L-8 FOR PLANTING CLUSTER DETAIL (TYPICAL)
- 4 SEE PLANT SCHEDULE SHEET L-7 FOR PLANT NAMES (TYPICAL)
- 5 PLUG PLANT GRASSES AT BASE OF SLOPE. SEE DETAIL, SHEET L-8
- 6 PLANT TREES ON TERRACE (TYPICAL) SEE CROSS-SECTIONS ON SHEETS C-11 & C-12
- 7 SCARIFY SOILS OUTSIDE BASINS BEFORE APPLYING HYDROSEED (TYPICAL)

SPRAY EXISTING BERMUDA GRASS WITH APPROVED SYSTEMIC HERBICIDE BEFORE APPLYING SHRUB MIX

ARCHAEOLOGICAL LIMITS (CONSTRUCTION LIMITS)

STATE BOUNDARY LIMITS (CONSTRUCTION LIMITS)

PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT					
LANDSCAPE PLANTING PLAN					
ENTRANCO CORPORATION 1800 E. RIVER ROAD, SUITE 300 TULSON, ARIZONA 85718-3636					
JOB NO. 98062-60	DESIGNED BY MJT	DRAWN BY ATS	APPROVED BY DPM	DATE 3/00	
REV.			DWG NO. L-1	SHEET 25 OF 34	

MATCH LINE SEE SHT L-3

ARCHAEOLOGICAL LIMITS
(CONSTRUCTION LIMITS)

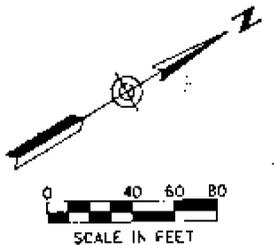
RECHARGE
CELL NO. 4

RECHARGE
CELL NO. 3

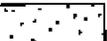
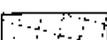
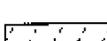
RECHARGE
CELL NO. 2

RECHARGE
CELL NO. 1

MATCH LINE SEE SHT L-1



LEGEND

-  MAINTENANCE ROAD
6" THICK AB
-  TRAIL
COMPACTED EARTH
-  UPLAND GRASS SEED MIX
SEE SHEET L-7
-  SHRUB SEED MIX
SEE SHEET L-7
-  RECHARGE BASIN SEED MIX
SEE SHEET L-7
-  CONTAINER PLANTING
SEE SHEET L-7
-  POLE PLANTING
-  BENCH
(SUPPLIED BY THE COUNTY)

PLANTING NOTES

- 1 ADJUST INDIVIDUAL PLANT LOCATIONS AS NECESSARY TO ACCOUNT FOR SITE VARIABILITY (TYPICAL)
- 2 CONTINUE PLANTING ALONG WEST-SIDE OXBOW CHANNEL, ADDITIONAL
(10) SALIX GOODINGII
(19) POPULUS FREMONTII
- 3 SEE SHEET L-8 FOR PLANTING CLUSTER DETAIL (TYPICAL)
- 4 SEE PLANT SCHEDULE SHEET L-7 FOR PLANT NAMES (TYPICAL)
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- 7 SCARIFY SOILS OUTSIDE BASINS BEFORE APPLYING HYDROSEED (TYPICAL)

EXISTING IRRIGATION CANAL

STATE BOUNDARY LIMITS
(CONSTRUCTION LIMITS)

SPRAY EXISTING BERMUDA GRASS WITH APPROVED SYSTEMIC HERBICIDE BEFORE APPLYING SHRUB MIX

PLANTING CLUSTER C

PLANTING CLUSTER C

PLANTING CLUSTER C

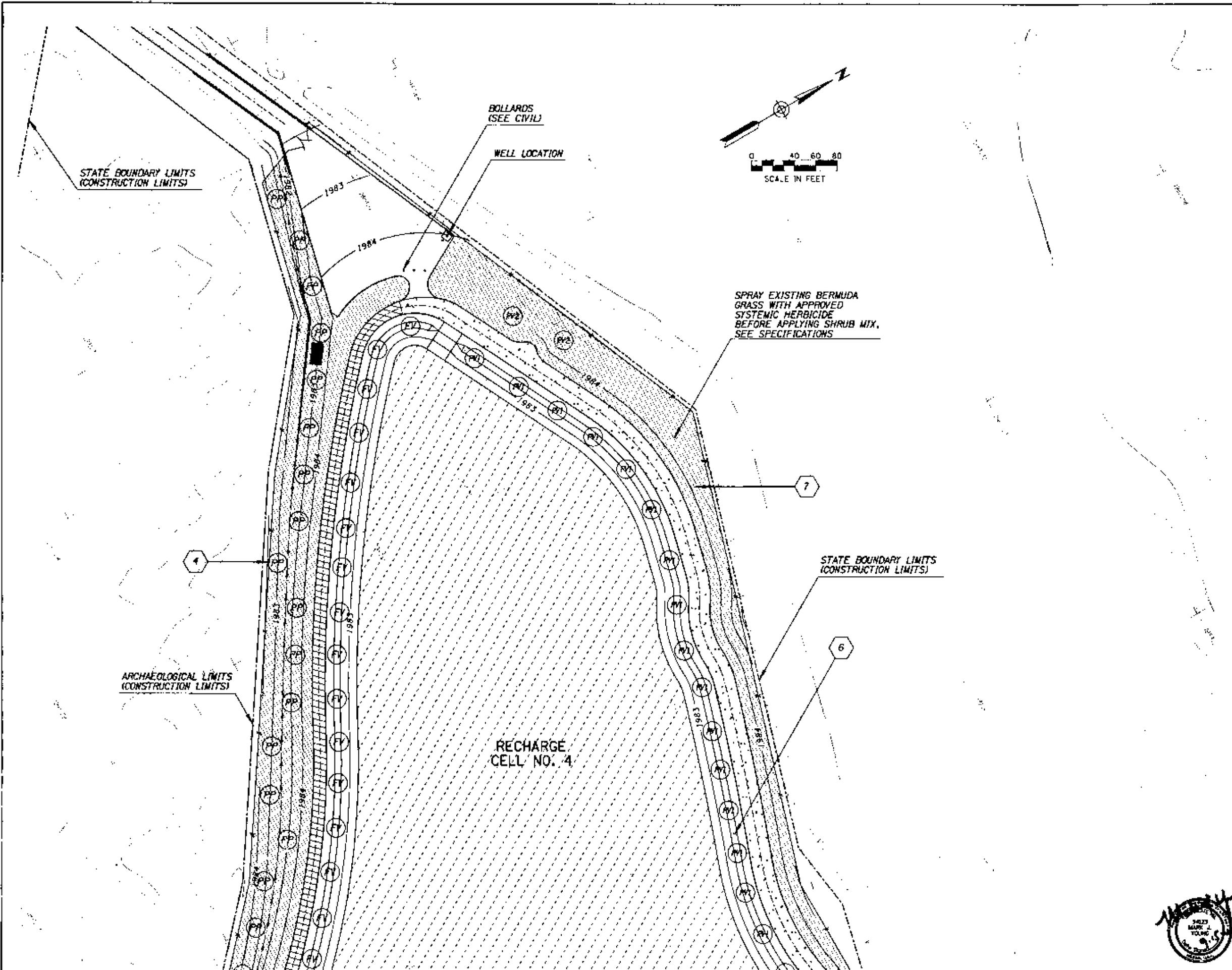
PLANTING CLUSTER C

PLANTING

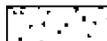
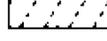
PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT			
LANDSCAPE PLANTING PLAN			
ENTRANCO			
DESIGNED BY: [Signature] DRAWN BY: [Signature] CHECKED BY: [Signature]			
1140 S. RIVER ROAD, SUITE 300 TUCSON, ARIZONA 85719-5636			
JOB NO. 9002-50	DESIGNED BY MJY	DRAWN BY ATS	DATE 3/00
REV.		DWG. NO. L-2	SHEET 26 OF 36



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LEGEND

-  MAINTENANCE ROAD
6" THICK AB
-  TRAIL
COMPACTED EARTH
-  UPLAND GRASS SEED MIX
SEE SHEET L-7
-  SHRUB SEED MIX
SEE SHEET L-7
-  RECHARGE BASIN SEED MIX
SEE SHEET L-7
-  CONTAINER PLANTING
SEE SHEET L-7
-  POLE PLANTING
-  BENCH
(SUPPLIED BY THE COUNTY)

PLANTING NOTES

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- 7 SCARIFY SOILS OUTSIDE BASINS BEFORE APPLYING HYDROSEED (TYPICAL)

PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

LANDSCAPE
PLANTING PLAN

ENTRANCO
LANDSCAPE ARCHITECTS

1860 E. RIVER ROAD, SUITE 300
TUCSON, ARIZONA 85718-5636

JOB NO. 98062-50	DESIGNED BY M.J.F.	DRAWN BY A.T.S.	APPROVED BY D.P.W.	DATE 3/00
DWG. NO. L-3			SHEET 27 OF 36	

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RECHARGE
CELL NO. 1

RECHARGE
CELL NO. 2

1 GPH EMITTERS AT 24" O.C.
ON SEEDED BASINS (TYP)

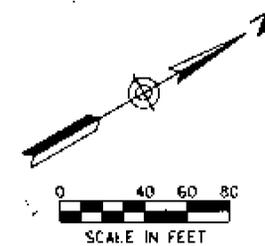
EQUALIZATION
BASIN

LEGEND

-  CONTROLLER (LOCATE ON ELECTRICAL RACK - SEE ELECTRICAL PLANS) RAINBIRD ESP-MC 12 STATION
 -  CONTROL VALVE RAINBIRD PESB SERIES-SIZE AS NOTED, WITH NON-POTABLE HANDLE
 -  IN-LINE WYE FILTER RAINBIRD RBY 150MX, SIZE TO MATCH VALVE
 -  IN-LINE PRESSURE REGULATOR RAINBIRD PSI-M30X-075
 -  BACKFLOW PREVENTER FEBCO B25Y 2" *Y" STRAINER
 -  BALL VALVE
 -  QUICK COUPLER WITH NON-POTABLE CAP
 -  BALL VALVE SUMP
 -  CRISPIN 3/4" AIR RELEASE VALVE
 -  MAINLINE - 1 1/2" UNLESS NOTED, PVC SCHEDULE 40
 -  LATERAL - PVC CLASS 200 SIZE TO MATCH VALVE UNLESS NOTED OTHERWISE
 -  1/2" DRIP POLYETHYLENE DISTRIBUTION TUBING
 -  APPROX. WELL LOCATION
 -  END FLUSH CAP IN 6" DIA. BCX
- | ZONE | |
|------------|-------|
| VALVE SIZE | GPM |
| 1 | 1 R.4 |

IRRIGATION NOTES

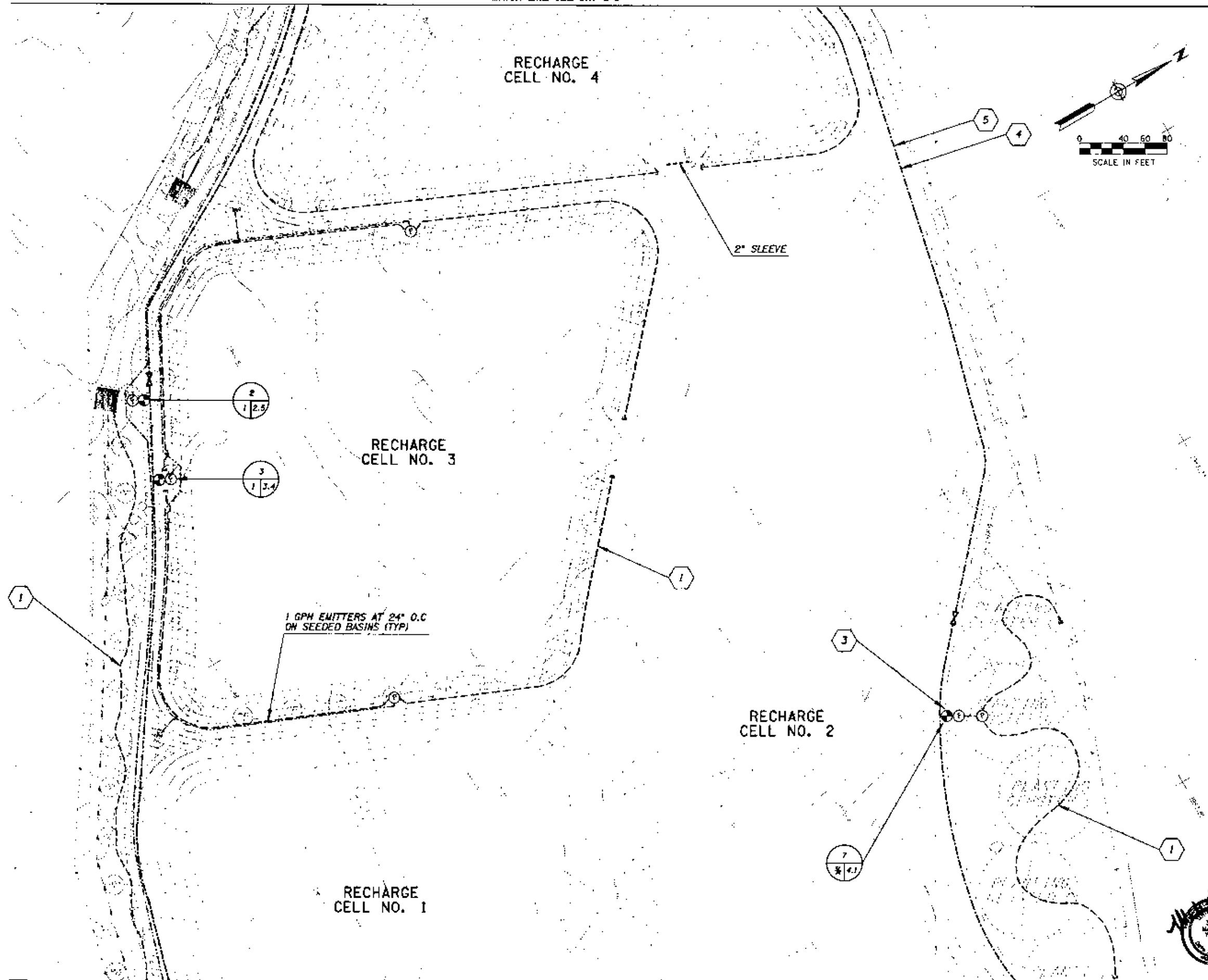
-  EMITTERS - NOT SHOWN. REFER TO PLANT LIST FOR GPM. SHEET L-7. USE RAINBIRD XB-05, XB-10 AND XB-20, RESPECTIVELY. EMITTERS SHALL BE PLACED PER TYPICAL CROSS SECTION ON SHEET L-8 OR AT EACH TREE/SHRUB AS APPROPRIATE. (TYPICAL)
-  ZONE LOCATIONS ARE APPROXIMATE.
-  ALL VALVE BOXES TO HAVE PURPLE COVERS TO DENOTE NON-POTABLE WATER. (TYPICAL)
-  LOCATION OF MAINLINE IS SCHEMATIC. ACTUAL LOCATION IS MAINLY ALONG BASIN SIDE EDGE OF ACCESS ROAD AND TRAIL.
-  USE 4-INCH SLEEVE FOR MAINLINE WHEN CROSSING ACCESS ROAD AND TRAIL. (TYPICAL)



PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT				
LANDSCAPE IRRIGATION PLAN				
 ENTRANCO IRRIGATION SYSTEMS				
1840 E. RIVER ROAD, SUITE 300 TUCSON, ARIZONA 85718-3434				
JOB NO.	DESIGNED BY	DRAWN BY	APPROVED BY	DATE
98062-60	MJT	415	DPM	3/00
REV.			DWG NO.	SHEET
			L-4	28 OF 36



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LEGEND

-  CONTROLLER (LOCATE ON ELECTRICAL RACK - SEE ELECTRICAL PLANS)
RAINBIRD ESP-MC 12 STATION
 -  CONTROL VALVE
RAINBIRD PESB SERIES-SIZE AS NOTED,
WITH NON-POTABLE HANDLE
 -  IN-LINE WYE FILTER
RAINBIRD RBY 150WX,
SIZE TO MATCH VALVE
 -  IN-LINE PRESSURE REGULATOR
RAINBIRD PSI-M30X-075
 -  BACKFLOW PREVENTER
FEBCO B25Y 2" "Y" STRAINER
 -  BALL VALVE
 -  QUICK COUPLER WITH NON-POTABLE CAP
 -  BALL VALVE SUMP
 -  CRISPIN 3/4" AIR RELEASE VALVE
 -  MAINLINE - 1 1/2" UNLESS NOTED,
PVC SCHEDULE 40
 -  LATERAL - PVC CLASS 200
SIZE TO MATCH VALVE UNLESS NOTED
OTHERWISE
 -  1/2" DRIP POLYETHYLENE
DISTRIBUTION TUBING
 -  APPROX. WELL LOCATION
 -  END FLUSH CAP IN 6" DIA. BOX
- | ZONE | |
|------|-----|
| 1 | 2.5 |
| 1 | 3.4 |
| 1 | 4.1 |

IRRIGATION NOTES

-  EMITTERS - NOT SHOWN, REFER TO PLANT LIST FOR GPH, SHEET L-7. USE RAINBIRD XB-05, XB-10 AND XB-20, RESPECTIVELY. EMITTERS SHALL BE PLACED PER TYPICAL CROSS SECTION ON SHEET L-8 OR AT EACH TREE/SHRUB AS APPROPRIATE. (TYPICAL)
-  ZONE LOCATIONS ARE APPROXIMATE.
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-  LOCATION OF MAINLINE IS SCHEMATIC. ACTUAL LOCATION IS MAINLY ALONG BASIN SIDE EDGE OF ACCESS ROAD AND TRAIL.
-  USE 4-INCH SLEEVE FOR MAINLINE WHEN CROSSING ACCESS ROAD AND TRAIL. (TYPICAL)

PRIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
WARMA HIGH PLAINS EFFLUENT RECHARGE PROJECT

LANDSCAPE
IRRIGATION PLAN

ENTRANCO
DESIGNERS ENGINEERS ARCHITECTS
3425 N. RIVER RD., SUITE 200
TUCSON, ARIZONA 85718-9636

JOB NO. 88062-60	DESIGNED N.J.Y.	DRAWN A.T.S.	APPROVED O.P.W.	DATE 3/00
REV.			DWG NO. L-5	SHEET 29 OF 36

DATE PLOTTED: 03/01/00 10:24:27 AM

LEGEND

-  CONTROLLER (LOCATE ON ELECTRICAL RACK - SEE ELECTRICAL PLANS) RAINBIRD ESP-MC 12 STATION
-  CONTROL VALVE RAINBIRD PESB SERIES-SIZE AS NOTED, WITH NON-POTABLE HANDLE
-  IN-LINE WYE FILTER RAINBIRD RBY 150MX (UNLESS NOTED OTHERWISE), SIZE TO MATCH VALVE
-  IN-LINE PRESSURE REGULATOR RAINBIRD PSI-M30X-075
-  BACKFLOW PREVENTER FEBCO B25Y 2" *Y* STRAINER
-  BALL VALVE
-  QUICK COUPLER WITH NON-POTABLE CAP
-  BALL VALVE SUMP
-  CRISPIN 3/4" AIR RELEASE VALVE
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-  LATERAL - PVC CLASS 200 SIZE TO MATCH VALVE UNLESS NOTED OTHERWISE
-  1/2" DRIP POLYETHYLENE DISTRIBUTION TUBING
-  APPROX. WELL LOCATION
-  END FLUSH CAP IN 6" DIA. BOX

ZONE	
1	VALVE SIZE
1 2.4	GPM

IRRIGATION NOTES

-  EMITTERS - NOT SHOWN, REFER TO PLANT LIST FOR GPH, SHEET L-7. USE RAINBIRD XB-05, XB-10 AND XB-20, RESPECTIVELY. EMITTERS SHALL BE PLACED PER TYPICAL CROSS SECTION ON SHEET L-8 OR AT EACH TREE/SHRUB AS APPROPRIATE. (TYPICAL)
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-  LOCATION OF MAINLINE IS SCHEMATIC. ACTUAL LOCATION IS MAINLY ALONG BASIN SIDE EDGE OF ACCESS ROAD AND TRAIL.
-  USE 4-INCH SLEEVE FOR MAINLINE WHEN CROSSING ACCESS ROAD AND TRAIL. (TYPICAL)
-  WELL ELECTRICAL/PUMP CONNECTION BY ELECTRICAL CONTRACTOR - SEE ELECTRICAL PLANS.
-  WELL ASSUMED TO SUPPLY 32 GPM @ 55 PSI.

-  LOCATE END OF PVC PIPE IN RIP-RAP TO AVOID RODENT PROBLEMS.
-  CONTRACTOR TO RUN ZONE #12 TO FLUSH SYSTEM BEFORE NORMAL OPERATION.

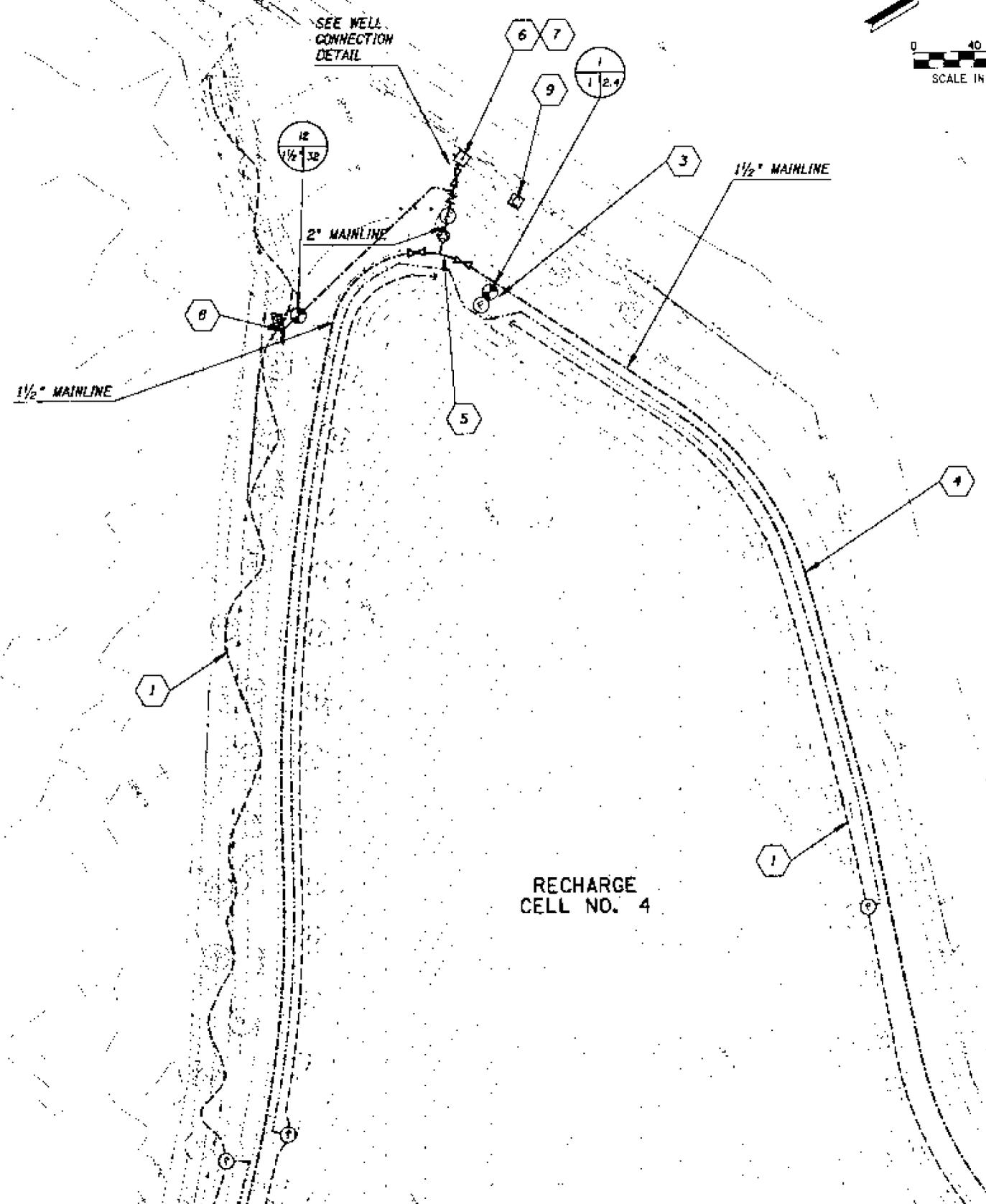
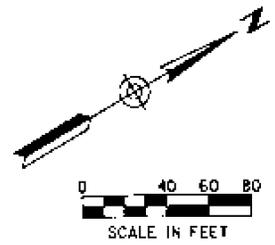
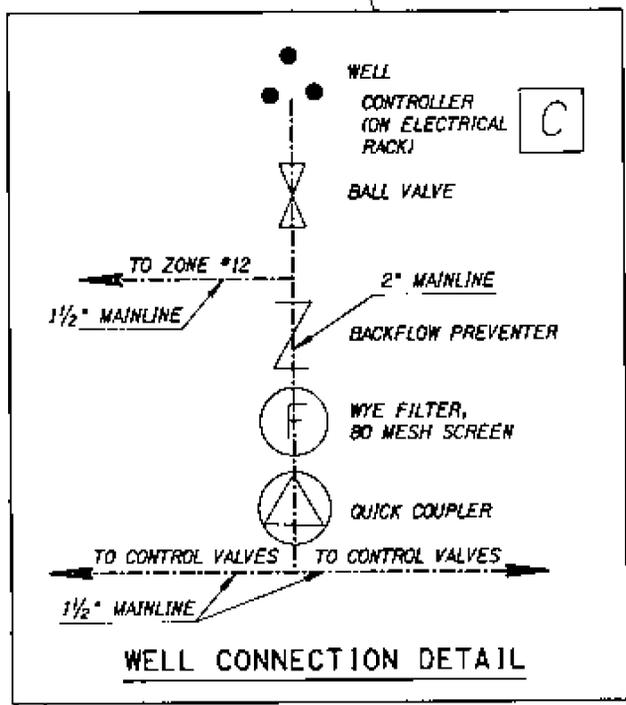
NOTE:
ALL ZONES TO OVERLAP WATERING TIMES BY ONE MINUTE DURING NORMAL OPERATION.

PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

LANDSCAPE IRRIGATION PLAN

ENTRANCO
CONTRACTORS PLUMBERS SCHEDERS
ARIZONA WASHINGTON
1360 L. RIVER WALK, SUITE 300
LESCON, ARIZONA 85789-5636 602999-8700

JOB NO. 90062-60	DESIGNED BY MLY	DRAWN BY ATS	APPROVED BY DFW	DATE 3/00
DRG NO. L-6			SHEET 30 OF 36	



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HYDROSEED MIX SCHEDULE

	BOTANICAL NAME	COMMON NAME	PERCENT BY WEIGHT
SHRUB SEED MIX MIX NO. 1	<i>Ambrosia Deltoidea</i>	Triangle Leaf Bursage	20%
	<i>Atriplex Lentiformis</i>	Quail Bush	10%
	<i>Atriplex Canescens</i>	Desert Saltbush	40%
	<i>Encelia Farinosa</i>	Brittle Bush	5%
	<i>Eriocameria Laricifolia (=H) aptopappus</i>	Turpentine Bush	5%
	<i>Larrea Tridentata</i>	Creosote Bush	10%
	<i>Senna Cavasii (= Cassia)</i>	Desert Senna	4%
	<i>Baleya Nutfradifata</i>	Desert Marigold	2%
	<i>Sphaeralcea Ambigua</i>	Desert Globe Mallow	4%
			100%
UPLAN GRASS SEED MIX MIX NO. 2	<i>Aristida Purpurea</i>	Purple Three-awn	30%
	<i>Bouteloua Aristidoides</i>	Needle Grass	20%
	<i>Bouteloua Curtipendula</i>	Sideoats Grass	20%
	<i>Sporobolus Cryptandrus</i>	Sand Dropseed	10%
	<i>Tridens Pulchellus</i>	Fluffgrass	20%
		100%	
BASIN SEED MIX	<i>Bromus Carinatus</i>	California Brome	25%
	<i>Deschampsia Caspifosa</i>	Tufted Hairgrass	5%
	<i>Distichlis Stricta</i>	Inland Saltgrass	30%
	<i>Hordeum Brochyantherum</i>	Meadow Barley	15%
	<i>Leymus Trifloides</i>	Beardless Wildrye	15%
	<i>Panicum Obtusum</i>	Vine Mesquite	10%
			100%

PLANT SCHEDULE

	KEY	QTY	CLUSTER	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	GPH
TREES	AG	28		<i>Acacia Constricta</i>	Whitethorn Acacia	5 gal		4
	CR	17		<i>Celtis Reticulata</i>	Western Hackberry	5 gal		4
	CF1	10	B C	<i>Cercidium Floridum</i>	Blue Palo Verde	15 gal	Mutt-Stem	4
	CL	15	B	<i>Chilopsis Linearis</i>	Desert Willow	5 gal		4
	FV	28		<i>Fraxinus Velutina</i>	Arizona Ash	5 gal		6
	PF1	4	A	<i>Populus Fremontii</i>	Fremont Cottonwood	5 gal		6
	PF2	33		<i>Populus Fremontii</i>	Fremont Cottonwood	Pole	Min 1" x 8' Long	
	PP	22		<i>Prosopis Pubescens</i>	Scrawbean Mesquite	5 gal		4
	PV1	49		<i>Prosopis Velutina</i>	Arizona Mesquite	5 gal		4
	PV2	4	A	<i>Prosopis Velutina</i>	Arizona Mesquite	15 gal	Mutt-Stem	4
	SG	31		<i>Salix Gooddingii</i>	Goodding Willow	Pole	Min 1" x 4' Long	
	TOTAL	241						
	SHRUBS	AD	4	A	<i>Ambrosia Deltoidea</i>	Triangle Leaf Bursage	1 gal	
AC1		10	B	<i>Atriplex Canescens</i>	Desert Saltbush	5 gal	Bushy	1
AC2		8	A	<i>Atriplex Canescens</i>	Desert Saltbush	1 gal		1
CP		10	B	<i>Celtis Pallida</i>	Desert Hackberry	1 gal		1
EF1		10	B	<i>Encelia Farinosa</i>	Brittle Bush	1 gal		0.5
EL		5	C	<i>Eriocameria Laricifolia (= H) aptopappus</i>	Turpentine Bush	1 gal		0.5
JC		4	A	<i>Justicia Californica</i>	Chuparosa	1 gal	Bushy	1
LE		5	C	<i>Lycium Exsertum</i>	Thorn Bush	5 gal		0.5
TOTAL		56						
GROUND COVER	EF2	39	A B C	<i>Eriogonum Fasciculatum</i>	Flat-top Buckwheat	1 gal		0.5
	MR	28	A B	<i>Mullenbergia Rigens</i>	Deergrass	1 gal		1
	SW	28	A B	<i>Senna Wislizenii (= Cassia)</i>	Shrubby Senna	1 gal		1
	SA	28	A C	<i>Sphaeralcea Ambigua</i>	Desert Globe Mallow	1 gal		0.5
	TOTAL	123						
GRASS PLUG PLANTING	DS	1,000		<i>Distichlis Stricta</i>	Inland Saltgrass	1 gal	Space Evenly	None
							Root Mass	
							Shell Fill	
	TOTAL	1,000					Container	

Notes

- Pole planting to be paid as "Miscellaneous Landscaping"

PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

LANDSCAPE
HYDROSEED MIX/PLANT SCHEDULE

ENTRANCO

CORPORATION
1880 E. RIVER ROAD, SUITE 300
TUCSON, ARIZONA 85718-3428

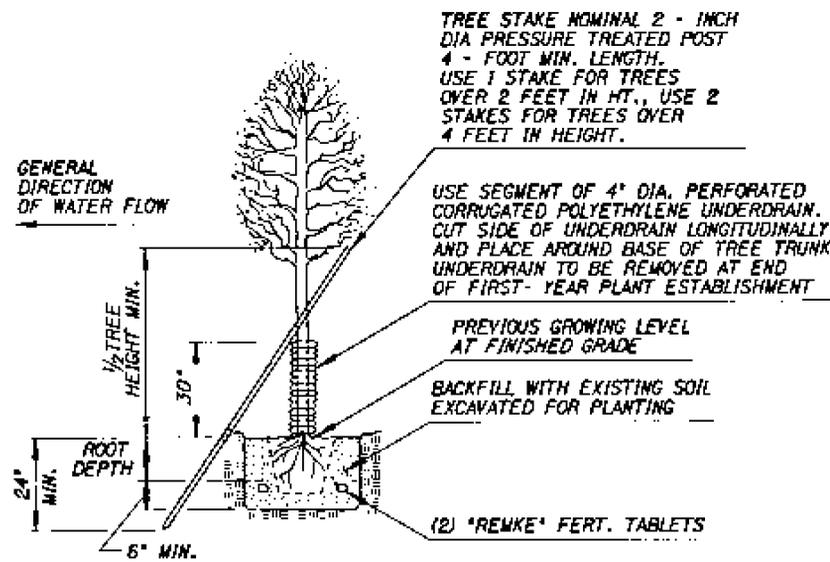
PHOENIX PLAZA SUBDIVISION

WASHINGTON 000999-8700

JOB NO. 98062-60	DESIGNED N.J.Y.	DRAWN A.T.S.	APPROVED D.P.M.	DATE 3/00
REV.			DRG. NO. L-7	SHEET 31 OF 36



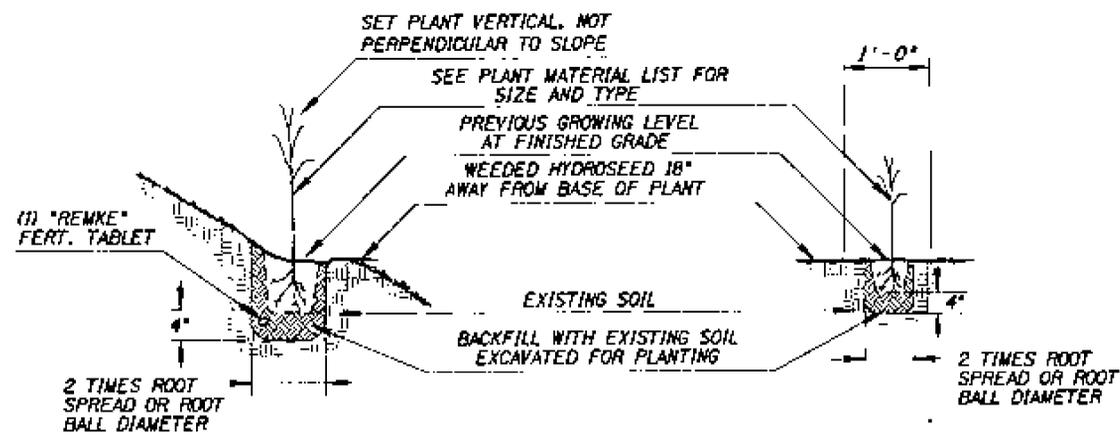
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TREE PLANTING AND STAKING DETAIL

BARE ROOT, & CONTAINER

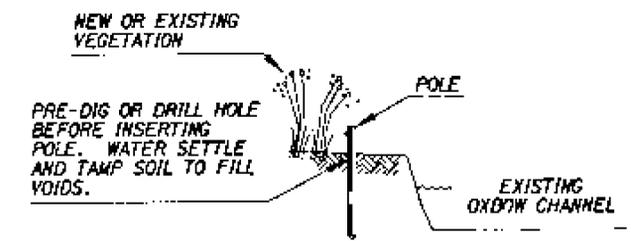
NOT TO SCALE



TREE, SHRUB, AND GROUND COVER PLANTING ON SLOPED AREA OR FLAT AREA

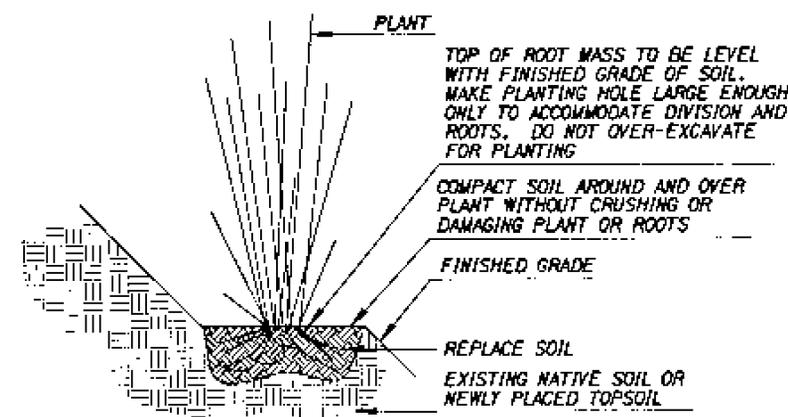
BARE ROOT AND CONTAINER

NOT TO SCALE



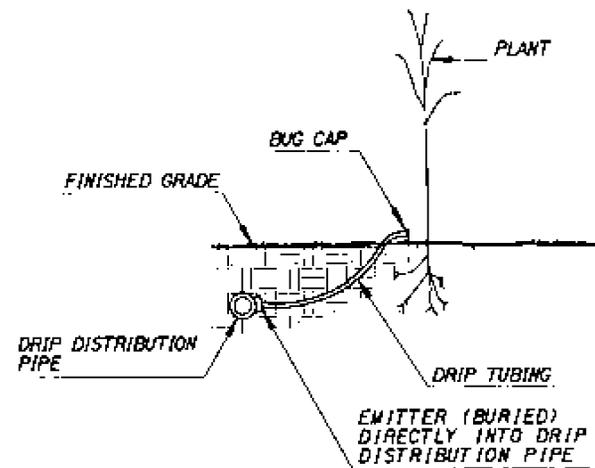
COTTONWOOD & WILLOW POLE DETAIL (TYP)

NOT TO SCALE



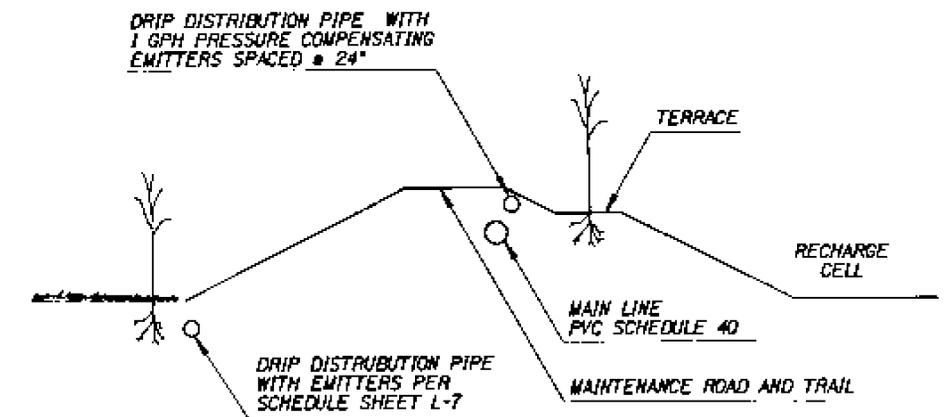
PLUG PLANT DETAIL

NOT TO SCALE



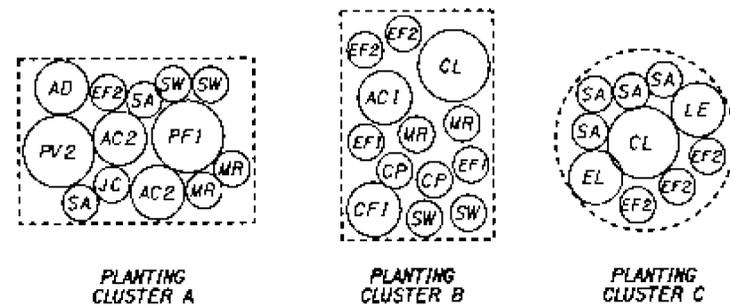
DRIP IRRIGATION DETAIL

NOT TO SCALE



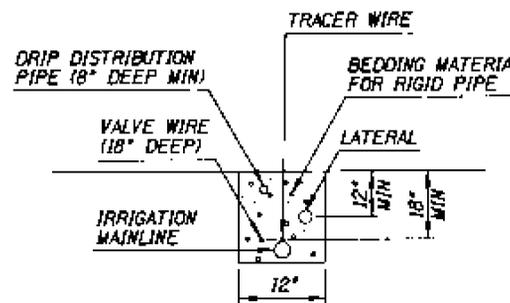
TYPICAL SECTION

NOT TO SCALE



PLANTING CLUSTER DETAIL

NOT TO SCALE



TRENCHING DETAIL

NOT TO SCALE

NOTES:

ALL ELECTRICAL WIRE CONNECTIONS TO VALVES AND SPLICES TO BE INSTALLED IN VALVE BOX AND MADE WITH PEN-TILE WATERPROOF CONNECTORS OR APPROVED EQUAL, BUNDLE AND TAPE WIRING AT 10' INTERVALS.

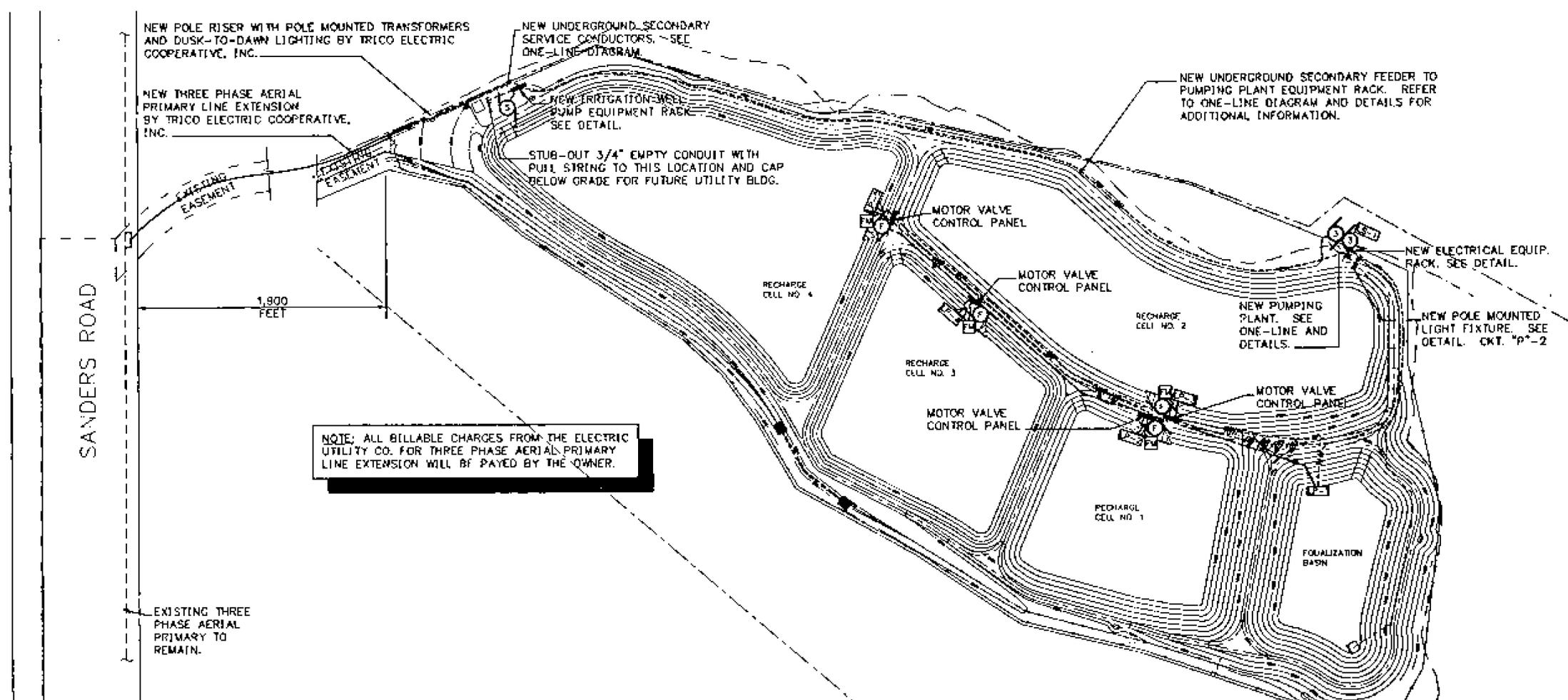
VALVE WIRES TO BE INSTALLED IN MAINLINE TRENCH WHEN POSSIBLE.

BEDDING MATERIAL TO BE CLEAN SAND/SOIL BACKFILL FREE OF ROCKS 1/2" DIA OR LARGER.

TRACER WIRE TO BE INSTALLED IN MAINLINE AND LATERAL TRENCHES ONLY AND ON TOP OF MAINLINE.

PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT				
LANDSCAPE DETAILS				
ENTRANCO				
CORPORATION				
1380 E. RIVER ROAD, SUITE 300 SUNNYVALE, CALIFORNIA 95086				
JOB NO. 98052-50	DESIGNED BY MJJ	DRAWN BY ATS	APPROVED BY DPW	DATE 3/00
DWG NO. L-8			SHEET 32 OF 36	

P:\MARBOR\03-22-99



1 ELECTRICAL SITE PLAN
SCALE: 1" = 40'-0"

GENERAL ELECTRICAL NOTES

1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ELECTRICAL INSTALLATIONS WITH ALL OTHER TRADES TO AVOID CONFLICTS WITH PIPING, STRUCTURE, ETC.
2. ALL NEW WIRING ABOVE GRADE SHALL BE INSTALLED IN RIGID GALVANIZED STEEL CONDUIT WITHOUT EXCEPTION. ALL NEW WIRING BELOW GRADE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT. ALL BENDS AND RISERS IN BELOW GRADE CONDUITS SHALL BE RIGID GALVANIZED STEEL.
3. ALL NEW CONDUCTORS SHALL BE TYPE THWN/THHN 90°C COPPER ABOVE GRADE #6 AWG AND SMALLER. ALL CONDUCTORS ROUTED BELOW GRADE OR LARGER THAN #6AWG SHALL BE TYPE "XHHW" 90°C COPPER.
4. THE USE OF NO. 14 AWG COPPER CONDUCTORS SHALL BE RESTRICTED TO CONTROL AND INSTRUMENT WIRING.
5. ALL ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE N.E.C.
6. ALL CUTTING AND PATCHING REQUIRED FOR THE INSTALLATION OF NEW RACEWAYS OR EQUIPMENT SHALL BE PERFORMED BY A TRADESMAN EXPERIENCED IN THE WORK REQUIRED. ALL FINISHES SHALL MATCH EXISTING ADJACENT SURFACES.
7. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY LOSS OR DAMAGE CAUSED BY HIM OR HIS WORKMAN TO THE FACILITY DURING THE COURSE OF CONSTRUCTION. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING SUCH LOSS OR DAMAGE AT NO ADDITIONAL COST TO THE OWNER.
8. ALL ELECTRICAL EQUIPMENT INSTALLED ON THE ROOF OR OUTSIDE SHALL BE NEMA 4X RATED.
9. THE ELECTRICAL WORK SHALL COMPLY WITH ALL APPLICABLE CITY, COUNTY, STATE AND SERVING ELECTRICAL UTILITY CODES, ORDINANCES, RULES AND REGULATIONS. THE ENTIRE ELECTRICAL INSTALLATION SHALL COMPLY WITH OR SURPASS THE LATEST EDITION OF THE NEC.
10. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL MATERIALS, TOOLS, LABOR, PLAN CHECK FEES, ETC., FOR A COMPLETE ELECTRICAL INSTALLATION OTHERWISE NOTED ON PLANS.
11. ALL MATERIALS FURNISHED BY THE ELECTRICAL CONTRACTOR SHALL BE NEW AND OF FIRST CLASS QUALITY, SHALL BE U.L. LISTED AND FREE OF ANY DEFECTS UNLESS OTHERWISE NOTED ON PLANS.
12. ALL EQUIPMENT SHALL BE RATED FOR USE INTENDED - VOLTAGE, H.P., ETC. ALL DISCONNECT SWITCHES FURNISHED SHALL BE LOAD BREAK RATED.
13. ALL NECESSARY PERMITS REQUIRED FOR ELECTRICAL INSTALLATIONS ARE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR AND SHALL BE CONSIDERED TO BE PART OF HIS CONTRACT FEE.
14. THE ELECTRICAL CONTRACTOR SHALL FULLY GUARANTEE HIS INSTALLATION FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER AGAINST IMPERFECT WORKMANSHIP AND MALFUNCTION OF EQUIPMENT. ANY WORK FOUND TO BE DEFECTIVE WITHIN THIS PERIOD SHALL BE REPAIRED OR REPLACED PROMPTLY AT NO ADDITIONAL COST TO THE OWNER.
15. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND CANNOT SHOW EVERY CONNECTION, JUNCTION BOX, WIRE, CONDUIT, ETC. THE EXACT LOCATION AND ARRANGEMENT OF ALL PARTS SHALL BE DETERMINED AS THE WORK PROGRESSES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEM.
16. REFER TO CIVIL DRAWINGS, DETAILS AND SPECIFICATIONS FOR SEQUENCE OF OPERATION AND LEVEL SWITCH MOUNTING HEIGHTS.

ELECTRICAL SYMBOL LIST

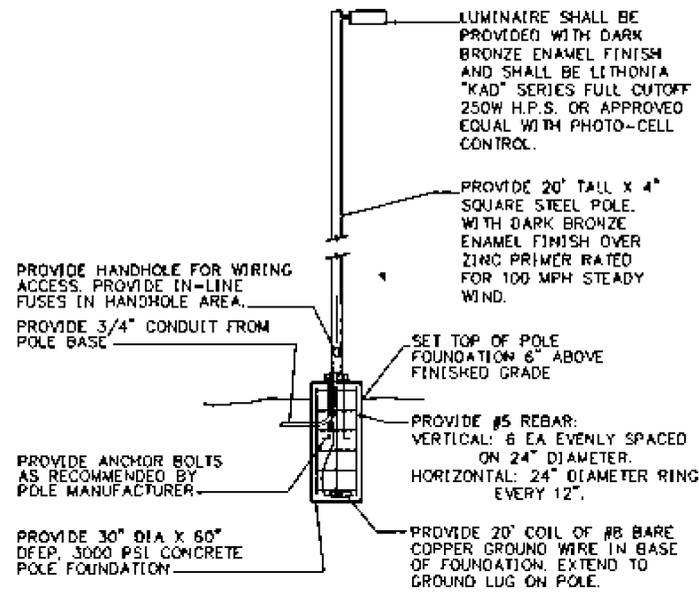
- INDICATES CONDUIT ROUTED BELOW GRADE.
- /— INDICATES GROUND, PHASE AND NEUTRAL CONDUCTOR (LEFT TO RIGHT)
- /—/— INDICATES 2-CONDUCTOR TWISTED SHIELDED PAIR CABLE IN CONDUIT.
- Ⓛ INDICATES KEYED NOTE. REFER TO SPECIFIC INSTRUCTIONS.
- Ⓜ INDICATES ELECTRIC MOTOR, HORSE POWER AS INDICATED.
- Ⓡ INDICATES 20A/125V DUPLEX RECEPTACLE.
- Ⓢ INDICATES BRANCH CIRCUIT HOMERUN TO PANEL "MP2", CIRCUIT NO. 5. 3/4" CONDUIT WITH 3 # 12 AWG UNLESS OTHERWISE INDICATED ON PLAN.
- ES-3 FLOAT SWITCH. SJE RHOMBUS AMPMASTER, FLYGT OR APPROVED EQUAL.
- FM FLOW METER. REFER TO CIVL PLANS FOR SPECIFICATIONS
- LP-1 WARRICK LEVEL PROBES OR APPROVED EQUAL.



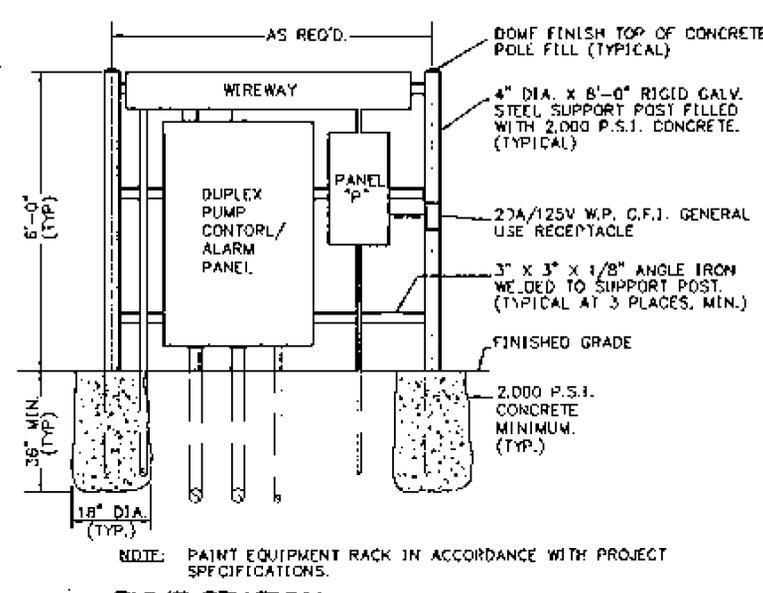
THE TUCSON BUILDERS GROUP
1334 NORTH WILSON, SUITE 440
TUCSON, ARIZONA 85718
PH: 520-797-0948
WWW.STARTEC.COM
TUCSON@STARTEC.COM
Project No. 1806701/85206194



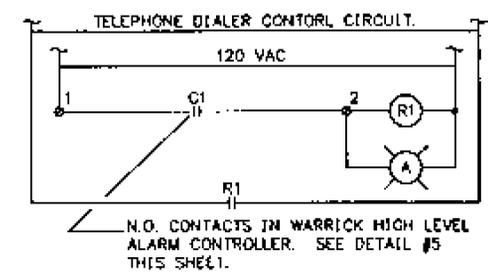
PIMA COUNTY DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT				
ELECTRICAL SITE PLAN				
ENTRANCO TUCSON, ARIZONA 1880 E. RIVER ROAD, SUITE 300 TUCSON, ARIZONA 85718-5636				
JOB NO. 1 98062-00	DESIGNED BY A. BROTHERS	DRAWN BY A. BROTHERS	APPROVED BY T. BALILES	DATE 09/15/00
REV.	DWG NO. E-1		SHEET 34 OF 36	



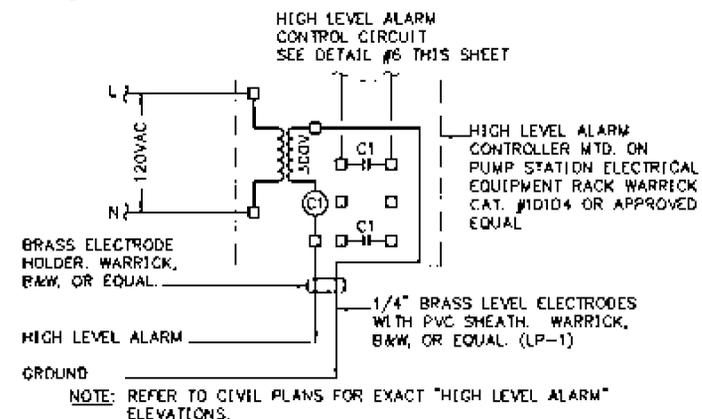
3 POLE INSTALLATION DETAIL
NOT TO SCALE



2 PUMP STATION ELECTRICAL EQUIPMENT RACK DETAIL
NOT TO SCALE



6 HIGH LEVEL ALARM CONTROL DIAGRAM
NOT TO SCALE



5 LP-1 HIGH LEVEL ALARM CONTROLLER
NOT TO SCALE

Panel Schedule 2 PANEL P

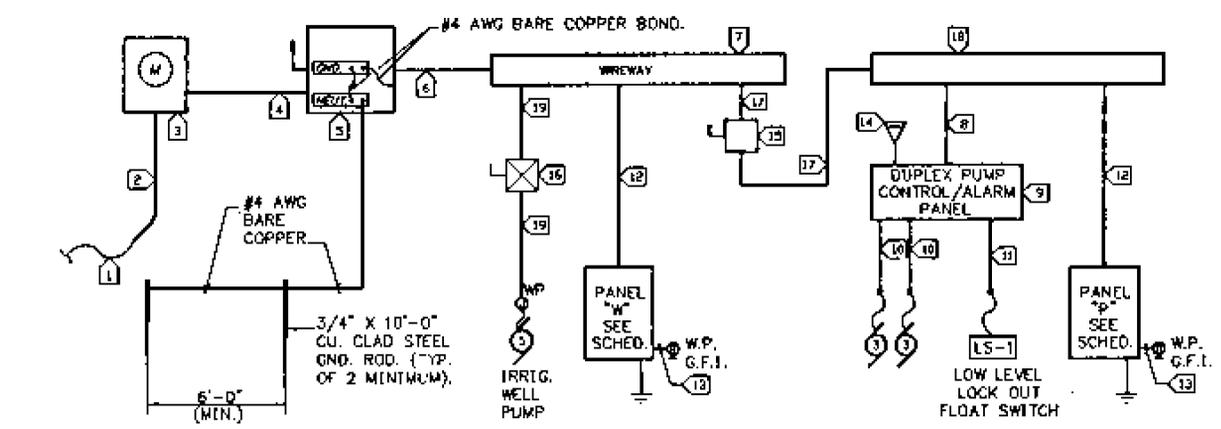
Ckt No.	Description/Location	Load Type	Criteria	Total VA	Remarks	Device P	Device Remarks	Total VA	Load Criteria	Description/Location	Ckt No.
1	RACK RECEPTACLE		3	180		20	A	20		1	1
2	RECHARGE CELL RECEPT		3	360		20	B	20		2	2
3	RECHARGE CELL RECEPT		3	360		20	B	20		3	3
4	RECHARGE CELL RECEPT		3	360		20	B	20		4	4
5	RECHARGE CELL RECEPT		3	360		20	B	20		5	5
6	RECHARGE CELL RECEPT		3	360		20	B	20		6	6
7	RECHARGE CELL RECEPT		3	360		20	B	20		7	7
8	RECHARGE CELL RECEPT		3	360		20	B	20		8	8
9	RECHARGE CELL RECEPT		3	360		20	B	20		9	9
10	SPACE										10
11	SPACE										11
12	SPACE										12
ENDUSE LOADS PHASE A VA		1877	PHASE B VA	460	PHASE C VA	1752					
TOTAL LOADS CONNECTED KVA		8.1	DEMAND KVA	4.3	DESIGN KVA	4.3					
CONNECTED FLA		13.3	DEMAND FLA	11.3	DESIGN FLA	11.3					

PANEL "P" SHALL HAVE AN INTEGRAL 15 KVA DRY TYPE TRANSFORMER, 480V, 3-PHASE PRIMARY TO 208/120V, 3-PHASE, 4-WIRE SECONDARY WITH 40A/3P PRIMARY CIRCUIT BREAKER AND 60A/3P SECONDARY MAIN CIRCUIT BREAKER.

Panel Schedule 3 PANEL W

Ckt No.	Description/Location	Load Type	Criteria	Total VA	Remarks	Device P	Device Remarks	Total VA	Load Criteria	Description/Location	Ckt No.
1	RACK RECEPTACLE		3	180		20	A	20		1	1
2	FUTURE BLDG. RECEPT		3	360		20	B	20		2	2
3	IRRIGATION CONTROL		4	500		20	C	20		3	3
4	SPACE										4
5	SPACE										5
6	SPACE										6
7	SPACE										7
8	SPACE										8
9	SPACE										9
10	SPACE										10
11	SPACE										11
12	SPACE										12
ENDUSE LOADS PHASE A VA		380	PHASE B VA	665	PHASE C VA	500					
TOTAL LOADS CONNECTED KVA		1.5	DEMAND KVA	1.5	DESIGN KVA	1.5					
CONNECTED FLA		4.2	DEMAND FLA	4.2	DESIGN FLA	4.5					

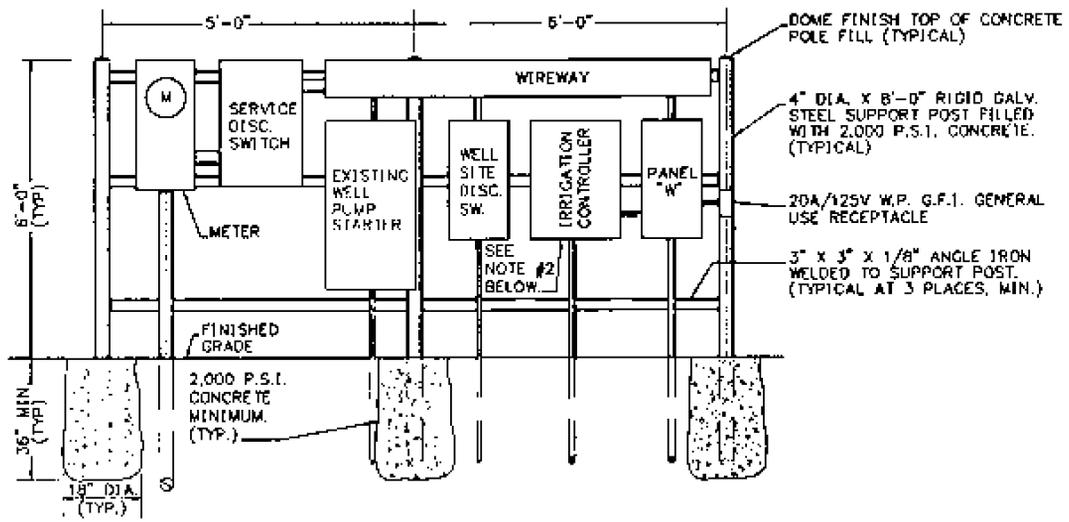
PANEL "W" SHALL HAVE AN INTEGRAL 15 KVA DRY TYPE TRANSFORMER, 480V, 3-PHASE PRIMARY TO 208/120V, 3-PHASE, 4-WIRE SECONDARY WITH 40A/3P PRIMARY CIRCUIT BREAKER AND 60A/3P SECONDARY MAIN CIRCUIT BREAKER.



- 1) NEW SERVICE CONDUCTORS AND RACEWAY BY TRICO ELECTRIC COOPERATIVE, INC. ALL REQUIRED TRENCHING AND BACKFILL SHALL BE BY THE CONTRACTOR PER TRICO ELECTRIC COOPERATIVE, INC. REQUIREMENTS.
- 2) PROVIDE 2" RGS CONDUIT WITH 45" SWEEP AT 18" BELOW GRADE PER TRICO ELECTRIC COOPERATIVE, INC. REQUIREMENTS.
- 3) PROVIDE 100A - 480V, 3 PHASE, 4 WIRE 7-JAW TYPE METER BASE WITH FACTORY INSTALLED TEST BYPASS FACILITIES PER TRICO ELECTRIC COOPERATIVE, INC. REQUIREMENTS.
- 4) 1 1/4" RGS WITH 4 #2 THWN/THHN COPPER.
- 5) 100A/3P/800V S/N SERVICE ENTRANCE RATED NEMA 4X DISC SW. FUSED AT 100A CLASS RK-1.
- 6) 1 1/4" RGS WITH 4 #2 AND 1 #8 GND. THWN/THWN COPPER.
- 7) 6" X 6" X LENGTH AS REQUIRED, NEMA 3R 100A 480V, 3P WIREWAY PROVIDED WITH TERMINAL LANDING LUGS AND STAND-OFF BRACKETS.
- 8) 3/4" RGS WITH 3 #10 AND 1 #10 GND. THWN/THHN COPPER.
- 9) DUPLEX PUMP CONTROL/ALARM PANEL. (SEE SPECIFICATIONS)
- 10) 2" RGS WITH (1) 6 COND. SUBMERSIBLE CABLE PROVIDED WITH PUMP, (POWER AND THERMAL CONDUCTORS), AND (1) 2 COND. SUBMERSIBLE CABLE PROVIDED WITH PUMP, (SEAL FAILURE CONDUCTORS).
- 11) 1" RGS WITH (2) 3 COND. #12 AWG SUBMERSIBLE CABLE.
- 12) 3/4" RGS WITH 3 #8 AND 1 #10 GND. THWN/THHN COPPER.
- 13) 3/4" RGS WITH 2 #12 AND 1 #12 GND. THWN/THHN COPPER.
- 14) CELLULAR TELEPHONE ANTENNA.
- 15) 30A/3P/800V NEMA 4X DISCONNECT SWITCH FUSED AT 30A CLASS RK-1 MOUNTED ON WELL SITE EQUIPMENT RACK.
- 16) EXISTING FUSED SWITCH COMBINATION WELL PUMP CONTROL PANEL. DISCONNECT, REMOUNT ON NEW EQUIPMENT RACK, AND RECONNECT TO EXISTING WELL PUMP MOTOR AS INDICATED.
- 17) 1 1/4" CONDUIT WITH 4 #4 AND 1 #8 GND. THWN/THWN COPPER.
- 18) 6" X 6" X LENGTH AS REQUIRED, NEMA 3R 480V, 3P WIREWAY PROVIDED WITH TERMINAL LANDING LUGS AND STAND-OFF BRACKETS.
- 19) 3/4" RGS WITH 3 #12 AND 1 #12 GND. THWN/THHN COPPER.

NOTE: ALL BILLABLE CHARGES FROM THE ELECTRIC UTILITY CO. FOR THREE PHASE AERIAL PRIMARY LINE EXTENSION WILL BE PAID BY THE OWNER.

1 ONE-LINE DIAGRAM
NOT TO SCALE



- 1) PAINT EQUIPMENT RACK IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
- 2) PROVIDE 24"W X 24"H X 6"D NEMA 4X STAINLESS STEEL ENCLOSURE FOR IRRIGATION CONTROLLER. MOUNT CONTROLLER IN ENCLOSURE AND MAKE ALL REQUIRED CONNECTIONS.

4 IRRIGATION WELL SITE ELECTRICAL EQUIPMENT RACK DETAIL
NOT TO SCALE

Startec
THE TUCSON ILLUMINANCE GROUP
540 NORTH WILSON, SUITE 449
TUCSON, ARIZONA 85718
520.747.0548
www.startec.com
tucson@startec.com
Project No. 1000111/05200104

PIMA COUNTY
DEPARTMENT OF TRANSPORTATION & FLOOD CONTROL DISTRICT
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

ENTRANCO
4811TH AVENUE, WASHINGTON
1869 E. RIVER ROAD, SUITE 300
TUCSON, ARIZONA 85718-3636

ONE-LINE DIAGRAM
PANEL SCHEDULES
AND DETAILS

JOB NO.:	DESIGNED BY:	DRAWN BY:	APPROVED BY:	DATE:
98062-60	A. BROTHERS	A. BROTHERS	T. BALLES	09/15/00

DWG NO. **E-3** SHEET 36 OF 36

APPENDIX C

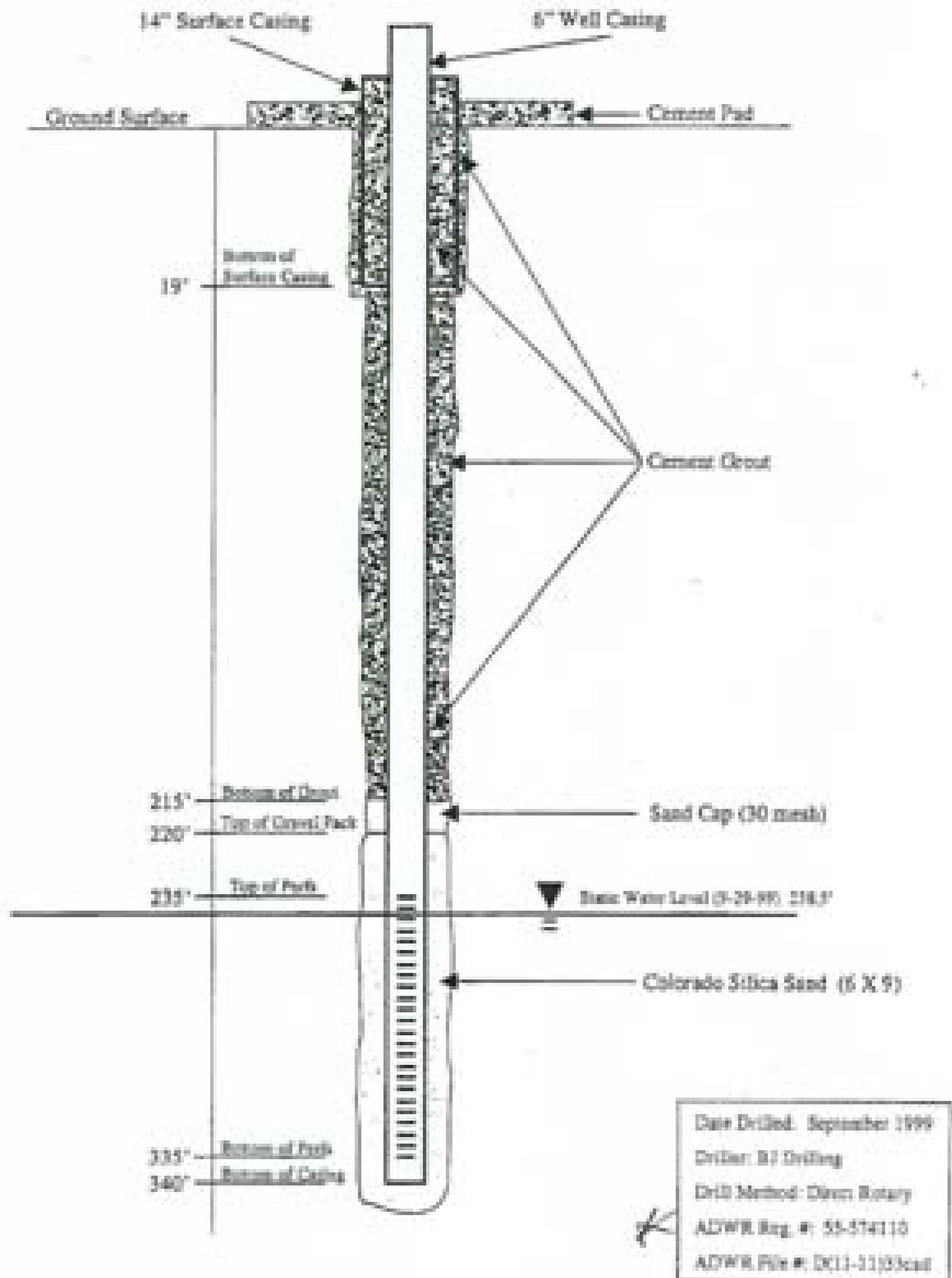
CONSTRUCTION INFORMATION FOR ON-SITE MONITOR WELLS

MONITOR WELL HP-1

FIGURE 3

PCFCD MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

AS-BUILT: WELL HP-1



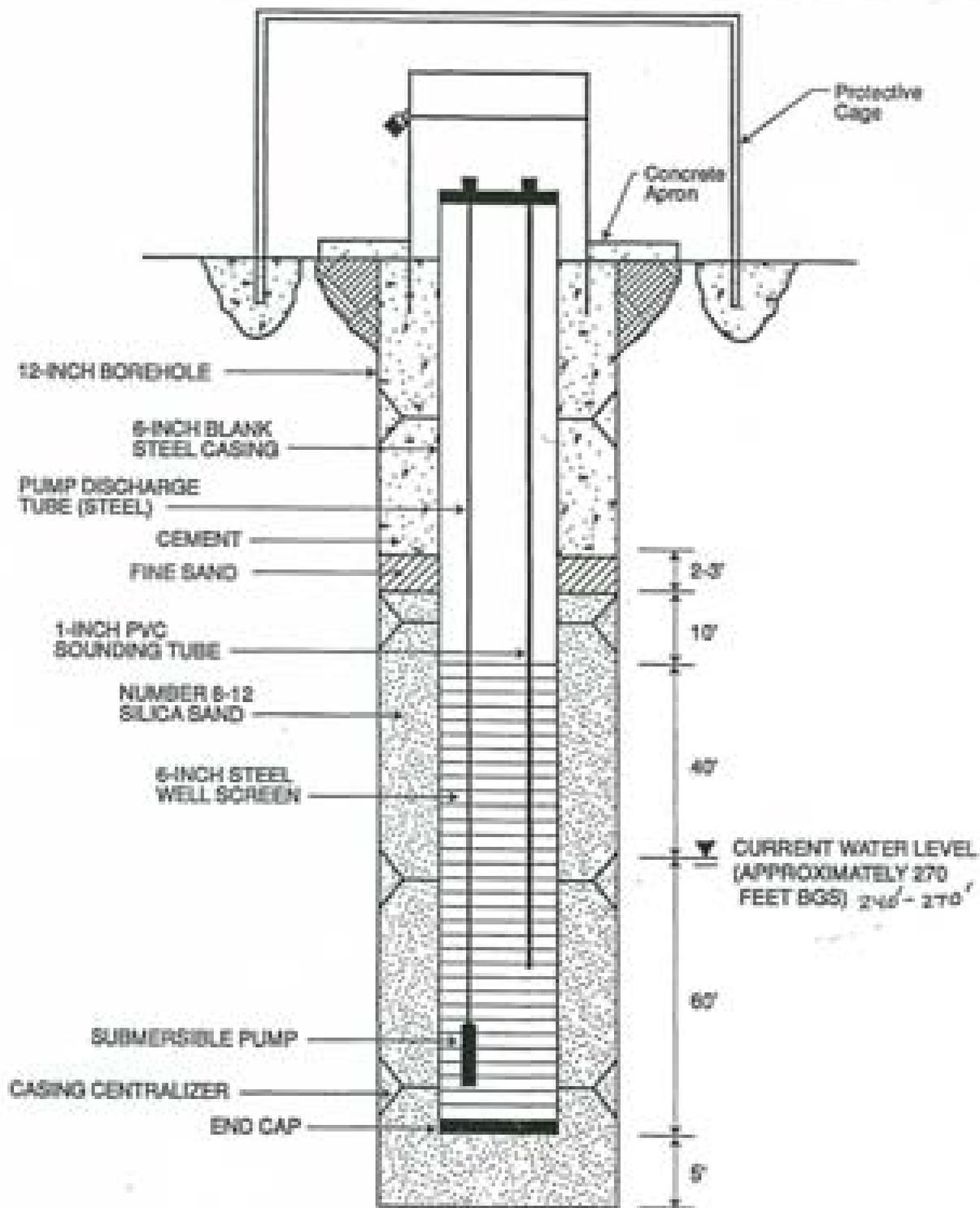


FIGURE 9

FIMA COUNTY DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

**CONSTRUCTION DIAGRAM
MONITOR WELL HP-1**

Drawing is not to scale

GEOLOGIC BOREHOLE LOG

Well ID HP-1 Date Drilled 9-15-99 Location Mirana, AZ (Pima County)
 Driller BJ Drilling Drill Method Direct Rotary Drill Rig (Failing) Speedstar 10K/40K
 Well Owner PCFCD Field Personnel SRP: Mark Freshbury Borehole Diameter 1 1/2"

Interval Sample (feet)	Description: Rock type (secondary component, primary component(s)), color, grain size % (gravel, sand, silt, clay), cementation, gravel fraction (rounding/color/lithology%), acid reaction
	*(1 1/2" Tricone bit used to drill surface casing borehole to 20')
2	SILT; Dark yellowish brown (10YR 4/2); 0% gravel, 20% sand, 80% silt. (Very fine material; borehole is in area of overbank flood deposits from the Santa Cruz River 1/4 mile to northeast. (Upper layer of material clearly visible in side of mud pit dug adjacent to borehole
4	SILT; (Same as 2')
6-8	SILT (10YR 4/2); Same as 2'-4' but with slight increase in fine sand fraction (25%)
8-10	SANDY SILT; (10YR 4/2); 0% gravel, 40% sand, 60% silt. SAND: Moderately well sorted medium grained sand w/approx. 5-10% of fraction fine grained.
10-15	SILTY SAND; (10YR 4/2); 0% gravel, 60% sand, 40% silt. SAND: Mostly fine sand with approx. 10% of fraction medium grained. Trace coarse sand.
15-20	SILTY SAND; (10YR 4/2); trace gravel, 75% sand, 25% silt. SAND: Approx. 80% fine and 20% medium. Trace coarse grained. GRAVEL: Approx. 3/8" diameter. Rounded to subangular.
	*Surface casing completed to 19' depth with 1-foot stick-up. Overdrill was filled with cement prior to setting of 14" surface casing. Casing was aligned with plumb bob and rules and grouted into place. Alignment re-verified after grout hardened. Deemed correct.
	Drilling on 9-16-99
20-30	GRAVELLY SAND; Dark yellowish brown (10YR 4/2); 20% gravel, 80% sand, trace silt. SAND: Fraction is approx. 10% fine, 50% medium and 20% coarse. GRAVEL: subrounded to angular. Average diameter is 1/4" to 3/8". 10% of diameters up to 1/2".
30-40	GRAVELLY SAND (10YR 4/2); 40% gravel, 60% sand, trace silt. SAND: Moderately well graded fine to coarse grained. GRAVEL: Graded from 1/4" to 1/2" diameter. 5% of gravel to 3/8" diameter. Rounded to subangular. Multi-colored; multi-lithologies.
40-50	GRAVELLY SAND; (Same as 30'-40')
50-60	GRAVELLY SAND; (Same as 30'-50')
60-70	GRAVELLY SAND; (10YR 4/2); 25% gravel, 70% sand, 5% silt. SAND: Moderately well graded fine to coarse grained. GRAVEL: Well sorted at approx. 1/4" diameter. (According to driller, sorting is probably due to specific lifting ability of air/water fluid mix in hole). 20% gravel to 5/8" diameter.

GEOLOGIC BOREHOLE LOG

Well ID HP-1 Date Drilled 9-16-99 Location Mazon, AZ

Interval Sample (feet)	Description: Rock type (secondary component, primary component(s)); color; grain size % (gravel, sand, silt, clay); cementation; gravel fraction (rounding/shape/lithology%); acid reaction
70-80	GRAVELLY SAND; (10YR 4/2); 20% gravel, 80% sand, trace silt, trace clay. SAND: Moderately well sorted coarse sand with up to 20% of fraction as medium grained. Trace fine grained. GRAVEL: Well sorted 1/4" to 3/8" diameter. Subrounded to subangular.
80-90	GRAVELLY SAND; (10YR 4/2); 20% gravel, 80% sand, trace silt, trace clay. SAND: 15% fine, 25% medium, balance coarse. GRAVEL: Same as 70'-80'
90-100	GRAVELLY SAND; (10YR 4/2); 20% gravel, 80% sand, trace silt. SAND: Moderately well graded fine to coarse grained. GRAVEL: Average 1/4" to 3/8" diameter. 10% of fraction to 1/2" diameter. Rounded to subangular.
100-110	GRAVELLY SAND; (10YR 4/2); Same as 90'-100' but with slightly better grading (fine to coarse sand) and slightly higher % volume of fine to medium.
110-120	GRAVELLY SAND; (10YR 4/2); Same as 100'-110'
120-130	GRAVELLY SAND; (10YR 4/2); Same as 100'-120' but with smaller average gravel diameter (1/4" average with max up to 1/2")
130-140	GRAVELLY SAND; (10YR 4/2); 20% gravel, 80% sand, trace silt. SAND: well graded fine to coarse grained. GRAVEL: smaller diameter than previous samples (3/16" TO 5/16"). Max size to 1/2".
140-150	Missed Sample
150-160	GRAVELLY SAND; (10YR 4/2); 10% gravel, 70% sand, trace silt. SAND: Moderately well graded fine to coarse sand. GRAVEL: Average diameter 3/8". Max diameter 1/2". Rounded to subangular.
	* Upper borehole (Ground Surface to 160') drilled with air/water fluid mix only.
	* All intervals from 160' to total depth drilled with bentonite-based drill mud
	Drilling on 9-19-99
160-170	SANDY GRAVEL; Dark yellowish brown (10YR 4/2); gravel fraction is multi-colored with multiple lithologies. 60% gravel, 40% sand, trace silt. SAND: moderately well graded fine to coarse. GRAVEL: 90% subangular to very angular. Driller reported substantial bit movement during drilling and that a significant portion of gravel fraction could be sluff from area of believed wash-cut higher up in borehole. Average gravel diameters 3/8" to 1/2".
170-180	SANDY GRAVEL; Same as above but with slight fining of sand component and reduced average gravel diameter (1/4" to 3/8")
180-190	SANDY GRAVEL; Same as above but 65% gravel, 35% sand. SAND: moderately well sorted coarse sand with 20% of fraction fine to medium. GRAVEL: subrounded to angular. Average diameter of 1/4". Wide range of lithologies.

GEOLOGIC BOREHOLE LOG

Well ID HP-1 Date Drilled 9-19-99 Location Marana, AZ

Interval Sample (feet)	Description: Rock type (secondary component, primary component(s)), color, grain size % (gravel, sand, silt, clay); cementation, gravel fracture (rounding/vesicles/lithology%), acid reaction
190-200	SANDY GRAVEL; (10YR 4/2); 70% gravel, 30% sand. SAND: lower % of fines than 160'-190'. Sand fraction is 85% coarse. GRAVEL: rounded to subangular. Average diameter is 3/16". Multi-colored. Wide range of lithologies.
200-210	CLAYEY SANDY GRAVEL; (10YR 4/2); 50% gravel, 30% sand, 10% silt, 10% clay. SAND: moderately well graded fine to coarse sand fraction. Contains enough clay to provide binding of dry sample. GRAVEL: rounded to angular. Sizes range from average 1/4" diameter to 3/8".
210-220	CLAYEY SANDY GRAVEL; (same as 200'-210')
220-230	GRAVELLY CLAY; (10YR 4/2); 25% gravel, 25% sand, 10% silt, 40% clay. SAND: fine to coarse. GRAVEL: rounded to subangular. 1/4" to 3/8" diameter. Significant increase in clay content from 210'-220' interval.
230-240	GRAVELLY CLAY; Same as above but 20% gravel, 20% sand, 20% silt and 40% clay.
240-250	CLAYEY GRAVEL; (10YR 4/2); 40% gravel, 20% sand, 10% silt, 30% clay. SAND: fine to coarse. GRAVEL: subrounded to angular. Wider size range than previous intervals (1/4" to 5/8" diameter). Multi-colored. Multi-lithologies.
250-260	CLAYEY GRAVEL; Same as 240'-250'
260-270	CLAYEY GRAVEL; Same as 240'-250'
270-280	CLAYEY SANDY GRAVEL; (10YR 4/2); 35% gravel, 30% sand, 10% silt, 25% clay. SAND: fine to coarse. Significant increase in coarse fraction from 240' - 270' intervals. GRAVEL: rounded to angular. 75% of gravel is 1/4" to 3/8" diameter. Balance is 1/2" diam.
280-290	SANDY GRAVEL; (10YR 4/2); 40% gravel, 40% sand, 10% silt, 10% clay. SAND: fine to coarse but approximately 75% coarse. GRAVEL: moderately well sorted, approx. 1/4" diameter gravel. 25% of fraction to 1/2" diameter. Rounded to subangular. Multi-colored. Multi-lithologies.
290-300	SANDY GRAVEL; (Same as 280'-290' but with slightly less clay (<10%))
300-310	SANDY GRAVEL; (10YR 4/2); 40% gravel, 40% sand, 15% silt, 5% clay. SAND: Predominantly coarse grained with approximately 30% comprised of fine to medium grained. GRAVEL: subrounded to subangular. 1/4" average diameter.
310-320	GRAVELLY SAND; (10YR 4/2); 25% gravel, 65% sand, 10% silt, trace clay. SAND: Moderately well graded fine to coarse grained. GRAVEL: average 3/16" to 1/4" diameter. Rounded to subangular. Multi colors and lithologies.
320-330	SANDY GRAVEL; (10YR 4/2); 50% gravel, 45% sand, 5% silt, trace clay. SAND: moderately well graded fine to coarse. GRAVEL: subrounded to angular. 75% of fraction is 1/4" diameter.
330-340	SANDY GRAVEL; (same as 320'-330')
340-350	SANDY GRAVEL; (same as 320'-340')
350-360	SANDY CLAY; (10YR 4/2); 5% gravel, 15% sand, 30% silt, 50% clay. SAND: fine to coarse but predominantly silt and clay. GRAVEL: approx 1/4" - 3/8" diameter. Sharp

**ARIZONA DEPARTMENT OF WATER RESOURCES
GROUNDWATER MANAGEMENT SUPPORT SECTION
MAIL TO: P. O. BOX 458, PHOENIX, ARIZONA 85001-0458
PHONE (602) 417-2470**

D E C R E T E
MAR 29 1999
GROUNDWATER MGT

NOTICE OF INTENTION TO DRILL, DEEPEN, REPLACE OR MODIFY A WELL

PLEASE COMPLETE ALL ITEMS IN THE BOX BELOW SUBJECT TO COUNTY OR LOCAL AUTHORITY ENDORSEMENT. IF ANY WATER FROM THE PROPOSED WELL LISTED BELOW WILL BE USED FOR DOMESTIC PURPOSES ON A PARCEL OF LAND 20 OR FEWER ACRES, THE APPLICABLE COUNTY OR LOCAL HEALTH AUTHORITY MUST ENDORSE ALL ITEMS IN THE BOX BEFORE SUBMISSION TO THE DEPARTMENT OF WATER RESOURCES.

A. Arizona State Land Dept 1616 West Adams Phoenix AZ 85007
LAND OWNER'S NAME CURRENT MAILING ADDRESS CITY STATE ZIP

B. TELEPHONE NO. (602) 542-4611 COUNTY ASSESSOR'S PARCEL ID INFORMATION

C. WELL LOCATED IN Pima COUNTY D. 217 E. 18 OFFICIAL SEAL OR STAMP
BOOK MAP PARCEL # OF ACRES

F. SE 1/4 SE 1/4 SW 1/4 OF SECTION 11 TOWNSHIP 11S RANGE 11E RW
SEAC SWAC SWAC COUNTY OR LOCAL AUTHORITY ENDORSEMENT

Pima County DEQ
130 W. Congress
Tucson, AZ 85701

G. RECORDING APPROVAL INSUFFICIENT INFORMATION TO MAKE DETERMINATION _____ VARIANCE REQUIRED _____ EXPLANATION ATTACHED _____
H. DATE 1/25/99 AUTHORIZED SIGNATURE [Signature] TITLE SR Civil Engineering

GENERAL INSTRUCTIONS BELOW - PLEASE READ SPECIFIC INSTRUCTION ON BACK

- Section 45-596(D) provides that the director shall determine that all information required on this form has been submitted. If not, the person filing will be notified, and the drilling or modification of the well may not proceed.
- Section 45-596(D) provides that the department has 15 days after the receipt of a complete and correct notice of intention, to record the notice and mail duplicate to owner. Drill and will be mailed directly to drilling firm as stated in item #14.
- Please mail two original notices with original signatures, a site plan in duplicate, and a check or money order (no cash) in the amount of \$14.00 to P.O. Box 458, Phoenix, Arizona, 85001-0458 or hand-deliver to 500 North Third Street, Phoenix, Arizona. Please use black or blue ink, and print legibly.
- If the well is a replacement, deepening or modification of an existing well, provide the registration number of the existing well in item 2.
- Construction standards for wells, including abandonment, shall be in accordance with department rules.

1. OWNER OF WELL:
Pima County Flood Control Dist.
NAME
201 North Stone Avenue
CURRENT MAILING ADDRESS
Tucson, Arizona 85701
CITY STATE ZIP
TELEPHONE NUMBER (520) 740-6350

4. LESSEE OF LAND OF WELLSITE:
Pima County Flood Control Dist.
NAME
201 North Stone Avenue
CURRENT MAILING ADDRESS
Tucson, Arizona 85701
CITY STATE ZIP
TELEPHONE (520) 740-6350

10. PLACE OF USE (LEGAL DESCRIPTION OF LAND):
SE 1/4 NE 1/4 SW 1/4 SECTION 11
18AC 49AC 18AC
TOWNSHIP 11S RANGE 11E RW

2. ACTION REQUESTED:
DRILL NEW WELL DEEPEN _____
MODIFY _____ REPLACE _____
WELL REGISTRATION NO. IS NA
FOR A REPLACEMENT WELL PROVIDE:
MAX. CAPACITY OF THE ORIGINAL WELL _____
NA GALLONS PER MINUTE
DISTANCE FROM THE ORIGINAL WELL:
NA FEET

7. PRINCIPLE USE OF WATER (BE SPECIFIC):
Water Quality Monitoring
8. OTHER USES OF WATER (BE SPECIFIC):
Vegetation Establishment
9. IF USE INCLUDES IRRIGATION, STATE TO NEAREST TENTH, THE NUMBER OF ACRES TO BE IRRIGATED: 1

11. TYPE OF WELL (CHECK ONE):
EXEMPT NON-EXEMPT _____
12. CHECK ONE:
RESIDENTIAL _____ COMMERCIAL

13. IS THE PROPOSED WELLSITE WITHIN 100 FEET OF A SEPTIC TANK SYSTEM, SEWER DISPOSAL AREA, LANDFILL, HAZARDOUS MATERIALS OR PETROLEUM STORAGE AREAS AND TANKS?
YES _____ NO

3. CONSTRUCTION WILL START ABOUT:
MONTH _____ YEAR _____
4. TYPE OF CASING FOR PROPOSED WELL:
SURFACE CASING: steel
DIAMETER: 14 " DEPTH: 20 "
DOWNHOLE CASING: steel
DIAMETER: 6 " DEPTH: 150 "
5. DESIGN PUMP CAPACITY:
15 GALLONS PER MINUTE

FOR DEPARTMENT USE ONLY
REGISTRATION NO. IS 127110
DATE FILED 3-25-99
FILE NO. DCI-1133 LRD
AMAZON Tucson
WR 09 SS 15
PROCESSED BY _____
DATE MAILED _____

14. DRILLING FIRM:
B. J. Drilling Company, Inc.
NAME
P. O. Box 815
MAILING ADDRESS
Bronck, AZ 85602
CITY STATE ZIP
(520) 586-3282
TELEPHONE NO.
25
DWR LICENSE NUMBER
E-4
ROC LICENSE CATEGORY

I STATE THAT THIS NOTICE IS FILED IN COMPLIANCE WITH A.R.S. 84-700 & 45-596 AND IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND THAT I UNDERSTAND THE LIMITATIONS AND CONDITIONS SET FORTH ON THE REVERSE SIDE OF THIS FORM.

15. TYPE OR PRINT NAME AND TITLE Dorothy C. Dolan Deputy Director 16. SIGNATURE (LAND OWNER/LESSEE OF WELLSITE) [Signature] 17. DATE 1-26-99



Arizona Department of Water Resources
 Records Management Section
 500 N. 3rd Street • Phoenix, Arizona 85004
 (602) 417-2405 • (800) 452-2262
 www.wtrr.arizona.gov

Pump Installation Completion Report

RECORDS MGT
 OCT - 7 2002

- Review instructions prior to completing form.
- The registered well owner should file this report with the Department within 30 days following installation of pump equipment.

FILE NUMBER
 WELL REGISTRATION NUMBER
 55-574110

** PLEASE PRINT CLEARLY **

SECTION 1. REGISTRY INFORMATION

Well Owner FULL NAME OF COMPANY, ORGANIZATION OR INDIVIDUAL Pima County Flood Control District		Location of Well WELL LOCATION ADDRESS (IF ANY)					
MAILING ADDRESS 201 N. Stone Ave., 4th Floor TUCSON, ARIZ. 85701		TOWNSHIP AND RANGE (E/W)	SECTION	1/4 ACRE SW 1/4	1/4 ACRE NE 1/4	1/4 ACRE SE 1/4	
CONTACT PERSON NAME AND TITLE Suzanne Shields, Deputy Director		COUNTY ASSESSOR'S PARCEL ID NUMBER (MOST RECENT)			BOOK MAP PARCEL		
TELEPHONE NUMBER FAX (520) 740-6350 (520) 740-6749		COUNTY WHERE WELL IS LOCATED Pima					

SECTION 2. EQUIPMENT INSTALLED

Pump Type CHECK ONE		Power Type CHECK ONE	
<input type="checkbox"/> Air Lift	<input type="checkbox"/> Rotary	<input type="checkbox"/> Diesel Engine	<input type="checkbox"/> Windmill
<input type="checkbox"/> Bucket	<input checked="" type="checkbox"/> Submersible	<input checked="" type="checkbox"/> Electric Motor	<input type="checkbox"/> Other (please specify):
<input type="checkbox"/> Centrifugal	<input type="checkbox"/> Turbine	<input type="checkbox"/> Gasoline Engine	
<input type="checkbox"/> Jet	<input type="checkbox"/> Other (please specify):	<input type="checkbox"/> Hand	
<input type="checkbox"/> Piston		<input type="checkbox"/> Natural Gas	
RATED PUMP CAPACITY 35 Gallons Per Minute		HORSE POWER RATING OF MOTOR 5-horsepower	

SECTION 3. WELL TEST

Pump Test Data		Method of Discharge Measurement CHECK ONE		Method of Measuring Water Level CHECK ONE	
DATE WELL TESTED 9-29-99		<input checked="" type="checkbox"/> Bailer		<input type="checkbox"/> Air Line	
STATIC WATER LEVEL (ft) 238.45 Feet Below Land Surface		<input type="checkbox"/> Bucket - Barmet - Stopwatch		<input checked="" type="checkbox"/> Electric Measuring Line (Sounding)	
PUMPED WATER LEVEL (ft) 238.64 Feet Below Land Surface		<input type="checkbox"/> Current		<input type="checkbox"/> Steel Tape	
DRAWDOWN (ft) - (S)		<input type="checkbox"/> Estimated - Air Lift		<input type="checkbox"/> Other (please specify):	
TEST PUMPING RATE 34.5 Gallons Per Minute		<input type="checkbox"/> Gauge			
DURATION OF PUMP TEST (Minimum 4 hours) 1.80 Hours		<input type="checkbox"/> Meter			
TOTAL PUMPING LIFT Feet		<input type="checkbox"/> Orifice			
		<input type="checkbox"/> Volume			
		<input type="checkbox"/> Weir - Flume			
		<input type="checkbox"/> Other (please specify):			
FOR FLOWING WELL, MEASURED SHUT IN HEAD		<input type="checkbox"/> FT			
		<input type="checkbox"/> PSI			

I HEREBY CERTIFY that the above statements are true to the best of my knowledge and belief according to A.R.S. § 45-600(B).

SIGNATURE OF WELL OWNER: *Suzanne Shields* Suzanne Shields 9/01/04/02

MONITOR WELL HP-2

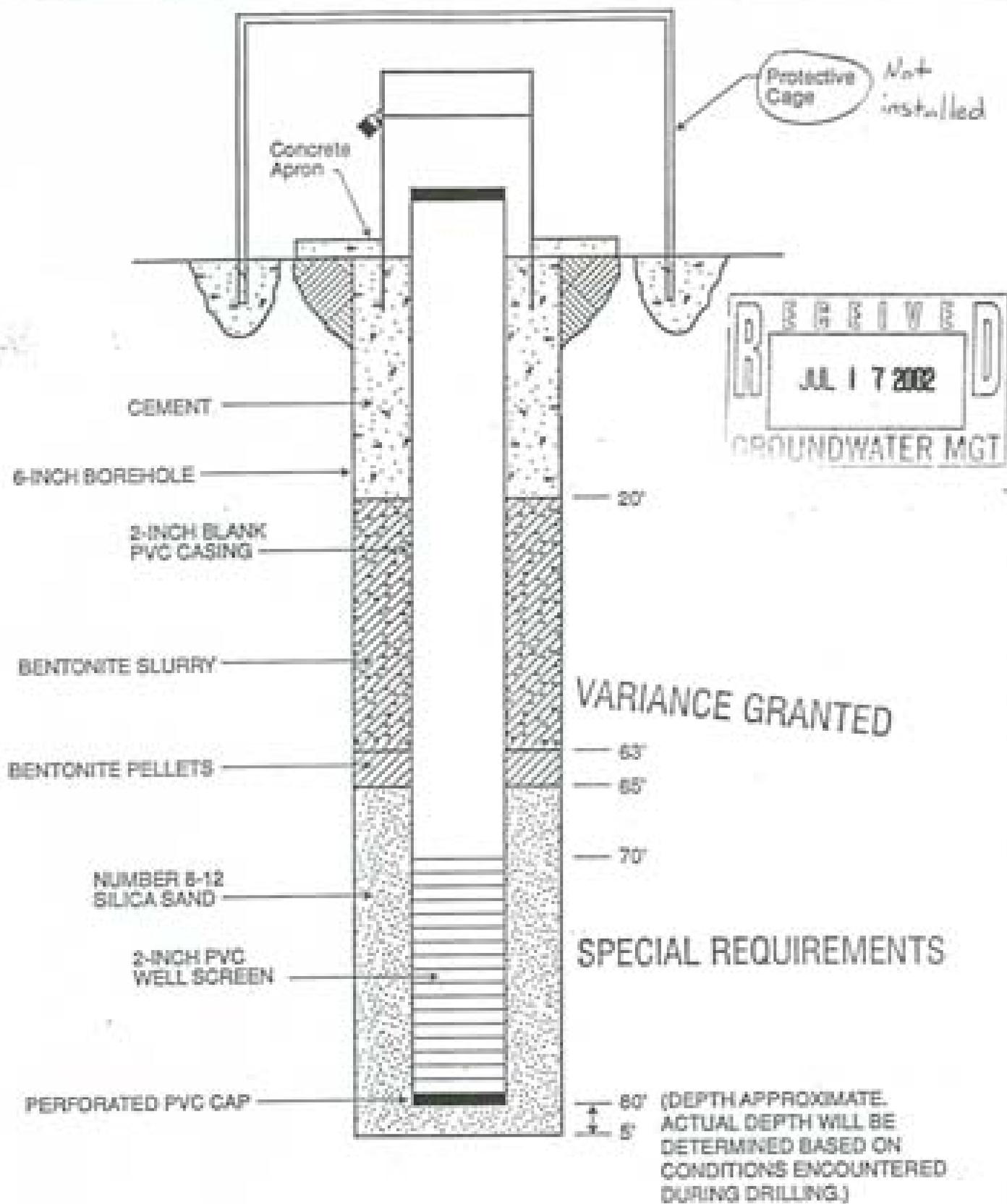


FIGURE 13
 FIMA COUNTY DEPARTMENT OF TRANSPORTATION
 AND FLOOD CONTROL DISTRICT

**CONSTRUCTION DIAGRAM
 PIEZOMETER HP-2**

GEOLOGIC BOREHOLE LOG

Well ID HP-2 Date Drilled 9/24/2002 Location Marana, AZ (Pima County)

Driller Geomechanics Southwest, Inc. Drill Method Auger Drill Rig _____

Well Owner PCFCD Field Personnel David Scalero Borehole Diameter 6.0"

Interval Sample (feet)	Description: Rock type (secondary component, primary component(s)); color; grain size % (gravel, sand, silt, clay); cementation; gravel fraction (rounding/color/size/lithology%); acid reaction.
0-5	SILT; Dark brown; 0% gravel, 0% sand, 100% silt; borehole is in area of overbank deposits from the Santa Cruz River.
5-10	SILT; Medium brown in color; 0% gravel, 20% sand, 80% silt.
10-20	SILTY SAND; Light brown; 5% gravel, 70% sand, 25% silt. Mostly fine grained sand with some coarse grains. Gravel: approx. 3/8" in diameter. Rounded to subangular.
20-25	GRAVELLY SAND; Light brown; 20% gravel, 80% sand, trace silt. Gravel rounded to subangular.
30-35	GRAVELLY SAND; Light brown; 25% gravel, 75% sand, trace silt. Gravel: graded from 1/4 to 1/2" in diameter. 5% of gravel is 3/4" in diameter. Rounded to subangular.
35-55	COBBLE: 1 to 2" in diameter. Approximately 5% of cobble is greater than 2", but less than 4", in diameter. Multi-colored; multi-lithologies.
55-72	GRAVELLY SAND; Light brown; 40% gravel, 60% sand. Gravel: 1/4 to 1/2" in diameter. Rounded to subangular. Sand: ranging from fine to coarse grained.
72-77	SANDY CLAY; Orangish-brown in color; 25% sand, 75% clay, trace gravel. Gravel is approx. 1/4" in diameter. Sand is mostly fine grained.
77-80.8	SILTY, GRAVELLY, SAND; 10% gravel, 80% sand, 10% silt. Sand: fine to coarse grained. Gravel: 1/4 to 1/2" diameter.
	Borehole was drilled down to 80' 10" below ground surface. Sand was used to fill hole to depth of 80' prior to placing PVC pipe/screen. Well casing extends above ground for approximately 16 inches above ground surface.

\$10 FEE



Arizona Department of Water Resources
 Groundwater Management Section
 P.O. Box 2189 Phoenix, Arizona 85001-0218
 (602) 417-2570 • (800) 352-8488
 www.water.arizona.gov

Notice of Intent to
 Drill, Deepen, or Modify a
 Monitor / Piezometer / Environmental Well

- Review instructions prior to completing form.
- You must include with this form:
 - \$10 check or money order for processing fee
 - Well construction diagram, labeling all specifications listed in Section 2.
- Authority for fee: A.R.S. §40-113(B), A.A.C. R13-15-1501(F)(4)
- PLEASE PRINT CLEARLY

GROUNDWATER MGT.

APPROVAL	DATE
166.00m	7-17-02
WELL NO.	WELL DATE
15	09
WELL TYPE	WELL DEPTH
8-2-02	

FILE NUMBER
0-01-11233 CAD
WELL REGISTRATION NUMBER
55-593607

SECTION 1. REGISTRY INFORMATION

Well Type CHECK ONE	Proposed Action CHECK ONE	Location of Well WELL LOCATION ADDRESS (if any)
<input type="checkbox"/> Monitor	<input checked="" type="checkbox"/> Drill New Well	
<input type="checkbox"/> Piezometer	<input type="checkbox"/> Deepen	
<input type="checkbox"/> Vadose Zone	<input type="checkbox"/> Modify	
<input type="checkbox"/> Air Sparging	<i>If Deepening or Modifying:</i>	
<input type="checkbox"/> Soil Vapor Extraction	WELL RESTRICTION NUMBER	
<input type="checkbox"/> Other (please specify)	55 -	
		CONTR. PER. (NAME & TITLE) SECTION 1E1 ACRES 1E2 ACRES 1E3 ACRES 115 112 33 SW ¼ NE ¼ SE ¼
		COUNTY ADDRESS/PORTAL NUMBER
		BOOK MAP PARCEL
		COUNTY WHERE WELL IS LOCATED
		PIMA

SECTION 2. OWNER INFORMATION

Well Owner FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL	Landowner FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL
PIMA COUNTY FLOOD CONTROL DISTRICT	ARIZONA STATE LAND DEPARTMENT
WELL ADDRESS	WELL ADDRESS
201 N. STONE AVE., 4TH FLOOR	1616 WEST ADAMS
CITY/STATE/ZIP CODE	CITY/STATE/ZIP CODE
TUCSON, AZ 85701	PHOENIX, AZ 85007
CONTACT PERSON NAME AND TITLE	CONTACT PERSON NAME AND TITLE
SUZANNE SHIELDS, DEPUTY DIRECTOR	GLORIA NICHOLS
TELEPHONE NUMBER	TELEPHONE NUMBER
(520) 740-6350	(602) 542-4611
FAX	FAX
(520) 740-6749	

VARIANCE GRANTED

SPECIAL REQUIREMENTS

SECTION 3. DRILLING AUTHORIZATION

Drilling Firm NAME	Consultant (if applicable) CONSULTING FIRM
GEOMECHANICS SOUTHWEST, INC.	N/A
DRILL LICENSE NUMBER	CONTACT PERSON NAME
498	
REG. LICENSE CATEGORY	TELEPHONE NUMBER
A-4	(520) 889-8561
TELEPHONE NUMBER	FAX
(520) 889-7787	
WELL ADDRESS	

SECTION 4.

Questions	Yes	No	Explanation:
1. Are all annular spaces between the casing(s) and the borehole for the placement of grout at least 2 inches?		X	2 inch annular spaces are special standards required for wells located in and near groundwater contamination sites (such as CERCLA, RCRA, DOD, LUST).
2. Is the screened or perforated interval of casing greater than 100 feet in length?		X	100-foot maximum screen intervals are a special standard for wells located in and near groundwater contamination sites (such as CERCLA, RCRA, DOD, LUST).
3. Are you requesting a variance to use thermoplastic casing in lieu of steel casing in the surface well?		X	The well must be constructed in a vault as defined in A.A.C. R13-15-01(D).
4. Is there another well name or identification number associated with this well?	X		IF YES, PLEASE STATE
5. Have construction plans been coordinated with the Arizona Department of Environmental Quality?	X		IF YES, PLEASE STATE AGENCY CONTACT & PHONE NUMBER
6. For monitor wells, is dedicated pump equipment to be installed?		X	IF YES, PLEASE STATE SECTION PUMP CAPACITY
7. Will the well registration number be stamped on the vault cover or on the upper part of the casing?	X		IF NO, WHERE WILL THE REGISTRATION NUMBER BE PLACED?

SECTION 5. WELL CONSTRUCTION DETAILS

Drill Method CHECK ONE <input type="checkbox"/> Air Rotary <input type="checkbox"/> Bored or Augered <input type="checkbox"/> Cable Tool <input type="checkbox"/> Dual Rotary <input type="checkbox"/> Mud Rotary <input type="checkbox"/> Reverse Circulation <input type="checkbox"/> Driven <input type="checkbox"/> Jetted <input type="checkbox"/> Air Percussion / Cdx Tubing <input type="checkbox"/> Other (please specify)	Method of Well Development CHECK ONE <input type="checkbox"/> Airlift <input type="checkbox"/> Ball <input type="checkbox"/> Surge Block <input type="checkbox"/> Surge Pump <input type="checkbox"/> Other (please specify)	Grout Emplacement Method CHECK ONE <input type="checkbox"/> Gravity <input type="checkbox"/> Pressure Grout <input checked="" type="checkbox"/> Tremie <input type="checkbox"/> Other (please specify)
	Method of Sealing at Reduction Points CHECK ONE <input checked="" type="checkbox"/> None <input type="checkbox"/> Welded <input type="checkbox"/> Swedged <input type="checkbox"/> Packed <input type="checkbox"/> Other (please specify)	Surface or Conductor Casing CHECK ONE <input type="checkbox"/> Flush Mount in a vault <input checked="" type="checkbox"/> Extend 1' above grade

RECEIVED
JUL 17 2002

SECTION 6. PROPOSED WELL CONSTRUCTION PLAN (attach additional page if needed) DATE CONSTRUCTION TO BEGIN
 Attach a well construction diagram labeling all specifications below. JULY 2002

Borehole			Casing												
DEPTH FROM SURFACE		BOREHOLE DIAMETER (INCH)	DEPTH FROM SURFACE		OUTER DIAMETER (INCH)	MATERIAL TYPE (X)			PRESERVATION TYPE (X)				SLOT SIZE IF ANY (INCH)		
FROM (FEET)	TO (FEET)		FROM (FEET)	TO (FEET)		STEEL	PC	ALU	BLANK OR	WIRE W	SHUTTER	BELLS		SLOTS	DESCRIBE
0	80	6.0	0	70	2.0										
			70	80	2.0								X		0.020

VARIANCE GRANTED

DEPTH FROM SURFACE		Annular Material SPECIAL REQUIREMENTS									
FROM (FEET)	TO (FEET)	ANNULAR MATERIAL TYPE (X)			IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	SAND	GRAVEL	SIZE			
		NONE	CONCRETE	HEAVY GROUT OR COARSE GROUT					BENTONITE		
0	20		X								
20	63			X							
63	65										
65	85							X #10 x 20			

IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS: _____ EXPECTED DEPTH TO WATER: 200 Feet Below Ground Surface

I state that this notice is filed in compliance with A.R.S. § 45-506 and is complete and correct to the best of my knowledge and belief.
 TYPE OR PRINT NAME AND TITLE: SUZANNE SHIELDS, DEPUTY DIRECTOR
 SIGNATURE OF WELL OWNER OR OPERATOR: *Suzanne Shields*
 DATE: _____

APPENDIX D

2006 ANNUAL REPORT

**ANNUAL MONITORING REPORT
2006**

MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT

**Underground Storage Facility Permit No. 71-563876 (PCFCD)
Water Storage Permit No. 73-563876.0100 (CMID)
Recovery Well Permit No. 74-568133 (CMID)**



**Pima County, Arizona
Board of Supervisors**

**Ann Day, District 1
Barney Valdes, District 2
Marion Deason, District 3, Chair
Raymond J. Carroll, District 4
Richard Ellis, District 5**

**County Administrator
Chuck Hochstetler**

Prepared by

**David Scalero, Principal Hydrologist
Pima County Regional Flood Control District
Water Resources Division
97 E. Congress St., 2nd Floor
Tucson, Arizona 85701**

for

**Arizona Department of Water Resources
500 N. Third Street
Phoenix, Arizona 85004**

March 19, 2007

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- C AZMET Method for Determining Evapotranspiration
- D Laboratory Data Sheets and Chain of Custody Forms

1.0 INTRODUCTION

The Marana High Plains Effluent Recharge Project (MHPERP) is a demonstration recharge project developed by the Pima County Flood Control District (PCFCD) in cooperation with the Bureau of Reclamation (BOR), Arizona Water Protection Fund (AWPF), Cortaro-Marana Irrigation District (CMID), and the Town of Marana. The project is located in Section 33 of Township 11 South, Range 11 East in the Avra Valley sub-basin of the Tucson Active Management Area (Figure 1). It is one component of a regional water resource, flood control, environmental protection and enhancement, and recreation program (the Northwest TAMA Replenishment Program) that is sponsored by more than a dozen local, state, and federal entities.

MHPERP is designed to investigate the feasibility of recharging treated effluent into the local groundwater aquifer, while simultaneously investigating wildlife habitat opportunities associated with recharge facilities. The overall objectives for the project, as identified in the final Environmental Assessment (BOR, 1998), include the following:

- To recharge approximately 600 acre-feet of water per year for two years while determining what infiltration rates can be maintained in basins having side slopes vegetated with emergent plants and riparian trees, and in basins fully vegetated with native grasses tolerant of periodic inundation;
- To provide trails, descriptive literature, and interpretive signs describing the pilot project operation. Trails at the effluent pilot project site may eventually be linked to a longer river trail network that is scheduled to be built along the Santa Cruz River;
- To revegetate the area outside the recharge basins with plants that will improve wildlife habitat value and, once established, could survive if the recharge activities cease;
- To characterize wildlife, aquatic macroinvertebrates, and vegetative resources associated with an important effluent-dominated stream; and
- To identify and monitor any biological effects that may result from establishing other habitat types that are now rare to the area (e.g., marsh, grassland), and increase the aerial extent of riparian vegetation.

The MHPERP facility is comprised of one settling basin (equalization basin) and four spreading basins (recharge cells), totaling 3.88 acres of recharge area (Figure 2). A comprehensive description of the MHPERP and the related monitoring plan was provided to the Arizona Department of Water Resources (ADWR) in support of the Constructed Underground Storage Facility (USF) Permit Application for the project filed in October 1999. In addition to the USF Permit (No. 71-563876), the facility also has an Aquifer Protection Permit (No. P-103195) from the Arizona Department of Environmental Quality (ADEQ) authorizing the discharge of treated effluent into the aquifer.

Operations began in February 2003 and, in accordance with Sections 2 and 3 of the USF Permit, this is the fourth annual report for the MHPERP. This report includes all of the data that was collected during the 2006 Calendar Year.

2.0 PROJECT OPERATIONS

2.1 Water Delivery

Water is delivered to the MHPERP via the "oxbow" channel, a remnant channel of the Santa Cruz River from when the riverbed was less incised and the channel meandered back and forth across the floodplain. A berm consisting of streambed materials is used to divert some of the effluent flowing down the main channel of the Santa Cruz River into the oxbow channel. Sources of the effluent discharges are the Roger Road Wastewater Treatment Plant and the Ina Road Wastewater Treatment Plant, which are located approximately 15 miles and 10 miles upstream of the diversion structure respectively. The effluent flows down the oxbow channel for about one mile before reaching the MHPERP.

A constructed wet well collects the oxbow channel flows and two non-clogging, submersible pumps convey the effluent through an 8-inch line into an equalization basin. The equalization basin is used to provide a more constant source of available effluent for recharge, and to help serve as a settling basin for removing particulate materials that could clog the recharge cells. A level sensor is installed in this basin to automatically turn the pumps on and off based on levels within the oxbow channel and the equalization basin. From the equalization basin, the effluent passes through a 16-inch isolation valve into the main distribution line, which feeds into each of the four recharge cells through motorized butterfly valves. A level sensor is installed at each cell to automatically open and close the valves based on pre-set water levels. The valves are closed manually, using an electronic switch, by the daily operator when the cells are scheduled for a drying cycle.

Deliveries to MHPERP are based on the daily cycle of discharges from the treatment plants to the Santa Cruz River. Peaks in water levels at this site normally occur in the late morning and early evening hours. Deliveries to the facility are impacted by storm water events in the Santa Cruz River that demolish the earthen diversion structure used to divert flows into the oxbow channel. There were a number of interruptions to the recharge facility delivery system during the 2005 Calendar Year. Details of these interruptions are provided in Section 6.0 (Facility Inspections and Maintenance) of this report.

2.2 Inflow Volumes

Water deliveries into the MHPERP facility are measured using an American Sigma 950 Flow Meter equipped with a depth/velocity sensor installed within the main line that runs from the pumps to the equalization basin. Deliveries into each of the recharge cells are measured using an American Sigma 950 Flow Meter equipped with a depth/velocity sensor installed within the outlet pipe feeding into the cell. The meters measure flows on a continuing basis, record the data every minute, and compile the data into daily totals. The daily totals are read on-site by the facility operator, who compiles the data onto a daily log sheet. The daily log sheets are transmitted to PCFCD staff on a weekly basis.

Appendix A contains the daily inflow volumes recharged at the project for Calendar Year 2006. The total water volume delivered to the MHPERP for the year is 160.14 acre-feet. Water volumes stored by month are as follows: January - 10.80 AF, February -17.98 AF, March -22.03 AF, April - 14.91 AF, May - 23.54 AF, June 14.86 AF, July - 2.54 AF, August - 0.00 AF, September - 0.00 AF, October - 0.00 AF, November 0.00 AF, and December - 53.48 AF. Water recharged during this Calendar Year was stored for and recovered by CMID, who has both a Water Storage Permit (No. 73-563876.0100) and a Recovery Well Permit (No. 74-568133) for this facility.

Column 2 of the Monthly Accounting Report (**Appendix A**) indicates the daily delivered volume to the equalization basin, which is used for temporary storage of the water before it is directed into the recharge cells.¹ Columns 3-6 show daily volumes delivered to each of the recharge cells. Column 7 shows the total daily volume delivered to the project, which is simply the sum of the inflows into each of the recharge cells. The difference between Column 2 and Column 7 indicates an approximate amount of effluent lost through infiltration and evaporation within the equalization basin.

2.3 Evaporation/Evapotranspiration

Column 8 of the Monthly Accounting Report displays the calculated evaporation volumes for Recharge Cells 1-3. These calculations are based on the Cooley Method (1970) using the "Maximum Curve", as approved by ADWR (**Appendix B**).

Column 9 shows the daily evapotranspiration volumes for Recharge Cell 4. These volumes are calculated using the daily reference evapotranspiration values determined by the Arizona Meteorological Network (AZMET) at their Marana weather station (**Figure 3**). AZMET determines reference evapotranspiration (ET_o) using a modification to the Penman Equation developed for the California Irrigation Management Information System (CIMIS). An explanation of the procedures used in this computation is provided in **Appendix C**. No multiplication factor was used in the calculation of reference evapotranspiration (ET_o) for the MHPERP because there are no available crop coefficients for the native vegetation in this region.²

2.4 Recharge Volumes

Column 10 in the Monthly Accounting Report displays the adjusted net recharge volume for the facility, which is the sum of the daily volumes delivered to the recharge cells less the evaporation/evapotranspiration losses. Net recharge for the facility during the 2006 Calendar Year

¹ The totals for this quarter have been corrected due to errors in the flow calculations by the flow meter, Flowq. See Section 4.0, Facility Inspections, for details.

² The reference evapotranspiration values are determined for tall (8-15 inches), cool season grasses. Much of the vegetation within Recharge Cell 4 consists mostly of grasses that are approximately 8-15 inches in height. Since no information is available for the species established at MHPERP, it is assumed that the evapotranspiration losses at this facility are the same as those calculated at the AZMET station.

is 149.49 AF. Monthly and cumulative recharge for each recharge cell and for the total project are displayed in Figures 5 through 9.

3.0 HYDROLOGIC MONITORING

Hydrologic monitoring of the facility includes measurement of on-site and off-site groundwater levels and direct observation of basin water levels. The on-site monitoring network consists of one monitor well and one piezometer, both measured bi-weekly using a depth sounder (Figure 4). Off-site monitoring consists of monthly water level measurements for three monitor wells: SC-09, SC-10 and AVMW-1 (Figure 4).

3.1 Basin Water Levels

Water levels within the equalization basin are expected to fluctuate from one to four feet above the bottom elevation of 1,984 feet above mean sea level. Water depths in each of the recharge cells are expected to fluctuate from three to nine inches during the wet cycles. Water levels sensors within the basins are programmed to automatically maintain these ranges. Basin water levels are observed visually on a daily basis to insure that the sensors are working properly.

3.2 Regional Groundwater Levels

Groundwater levels are measured for four monitoring wells, one on-site (HP-1) and three off-site (SC-09, SC-10 and AVMW-1). HP-1 is measured monthly by PCFCD personnel using an electric sounder. Wells SC-09 and SC-10 are also monitored on a monthly basis by PCFCD staff using an electric sounder. Well AVMW-1 is measured monthly by the Central Arizona Water Conservation District (CAWCD) using both an automatic datalogger and a manually operated electric sounder. PCFCD has an agreement with CAWCD to obtain the data collected from the AVMW-1 well.

Table 1 contains the water level data collected for the on-site and off-site monitor wells. All of the monitor wells have alert levels of 20 feet below land surface. Alert levels for the monitoring wells were not exceeded during the 2006 Calendar Year.

3.3 Perched Groundwater Occurrence

Table 2 contains the monitoring data for the one piezometer (HP-2) used to assess perched water conditions. This well was dry during the entire 2006 Calendar Year. The alert levels for this well are set at 20 feet below land surface.

4.0 INFILTRATION RATE ASSESSMENT

Table 3 displays the average daily and monthly infiltration rates for each of the recharge cells during the 2006 Calendar Year. Infiltration rates were estimated using the "volumetric" method, which is simply the total daily inflow divided by the wetted acreage. The total wetted acreage used to calculate the infiltration rate is determined using the level sensor on the area/velocity flow meter. Data downloaded from the flow meter is used to determine average daily water levels in the recharge

cells. Rating curves calculated using topography of the site are then used to determine wetted area of each recharge cell. Daily visual estimates are also provided by the facility operator as a check.

The average monthly infiltration rates for the annual reporting period ranged from 0.08 feet/day to 2.65 feet/day. A graph of the average monthly rates is displayed in **Figure 10**. Infiltration rates were quite low (< 0.5 feet/day) in Recharge Cells 1 through 3 during the first seven months of Calendar Year 2006. This suggests that the soils were becoming heavily clogged with fine-grained sediment and organic material due to the continual addition of a water source that is high in dissolved solids and nutrient content. Cell 4, which has a vegetative bottom, experienced the lowest rates during this time period, suggesting that the build-up of vegetative debris, coupled with no maintenance over the last 3 years, has a profound effect on infiltration. Infiltration rates within all the cells increased substantially in December, after a four-month drying period and mechanical removal and break-up of the fine sediment layers within the cell bottoms.

5.0 WATER QUALITY MONITORING

5.1 Water Quality Sampling Activities

The Aquifer Protection Permit requires water quality samples to be collected and analyzed on a monthly basis for nutrients (Nitrogen constituents), and on a quarterly basis for total metals and Volatile Organic Compounds (VOCs). Samples are collected from the source water inflow and from monitor well HP-1. Nitrogen forms are monitored more frequently because of the high nitrogen content in effluent water, and the potential for recharge to increase the nitrogen content in the local aquifer through leaching of nearby agricultural soils. Water quality sampling at the MHPERP also serves as a tool for studying nitrogen transformations in riparian and aquatic ecosystems, to determine if nitrogen levels can be reduced through the wetland recharge process.

5.2 Chemical Analyses Results

Table 4 summarizes the results from sampling taken during the 2006 Calendar Year. Samples were taken at the oxbow channel, when flowing, and at monitoring well HP-1. Sampling for nitrogen constituents was performed on a monthly basis, while sampling for Total Metals and VOCs was performed quarterly. There were no analytes reported above the alert levels set by the Aquifer Protection Permit for this facility. The laboratory reports and chain of custody forms are provided for reference in **Appendix D**.

6.0 FACILITY INSPECTIONS

Inspections of the facility equipment and functions are required by the Aquifer Protection Permit on a weekly basis. The facility operator at MHPERP performs inspections on a daily basis while collecting data for PCFCD, transmitting any problems or required maintenance through daily logs that are delivered on a weekly basis to PCFCD. PCFCD staff is contacted immediately for any alarms or serious problems concerning the facility equipment. PCFCD staff perform weekly investigations of the facility to insure quality of the data collected and note any general maintenance needs.

Table 5 lists the problems that occurred throughout the 2006 Calendar Year and the solutions performed to resolve them. Major hindrances to recharge at the facility were the occurrence of periodic storm water flows within the Santa Cruz River during a particularly wet summer season and the lack of regular maintenance performed on the recharge cells.

7.0 CONCLUSIONS

The volume of water stored at the MHPERP for Calendar Year 2006 is 160.14 AF. This total is 11.21 AF higher than last year's total, but is still almost 440 AF lower than the yearly permitted total for the recharge facility. Monitoring of operations has shown no exceedences of water quality standards nor water alert levels at the project site. Off-site monitoring showed no negative impacts to surrounding operation from a water level perspective.

Infiltration rates were very low for about the first half of the 2006 Calendar Year. This is most likely due to the build-up of salt residues, fine sediment, and organic layers created from a water source that is high in dissolved solids and nutrient content. Infiltration rates observed in Cell 4 were particularly low during this period due to the build-up of vegetative debris and lack of maintenance over the last few years. Infiltration rates in all of the cells increased significantly after a four-month drying period (due to washout of the diversion berm), coupled with the mechanical removal and breakdown of the clogging layers and removal of vegetative debris.

Annual recharge volumes at the facility continue to be significantly lower than what was expected at the beginning of the project. Periodic washouts of the diversion berm are a significant source for these lower volumes, however recharge could most likely be increased with a regular maintenance program for the facility. Efforts are being made to scrape and remove the clogging layers at least two times a year.

PCRFCDD staff is also investigating other means to increase the recharge capacity of the facility. Exploratory trenching indicates a very permeable layer beneath Cell 2 beginning at 4.5-5.0 feet below the pond bottom. Future permitting may include deepening of the recharge cells.

Matted vegetative debris and no regular maintenance greatly decreased the infiltration rates observed in Cell 4, suggesting that a fully vegetated basin bottom has a negative effect on overall recharge capacity. However, the vegetated side slopes within Cell 3 did not appear to have any significant affect on infiltration rates when compared with Cells 1 and 2, which were devoid of vegetation. Based on this information, it appears that vegetation can be used to enhance the surrounding environment while maintaining recharge capacity, but it should be kept out of the recharge cell bottoms or confined to small islands and along the cells' side slopes.

The current Underground Storage Facility Permit for MHPERP will expire on September 26, 2007. PCRFCDD staff are investigating activities to increase the facility's recharge capacity and efficiency of operation in an effort to obtain a new permit for this project before the termination date.

FIGURES

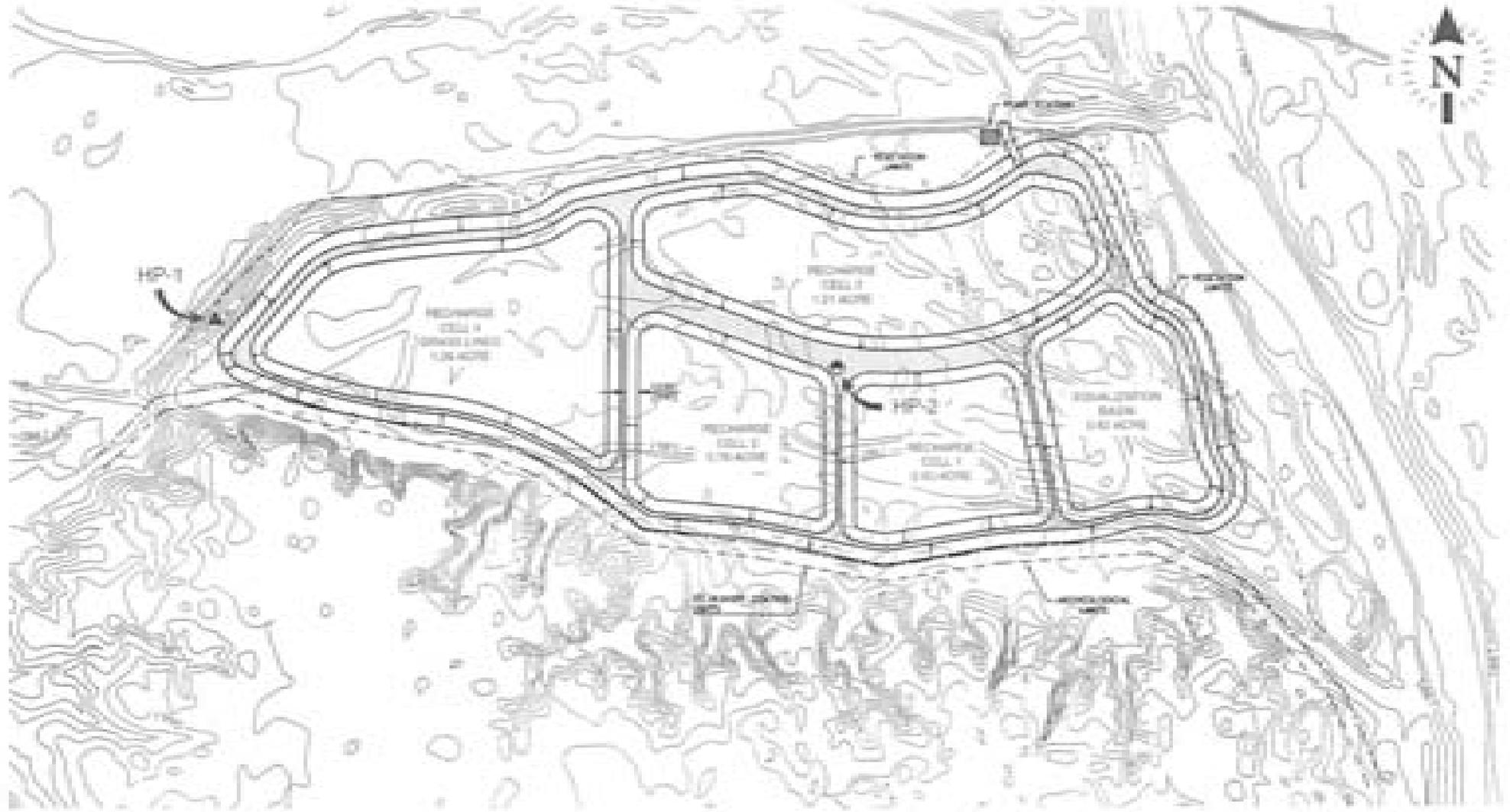
FIGURE 1
Location Map



SCALE IN FEET:



FIGURE 2
Facility Map



SCALE IN FEET:



TOTAL RECHARGE AREA = 3.88 ACRES
ESTIMATED RECHARGE VOLUME = 290 ACRE-FT/YR

LEGEND

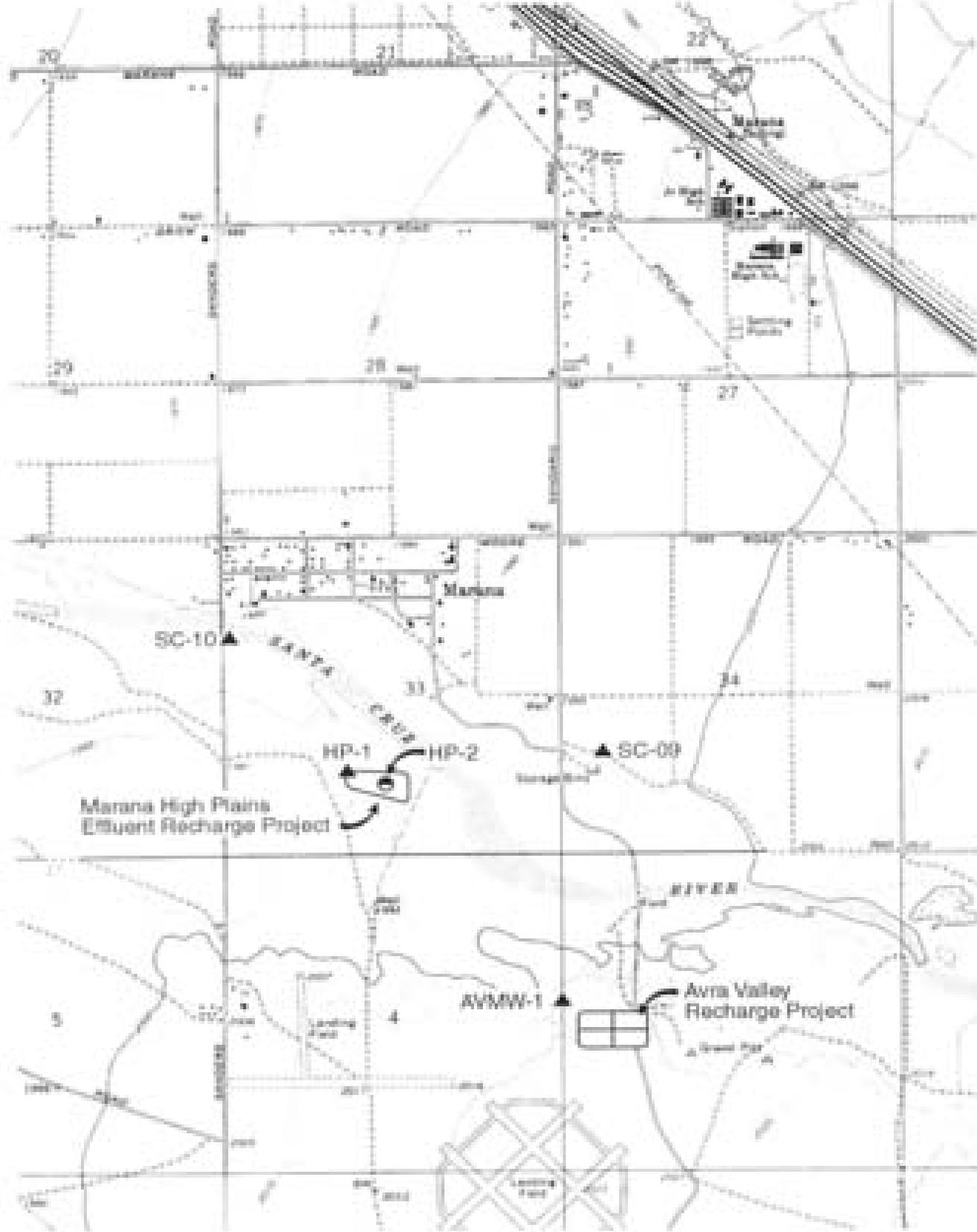
- ▲ MONITOR WELL
- PIEZOMETER



Date on line: Sep 1 1987 (Julian Day 244)
 Location: 1.6 km (1 mile) west of I-10 on Trico-Marana Rd.
 Elevation: 601 meters (1972 ft)
 Coordinates: Latitude = 32° 27' 40" N; Longitude = 111° 14' 00" W
 Cooperator: Marana Agricultural Center College of Agri., Univ. of Arizona

FIGURE 3
 Marana High Plains
 Effluent Recharge Project :
 AZMET Weather Station
 Location Map





LEGEND

- ▲ MONITOR WELL
- PIEZOMETER



FIGURE 4
Marana High Plains
Effluent Recharge Project :
Offsite Monitor Well Location Map

FIGURE 5
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
Cell 1 - 2006 Monthly and Cumulative Recharge

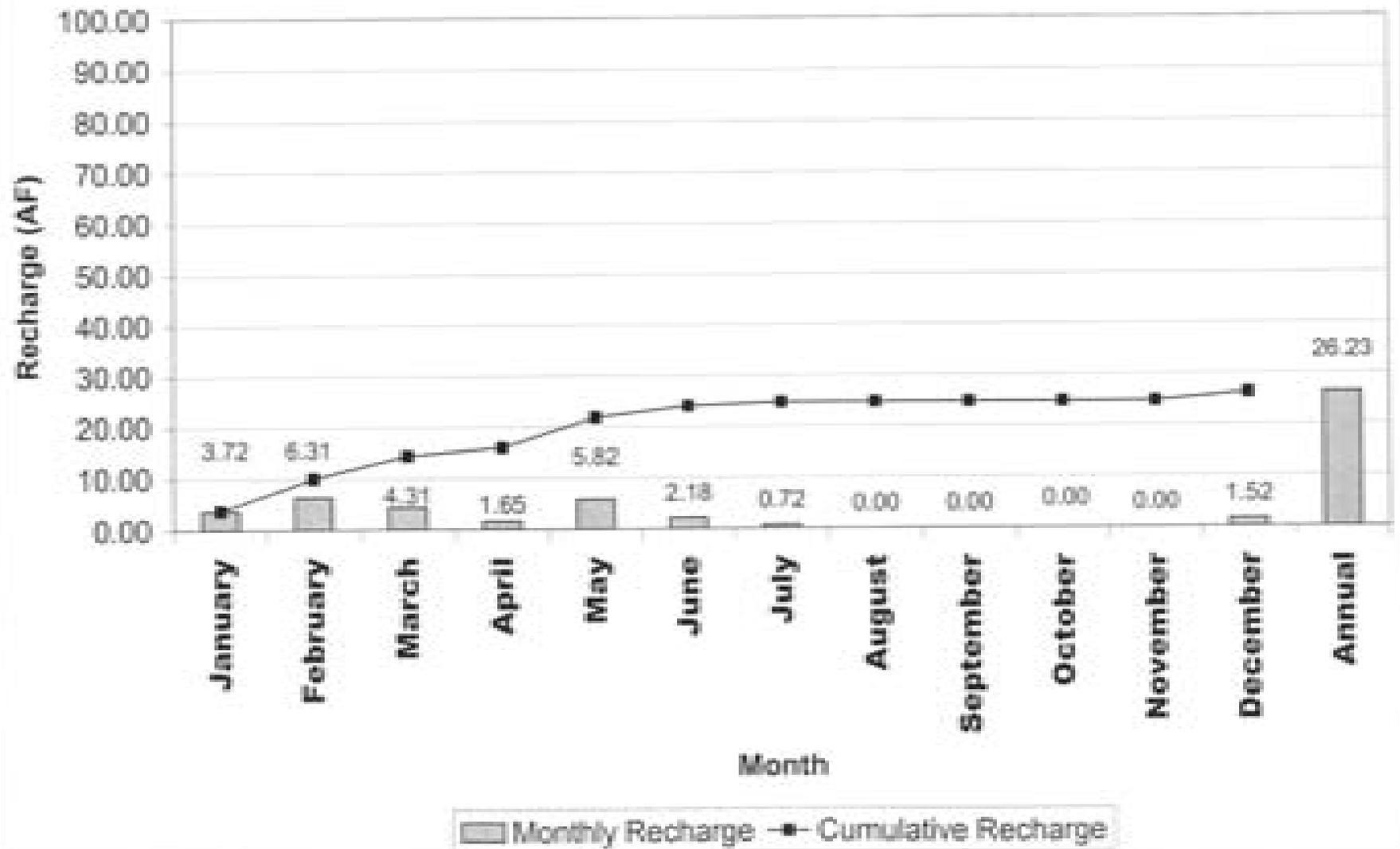


FIGURE 6
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
Cell 2 - 2006 Monthly and Cumulative Recharge

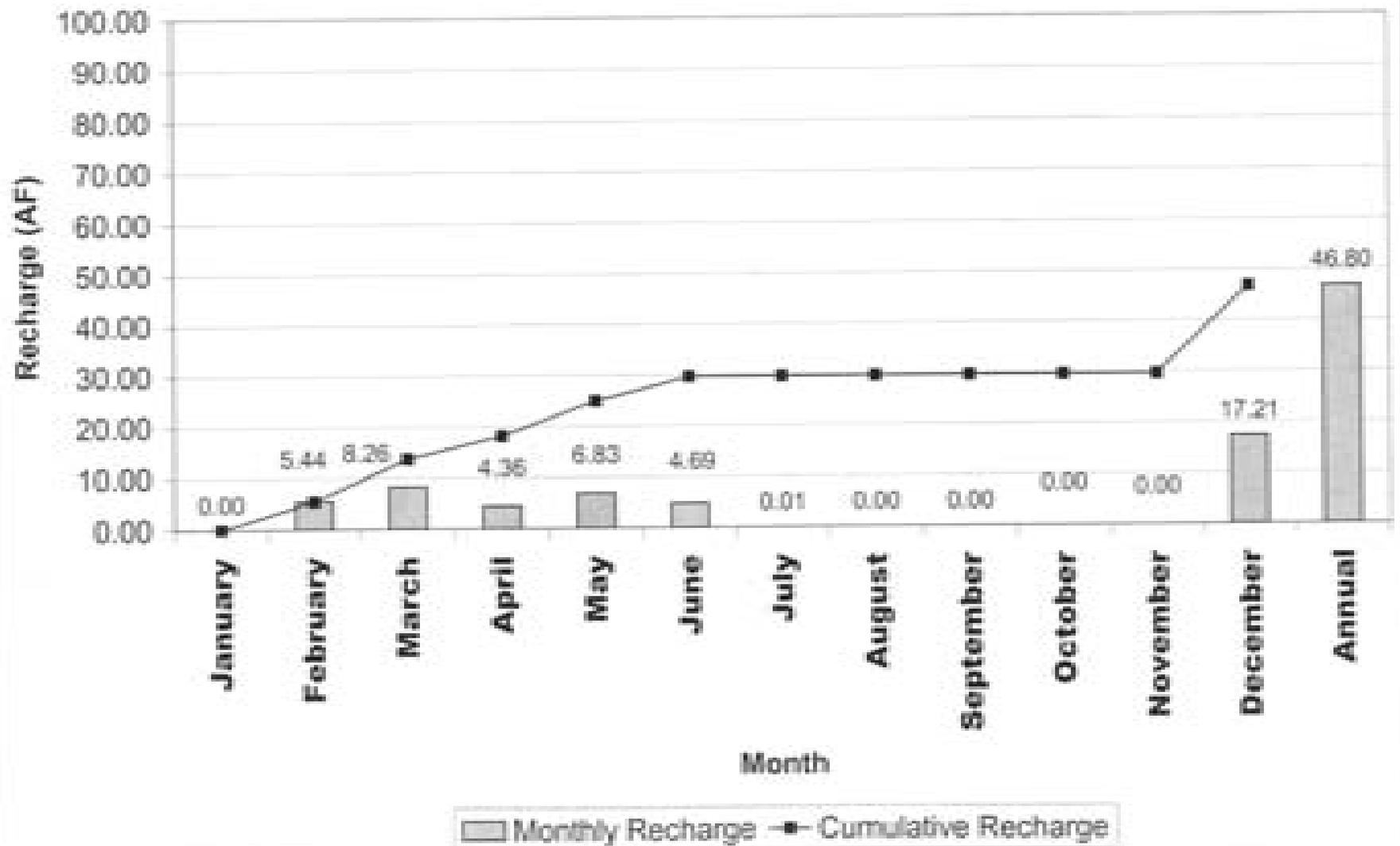


FIGURE 7
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
Cell 3 - 2006 Monthly and Cumulative Recharge

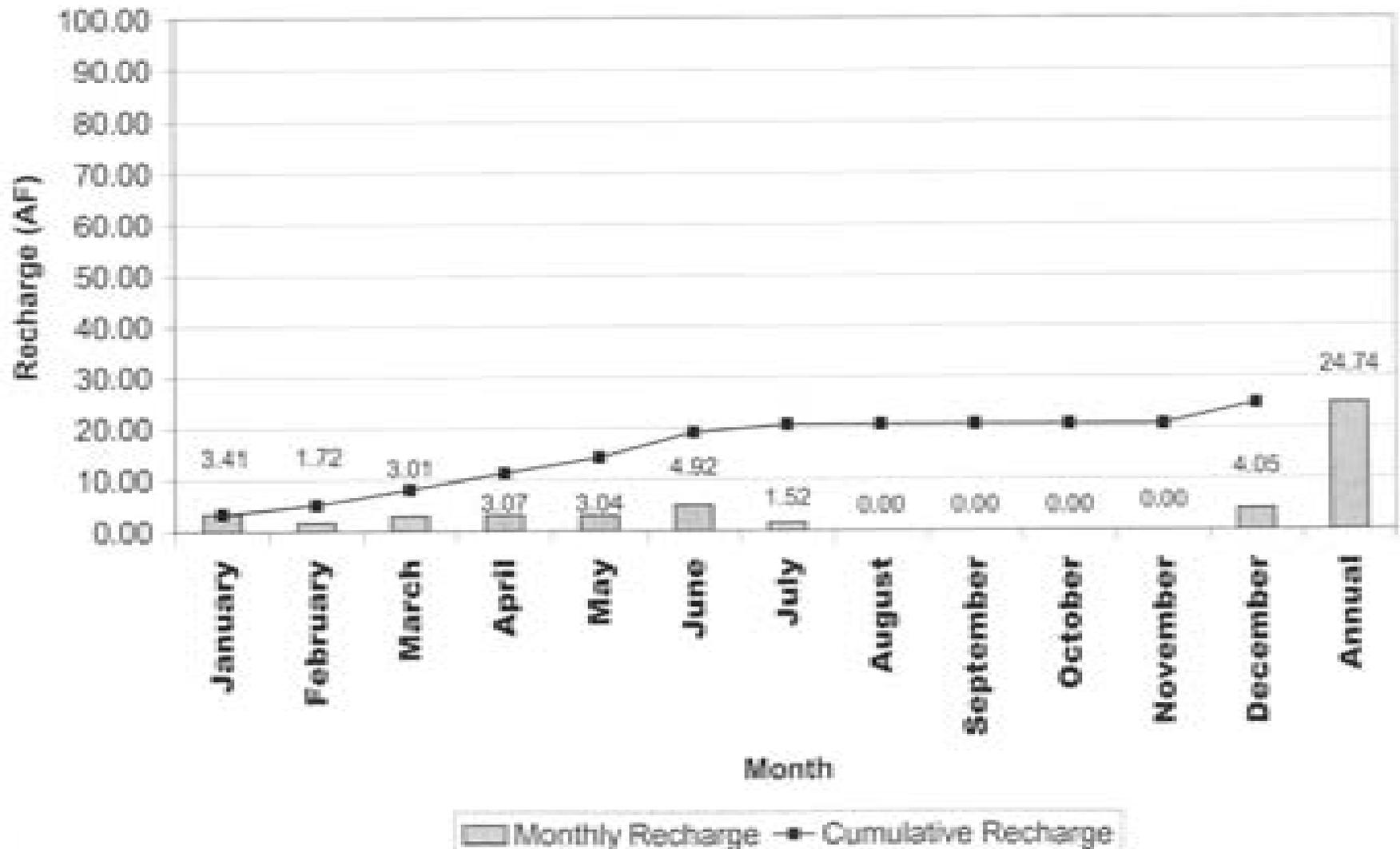


FIGURE 8
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
Cell 4 - 2006 Monthly and Cumulative Recharge

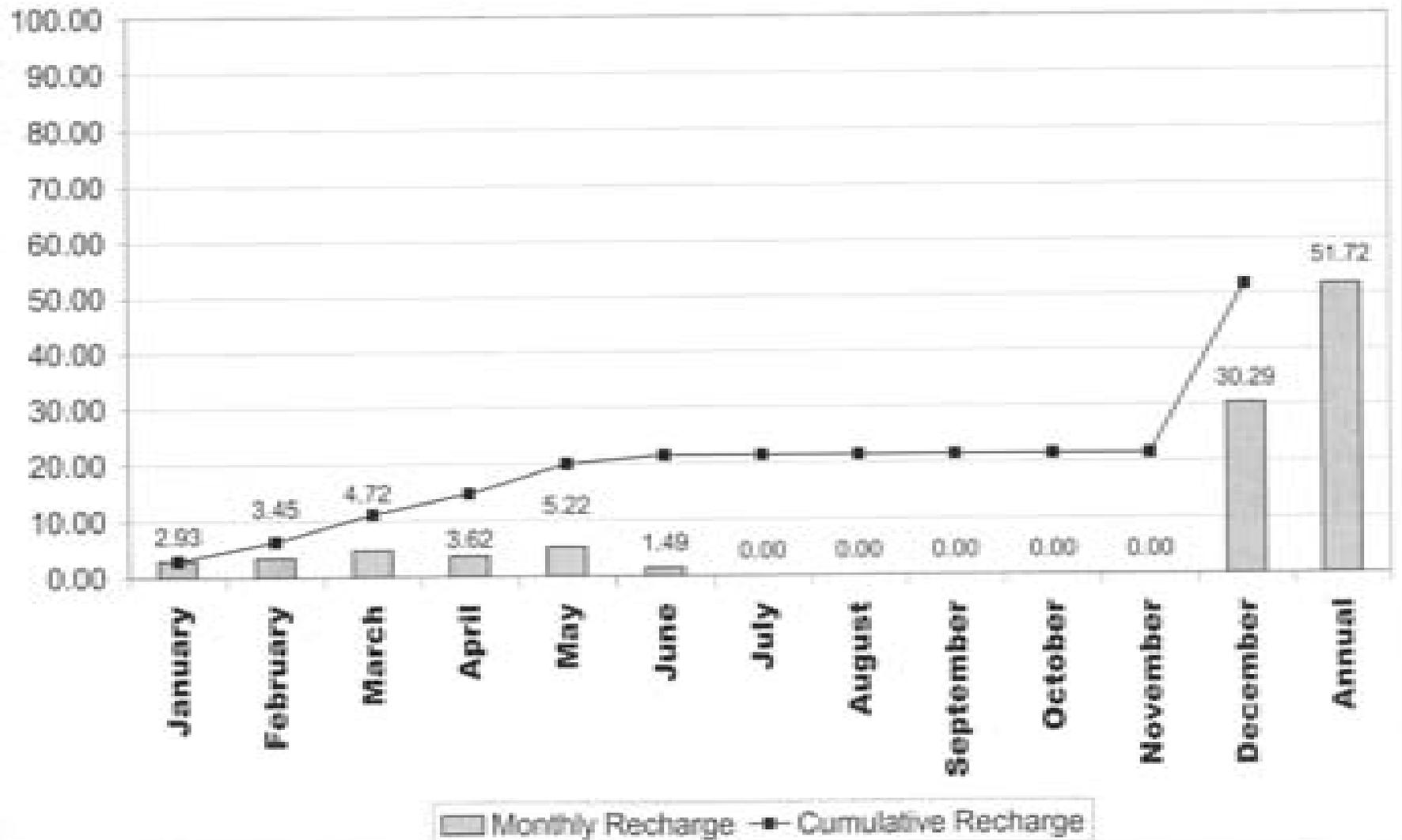


FIGURE 9
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
Total Project - 2006 Monthly and Cumulative Recharge

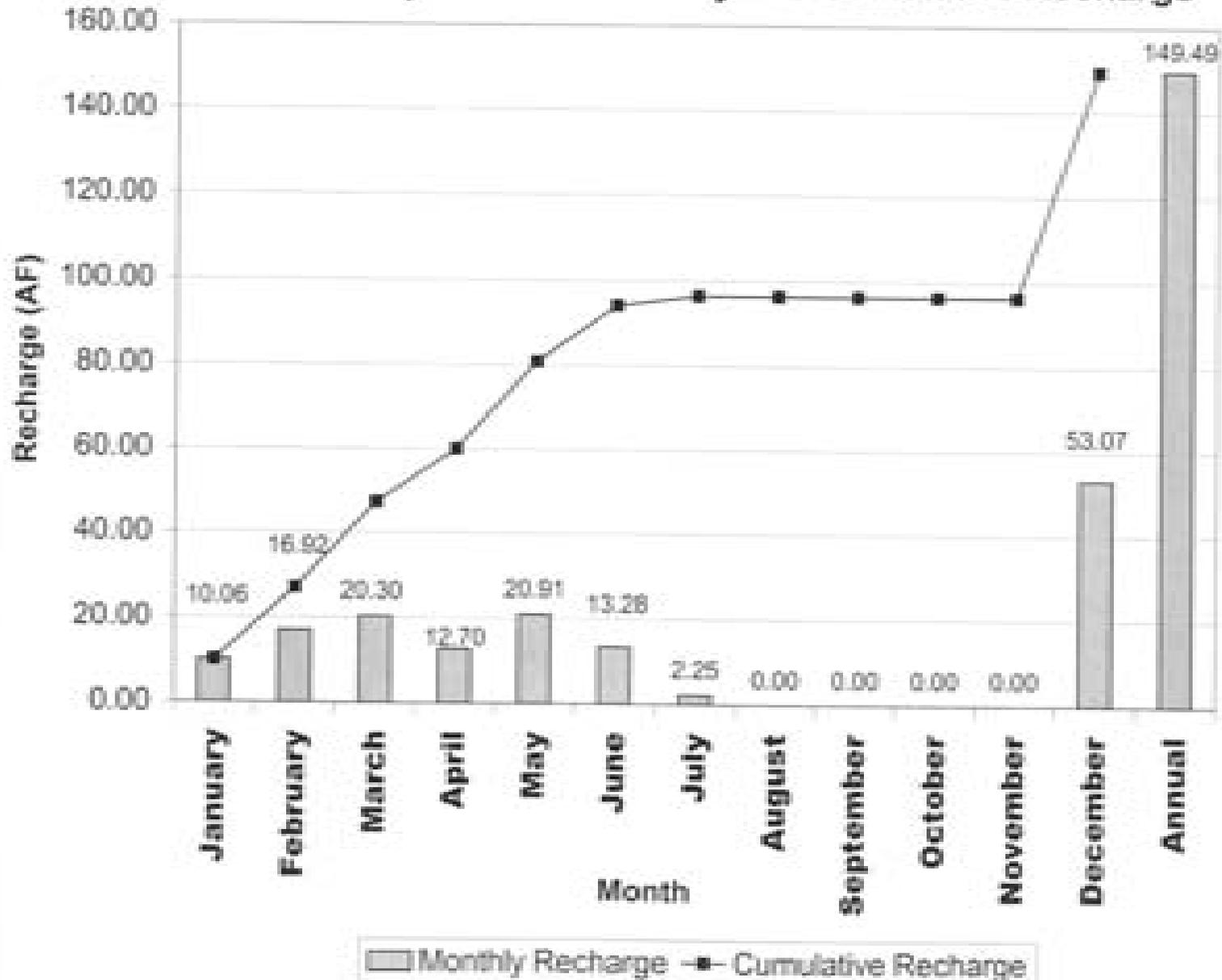
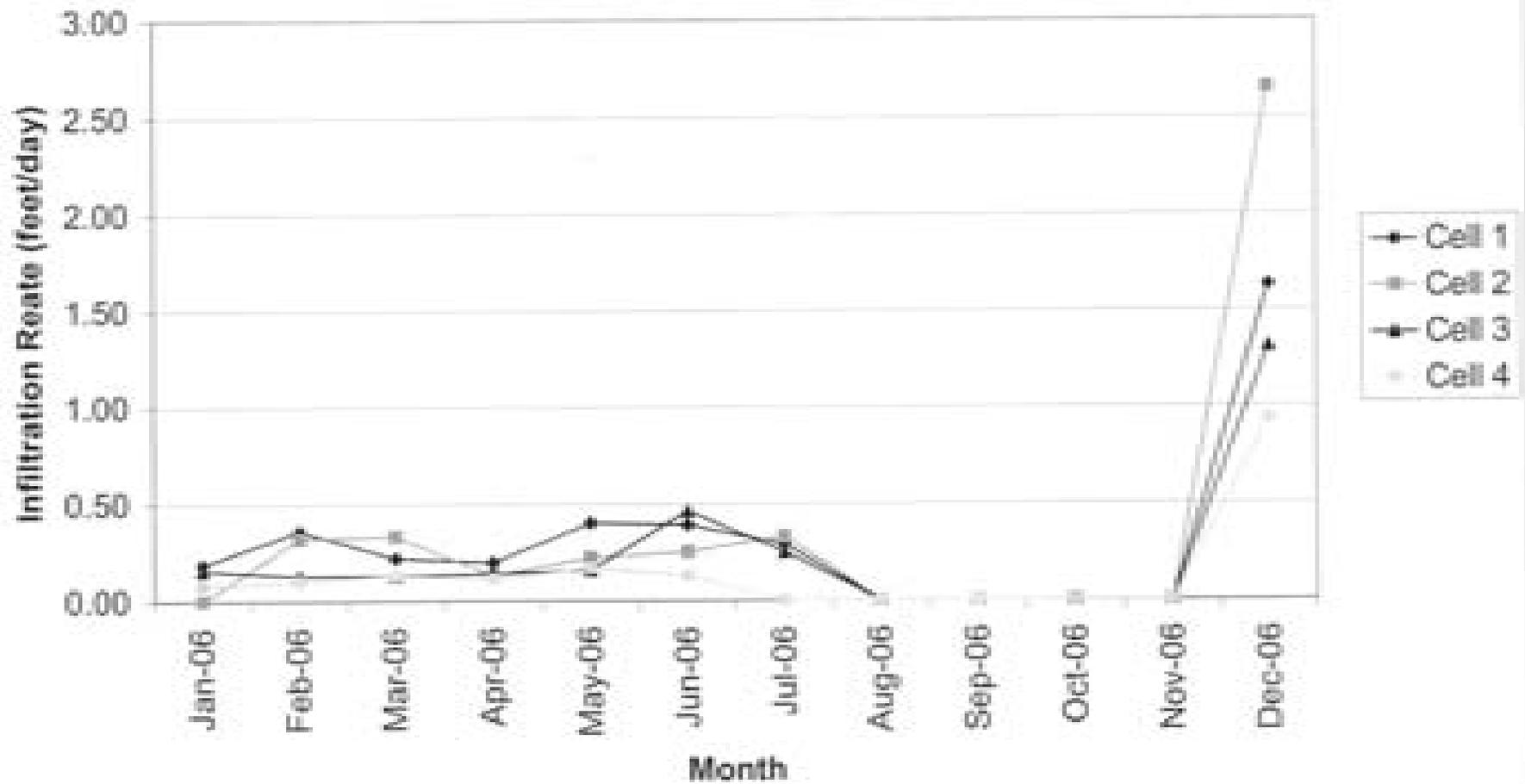


Figure 10
Marana High Plains Effluent Recharge Project
Average Monthly Infiltration Rates: CY 2006



TABLES

**TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
JANUARY 2005**

Day	Cell 1			Cell 2			Cell 3			Cell 4		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.11	0.63	0.17	0.00	0.00	N/A	0.00	0.78	0.00	0.00	1.23	0.00
2	0.12	0.63	0.19	0.00	0.00	N/A	0.00	0.73	0.00	0.00	1.16	0.00
3	0.09	0.63	0.14	0.00	0.00	N/A	0.00	0.72	0.00	0.06	1.18	0.05
4	0.00	0.63	0.00	0.00	0.00	N/A	0.00	0.72	0.00	0.00	1.16	0.00
5	0.02	0.63	0.03	0.00	0.00	N/A	0.00	0.72	0.00	0.12	1.22	0.10
6	0.10	0.63	0.16	0.00	0.00	N/A	0.00	0.59	0.00	0.00	1.18	0.00
7	0.11	0.63	0.17	0.00	0.00	N/A	0.00	0.39	N/A	0.00	1.16	0.00
8	0.17	0.61	0.28	0.00	0.00	N/A	0.00	0.00	0.00	0.26	1.16	0.22
9	0.19	0.58	0.33	0.00	0.00	N/A	0.18	0.01	0.25	0.08	1.16	0.07
10	0.41	0.61	0.67	0.00	0.00	N/A	0.41	0.72	0.53	0.56	1.23	0.46
11	0.12	0.63	0.19	0.00	0.00	N/A	0.85	0.78	1.09	0.00	1.18	0.00
12	0.04	0.63	0.06	0.00	0.00	N/A	0.00	0.78	0.00	0.00	1.16	0.00
13	0.08	0.63	0.13	0.00	0.00	N/A	0.00	0.78	0.00	0.28	1.23	0.23
14	0.11	0.63	0.17	0.00	0.00	N/A	0.00	0.78	0.00	0.00	1.26	0.00
15	0.13	0.63	0.21	0.00	0.00	N/A	0.00	0.78	0.00	0.00	1.22	0.00
16	0.15	0.63	0.24	0.00	0.00	N/A	0.00	0.73	0.00	0.24	1.11	0.22
17	0.18	0.63	0.29	0.00	0.00	N/A	0.00	0.72	0.00	0.33	1.26	0.26
18	0.07	0.63	0.11	0.00	0.00	N/A	0.00	0.59	0.00	0.00	1.23	0.00
19	0.07	0.63	0.11	0.00	0.00	N/A	0.00	0.59	0.00	0.00	1.16	0.00
20	0.06	0.63	0.10	0.00	0.00	N/A	0.00	0.20	N/A	0.19	1.16	0.16
21	0.09	0.63	0.14	0.00	0.00	N/A	0.00	0.00	0.00	0.00	1.23	0.00
22	0.05	0.63	0.08	0.00	0.00	N/A	0.00	0.59	0.00	0.00	1.22	0.00
23	0.26	0.61	0.43	0.00	0.00	N/A	0.38	0.78	0.49	0.10	1.11	0.09
24	0.19	0.63	0.30	0.00	0.00	N/A	0.73	0.78	0.94	0.46	1.23	0.37
25	0.14	0.63	0.22	0.00	0.00	N/A	0.92	0.78	1.18	0.00	1.23	0.00
26	0.06	0.63	0.10	0.00	0.00	N/A	0.00	0.78	0.00	0.02	1.11	0.02
27	0.08	0.63	0.13	0.00	0.00	N/A	0.00	0.78	0.00	0.11	1.26	0.09
28	0.07	0.63	0.11	0.00	0.00	N/A	0.00	0.78	0.00	0.00	1.23	0.00
29	0.08	0.63	0.13	0.00	0.00	N/A	0.00	0.78	0.00	0.00	1.11	0.00
30	0.29	0.59	0.49	0.00	0.00	N/A	0.00	0.78	0.00	0.23	1.16	0.20
31	0.07	0.58	0.12	0.00	0.00	N/A	0.00	0.78	N/A	0.03	0.95	0.03
	Average =			Average =			Average =			Average =		
	0.19			N/A			0.16			0.08		

TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
FEBRUARY 2006

Day	Cell 1			Cell 2			Cell 3			Cell 4		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.40	0.63	0.63	0.00	0.00	N/A	0.00	0.78	0.00	0.30	0.95	0.32
2	0.25	0.63	0.40	0.00	0.00	N/A	0.00	0.78	0.00	0.37	1.26	0.29
3	0.15	0.63	0.24	0.00	0.00	N/A	0.00	0.78	0.00	0.14	1.26	0.11
4	0.15	0.63	0.24	0.00	0.00	N/A	0.12	0.78	0.15	0.14	1.13	0.12
5	0.15	0.63	0.24	0.00	0.00	N/A	0.12	0.78	0.15	0.14	1.26	0.11
6	0.15	0.63	0.24	0.00	0.00	N/A	0.12	0.78	0.15	0.14	1.26	0.11
7	0.28	0.63	0.44	0.00	0.00	N/A	0.12	0.78	0.15	0.28	1.26	0.22
8	0.15	0.63	0.25	0.00	0.00	N/A	0.12	0.78	0.15	0.08	1.26	0.06
9	0.07	0.63	0.11	0.03	0.02	1.50	0.00	0.78	0.00	0.00	1.26	0.00
10	0.39	0.63	0.62	0.29	1.21	0.24	0.00	0.78	0.00	0.11	1.26	0.09
11	1.08	0.63	1.71	0.77	1.21	0.64	0.00	0.78	0.00	0.14	1.26	0.11
12	0.18	0.63	0.29	0.85	1.21	0.70	0.00	0.78	0.00	0.35	1.26	0.28
13	0.07	0.63	0.11	0.40	1.21	0.33	0.00	0.78	0.00	0.00	1.26	0.00
14	0.06	0.63	0.10	0.01	1.21	0.01	0.00	0.78	0.00	0.00	1.26	0.00
15	0.23	0.63	0.37	0.03	1.19	0.03	0.00	0.62	0.00	0.16	1.26	0.13
16	0.07	0.63	0.11	0.00	1.15	0.00	0.08	0.55	0.15	0.00	1.07	0.00
17	0.10	0.63	0.16	0.00	1.09	0.00	0.00	0.51	0.00	0.00	0.95	0.00
18	0.06	0.63	0.10	0.00	0.91	0.00	0.00	0.39	0.00	0.02	0.88	0.02
19	0.28	0.63	0.44	0.00	0.91	0.00	0.00	0.27	0.00	0.22	1.26	0.17
20	0.17	0.63	0.27	0.05	0.24	0.21	0.34	0.20	1.70	0.09	1.26	0.07
21	0.28	0.63	0.44	0.29	0.91	0.32	0.12	0.78	0.15	0.22	1.26	0.17
22	0.45	0.63	0.71	0.70	1.21	0.58	0.11	0.78	0.14	0.17	1.26	0.13
23	0.15	0.63	0.24	0.22	1.21	0.18	0.00	0.78	0.00	0.29	1.26	0.23
24	0.05	0.63	0.08	0.00	1.21	0.00	0.00	0.78	0.00	0.00	1.26	0.00
25	0.03	0.63	0.05	0.00	1.09	0.00	0.00	0.78	0.00	0.00	1.26	0.00
26	0.06	0.63	0.10	0.00	0.97	0.00	0.00	0.78	0.00	0.16	1.26	0.13
27	0.58	0.63	1.05	0.64	0.91	0.70	0.00	0.78	0.00	0.00	1.26	0.00
28	0.17	0.63	0.27	1.22	1.21	1.01	0.56	0.78	0.72	0.00	1.26	0.00
	Average =		0.38	Average =		0.32	Average =		0.13	Average =		0.10

**TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
MARCH 2006**

Day	Cell 1			Cell 2			Cell 3			Cell 4		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.09	0.63	0.14	0.35	1.21	0.29	0.15	0.78	0.19	0.21	1.26	0.17
2	0.05	0.63	0.08	0.00	1.21	0.00	0.00	0.78	0.00	0.01	1.26	0.01
3	0.06	0.63	0.10	0.00	1.21	0.00	0.00	0.78	0.00	0.02	1.26	0.02
4	0.05	0.63	0.08	0.00	1.09	0.00	0.00	0.78	0.00	0.21	1.26	0.17
5	0.03	0.63	0.05	0.00	0.97	0.00	0.00	0.78	0.00	0.08	1.26	0.06
6	0.25	0.63	0.40	0.91	0.91	1.00	0.16	0.78	0.21	0.17	1.26	0.13
7	0.17	0.63	0.27	0.72	1.21	0.60	0.14	0.78	0.18	0.24	1.26	0.19
8	0.14	0.63	0.22	0.36	1.21	0.30	0.23	0.78	0.29	0.31	1.26	0.25
9	0.10	0.63	0.16	0.22	1.21	0.18	0.11	0.78	0.14	0.30	1.26	0.24
10	0.15	0.63	0.24	0.04	1.21	0.03	0.13	0.78	0.17	0.00	1.26	0.00
11	0.20	0.63	0.32	0.02	1.21	0.02	0.45	0.78	0.58	0.01	1.26	0.01
12	0.05	0.63	0.08	0.00	1.15	0.00	0.00	0.78	0.04	0.02	1.26	0.02
13	0.38	0.63	0.60	0.70	1.09	0.64	0.14	0.78	0.18	0.39	1.26	0.31
14	0.21	0.63	0.33	0.50	1.21	0.41	0.13	0.78	0.17	0.20	1.13	0.18
15	0.05	0.58	0.09	0.99	1.21	0.82	0.00	0.78	0.00	0.01	0.95	0.01
16	0.08	0.63	0.13	0.60	1.21	0.50	0.00	0.78	0.00	0.33	1.22	0.27
17	0.10	0.63	0.16	0.00	1.21	0.00	0.00	0.78	0.00	0.00	1.18	0.00
18	0.11	0.63	0.17	0.00	1.21	0.00	0.03	0.76	0.04	0.00	1.16	0.00
19	0.08	0.63	0.13	0.00	1.17	0.00	0.02	0.73	0.03	0.26	1.22	0.21
20	0.18	0.61	0.30	0.43	1.14	0.38	0.20	0.73	0.27	0.29	1.23	0.24
21	0.13	0.63	0.21	0.28	1.15	0.24	0.13	0.78	0.17	0.15	1.23	0.12
22	0.06	0.63	0.10	0.00	1.14	0.00	0.00	0.76	0.00	0.11	1.22	0.09
23	0.10	0.63	0.16	0.00	1.06	0.00	0.00	0.73	0.00	0.27	0.95	0.28
24	0.08	0.63	0.13	0.00	1.03	0.00	0.01	0.72	0.01	0.00	1.26	0.00
25	0.09	0.63	0.14	0.00	0.30	0.00	0.02	0.72	0.03	0.03	1.23	0.02
26	0.08	0.63	0.13	0.00	0.90	N/A	0.02	0.72	0.03	0.14	1.18	0.12
27	0.40	0.59	0.68	0.31	0.12	2.58	0.16	0.72	0.22	0.27	1.16	0.23
28	0.33	0.59	0.56	1.00	1.03	0.97	0.14	0.72	0.19	0.29	1.22	0.24
29	0.33	0.63	0.52	0.61	1.14	0.54	0.49	0.76	0.64	0.36	1.23	0.29
30	0.09	0.63	0.14	0.34	1.17	0.29	0.19	0.78	0.24	0.05	1.23	0.04
31	0.09	0.63	0.14	0.00	1.21	0.00	0.00	0.78	0.00	0.04	1.26	0.03
	Average =			Average =			Average =			Average =		
			0.22			0.33			0.13			0.13

TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
APRIL 2006

Day	Cell 1			Cell 2			Cell 3			Cell 4*		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.05	0.63	0.08	0.00	1.14	0.00	0.00	0.75	0.00	0.25	1.23	0.20
2	0.05	0.63	0.08	0.00	1.09	0.00	0.00	0.73	0.00	0.00	1.23	0.00
3	0.34	0.63	0.54	0.57	1.09	0.52	0.23	0.73	0.32	0.01	1.16	0.01
4	0.07	0.63	0.11	0.76	1.15	0.66	0.18	0.78	0.23	0.51	1.23	0.41
5	0.11	0.63	0.17	0.43	1.21	0.36	0.00	0.76	0.00	0.01	1.23	0.01
6	0.01	0.61	0.02	0.00	1.21	0.00	0.00	0.75	0.00	0.06	0.95	0.06
7	0.07	0.61	0.11	0.00	1.17	0.00	0.02	0.72	0.03	0.23	1.23	0.19
8	0.09	0.59	0.15	0.00	1.14	0.00	0.02	0.72	0.03	0.00	1.16	0.00
9	0.11	0.58	0.19	0.01	1.11	0.01	0.01	0.72	0.01	0.00	1.16	0.00
10	0.11	0.58	0.19	0.20	1.09	0.18	0.25	0.72	0.35	0.32	1.11	0.29
11	0.22	0.58	0.38	0.55	1.14	0.48	0.34	0.76	0.45	0.36	1.23	0.29
12	0.17	0.47	0.36	0.34	1.17	0.29	0.19	0.78	0.24	0.00	1.23	0.00
13	0.14	0.47	0.30	0.04	1.17	0.03	0.00	0.78	0.00	0.02	1.11	0.02
14	0.09	0.47	0.19	0.04	1.15	0.03	0.00	0.78	0.00	0.01	1.23	0.01
15	0.03	0.32	0.09	0.07	1.14	0.06	0.00	0.78	0.00	0.12	1.16	0.10
16	0.00	0.00	NA	0.04	1.11	0.04	0.02	0.75	0.03	0.14	1.23	0.11
17	0.00	0.00	NA	0.03	1.09	0.03	0.33	0.76	0.43	0.36	1.22	0.30
18	0.00	0.00	NA	0.53	1.14	0.62	0.48	0.78	0.62	0.07	1.23	0.06
19	0.00	0.00	NA	0.26	1.21	0.21	0.00	0.78	0.00	0.03	1.11	0.03
20	0.00	0.00	NA	0.00	1.21	0.00	0.00	0.78	0.00	0.21	1.22	0.17
21	0.00	0.00	NA	0.00	1.21	0.00	0.00	0.78	0.00	0.03	1.11	0.03
22	0.00	0.00	NA	0.00	1.17	0.00	0.05	0.78	0.06	0.03	0.32	0.09
23	0.00	0.00	NA	0.03	1.15	0.03	0.09	0.78	0.12	0.00	0.00	NA
24	0.00	0.00	NA	0.02	1.14	0.02	0.11	0.75	0.14	0.34	0.95	0.36
25	0.00	0.00	NA	0.06	1.11	0.05	0.18	0.78	0.24	0.40	1.26	0.32
26	0.00	0.00	NA	0.06	1.09	0.06	0.19	0.73	0.26	0.00	1.23	0.00
27	0.00	0.00	NA	0.04	1.06	0.04	0.15	0.72	0.21	0.00	1.23	0.00
28	0.00	0.00	NA	0.01	1.03	0.01	0.12	0.72	0.17	0.01	0.95	0.01
29	0.00	0.00	NA	0.01	0.61	0.02	0.13	0.72	0.18	0.21	1.23	0.17
30	0.00	0.00	NA	0.01	0.30	0.03	0.10	0.59	0.17	0.00	1.23	0.00
	Average =		0.29	Average =		0.13	Average =		0.14	Average =		0.11

**TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
MAY 2005**

Day	Cell 1			Cell 2			Cell 3			Cell 4		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.00	0.00	NA	0.36	1.09	0.33	0.27	0.78	0.35	0.01	1.26	0.01
2	0.00	0.00	NA	0.70	1.21	0.58	0.46	0.78	0.59	0.31	1.26	0.25
3	0.59	0.32	1.84	0.26	1.21	0.21	0.30	0.78	0.38	0.04	1.26	0.03
4	0.67	0.63	0.11	0.13	1.21	0.11	0.19	0.78	0.24	0.04	1.26	0.03
5	0.01	0.44	0.02	0.23	1.09	0.21	0.21	0.70	0.30	0.24	1.13	0.21
6	0.00	0.00	NA	0.26	0.85	0.31	0.14	0.62	0.23	0.07	0.95	0.07
7	0.00	0.00	NA	0.19	1.09	0.17	0.15	0.70	0.21	0.04	0.63	0.06
8	0.48	0.63	0.76	0.12	1.21	0.10	0.16	0.78	0.21	0.22	0.32	0.69
9	0.43	0.63	0.68	0.40	1.21	0.33	0.21	0.78	0.27	0.33	1.26	0.26
10	0.15	0.63	0.24	0.24	1.21	0.20	0.21	0.78	0.27	0.14	1.26	0.11
11	0.08	0.63	0.13	0.17	1.21	0.14	0.05	0.78	0.06	0.11	1.26	0.09
12	0.10	0.57	0.18	0.12	1.03	0.12	0.17	0.74	0.23	0.23	1.13	0.20
13	0.09	0.32	0.29	0.12	0.81	0.20	0.14	0.66	0.21	0.06	1.01	0.06
14	0.02	0.50	0.04	0.10	0.30	0.33	0.12	0.62	0.19	0.12	0.95	0.13
15	0.31	0.63	0.49	0.40	1.21	0.33	0.10	0.78	0.13	0.18	1.26	0.14
16	0.22	0.63	0.35	0.54	1.21	0.45	0.07	0.78	0.09	0.41	1.26	0.33
17	0.13	0.63	0.21	1.10	1.21	0.91	0.07	0.70	0.10	0.10	1.26	0.08
18	0.10	0.63	0.16	0.09	1.21	0.07	0.05	0.62	0.08	0.12	1.26	0.10
19	0.11	0.57	0.19	0.13	1.09	0.12	0.02	0.59	0.03	0.17	1.13	0.15
20	0.22	0.63	0.35	0.12	0.91	0.13	0.00	0.47	0.00	0.13	1.01	0.13
21	0.40	0.63	0.63	0.17	0.85	0.20	0.00	0.39	0.00	0.17	0.95	0.18
22	0.46	0.63	0.73	0.15	1.21	0.12	0.00	0.47	0.00	0.24	1.26	0.19
23	0.23	0.63	0.37	0.13	1.21	0.11	0.00	0.39	0.00	0.43	1.26	0.34
24	0.00	0.63	0.00	0.00	1.21	0.00	0.00	0.31	0.00	0.00	1.26	0.00
25	0.06	0.60	0.10	0.00	1.09	0.00	0.00	0.20	0.00	0.13	1.13	0.12
26	0.15	0.50	0.30	0.00	0.91	0.00	0.00	0.08	0.00	0.24	0.95	0.25
27	0.26	0.47	0.55	0.00	0.81	0.00	0.00	0.00	NA	0.17	0.75	0.22
28	0.18	0.50	0.36	0.00	0.00	NA	0.00	0.00	NA	0.11	0.50	0.22
29	0.22	0.54	0.41	0.00	0.00	NA	0.00	0.00	NA	0.03	0.32	0.09
30	0.45	0.63	0.71	0.68	1.21	0.56	0.00	0.00	NA	0.21	0.00	NA
31	0.32	0.63	0.51	0.03	1.21	0.02	0.00	0.00	NA	0.46	1.26	0.37
	Average =		0.40	Average =		0.22	Average =		0.16	Average =		0.17

**TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
JUNE 2006**

Day	Cell 1			Cell 2			Cell 3			Cell 4		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.15	0.63	0.24	1.11	1.21	0.92	0.00	0.00	NA	0.04	1.26	0.03
2	0.13	0.63	0.21	0.00	0.00	NA	0.00	0.00	NA	0.09	1.26	0.07
3	0.33	0.63	0.52	0.00	0.00	NA	0.00	0.00	NA	0.23	1.26	0.18
4	0.39	0.63	0.62	0.00	0.00	NA	0.00	0.00	NA	0.06	1.26	0.05
5	0.35	0.63	0.56	0.00	0.00	NA	0.00	0.00	NA	0.21	1.16	0.18
6	0.14	0.63	0.22	0.00	0.00	NA	0.00	0.00	NA	0.04	1.11	0.04
7	0.00	0.63	0.00	0.00	0.00	NA	0.00	0.00	NA	0.00	0.95	0.00
8	0.31	0.63	0.49	0.16	1.14	0.14	0.00	0.00	NA	0.14	0.32	0.44
9	0.40	0.63	0.63	0.25	1.21	0.21	0.00	0.00	NA	0.30	1.23	0.24
10	NA	NA	NA	0.21	1.21	0.17	0.00	0.00	NA	0.06	1.22	0.05
11	NA	NA	NA	0.21	1.17	0.18	0.00	0.00	NA	0.22	1.16	0.19
12	NA	NA	NA	0.20	1.17	0.17	0.00	0.00	NA	0.06	1.11	0.05
13	NA	NA	NA	0.34	1.17	0.29	0.58	0.29	2.90	0.06	0.32	0.19
14	NA	NA	NA	0.25	1.17	0.21	0.88	0.78	1.13	0.04	0.00	NA
15	NA	NA	NA	0.34	1.15	0.30	0.00	0.78	0.00	0.00	0.00	NA
16	NA	NA	NA	0.22	1.14	0.19	0.02	0.78	0.03	0.00	0.00	NA
17	NA	NA	NA	0.18	1.14	0.16	0.13	0.72	0.18	0.00	0.00	NA
18	NA	NA	NA	0.17	1.11	0.15	0.18	0.72	0.25	0.00	0.00	NA
19	NA	NA	NA	0.15	1.09	0.14	0.65	0.76	0.86	0.00	0.00	NA
20	NA	NA	NA	0.13	1.09	0.12	0.11	0.78	0.14	0.00	0.00	NA
21	NA	NA	NA	0.11	1.06	0.10	0.17	0.78	0.22	0.00	0.00	NA
22	NA	NA	NA	0.10	1.03	0.10	0.15	0.73	0.21	0.00	0.00	NA
23	NA	NA	NA	0.06	1.03	0.06	0.17	0.72	0.24	0.00	0.00	NA
24	NA	NA	NA	0.05	0.91	0.08	0.12	0.58	0.20	0.00	0.00	NA
25	NA	NA	NA	0.04	0.30	0.13	0.03	0.39	0.08	0.00	0.00	NA
26	NA	NA	NA	0.04	0.30	0.13	0.00	0.00	NA	0.00	0.00	NA
27	NA	NA	NA	0.13	0.12	1.08	1.03	0.72	1.43	0.00	0.00	NA
28	NA	NA	NA	0.18	0.30	0.60	0.71	0.78	0.91	0.00	0.00	NA
29	NA	NA	NA	0.03	0.30	0.10	0.00	0.78	0.00	0.00	0.00	NA
30	NA	NA	NA	0.03	0.12	0.25	0.02	0.78	0.03	0.00	0.00	NA
	Average =			Average =			Average =			Average =		
			0.39			0.25			0.46			0.13

**TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
JULY 2006**

Day	Cell 1			Cell 2			Cell 3			Cell 4*		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.11	0.58	0.19	0.01	0.06	0.17	0.05	0.78	0.06	0.00	0.00	N/A
2	0.23	0.63	0.37	0.01	0.02	0.50	0.06	0.78	0.08	0.00	0.00	N/A
3	0.09	0.58	0.15	0.00	0.00	N/A	0.17	0.78	0.22	0.00	0.00	N/A
4	0.05	0.47	0.11	0.00	0.00	N/A	0.21	0.76	0.28	0.00	0.00	N/A
5	0.00	0.32	0.00	0.00	0.00	N/A	0.24	0.73	0.33	0.00	0.00	N/A
6	0.06	0.32	0.19	0.00	0.00	N/A	0.22	0.72	0.31	0.00	0.00	N/A
7	0.00	0.16	0.00	0.00	0.00	N/A	0.18	0.72	0.22	0.00	0.00	N/A
8	0.00	0.16	0.00	0.00	0.00	N/A	0.17	0.59	0.29	0.00	0.00	N/A
9	0.04	0.16	0.25	0.00	0.00	N/A	0.13	0.39	0.33	0.00	0.00	N/A
10	0.04	0.06	0.67	0.00	0.00	N/A	0.07	0.29	0.35	0.00	0.00	N/A
11	0.04	0.06	0.67	0.00	0.00	N/A	0.02	0.08	0.25	0.00	0.00	N/A
12	0.05	0.06	0.83	0.00	0.00	N/A	0.00	0.00	N/A	0.00	0.00	N/A
13	0.00	0.00	N/A									
14	0.00	0.00	N/A									
15	0.00	0.00	N/A									
16	0.00	0.00	N/A									
17	0.00	0.00	N/A									
18	0.00	0.00	N/A									
19	0.00	0.00	N/A									
20	0.00	0.00	N/A									
21	0.00	0.00	N/A									
22	0.00	0.00	N/A									
23	0.00	0.00	N/A									
24	0.00	0.00	N/A									
25	0.00	0.00	N/A									
26	0.00	0.00	N/A									
27	0.00	0.00	N/A									
28	0.00	0.00	N/A									
29	0.00	0.00	N/A									
30	0.00	0.00	N/A									
31	0.00	0.00	N/A									
	Average =			Average =			Average =			Average =		
			0.29			0.33			0.25			N/A

TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
AUGUST 2006

Day	Cell 1			Cell 2			Cell 3			Cell 4		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.00	0.00	N/A									
2	0.00	0.00	N/A									
3	0.00	0.00	N/A									
4	0.00	0.00	N/A									
5	0.00	0.00	N/A									
6	0.00	0.00	N/A									
7	0.00	0.00	N/A									
8	0.00	0.00	N/A									
9	0.00	0.00	N/A									
10	0.00	0.00	N/A									
11	0.00	0.00	N/A									
12	0.00	0.00	N/A									
13	0.00	0.00	N/A									
14	0.00	0.00	N/A									
15	0.00	0.00	N/A									
16	0.00	0.00	N/A									
17	0.00	0.00	N/A									
18	0.00	0.00	N/A									
19	0.00	0.00	N/A									
20	0.00	0.00	N/A									
21	0.00	0.00	N/A									
22	0.00	0.00	N/A									
23	0.00	0.00	N/A									
24	0.00	0.00	N/A									
25	0.00	0.00	N/A									
26	0.00	0.00	N/A									
27	0.00	0.00	N/A									
28	0.00	0.00	N/A									
29	0.00	0.00	N/A									
30	0.00	0.00	N/A									
31	0.00	0.00	N/A									
	Average =		N/A									

**TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
SEPTEMBER 2006**

Day	Cell 1			Cell 2			Cell 3			Cell 4		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.00	0.00	N/A									
2	0.00	0.00	N/A									
3	0.00	0.00	N/A									
4	0.00	0.00	N/A									
5	0.00	0.00	N/A									
6	0.00	0.00	N/A									
7	0.00	0.00	N/A									
8	0.00	0.00	N/A									
9	0.00	0.00	N/A									
10	0.00	0.00	N/A									
11	0.00	0.00	N/A									
12	0.00	0.00	N/A									
13	0.00	0.00	N/A									
14	0.00	0.00	N/A									
15	0.00	0.00	N/A									
16	0.00	0.00	N/A									
17	0.00	0.00	N/A									
18	0.00	0.00	N/A									
19	0.00	0.00	N/A									
20	0.00	0.00	N/A									
21	0.00	0.00	N/A									
22	0.00	0.00	N/A									
23	0.00	0.00	N/A									
24	0.00	0.00	N/A									
25	0.00	0.00	N/A									
26	0.00	0.00	N/A									
27	0.00	0.00	N/A									
28	0.00	0.00	N/A									
29	0.00	0.00	N/A									
30	0.00	0.00	N/A									
	Average =		N/A									

TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
OCTOBER 2006

Day	Recharge Volume (AF)	Cell 1 Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Cell 2 Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Cell 3 Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Cell 4 Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.00	0.00	NA									
2	0.00	0.00	NA									
3	0.00	0.00	NA									
4	0.00	0.00	NA									
5	0.00	0.00	NA									
6	0.00	0.00	NA									
7	0.00	0.00	NA									
8	0.00	0.00	NA									
9	0.00	0.00	NA									
10	0.00	0.00	NA									
11	0.00	0.00	NA									
12	0.00	0.00	NA									
13	0.00	0.00	NA									
14	0.00	0.00	NA									
15	0.00	0.00	NA									
16	0.00	0.00	NA									
17	0.00	0.00	NA									
18	0.00	0.00	NA									
19	0.00	0.00	NA									
20	0.00	0.00	NA									
21	0.00	0.00	NA									
22	0.00	0.00	NA									
23	0.00	0.00	NA									
24	0.00	0.00	NA									
25	0.00	0.00	NA									
26	0.00	0.00	NA									
27	0.00	0.00	NA									
28	0.00	0.00	NA									
29	0.00	0.00	NA									
30	0.00	0.00	NA									
31	0.00	0.00	NA									
		Average = NA		Average = NA		Average = NA		Average = NA		Average = NA		

**TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
NOVEMBER 2005**

Day	Cell 1			Cell 2			Cell 3			Cell 4		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.00	0.00	NA									
2	0.00	0.00	NA									
3	0.00	0.00	NA									
4	0.00	0.00	NA									
5	0.00	0.00	NA									
6	0.00	0.00	NA									
7	0.00	0.00	NA									
8	0.00	0.00	NA									
9	0.00	0.00	NA									
10	0.00	0.00	NA									
11	0.00	0.00	NA									
12	0.00	0.00	NA									
13	0.00	0.00	NA									
14	0.00	0.00	NA									
15	0.00	0.00	NA									
16	0.00	0.00	NA									
17	0.00	0.00	NA									
18	0.00	0.00	NA									
19	0.00	0.00	NA									
20	0.00	0.00	NA									
21	0.00	0.00	NA									
22	0.00	0.00	NA									
23	0.00	0.00	NA									
24	0.00	0.00	NA									
25	0.00	0.00	NA									
26	0.00	0.00	NA									
27	0.00	0.00	NA									
28	0.00	0.00	NA									
29	0.00	0.00	NA									
30	0.00	0.00	NA									
	Average =		NA									

TABLE 3
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
DAILY INFILTRATION RATES
DECEMBER 2006

Day	Cell 1			Cell 2			Cell 3			Cell 4		
	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)	Recharge Volume (AF)	Wetted Area (acres)	Infiltration Rate (feet/day)
1	0.00	0.00	NA									
2	0.00	0.00	NA									
3	0.00	0.00	NA									
4	0.00	0.00	NA									
5	0.00	0.00	NA	0.43	0.12	3.58	0.00	0.00	NA	0.68	0.95	0.72
6	0.00	0.00	NA	0.84	0.30	2.80	0.00	0.00	NA	1.40	1.16	1.21
7	0.00	0.00	NA	0.51	0.30	1.70	0.00	0.00	NA	1.27	1.16	1.09
8	0.00	0.00	NA	0.52	0.30	1.73	0.00	0.00	NA	1.29	1.16	1.11
9	0.00	0.00	NA	0.52	0.30	1.73	0.00	0.00	NA	1.29	1.16	1.11
10	0.00	0.00	NA	0.47	0.30	1.57	0.00	0.00	NA	1.26	1.16	1.09
11	0.00	0.00	NA	0.45	0.30	1.50	0.00	0.00	NA	1.22	1.16	1.05
12	0.00	0.00	NA	0.45	0.30	1.50	0.00	0.00	NA	1.17	1.22	0.96
13	0.00	0.00	NA	0.47	0.30	1.57	0.00	0.00	NA	1.13	1.22	0.93
14	0.00	0.00	NA	0.47	0.12	3.92	0.00	0.00	NA	1.10	1.22	0.90
15	0.00	0.00	NA	0.45	0.12	3.75	0.00	0.00	NA	1.10	1.22	0.90
16	0.00	0.00	NA	0.44	0.12	3.67	0.00	0.00	NA	1.08	1.22	0.89
17	0.00	0.00	NA	0.44	0.12	3.67	0.00	0.00	NA	1.06	1.22	0.87
18	0.00	0.00	NA	0.44	0.12	3.67	0.00	0.00	NA	1.05	1.22	0.86
19	0.00	0.00	NA	0.47	0.12	3.92	0.00	0.00	NA	1.04	1.22	0.85
20	0.00	0.00	NA	0.60	0.12	5.00	0.00	0.00	NA	1.26	1.23	1.02
21	0.00	0.00	NA	1.27	0.61	2.08	0.00	0.00	NA	1.22	1.23	0.99
22	0.00	0.00	NA	1.22	1.03	1.18	0.00	0.00	NA	0.92	1.23	0.75
23	0.00	0.00	NA	0.65	0.61	1.07	0.00	0.00	NA	0.97	1.23	0.79
24	0.00	0.00	NA	0.45	0.12	3.75	0.61	0.20	3.05	0.95	1.22	0.78
25	0.00	0.00	NA	0.52	0.12	4.33	0.64	0.73	0.88	1.21	1.22	0.99
26	0.00	0.00	NA	0.88	0.30	2.93	0.64	0.72	0.89	1.26	1.23	1.02
27	0.00	0.00	NA	1.00	0.61	1.64	0.71	0.59	1.20	0.94	1.23	0.76
28	0.00	0.00	NA	1.06	0.61	1.74	0.39	0.73	0.53	1.26	1.23	1.02
29	0.25	0.16	1.56	1.06	1.03	1.03	0.33	0.73	0.45	1.02	1.23	0.83
30	0.63	0.32	1.97	0.61	0.30	2.03	0.36	0.72	0.50	1.06	1.23	0.86
31	0.64	0.47	1.36	0.54	0.12	4.50	0.37	0.72	0.51	1.09	1.23	0.89
	Average =		1.63	Average =		2.65	Average =		1.31	Average =		0.93

**TABLE 4
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
WATER QUALITY SUMMARY: CALENDAR YEAR 2006**

Constituent	Unit	Sample Date and Location											
		Source Water											
		Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06
Nutrients													
Total Nitrogen ¹	mg/l	35.7	35.0	35.0	36.0	29.0	25.0	26.0	No Event	No Event	27.0	24.0	23.0
Nitrate-Nitrite as N	mg/l	1.7	1.0	1.4	0.8	1.9	1.9	1.9	No Event	No Event	3.7	3.0	3.8
Total Kjeldahl Nitrogen (TKN)	mg/l	34.0	38.0	29.0	37.0	29.0	27.0	22.0	No Event	No Event	23.0	21.0	19.0
Metals (Total)													
Arsenic	mg/l	No Event	0.0037	No Event	No Event	No Event	0.0058	No Event	0.0042				
Barium	mg/l	No Event	0.053	No Event	No Event	No Event	0.071	No Event	< 0.0010				
Cadmium	mg/l	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	< 0.0010				
Chromium	mg/l	No Event	0.0018	No Event	No Event	No Event	0.0017	No Event	0.0013				
Lead	mg/l	No Event	0.0012	No Event	No Event	No Event	0.002	No Event	0.0019				
Antimony	mg/l	No Event	< 0.0030	No Event	No Event	No Event	< 0.0030	No Event	< 0.0030				
Beryllium	mg/l	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	< 0.0010				
Nickel	mg/l	No Event	0.0036	No Event	No Event	No Event	0.0046	No Event	0.0048				
Mercury	mg/l	No Event	< 0.00020	No Event	No Event	No Event	< 0.00020	No Event	< 0.00020				
Selenium	mg/l	No Event	< 0.0020	No Event	No Event	No Event	0.0033	No Event	< 0.0020				
Thallium	mg/l	No Event	< 0.0010	No Event	No Event	No Event	No Event	No Event	No Event	No Event	No Event	No Event	No Event
Volatile Organic Compounds (VOCs)													
Benzene	mg/l	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	< 0.0010				
Carbon tetrachloride	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
o-Dichlorobenzene	mg/l	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	< 0.0010				
para-Dichlorobenzene	mg/l	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	< 0.0010				
1,2-Dichloroethane	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
1,1-Dichloroethylene	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
cis-1,2-Dichloroethylene	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
trans-1,2-Dichloroethylene	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
1,2-Dichloropropane	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
Ethylbenzene	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
Monochlorobenzene	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
Styrene	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
Tetrachloroethylene	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
Toluene	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
1,1,1-Trichloroethane	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
1,1,2-Trichloroethane	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
Trichloroethylene	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
Trifluoromethanes (total THMs)	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
Vinyl Chloride	ug/l	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	< 1.0				
Xylenes (Total)	ug/l	No Event	< 2.0	No Event	No Event	No Event	< 2.0	No Event	< 2.0				

No-Event = No sample was taken; No-Flow = No flow in the effluent channel

¹ Total Nitrogen is equal to Nitrate-Nitrite-N plus TKN (Aquifer Protection Permit No. P-100196)

**TABLE 4
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
WATER QUALITY SUMMARY: CALENDAR YEAR 2005**

Constituent	Sample Date and Location											
	Monitor Well HP-1											
	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05
Nutrients												
Total Nitrogen ¹	4.8	2.6	2.8	2.4	5.4	3.2	3.2	3.3	No Event	5.8	2.7	2.3
Nitrate-Nitrite as N	2.8	2.5	2.5	2.4	2.8	3.2	3.2	3.3	No Event	2.8	2.7	2.3
Total Kjeldahl Nitrogen (TKN)	2.0	< 1.3	< 1.3	< 1.3	2.6	< 1.3	< 1.3	< 1.3	< 1.3	3.0	< 1.3	< 1.3
Metals (Total)												
Arsenic	No Event	0.0013	No Event	No Event	No Event	0.002	No Event	No Event	0.002	No Event	No Event	0.0014
Barium	No Event	0.14	No Event	No Event	No Event	0.17	No Event	No Event	0.15	No Event	No Event	0.15
Cadmium	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010
Chromium	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010
Lead	No Event	0.0041	No Event	No Event	No Event	0.0012	No Event	No Event	0.004	No Event	No Event	0.0002
Antimony	No Event	< 0.00030	No Event	No Event	No Event	< 0.00030	No Event	No Event	< 0.00030	No Event	No Event	< 0.00030
Beryllium	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010
Nickel	No Event	0.0033	No Event	No Event	No Event	0.0036	No Event	No Event	0.011	No Event	No Event	0.0092
Mercury	No Event	< 0.00020	No Event	No Event	No Event	< 0.00020	No Event	No Event	< 0.00020	No Event	No Event	< 0.00020
Selenium	No Event	< 0.0020	No Event	No Event	No Event	0.0024	No Event	No Event	< 0.0020	No Event	No Event	< 0.0020
Thallium	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010
Volatile Organic Compounds (VOCs)												
Benzene	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010
Carbon tetrachloride	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
o-Dichlorobenzene	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010
para-Dichlorobenzene	No Event	< 0.0010	No Event	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010	No Event	No Event	< 0.0010
1,2-Dichloroethane	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
1,1-Dichloroethylene	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
cis-1,2-Dichloroethylene	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
trans-1,2-Dichloroethylene	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
1,2-Dichloropropane	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
Ethylbenzene	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
Monochlorobenzene	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
Styrene	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
Tetrachloroethylene	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
Toluene	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
1,1,1-Trichloroethane	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
1,1,2-Trichloroethane	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
Trichloroethylene	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
Trihalomethanes (total THMs)	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
Vinyl Chloride	No Event	< 1.0	No Event	No Event	No Event	< 1.0	No Event	No Event	< 1.0	No Event	No Event	< 1.0
Hydrides (Total)	No Event	< 2.0	No Event	No Event	No Event	< 2.0	No Event	No Event	< 2.0	No Event	No Event	< 2.0

No Event = No sample was taken; No Flow = 0

¹ Total Nitrogen is equal to Nitrate-Nitrite-N₃.

**TABLE 5
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
FACILITY INSPECTIONS: PROBLEMS AND RELATED SOLUTIONS
CALENDAR YEAR 2006**

Date	Problem	Solution
January 2006	The submersible pumps at the Influent Lift Station (main pumps) are not operating in "auto" mode, meaning that they will not operate with the level sensors in the oxbow channel and Equalization Basin to turn the pumps on and off automatically.	Pumps were run manually by the daily operator for much of the duration of this year. An electrician was able to fix the problem in February of 2007, thus allowing automated operation of the submersible pumps with the level sensors.
January 2006	The level sensor in Cell 3 does not operate in "auto" mode, meaning that the butterfly valve will not open and close automatically with high and low levels in the cell.	This valve was open and closed manually by the daily operator using the control switch during the 2006 Calendar Year. PCRFCO staff are currently working with an electrician to fix this problem.
January 2006	Cell 2 is still not being operated due to a malfunctioning flow meter.	A new flow meter was installed in February 2006.
January 2006	Monitor well HP-2 is still damaged from maintenance work in 2005.	Monitor well was repaired in January 2006 and three bollards were set in place to help protect the well from future damage.
May 2006	Recharge cells are becoming very weedy.	Weeds were removed in November 2006, during operation down time. Delay in weed removal was due to maintenance scheduling of Pima County Operations, which performs maintenance work for many other County departments. PCRFCO staff contracted a firm in February 2007 to handle maintenance activities in case Pima County Operations has a busy schedule.
June 2006	A tee pipe connector for compliance well HP-1 is broken, thus affecting PCRFCO staff's ability to take water quality samples.	The tee pipe connector was repaired in June 2006 by a contracted well and pump company.
July 2006	Earthen diversion berm has been washed out by storm water flow in the Santa Cruz River.	The earthen berm was repaired in October 2006.

**TABLE 5
 MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
 FACILITY INSPECTIONS: PROBLEMS AND RELATED SOLUTIONS
 CALENDAR YEAR 2006**

October 2006	The submersible pumps at the Influent Lift Station are not operating.	A pump relay switch was by-passed and the pumps are temporarily being run in manual mode by the daily operator. An electrician was able to fully fix this problem in February 2007, thus allowing for automated control of the pumps.
December 2006	The level sensor in Cell 2 will not close the butterfly valve at the high water level in "auto" mode.	The valve is being opened and closed manually by the daily operator using the control switch. PCRFCO staff are working with an electrician to allow for automated control of the valve using the level sensor.
December 2006	The pump for compliance well HP-1 is losing capacity; flow has been reduced from 10 gallons per minute to 6 gallons per minute).	The pump was rewired by an electrician in January 2007 and now has a capacity of approximately 23 gallons per minute.

APPENDIX A

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
JANUARY 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ¹ (AF)	Calculated Evaporation Volume ² (AF)	Calculated ET Volume ³ (AF)	Net Recharge (AF)
1	0.00	0.12	0.00	0.00	0.00	0.12	0.01	0.01	0.10
2	1.28	0.12	0.00	0.02	0.00	0.15	0.01	0.02	0.12
3	1.86	0.10	0.00	0.00	0.06	0.16	0.01	0.01	0.14
4	0.49	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.00
5	0.00	0.02	0.00	0.00	0.13	0.15	0.01	0.01	0.13
6	0.00	0.10	0.00	0.00	0.00	0.11	0.01	0.02	0.08
7	0.00	0.11	0.00	0.00	0.01	0.12	0.01	0.02	0.09
8	0.00	0.18	0.00	0.00	0.27	0.45	0.01	0.01	0.43
9	0.91	0.19	0.00	0.18	0.09	0.46	0.01	0.01	0.44
10	1.86	0.42	0.00	0.42	0.57	1.40	0.01	0.01	1.38
11	1.86	0.13	0.00	0.86	0.02	1.00	0.01	0.01	0.98
12	0.79	0.05	0.00	0.00	0.01	0.06	0.01	0.01	0.04
13	0.00	0.09	0.00	0.00	0.30	0.39	0.01	0.02	0.36
14	0.00	0.11	0.00	0.00	0.00	0.11	0.01	0.01	0.09
15	0.00	0.13	0.00	0.00	0.00	0.14	0.01	0.01	0.11
16	0.85	0.10	0.00	0.00	0.25	0.41	0.01	0.01	0.39
17	1.86	0.18	0.00	0.00	0.34	0.52	0.01	0.01	0.50
18	0.85	0.07	0.00	0.00	0.00	0.08	0.01	0.01	0.06
19	0.00	0.08	0.00	0.01	0.01	0.10	0.01	0.01	0.07
20	0.00	0.07	0.00	0.00	0.20	0.27	0.01	0.01	0.25
21	0.00	0.09	0.00	0.00	0.01	0.10	0.01	0.01	0.08
22	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.01	0.04
23	1.20	0.27	0.00	0.39	0.11	0.77	0.01	0.01	0.74
24	1.86	0.20	0.00	0.74	0.47	1.41	0.01	0.01	1.38
25	1.86	0.14	0.00	0.03	0.01	1.08	0.01	0.02	1.05
26	0.72	0.07	0.00	0.00	0.03	0.10	0.01	0.01	0.08
27	0.00	0.09	0.00	0.00	0.13	0.22	0.01	0.02	0.19
28	0.00	0.07	0.00	0.00	0.00	0.08	0.01	0.01	0.06
29	0.00	0.08	0.00	0.00	0.01	0.09	0.01	0.01	0.07
30	0.00	0.30	0.00	0.00	0.24	0.54	0.01	0.01	0.51
31	0.00	0.08	0.00	0.00	0.05	0.13	0.01	0.01	0.10
Total	18.03	3.88	0.00	3.58	3.34	10.80	0.34	0.41	10.06

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1970)

4 Calculated for Recharge Cell 4 using AZMET data (Marana Station)

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
FEBRUARY 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated Evaporation Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	1.12	0.41	0.00	0.01	0.31	0.72	0.0151	0.0095	0.70
2	1.88	0.26	0.00	0.01	0.39	0.66	0.0151	0.0158	0.63
3	0.60	0.16	0.00	0.00	0.16	0.32	0.0151	0.0158	0.29
4	0.00	0.16	0.00	0.13	0.16	0.45	0.0151	0.0161	0.42
5	0.00	0.16	0.00	0.13	0.16	0.45	0.0151	0.0147	0.42
6	0.00	0.16	0.00	0.13	0.16	0.45	0.0151	0.0168	0.41
7	0.85	0.29	0.00	0.13	0.29	0.71	0.0151	0.0179	0.67
8	1.08	0.17	0.00	0.13	0.10	0.39	0.0151	0.0189	0.36
9	1.74	0.07	0.03	0.00	0.00	0.11	0.0153	0.0084	0.08
10	1.88	0.40	0.31	0.00	0.12	0.83	0.0280	0.0147	0.78
11	1.74	1.09	0.78	0.00	0.16	2.03	0.0280	0.0179	1.99
12	0.00	0.19	0.87	0.00	0.37	1.42	0.0280	0.0189	1.37
13	1.29	0.08	0.41	0.00	0.01	0.59	0.0280	0.0179	0.45
14	1.37	0.07	0.02	0.00	0.01	0.10	0.0272	0.0200	0.05
15	0.00	0.24	0.04	0.00	0.19	0.47	0.0261	0.0294	0.41
16	0.00	0.08	0.01	0.09	0.00	0.17	0.0249	0.0134	0.13
17	0.00	0.11	0.00	0.00	0.00	0.11	0.0238	0.0071	0.08
18	0.00	0.07	0.00	0.00	0.03	0.10	0.0206	0.0088	0.07
19	0.00	0.28	0.00	0.00	0.24	0.52	0.0161	0.0147	0.49
20	1.20	0.17	0.05	0.34	0.10	0.66	0.0114	0.0116	0.64
21	1.88	0.29	0.30	0.13	0.24	0.95	0.0248	0.0158	0.91
22	1.88	0.46	0.72	0.12	0.18	1.47	0.0280	0.0158	1.43
23	1.88	0.15	0.23	0.00	0.31	0.70	0.0280	0.0179	0.65
24	0.64	0.08	0.01	0.01	0.00	0.08	0.0280	0.0158	0.03
25	0.00	0.04	0.01	0.01	0.02	0.07	0.0267	0.0179	0.02
26	0.00	0.06	0.00	0.01	0.18	0.25	0.0254	0.0200	0.21
27	1.21	0.88	0.65	0.01	0.00	1.33	0.0248	0.0200	1.28
28	1.88	0.17	1.23	0.58	0.01	1.97	0.0280	0.0179	1.93
Total	23.98	6.50	5.65	1.93	3.90	17.98	0.6116	0.4486	16.92

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated for Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1975).

4 Calculated for Recharge Cell 4 using AZMET data (Marana Station)

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
MARCH 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated Evaporation Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	1.86	0.10	0.37	0.16	0.22	0.85	0.0400	0.0053	0.80
2	0.62	0.06	0.01	0.00	0.03	0.10	0.0400	0.0200	0.04
3	0.00	0.07	0.01	0.00	0.04	0.13	0.0400	0.0221	0.07
4	0.00	0.06	0.00	0.00	0.22	0.29	0.0382	0.0158	0.23
5	0.00	0.04	0.00	0.01	0.10	0.15	0.0363	0.0231	0.09
6	1.26	0.36	0.92	0.17	0.19	1.54	0.0354	0.0252	1.48
7	1.86	0.18	0.74	0.16	0.26	1.33	0.0400	0.0189	1.28
8	1.86	0.15	0.38	0.24	0.33	1.10	0.0400	0.0200	1.04
9	1.86	0.11	0.24	0.12	0.33	0.80	0.0400	0.0221	0.74
10	0.52	0.16	0.06	0.14	0.00	0.36	0.0400	0.0158	0.30
11	0.00	0.21	0.04	0.46	0.02	0.72	0.0400	0.0095	0.67
12	0.00	0.06	0.01	0.04	0.04	0.15	0.0391	0.0158	0.10
13	0.97	0.39	0.72	0.15	0.41	1.67	0.0382	0.0168	1.61
14	1.86	0.21	0.52	0.14	0.21	1.08	0.0400	0.0151	1.03
15	1.86	0.06	1.01	0.00	0.03	1.09	0.0389	0.0150	1.04
16	1.86	0.09	0.62	0.00	0.35	1.05	0.0400	0.0163	0.99
17	0.53	0.11	0.00	0.00	0.00	0.11	0.0400	0.0227	0.05
18	0.00	0.12	0.01	0.05	0.02	0.19	0.0397	0.0213	0.13
19	0.00	0.09	0.00	0.03	0.26	0.38	0.0388	0.0041	0.34
20	1.26	0.19	0.45	0.21	0.31	1.16	0.0379	0.0154	1.10
21	1.86	0.14	0.29	0.15	0.17	0.75	0.0391	0.0216	0.69
22	0.56	0.07	0.01	0.00	0.12	0.21	0.0386	0.0183	0.15
23	0.00	0.11	0.02	0.01	0.29	0.43	0.0371	0.0173	0.38
24	0.00	0.09	0.01	0.03	0.00	0.14	0.0363	0.0263	0.07
25	0.00	0.10	0.00	0.03	0.06	0.19	0.0252	0.0278	0.13
26	0.00	0.09	0.00	0.03	0.16	0.27	0.0206	0.0193	0.23
27	1.24	0.41	0.31	0.17	0.28	1.17	0.0219	0.0145	1.14
28	1.86	0.34	1.01	0.15	0.31	1.81	0.0357	0.0183	1.76
29	1.86	0.34	0.63	0.50	0.39	1.87	0.0386	0.0278	1.80
30	0.58	0.10	0.36	0.21	0.07	0.73	0.0395	0.0185	0.67
31	0.00	0.10	0.02	0.00	0.07	0.19	0.0400	0.0231	0.13
Total	26.09	4.60	8.76	3.37	5.29	22.03	1.1554	0.5726	20.30

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated for Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1970).

4 Calculated for Recharge Cell 4 using AZMET data (Marana Station)

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
APRIL 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated Evaporation Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	0.00	0.06	0.02	0.00	0.28	0.37	0.06	0.02	0.28
2	0.00	0.07	0.01	0.01	0.01	0.10	0.06	0.02	0.02
3	1.18	0.35	0.59	0.25	0.04	1.23	0.06	0.02	1.15
4	1.86	0.09	0.79	0.20	0.52	1.60	0.06	0.01	1.53
5	1.86	0.13	0.45	0.02	0.04	0.63	0.06	0.03	0.55
6	0.57	0.02	0.00	0.01	0.07	0.11	0.06	0.02	0.03
7	0.00	0.08	0.00	0.03	0.25	0.37	0.06	0.02	0.29
8	0.00	0.11	0.02	0.03	0.01	0.17	0.06	0.03	0.06
9	0.00	0.12	0.03	0.02	0.02	0.20	0.06	0.03	0.11
10	1.22	0.12	0.23	0.26	0.34	0.95	0.06	0.02	0.88
11	1.86	0.24	0.58	0.36	0.39	1.56	0.06	0.03	1.48
12	1.86	0.18	0.37	0.21	0.01	0.77	0.06	0.03	0.69
13	0.45	0.15	0.07	0.00	0.05	0.27	0.06	0.03	0.19
14	0.00	0.10	0.07	0.00	0.04	0.21	0.06	0.03	0.12
15	0.00	0.03	0.10	0.00	0.14	0.27	0.05	0.02	0.20
16	0.00	0.00	0.07	0.04	0.17	0.28	0.05	0.03	0.20
17	1.28	0.00	0.06	0.34	0.39	0.80	0.04	0.03	0.72
18	1.86	0.00	0.66	0.50	0.09	1.55	0.04	0.03	1.48
19	1.12	0.00	0.29	0.00	0.66	0.35	0.05	0.03	0.27
20	0.00	0.00	0.00	0.00	0.34	0.25	0.05	0.03	0.17
21	0.00	0.00	0.00	0.01	0.05	0.07	0.05	0.02	0.00
22	0.00	0.00	0.01	0.07	0.04	0.11	0.05	0.01	0.06
23	0.00	0.00	0.06	0.11	0.00	0.17	0.04	0.00	0.12
24	1.24	0.00	0.04	0.13	0.36	0.53	0.04	0.02	0.47
25	1.86	0.00	0.09	0.19	0.43	0.71	0.04	0.03	0.64
26	1.39	0.00	0.08	0.21	0.01	0.30	0.04	0.03	0.22
27	0.66	0.00	0.06	0.17	0.02	0.25	0.04	0.03	0.18
28	0.00	0.00	0.03	0.14	0.03	0.20	0.04	0.02	0.14
29	0.00	0.00	0.02	0.14	0.24	0.40	0.03	0.03	0.34
30	0.00	0.00	0.01	0.11	0.01	0.13	0.02	0.03	0.08
Total	20.24	1.85	5.11	3.99	4.35	14.91	1.48	0.74	12.70

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1970).

4 Calculated for Recharge Cell 4 using AZMET data (Marana Station)

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
MAY 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated Evaporation Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	1.21	0.00	0.39	0.29	0.05	0.72	0.05	0.03	0.64
2	1.86	0.00	0.74	0.48	0.34	1.56	0.06	0.04	1.47
3	1.86	0.59	0.29	0.32	0.07	1.27	0.06	0.03	1.17
4	0.54	0.09	0.16	0.22	0.08	0.55	0.07	0.04	0.43
5	0.00	0.02	0.26	0.23	0.27	0.78	0.06	0.03	0.69
6	0.00	0.00	0.29	0.16	0.10	0.54	0.04	0.02	0.48
7	0.00	0.00	0.22	0.17	0.05	0.44	0.05	0.02	0.37
8	1.29	0.49	0.16	0.18	0.23	1.05	0.07	0.01	0.97
9	1.86	0.45	0.44	0.34	0.37	1.49	0.07	0.04	1.38
10	1.86	0.17	0.27	0.23	0.17	0.85	0.07	0.03	0.74
11	0.54	0.10	0.20	0.07	0.15	0.52	0.07	0.03	0.41
12	0.00	0.12	0.15	0.19	0.27	0.73	0.07	0.03	0.63
13	0.00	0.10	0.14	0.16	0.09	0.49	0.04	0.03	0.41
14	0.00	0.04	0.10	0.14	0.15	0.43	0.04	0.03	0.36
15	1.34	0.33	0.43	0.12	0.20	1.08	0.07	0.02	0.99
16	1.86	0.23	0.57	0.09	0.44	1.34	0.07	0.04	1.23
17	1.86	0.14	1.13	0.09	0.12	1.48	0.07	0.03	1.39
18	0.85	0.12	0.12	0.07	0.15	0.46	0.06	0.03	0.37
19	0.00	0.13	0.16	0.04	0.20	0.52	0.06	0.03	0.44
20	0.00	0.24	0.14	0.02	0.16	0.56	0.06	0.03	0.47
21	0.00	0.42	0.19	0.01	0.20	0.82	0.06	0.03	0.73
22	1.28	0.48	0.18	0.00	0.29	0.94	0.06	0.05	0.83
23	1.86	0.25	0.16	0.00	0.47	0.88	0.06	0.03	0.78
24	0.54	0.00	0.00	0.00	0.00	0.00	0.06	0.04	-0.10
25	0.00	0.08	0.00	0.00	0.16	0.24	0.05	0.04	0.15
26	0.00	0.17	0.00	0.00	0.27	0.44	0.04	0.03	0.36
27	0.00	0.27	0.00	0.00	0.20	0.47	0.03	0.03	0.41
28	0.00	0.20	0.00	0.00	0.12	0.32	0.01	0.01	0.29
29	0.00	0.24	0.00	0.00	0.04	0.28	0.02	0.01	0.26
30	1.28	0.46	0.72	0.00	0.21	1.39	0.05	0.00	1.34
31	1.86	0.33	0.07	0.00	0.50	0.90	0.05	0.04	0.81
Total	23.72	6.25	7.68	3.51	6.11	23.54	1.74	0.89	20.91

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated for the equalization basin and Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1972)

4 Calculated for Recharge Cell 4 using AZMET data (Marana Station)

APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
JUNE 2006

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated EV Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	1.86	0.17	1.14	0.00	0.08	1.39	0.06	0.04	1.30
2	1.86	0.14	0.00	0.00	0.13	0.27	0.02	0.03	0.22
3	0.49	0.35	0.00	0.00	0.27	0.63	0.02	0.04	0.57
4	0.00	0.41	0.00	0.00	0.11	0.51	0.02	0.04	0.45
5	0.00	0.37	0.00	0.00	0.24	0.61	0.02	0.03	0.56
6	0.00	0.16	0.00	0.00	0.09	0.22	0.02	0.03	0.18
7	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	-0.04
8	1.08	0.33	0.19	0.00	0.14	0.67	0.05	0.01	0.60
9	1.86	0.41	0.29	0.00	0.34	1.04	0.06	0.04	0.94
10	0.45	0.00	0.25	0.00	0.10	0.35	0.04	0.04	0.27
11	0.00	0.00	0.25	0.00	0.26	0.51	0.04	0.04	0.43
12	0.00	0.00	0.24	0.00	0.10	0.33	0.04	0.04	0.26
13	1.24	0.00	0.37	0.58	0.07	1.02	0.04	0.01	0.97
14	1.86	0.00	0.28	0.90	0.01	1.19	0.08	0.00	1.13
15	0.53	0.00	0.37	0.01	0.00	0.39	0.06	0.00	0.33
16	0.00	0.00	0.25	0.04	0.00	0.30	0.06	0.00	0.24
17	0.00	0.00	0.21	0.16	0.00	0.37	0.06	0.00	0.31
18	0.00	0.00	0.20	0.20	0.00	0.40	0.06	0.00	0.34
19	1.26	0.00	0.18	0.68	0.00	0.86	0.06	0.00	0.80
20	0.79	0.00	0.17	0.13	0.00	0.30	0.06	0.00	0.24
21	0.00	0.00	0.14	0.19	0.00	0.34	0.05	0.00	0.28
22	0.00	0.00	0.13	0.17	0.00	0.30	0.05	0.00	0.24
23	0.00	0.00	0.10	0.19	0.00	0.29	0.05	0.00	0.24
24	0.00	0.00	0.07	0.13	0.00	0.21	0.04	0.00	0.17
25	0.00	0.00	0.05	0.04	0.00	0.09	0.02	0.00	0.07
26	0.00	0.00	0.05	0.00	0.00	0.05	0.01	0.00	0.04
27	1.13	0.00	0.14	1.05	0.00	1.19	0.03	0.00	1.17
28	1.86	0.00	0.19	0.73	0.00	0.92	0.03	0.00	0.89
29	0.51	0.00	0.04	0.06	0.00	0.04	0.03	0.00	0.01
30	0.00	0.00	0.04	0.05	0.00	0.08	0.03	0.00	0.05
Total	16.76	2.35	5.33	5.27	1.90	14.86	1.17	0.41	13.28

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated for the equalization basin and Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1970).

4 Calculated for Recharge Cell 4 using AZMET (Marana Station) data

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
JULY 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated Evaporation Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	0.00	0.12	0.00	0.07	0.00	0.20	0.04	0.00	0.16
2	0.00	0.25	0.01	0.08	0.00	0.34	0.04	0.00	0.30
3	0.00	0.10	0.00	0.19	0.00	0.30	0.04	0.00	0.26
4	0.00	0.07	0.00	0.23	0.00	0.30	0.03	0.00	0.26
5	0.00	0.01	0.00	0.26	0.00	0.27	0.03	0.00	0.24
6	0.00	0.07	0.00	0.24	0.00	0.32	0.03	0.00	0.29
7	0.00	0.01	0.00	0.18	0.00	0.19	0.02	0.00	0.17
8	0.00	0.01	0.00	0.18	0.00	0.19	0.02	0.00	0.17
9	0.61	0.04	0.00	0.14	0.00	0.19	0.02	0.00	0.17
10	0.00	0.05	0.00	0.08	0.00	0.12	0.01	0.00	0.12
11	0.00	0.04	0.00	0.02	0.00	0.07	0.00	0.00	0.06
12	0.00	0.05	0.00	0.00	0.00	0.05	0.00	0.00	0.05
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.61	0.62	0.02	1.70	0.00	2.54	0.29	0.00	2.25

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated for the equalization basin and Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1070)

4 Calculated for Recharge Cell 4 using AZMET data (Marana Station)

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
AUGUST 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated Evaporation Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated for the equalization basin and Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1975).

4 Calculated for Recharge Cell 4 using AZMET (Marana Station) data

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
SEPTEMBER 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow (AF)	Calculated Evaporation Volume (AF)	Calculated ET Volume (AF)	Net Recharge (AF)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated for the equalization basin and Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1970)

4 Calculated for Recharge Cell 4 using ADMET (Marana Station) data

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
OCTOBER 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated EV Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated for the equalization basin and Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1972).

4 Calculated for Recharge Cell 4 using AZMET data from the Tucson Station, modified for the Marana area.

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
NOVEMBER 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated Ev Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

- 1. Total inflow into the equalization basin
- 2. Total inflow into the recharge cells (1-4)
- 3. Calculated for the equalization basin and Recharge Cells 1-3 using the Cooley Method with "Maximum Curve" (1970)
- 4. Calculated for Recharge Cell 4 using AZMET (Marana Station) data

**APPENDIX A
MARANA HIGH PLAINS EFFLUENT RECHARGE PROJECT
MONTHLY ACCOUNTING REPORT
DECEMBER 2006**

1	2	3	4	5	6	7	8	9	10
Day	Project Inflow ¹ (AF)	Cell 1 Inflow (AF)	Cell 2 Inflow (AF)	Cell 3 Inflow (AF)	Cell 4 Inflow (AF)	Total Recharge Inflow ² (AF)	Calculated Evaporation Volume ³ (AF)	Calculated ET Volume ⁴ (AF)	Net Recharge (AF)
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	1.62	0.00	0.43	0.00	0.70	1.12	0.00	0.01	1.11
6	1.86	0.00	0.64	0.00	1.42	2.26	0.00	0.01	2.24
7	1.86	0.00	0.51	0.00	1.28	1.80	0.00	0.02	1.78
8	1.86	0.00	0.52	0.00	1.31	1.84	0.00	0.02	1.81
9	1.86	0.00	0.52	0.00	1.30	1.82	0.00	0.01	1.80
10	1.86	0.00	0.48	0.00	1.28	1.75	0.00	0.01	1.74
11	1.86	0.00	0.45	0.00	1.23	1.68	0.00	0.01	1.67
12	1.86	0.00	0.45	0.00	1.18	1.63	0.00	0.01	1.61
13	1.86	0.00	0.47	0.00	1.14	1.61	0.00	0.01	1.60
14	1.86	0.00	0.47	0.00	1.12	1.58	0.00	0.01	1.57
15	1.86	0.00	0.45	0.00	1.11	1.57	0.00	0.01	1.56
16	1.86	0.00	0.44	0.00	1.10	1.54	0.00	0.02	1.52
17	1.86	0.00	0.44	0.00	1.07	1.50	0.00	0.01	1.49
18	1.86	0.00	0.44	0.00	1.06	1.50	0.00	0.01	1.49
19	1.86	0.00	0.47	0.00	1.04	1.51	0.00	0.01	1.51
20	2.60	0.00	0.60	0.00	1.27	1.87	0.00	0.01	1.86
21	3.09	0.00	1.27	0.00	1.23	2.50	0.00	0.01	2.48
22	2.37	0.00	1.23	0.00	0.93	2.16	0.01	0.01	2.14
23	1.86	0.00	0.65	0.00	0.97	1.62	0.00	0.01	1.61
24	2.34	0.00	0.45	0.61	0.96	2.02	0.00	0.01	2.01
25	3.09	0.00	0.52	0.64	1.22	2.39	0.01	0.01	2.37
26	3.09	0.00	0.68	0.64	1.28	2.60	0.01	0.01	2.78
27	3.09	0.00	1.01	0.72	0.95	2.68	0.01	0.01	2.66
28	3.09	0.00	1.07	0.40	1.25	2.71	0.01	0.00	2.70
29	3.09	0.26	1.07	0.34	1.02	2.69	0.02	0.00	2.67
30	3.09	0.63	0.61	0.36	1.07	2.67	0.01	0.01	2.66
31	3.09	0.64	0.54	0.37	1.09	2.65	0.01	0.01	2.64
Total	61.52	1.53	17.28	4.09	30.58	53.48	0.12	0.29	53.07

1 Total inflow into the equalization basin

2 Total inflow into the recharge cells (1-4)

3 Calculated for the equalization basin and Recharge Cells 1-3 using the Corley Method with "Maximum Curve" (1979)

4 Calculated for Recharge Cell 4 using AZMET (Marana Station) data

APPENDIX B

ARIZONA DEPARTMENT OF WATER RESOURCES HYDROLOGY DIVISION

TECHNICAL BULLETIN

Justification for using the Cooley Method Maximum Curve as the standard method for calculating evaporation losses at open-air underground storage facilities.

The Hydrology Division recommends using the Cooley Method with the Maximum Curve when calculating evaporative losses for spreading basins. This recommendation was derived for the following reasons:

- The Cooley Method is very consistent, in that, the daily evaporation rates and adjustment factors are fixed and do not change over time. This allows for a very simplified calculation method that is identical from year to year.
- The Cooley method is easy to use and can be adopted by a wide range of permittees and facilities. Especially as it relates to the collecting, reporting, and reviewing of the data and calculations. This has proven to be a benefit for new facility operators and changes in personnel at the Department. This is an important factor to consider when taking into account a duration of twenty years or longer for some facilities.
- The consistency of the Cooley Method makes it easy for the Department to review and verify calculation parameters when reviewing a new application and/or determining long term storage credits.
- The Cooley Method can be used without the Department demanding extensive monitoring cost. The information required such as, wet/dry status of the basin(s) and the volume of water discharged are currently required in the USF permit for credit calculations and infiltration calculations.
- The Cooley Method unlike other empirical methods was designed specifically for Arizona.
- Other methods of determining evaporation can be very accurate, however, they are relatively expensive, requiring intensive measurements and calculation efforts to obtain evaporation values. In Hydrology's experience the difference between these methods and Cooley is negligible. This is especially true given the relatively small ratio of evaporation to the total amount of water recharged.
- The daily evaporation rates and adjustment factors, determined by Cooley, are used by the Arizona Department of Environmental Quality (ADEQ Engineering Bulletin No. 17). Thus, having consistency between state agencies.

Justification for Using the Maximum Curve of the Cooley Method

- Using the maximum evaporation rate calculates evaporative loss less than the Class A pan evaporation data and greater than the normal evaporation curve. This produces a value that assures that all losses have been accounted for when calculating annual storage credits but is not over conservative.
- Class A pan data was one of the three sources used in preparing the Cooley Method. The corrections used in Class A pan calculations were calibrated to open water surfaces, considerably deeper than the average spreading basin. These deep open water bodies contain cooler water upwelling toward the surface causing a decrease in the evaporation rate. The spreading basins used in current recharge operations typically contain very shallow water (2 to 3 feet) that heats up fairly rapidly, thus increasing evaporative losses. Therefore, using the evaporation values calibrated for open water conditions would underestimate the evaporative losses in a spreading basin. The maximum evaporation rate more accurately estimates the evaporative losses for the conditions present at shallow recharge basins.
- Evaporation caused by the "wicking effect" may continue during dry cycles even when the basin does not contain standing water. The "wicking effect" process consists of water moving upward toward the surface due to the drying and heating of the ground above. This factor is not taken into account when using the normal values of evaporation, but is compensated for when using the maximum evaporation rate in calculations.

Attachments:

Evaporation from Open Water Surfaces in Arizona, K.R. Cooley, 1973

EVAPORATION FROM OPEN WATER SURFACES IN ARIZONA

Earl E. Cooley
Research Hydrologist

U. S. Water Conservation Laboratory, Salt and Water Conservation Research Station, Agricultural Research Service, U. S. Department of Agriculture

Most people know that a considerable amount of water is lost by evaporation from open water surfaces in Arizona. However, they are amazed that, from a tank tank containing water 2 feet deep, the loss by evaporation in a year's time could be as much as 2 feet, leaving only one foot for livestock. On the other hand, declines in water level of 2 or 4 inches per day from salt ponds and swimming pools cannot be due entirely to evaporation.

Using the method outlined in this folder, the type of water, former, weather, conditions, or conditions can estimate the amount of evaporation expected from an open, saltwater water surface during any part of the year and for any location in Arizona. Results will generally be within 10 percent of actual evaporation in an annual total.

How to Estimate Evaporation

Estimate of evaporation comes in three steps:

1. Select the average daily or average monthly evaporation for the period in question from Figure 1. For daily evaporation, choose one of the three curves, depending on whether you want maximum, normal, or minimum expected evaporation.

Values of average normal evaporation are shown in the bar graph at inches per month.

Use the curve representing normal evaporation for an estimate of expected evaporation under average conditions. However, for unusually hot windy periods, or cold cloudy periods, the curves representing maximum and minimum evaporation, respectively, will give a better estimate. The curves of maximum and minimum evaporation may also be of value when considering the possible range of average losses from water storage facilities.

2. Determine an adjustment factor from Figure 2 for the location in question. Read from the map the factor nearest the location in which you are interested.

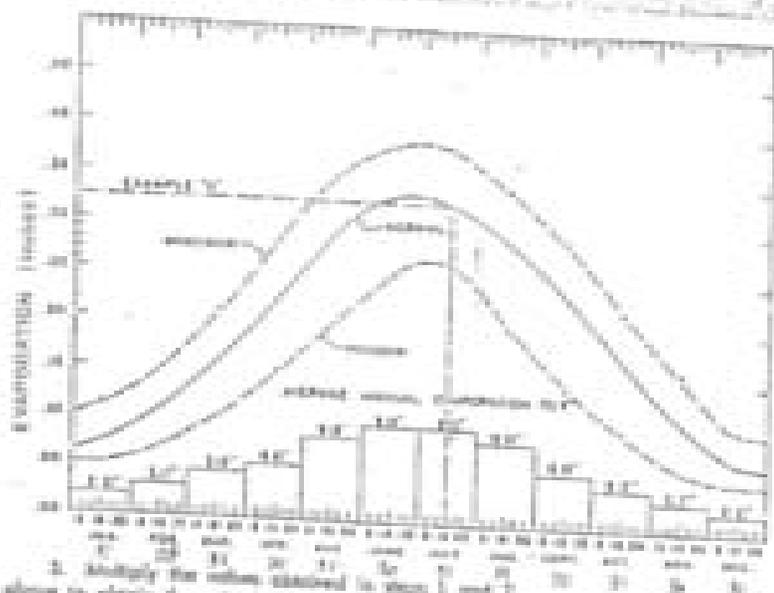


FIGURE 1. Maximum, Normal, and Minimum Daily Evaporation and Average Monthly Evaporation from Open Water Surfaces (Normal Year in 1955)

3. Multiply the value obtained in Step 1 and 2 above to obtain the estimated evaporation for the day and location in question.

For facilities with exposed walls, such as above-ground steel tanks and exposed-end swimming pools, multiply the value obtained in step 3 above by 1.25, which is an average coefficient for the same case for all types of exposed-end structures.

A. **Worked Example:** Average daily normal evaporation from a swimming pool in Tucson during July.

Step 1. From Figure 1, average evaporation for July is 0.22 inches/day.

Step 2. From Figure 2, adjustment factor is 0.95.

Step 3. Multiply values obtained in steps 1 and 2 above: $0.22 \times 0.95 = 0.21$ inches/day is average daily evaporation during July in Tucson.

B. **Worked Example:** Average normal evaporation from a salt pond in Phoenix during May and June.

Step 1. From Figure 1, average evaporation for May and June is 0.25 and 0.22 inches, respectively.

Step 2. Adjustment factor from Figure 2 for Phoenix is 1.0.

See over



FIGURE 2. Evaporation Adjustment Factors for Arizona

Step 2. Multiply values obtained in steps 1 and 2 above $0.92 \times 1.02 = .939$ or 0.94 or approximately 94 inches or total average evaporation for May and June.

C. Wanted: Maximum evaporation to be expected from a stock pond near Tempeville during May, June, and July.

Step 1. From the curve of maximum values in Figure 1, values for May, June, and July are: 0.28, 0.26, and 0.26 (inches), respectively.

Step 2. From Figure 2, adjustment factor for Tempeville is 0.92.

Step 3. Multiply values obtained in steps 1 and 2 above times the number of days in each month.

$$\text{May: } 0.28 \times 31 \times 0.92 = 8.1$$

$$\text{June: } 0.26 \times 30 \times 0.92 = 7.1$$

$$\text{July: } 0.26 \times 31 \times 0.92 = 7.4$$

Total: 22.6 inches
Maximum evaporation expected from a stock pond near Tempeville during May, June, and July is approximately 23 inches.

D. Wanted: Average normal evaporation from an exposed-well swimming pool near Tempe during June.

Step 1. From Figure 1, average evaporation for June is 7.9 inches.

Step 2. From Figure 2, adjustment factor for Tempe is 1.02.

Step 3. Multiply values obtained in steps 1 and 2 above.

$$7.9 \times 1.02 = 8.06$$

Step 4. Multiply by the coefficient for exposed-well average (0.87), 1.25.
 $8.06 \times 1.25 = 10.08$ inches or average evaporation from an exposed-well swimming pool at Tempe during June.

Acknowledgment

Data used in preparing this paper were obtained from three sources: (1) records of evaporation from surface included evaporation pans at the U. S. Water Conservation Laboratory near Phoenix, Arizona, for the years 1938-1942; (2) records of evaporation from a Class A evaporation pan at the University of Arizona Arid Experiment Farm for the years 1947-1957; and (3) evaporation maps of the United States based on 1946-1951 data.

Special acknowledgment is made to Dr. Paul C. Engstrom, U. S. Weather Bureau Climatologist, for supplying records of evaporation recorded at the Arid Experiment Farm.

EVAPORATION FROM OPEN WATER SURFACES IN ARIZONA

TABLE III

Agricultural Experiment Station
and
Cooperative Extension Service
The University of Arizona

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20, 1958, in cooperation with the U. S. Department of
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The University of Arizona College of Agriculture, Tucson.

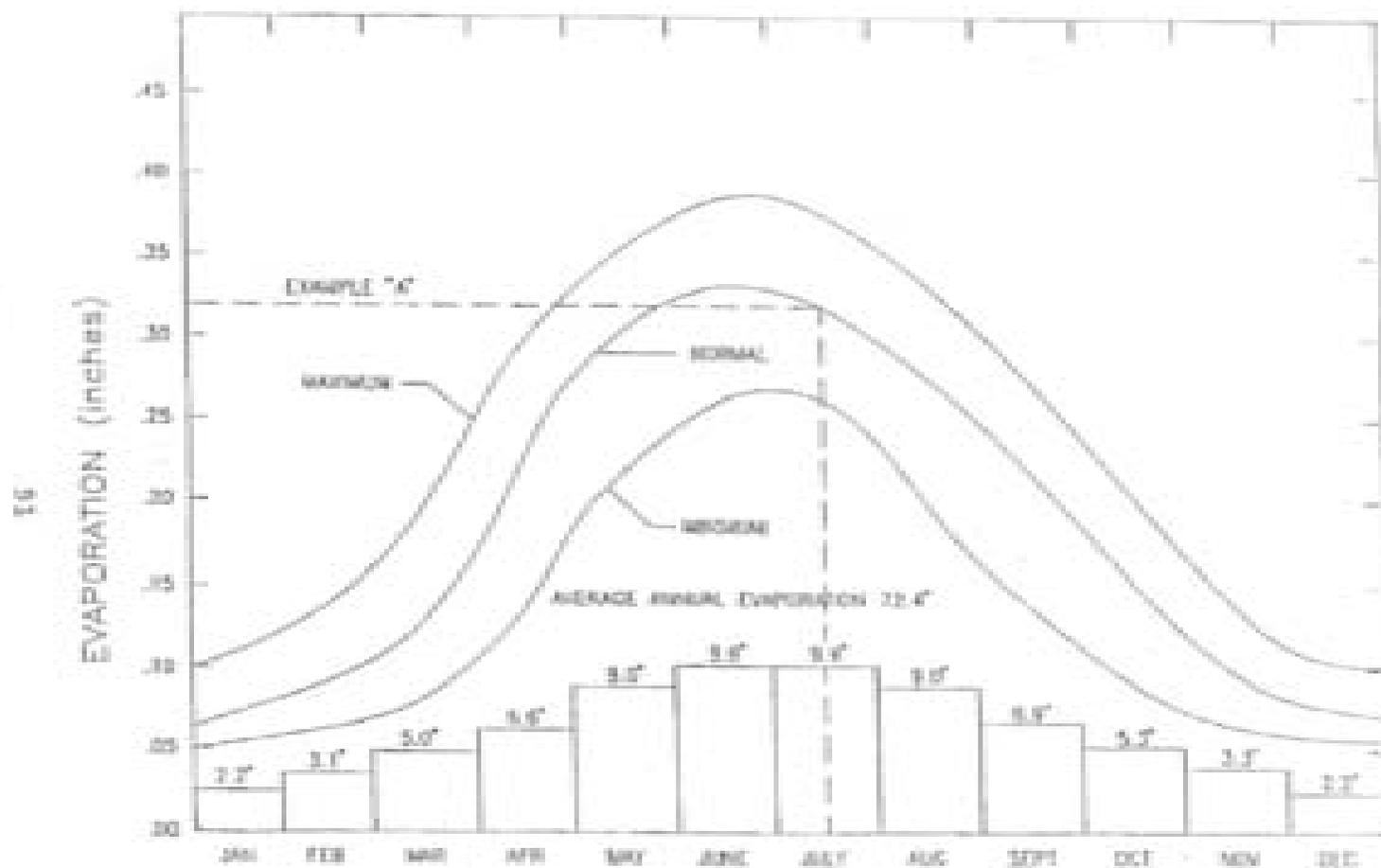


FIGURE 9. MAXIMUM, NORMAL AND MINIMUM DAILY EVAPORATION AND AVERAGE MONTHLY EVAPORATION FROM OPEN WATER SURFACES (Adjustment Factor = 1.00)

TABLE 3.2 MONTHLY MAXIMUM, NORMAL, AND MINIMUM OPEN WATER EVAPORATION AMOUNTS FOR ARIZONA (UNADJUSTED)

MONTH	EVAPORATION (IN)		
	MAXIMUM	NORMAL	MINIMUM
Jan (31 days)	3.6	2.2	1.6
Feb (28)	4.5	3.1	2.3
Mar (31)	6.5	5.0	3.1
April (30)	8.4	6.6	4.5
May (31)	10.9	9.0	6.2
June (30)	11.4	9.9	7.5
July (31)	11.8	9.9	8.1
August (31)	10.5	9.0	6.0
Sept (30)	8.7	6.9	4.1
Oct (31)	7.0	5.3	2.8
Nov (30)	4.8	3.3	1.8
Dec (31)	2.1	2.2	1.5
TOTAL	91.2 (7.6 ft.)	72.4 (6.0 ft.)	49.6 (4.1 ft.)

From Cooley, 1970

APPENDIX C

AZMET COMPUTATION OF REFERENCE CROP EVAPOTRANSPIRATION

Paul W. Brown
Extension Specialist, Biometeorology
University of Arizona

INTRODUCTION

The Arizona Meteorological Network (AZMET) calculates reference crop evapotranspiration (ET_o) using a modification of the Penman Equation developed for the California Irrigation Management Information System (CIMIS) by Snyder and Pruitt (1985). Reference crop evapotranspiration computed using this procedure provides an estimate of ET by a cool season grass, 8-15 cm in height, that completely covers the soil surface and is well watered. A detailed discussion of computational procedures employed by AZMET are provided in the paragraphs below.

ET_o COMPUTATIONAL PROCEDURE

The CIMIS Penman Equation was developed for use with hourly weather data. Required input data for the ET_o computation include hourly means of air temperature (T_a; units of degrees C), vapor pressure deficit (VPD; units of kilopascals: kPa), wind speed (U₂; units of m/s), and net radiation (R_n; units of mm/hr of equivalent evaporation). Hourly values of ET_o (ET_{oh}) in mm/hr are computed using the following:

$$ET_{oh} = W \cdot R_n + (1-W) \cdot VPD \cdot FU_2 \quad (1)$$

where W is a dimensionless partitioning factor, and FU₂ is an empirical wind function (units: mm/hr/kPa). Daily values of ET_o are computed by simply summing the twenty-four hourly ET_{oh} values computed from Eq. 1 for the period ending at midnight (end of AZMET day). Specific computational procedures used to obtain the required parameters for Eq. 1 are provided below.

Net Radiation (R_n)

CIMIS originally measured R_n using instruments known as net radiometers. CIMIS abandoned the use of net radiometers in the early 1990s for a variety of reasons. AZMET chose not use net radiometers and has computed hourly net radiation since network inception (1986) using a simple, clear sky estimation procedure that uses solar radiation (SR) expressed in units of MJ/m²/m²/hr and mean hourly vapor pressure (e_a; units: kPa). The procedure is provided below:

For Daytime Conditions ($SR > 0.21$ MJ/m²m/hr):

$$R_{no} = 277.8 * (-0.3 + 0.767 * SR) \quad (2)$$

For Nighttime Conditions ($SR < 0.21$ MJ/m²m/hr):

$$R_{no} = 277.8 * (-0.17 + 0.767 * SR + 0.056 * ea) \quad (3)$$

where the constant 277.8 converts the units of R_{no} from MJ/m²m/hr to W/m²m.

Vapor pressure (ea) is computed by subtracting VPD from the saturation vapor pressure (es):

$$ea = es - VPD \quad (4)$$

where es is computed using the following:

$$es = 0.6108 * \exp((17.27 * Ta) / (Ta + 237.2)) \quad (5)$$

It is important to note that this simple computational procedure for R_n works well in Arizona because: 1) the vast majority of the days are clear and 2) vapor pressure is reasonably constant throughout much of the year. Use of this R_n estimation procedure in regions with abundant cloudiness and high humidity is not recommended.

The R_{no} computed from Equations 2 and 3 is in units of W/m²m. Equation 1 requires net radiation in units of mm of equivalent water evaporation (R_n). This conversion of units is accomplished by dividing R_{no} in W/m²m by the latent heat of vaporization as follows:

$$R_n = R_{no} / (694.5 * (1 - 0.000946 * Ta)) \quad (6)$$

where T_a is the mean hourly air temperature.

Partitioning Factor (W)

The partitioning factor, W , is computed using Equation 7:

$$W = S / (S + G) \quad (7)$$

where S is the slope of the saturation vapor pressure curve at T_a and G is the psychrometer constant.

The value of S in units of kPa/C is computed using the following:

$$S = e_s'(1597.4 - 0.571 \cdot T_a) / (0.1103 \cdot (T_a + 273.16)^2) \quad (8)$$

where e_s is the saturation vapor pressure at T_a .

The psychrometer constant, G , is computed using the following:

$$G = 0.000646 \cdot P \cdot (1 + 0.000949 \cdot T_a) \quad (9)$$

where P is atmospheric station pressure in units of kPa.

For computation of ET_o , P is considered a constant and computed from elevation above sea level.

Vapor Pressure Deficit (VPD)

Vapor pressure deficit is computed by AZMET dataloggers and therefore no computation is required to obtain VPD. The AZMET datalogger computes VPD by 1) computing the saturation vapor pressure (e_s) from air temperature, 2) multiplying e_s by the relative humidity fraction to obtain actual vapor pressure (e_a), and 3) subtracting e_a from e_s to obtain VPD. The hourly VPD value used in the ET_o computation is the mean of 360 individual VPD computations (dataloggers scan sensors and make computations every 10 seconds).

Wind Function (FU2)

Two wind functions (FU2; units mm/hr/kPa) are used to compute ET_o – one for daytime conditions ($R_n > 0$) and one for nighttime conditions ($R_n \leq 0$). These wind functions are as follows:

Daytime; $R_n > 0$

$$FU2 = 0.03 + 0.0576 \cdot U2 \quad (10)$$

Nighttime: $R_n = 0$

$$EU2 = 0.125 + 0.0439 * U2 \quad (11)$$

where $U2$ is the mean hourly wind speed obtained at a height of 2 m in units of m/s. AZMET measures wind speed at a height of 3m ($U3$); thus AZMET wind speeds are adjusted using:

$$U2 = 0.93 * U3 \quad (12)$$

where the constant 0.93 is derived from the standard power law equations that predict the variation of wind speed with height.

AZMET vs. CIMIS ETo

Both AZMET and CIMIS provide ETo data for locations along the Colorado River for use in on-farm water management and to aid in overall management of the Colorado River. It is therefore important that AZMET and CIMIS compute ETo in a similar manner. Both CIMIS and AZMET use the same basic procedure for estimating ETo from hourly weather data. The only significant difference between AZMET and CIMIS ETo procedures rests with the computation of R_n -- an important parameter in the ETo computation. AZMET uses a relatively simple clear sky procedure for estimating R_n . This procedure compares well with R_n measured with net radiometers. CIMIS originally used net radiometers to measure R_n ; however, CIMIS abandoned measurement of R_n in the early 1990s and now uses an hourly R_n estimation procedure based on the work of Dong et al. (1992). A direct comparison of AZMET and the current CIMIS R_n procedures is nearing completion and should be available in written form by June 1998. Completion of this work will determine how much difference (if any) we can expect between AZMET ETo and CIMIS ETo.

REFERENCES

- A. Dong, S.R. Grattan, J.J. Carroll and C.R.K. Prasher, 1992. Estimation of daytime net radiation over well-watered grass. *J. Irr. & Drain. Eng.* 118(3): 466-478. ASCE.
- Snyder, R. and W. Pruitt, 1985. Estimating reference evapotranspiration with hourly data. In R. Snyder et al. (ed.) *California Irrigation Management Information System Final Report, June 1985, Vol. 1, Land, Air and Water Resources Paper #10013-A*. Univ. of California-Davis, Chpt. VII.
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APPENDIX D



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Monday, February 13, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX: (520) 205-8360

RE: MHP-ERM/Monthly

Order No.: 06010193

Dear David Scalero:

Aerotech Environmental received 2 sample(s) on 1/30/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

for

Korky Vault

Service Center Manager



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental

Date: 11-Feb-06

CLIENT: Pima County Flood Control
Project: MSP-ERM Monthly
Lab Order: 06010193

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06010193-01C	Source Water		1/30/2006 10:33:00 AM	1/30/2006
06010193-02C	HP-1		1/30/2006 12:23:00 PM	1/30/2006



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental

Date: 13-Feb-06

CLIENT: Pima County Flood Control
Project: MHP-ERM/Monthly
Lab Order: 06010193

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.

Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.

40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.

NIOSH Manual of Analytical Methods, Fourth Edition, 1994.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610 and AEL-Tucson holds Arizona certification no. AZ0609.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.



Aerotech Environmental Laboratories

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Aerotech Environmental

Analytical Report

Date: 11-Feb-06

CLIENT: Pima County Flood Control
 Lab Order: 06010193
 Project: MDP-ERM-Monthly
 Lab ID: 06010193-01C

Client Sample ID: Source Water
 Tag Number:
 Collection Date: 1/30/2006 10:33:00 AM
 Matrix: WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate-Nitrite Total	1.7	0.40		mg/L	1	2/8/2006 12:32:00 AM Analyst: D N
NITROGEN, TOTAL KJELDAHL AS N						
Nitrogen, Total Kjeldahl	34	1.3		mg/L	1	2/8/2006 Analyst: AT
NITROGEN, TOTAL						
Nitrogen, Total	35.7	1.7		mg/L	1	2/8/2006 Analyst: AC

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Kennesaw Laboratory

Page 1 of 2

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



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Aerotech Environmental

Analytical Report

Date: 11-Feb-06

CLIENT:	Pima County Flood Control	Client Sample ID:	10-1
Lab Order:	06010193	Tag Number:	
Project:	MDD-ESRM/Monthly	Collection Date:	1/30/2006 12:23:00 PM
Lab ID:	06010193-02C	Matrix:	DRINKING WATER

Analyses	Result	Limit	Qual	Units	DP	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY Nitrogen, Nitrate/Nitrite Total	2.8	E300		mg/L	1	2/6/2006 12:28:00 AM Analyst: D N
NITROGEN, TOTAL KJELDAHL AS N Nitrogen, Total Kjeldahl	2.0	E351.4		mg/L	1	2/6/2006 Analyst: AT
NITROGEN, TOTAL Nitrogen, Total	4.8	CALC		mg/L	1	2/6/2006 Analyst: AC

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Keweenaw Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.

Page 7 of 2



Aerotech Environmental Laboratories

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Aerotech Environmental

13-Feb-06

Lab Order: 06010193
Client: Pima County Flood Control
Project: MDP-ESOM/Monthly

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	DCLP Date	Prog Date	Analysis Date
06010193-01C	Storm Water	1/30/06 10:30:00 AM	Waste Water	AR0001 by JCM CHROMATOGRAPHY TOTAL KILGDALS NITROGEN Total Nitrogen (Calculated)			1/30/06 12:22:00 AM 1/30/06 1/30/06
06010193-02C	SP-1	1/30/06 11:21:00 AM	Drinking Water	AR0001 by JCM CHROMATOGRAPHY TOTAL KILGDALS NITROGEN Total Nitrogen (Calculated)			1/30/06 12:59:00 AM 1/30/06 1/30/06



Aerotech Environmental Laboratories

a division of Ametek Laboratories, Inc.

Aerotech Environmental

Date: 12/16/06

CLIENT: Pima County Flood Control

Work Order: 06010191

Project: MSP-ERM-Monrby

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W

Sample ID: MS-070006	Sample Type: WBLK	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 70006						
Client ID:	Batch ID: 070006	TestNo: E000		Analysis Date: 07/20/06	SeqNo: E04871						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Tot	0.40	0.40									

Sample ID: LCS-070006	Sample Type: LCS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 70006						
Client ID:	Batch ID: 070006	TestNo: E000		Analysis Date: 07/20/06	SeqNo: E04871						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Tot	1.570	0.40	0	0	54.8	0	110				

Sample ID: LCS0-070006	Sample Type: LCS0	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 70006						
Client ID:	Batch ID: 070006	TestNo: E000		Analysis Date: 08/20/06	SeqNo: E04871						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Tot	1.050	0.40	0	0	26.2	0	110	1.070	1.78	20	

Sample ID: 06010714-070006	Sample Type: MS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 70006						
Client ID:	Batch ID: 070006	TestNo: E000		Analysis Date: 08/20/06	SeqNo: E04881						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Tot	37.40	1.0	40	0	33.5	0	120				

Sample ID: 06010714-070006	Sample Type: MS0	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 70006						
Client ID:	Batch ID: 070006	TestNo: E000		Analysis Date: 08/20/06	SeqNo: E04882						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Tot	37.20	1.0	40	0	33.0	0	120	37.40	1.096	20	

- | | | | |
|---------|-------------------------------------|---|--|
| Q=Blank | 1. Value above qualitative range | 3. Blanking error in preparation or analysis recorded | 4. Analyte detected below qualitative limit |
| ND | Not Detected within Reporting Limit | 5. RPO outside accepted recovery limits | 6. Spike Recovery outside accepted recovery limits |

Page 1 of 2

■ Main Laboratory: 490 E. Camel Center Boulevard, Building 3, Suite 100 Phoenix, AZ 85040 Phone: 602.437.2340 Toll Free: 866.772.5207 Fax: 602.443.8192 www.aerotechlabs.com

■ Tucson Facility: 4425 S. Park Ave., Ste. 110 Tucson, AZ 85714 Phone: 520.807.3801 Fax: 520.807.3802

■ Corporate Address: 1507 W. Kinross Drive, Phoenix, Arizona 85027 Phone: 602.792.4900 Toll Free: 800.681.4802 Fax: 602.792.7899 www.aerotechlabs.com



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06010173
Project: MSP-EPDM Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: LCS-R00000	CompType: MSLK	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 00000						
Client ID:	Batch ID: R00000	Technic: E0014		Analysis Date: 28/000	SeqNo: 00004						
Analyte	Result	PQL	SPK value	SPK Ref Val	WREC	LowLimit	HighLimit	RPC Ref Val	NRPC	RPQLimit	Qual

Nitrogen, Total Kjeldahl	<1.3	1.3									
--------------------------	------	-----	--	--	--	--	--	--	--	--	--

Sample ID: LCS-R00001	CompType: LCS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 00001						
Client ID:	Batch ID: R00000	Technic: E0014		Analysis Date: 28/000	SeqNo: 00005						
Analyte	Result	PQL	SPK value	SPK Ref Val	WREC	LowLimit	HighLimit	RPC Ref Val	NRPC	RPQLimit	Qual

Nitrogen, Total Kjeldahl	27.88	1.3	25	0	111	85	115				
--------------------------	-------	-----	----	---	-----	----	-----	--	--	--	--

Sample ID: LCS0-R00001	CompType: LCS0	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 00001						
Client ID:	Batch ID: R00000	Technic: E0014		Analysis Date: 28/000	SeqNo: 00001						
Analyte	Result	PQL	SPK value	SPK Ref Val	WREC	LowLimit	HighLimit	RPC Ref Val	NRPC	RPQLimit	Qual

Nitrogen, Total Kjeldahl	25.83	1.3	25	0	103	85	115	27.88	7.01	20	
--------------------------	-------	-----	----	---	-----	----	-----	-------	------	----	--

Sample ID: 06010173-01000	CompType: MS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 00001						
Client ID:	Batch ID: R00000	Technic: E0014		Analysis Date: 28/000	SeqNo: 00001						
Analyte	Result	PQL	SPK value	SPK Ref Val	WREC	LowLimit	HighLimit	RPC Ref Val	NRPC	RPQLimit	Qual

Nitrogen, Total Kjeldahl	26.75	1.3	25	0	107	79	130				
--------------------------	-------	-----	----	---	-----	----	-----	--	--	--	--

Sample ID: 06010173-02000	CompType: MS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 00001						
Client ID:	Batch ID: R00000	Technic: E0014		Analysis Date: 28/000	SeqNo: 00001						
Analyte	Result	PQL	SPK value	SPK Ref Val	WREC	LowLimit	HighLimit	RPC Ref Val	NRPC	RPQLimit	Qual

Nitrogen, Total Kjeldahl	23.02	1.3	25	1.325	95.8	79	130				
--------------------------	-------	-----	----	-------	------	----	-----	--	--	--	--

Qualifiers: 1. Value above specification range 2. Holding time for preparation or analysis exceeded 3. Analyte below/above specification limits
 ND: Not Detected at the Reporting Limit 4. ETO waste exceeded recovery limits 5. Spike Recovery waste exceeded recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06000093
Project: MSP-ERM-Moody

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: 0601940-41CM50	SampType: MS0	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 8898						
Client ID:	Batch ID: 88988	TestNo: E0814		Analysis Date: 2/6/2008	SeqNo: 81150						
Analyte	Result	PQL	SPC value	SPC Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	25.00	1.3	25	0	104	10	100	25.75	1.94	20	

Sample ID: 0601940-41CM50	SampType: MS0	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 8898						
Client ID:	Batch ID: 88988	TestNo: E0814		Analysis Date: 2/6/2008	SeqNo: 80298						
Analyte	Result	PQL	SPC value	SPC Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	25.95	1.3	25	1.375	92.5	10	100	25.75	1.94	20	

Qualifiers: E: Tolerate above specification range B: Holding time for preparation or analysis exceeded J: Analyte detected below specification limits
 CO: Not Detected at the Reporting Limit S: SPO exceeds acceptance/recovery limits R: Spike Recovery outside accepted recovery limits

Laboratory Number: <u>06090193</u>	Checklist completed by: <u>[Signature]</u>
Client Name: <u>Pima County Flood Control District</u>	Signature Date: <u>1/30/06</u>
Matrix: <u>NH/DW</u> Center Name: <u>Chert</u>	Date/Time Rec'd: <u>1/30/06 1340</u> By: <u>[Signature]</u>

Temperature of Samples? 9.7 °C Circle one: Blue Ice Wet Ice Not Present

	Yes	No	Not Present	Soil Containers:
Shipping container/cooler in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Beeswax _____
Custody seals intact on shipping container/cooler?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Glass Jar _____
Custody seals intact on sample containers?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Methanol _____
Chain of Custody present and relinquished/received properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plastic Bag _____
Chain of Custody agrees with sample labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Excess Samples _____
Samples in proper containers/bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sample containers intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
All samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	*See Comment about Chlorine and pH
Is there sufficient sample volume to perform the tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
40mL vials for volatiles & SOCs received with zero headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A

Total number of bottles received: 2 pH sample media: _____

If applicable, how many sample bottles were shipped from AEL-Tucson? 2 N/A

Number of containers received by preservative and by sample number. (If more than 15 samples are rec'd, please continue on separate sheet(s))

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General															
B-HNO3															
C-H2SO4															
D-HCl															
E-acetic															
F-NaOH															
G-Sulfide															
H-Hg Sulfide															
I-MCAA															
J-Methanol															
K-HAA															
L-Other															

Water pH acceptable upon receipt? Yes No N/A

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and receipt ID, number
Metals <2		
Nutrients <2	<u>12</u>	
Total Phosph <2		
413 (O&O) <2		
418 (TPH) <2		
Cyanide >12		
Sulfide >9		

*Any No response must be detailed in the comments section below. Contact the PM immediately to determine how to proceed. Refer to SOP 11-001.04, Section 1.8.4. Continue on back if additional space is needed.

**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments:

Corrective Action:



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Thursday, March 09, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX: (520) 205-8360

RE: MHP-ERP/Monthly-Qrtly

Order No.: 06020155

Dear David Scalero:

Aerotech Environmental received 3 sample(s) on 2/27/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Korky Vault
Service Center Manager



Aerotech Environmental Laboratories

A Division of Aerotech Laboratories, Inc.

Aerotech Environmental

Date: 09-Mar-06

CLIENT: Pima County Flood Control
Project: MHP-ERP/Monthly-Only
Lab Order: 06020155

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06020155-01B	Source Water		3/27/2006 10:05:00 AM	3/27/2006
06020155-01C	Source Water		3/27/2006 10:05:00 AM	3/27/2006
06020155-01D	Source Water		3/27/2006 10:05:00 AM	3/27/2006
06020155-02B	HP-1		3/27/2006 2:10:00 PM	3/27/2006
06020155-02C	HP-1		3/27/2006 2:10:00 PM	3/27/2006
06020155-02D	HP-1		3/27/2006 2:10:00 PM	3/27/2006
06020155-03D	Trip Blank		3/27/2006	3/27/2006



Aerotech Environmental Laboratories

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Aerotech Environmental

Date: 09-Mar-06

CLIENT: Pima County Flood Control
Project: MWP-ERP/Monthly-Qtrly
Lab Order: 06020153

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.

Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.

40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.

NIOSH Manual of Analytical Methods, Fourth Edition, 1994.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610 and AEL-Tucson holds Arizona certification no. AZ0609.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.

Data Qualifiers:

Listed below are the data qualifiers used in your analytical report to explain any analytical or quality control issues. You will find them noted in your report under the column header "QUAL". Any quality control deficiencies that cannot be adequately described by these qualifiers will be addressed in the analytical comments section of this case narrative.

L1 The associated blank spike recovery was above laboratory acceptance limits.

M6 Matrix spike recovery was high. Data reported per ADEQ policy 0154.00.

M7 Matrix spike recovery was low. Data reported per ADEQ policy 0154.000.



Aerotech Environmental Laboratories

a division of Almetech Laboratories, Inc.

CLIENT: Pima County Flood Control
Project: MHP-ERP/Monthly-Qtly
Lab Order: 06020155

CASE NARRATIVE

V1 CCV recovery was above method acceptance limits. This target analyte was not detected in the sample.

Method 300.0

The sample selected as the duplicate and matrix spike contained high concentrations of chloride and/or sulfate. The analyte concentration in the sample is disproportionate to the spike level and it was not practical to analyze the sample at a dilution, as the spike would be diluted out. The LCS/LCSD were recovered acceptably demonstrating that the analytical process was in control.



Aerotech Environmental Laboratories

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Aerotech Environmental

Analytical Report

Date: 09-Mar-06

CLIENT: Pima County Flood Control	Client Sample ID: Source Water
Lab Order: 06020155	Tag Number:
Project: MBP-ERP/Monthly-Qrly	Collection Date: 3/27/2006 10:05:00 AM
Lab ID: 06020155-01B	Matrix: WASTE WATER

Analysis	Result	Limit	Qual	Units	DF	Date Analyzed
ICPMS METALS, TOTAL RECOVERABLE		E200.8				Analyst: TD
Antimony	< 0.0030	0.0030		mg/L	1	3/1/2006 3:31:23 PM
Arsenic	0.0037	0.0010		mg/L	1	3/1/2006 3:31:23 PM
Barium	0.058	0.0010		mg/L	1	3/1/2006 3:31:23 PM
Beryllium	< 0.0010	0.0010	VI	mg/L	1	3/1/2006 3:31:23 PM
Cadmium	< 0.0010	0.0010		mg/L	1	3/1/2006 3:31:23 PM
Chromium	0.0018	0.0010		mg/L	1	3/1/2006 3:31:23 PM
Cobalt	0.0012	0.0010		mg/L	1	3/1/2006 3:31:23 PM
Nickel	0.0036	0.0010		mg/L	1	3/1/2006 3:31:23 PM
Selenium	< 0.0020	0.0020		mg/L	1	3/1/2006 3:31:23 PM
Thallium	< 0.0010	0.0010		mg/L	1	3/1/2006 3:31:23 PM
MERCURY, TOTAL		E245.1				Analyst: PC
Mercury	< 0.00020	0.00020		mg/L	1	3/1/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Knudsen Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

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Aerotech Environmental

Analytical Report

Date: 09-Mar-06

CLIENT:	Pima County Flood Control	Client Sample ID:	Source Water
Lab Order:	06020155	Tag Number:	
Project:	MSP-ERP/Monthly-Qtrly	Collection Date:	2/27/2006 10:05:00 AM
Lab ID:	06020155-01C	Matrix:	WASTE WATER

Analytes	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate/Nitrite Total	1.0	0.40		mg/L	1	Analyst: LB 3/3/2006 6:23:00 PM
NITROGEN, TOTAL, KJELDAHL AS N						
Nitrogen, Total Kjeldahl	38	E351.4		mg/L	1	Analyst: AT 3/3/2006 12:15:00 PM
NITROGEN, TOTAL						
Nitrogen, Total	39.0	CALC		mg/L	1	Analyst: AC 3/3/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Knudsen Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.

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Aerotech Environmental

Analytical Report

Date: 09-Mar-06

CLIENT: Pima County Flood Control
Lab Order: 06020155
Project: MHP-ERP/Monthly-Grly
Lab ID: 06020155-01D

Client Sample ID: Source Water
Tag Number:
Collection Date: 3/27/2006 10:05:00 AM
Matrix: WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B		Analyst: SP		
1,1,1-Trichloroethane	< 1.0	1.0		ug/L	1	3/2/2006
1,1,2-Trichloroethane	< 1.0	1.0		ug/L	1	3/2/2006
1,1-Dichloroethane	< 1.0	1.0		ug/L	1	3/2/2006
1,2-Dichloroethane	< 1.0	1.0		ug/L	1	3/2/2006
1,2-Dichloroethane	< 1.0	1.0		ug/L	1	3/2/2006
1,2-Dichloropropane	< 1.0	1.0		ug/L	1	3/2/2006
1,4-Dichlorobenzene	< 1.0	1.0		ug/L	1	3/2/2006
Benzene	< 1.0	1.0		ug/L	1	3/2/2006
Carbon tetrachloride	< 1.0	1.0		ug/L	1	3/2/2006
Chlorobenzene	< 1.0	1.0		ug/L	1	3/2/2006
o,p-1,2-Dichloroethene	< 1.0	1.0		ug/L	1	3/2/2006
Ethylbenzene	< 1.0	1.0		ug/L	1	3/2/2006
Styrene	< 1.0	1.0		ug/L	1	3/2/2006
Trans-1,2-Dichloroethene	< 1.0	1.0		ug/L	1	3/2/2006
Toluene	< 1.0	1.0	L1	ug/L	1	3/2/2006
trans-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	3/2/2006
Trichloroethene	< 1.0	1.0		ug/L	1	3/2/2006
Trichloroethanes, Total	< 1.0	1.0		ug/L	1	3/2/2006
Vinyl chloride	< 1.0	1.0		ug/L	1	3/2/2006
Xylenes, Total	< 2.0	2.0		ug/L	1	3/2/2006
Sum: 4-Bromofluorobenzene	92.8	92.8-108		NRDC	1	3/2/2006
Sum: Chlorofluoromethane	92.8	76.1-118		NRDC	1	3/2/2006
Sum: Toluene-d8	91.0	74.9-110		NRDC	1	3/2/2006

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Knudsen Laboratory

Page 3 of 7

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

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Aerotech Environmental

Analytical Report

Date: 09-Mar-06

CLIENT:	Pima County Flood Control	Client Sample ID:	HP-1
Lab Order:	06020153	Tag Number:	
Project:	MHP-ERP/Monthly-Qtrly	Collection Date:	3/27/2006 2:10:00 PM
Lab ID:	06020153-02B	Matrix:	DRINKING WATER

Analytes	Result	Limit	Qual	Units	DF	Date Analyzed
ICP/MS METALS, TOTAL RECOVERABLE		E200.8				Analyst: TD
Antimony	< 0.0030	0.0030		mg/L	1	3/1/2006 3:35:26 PM
Arsenic	0.0013	0.0010		mg/L	1	3/1/2006 3:35:26 PM
Barium	0.14	0.0010		mg/L	1	3/1/2006 3:35:26 PM
Beryllium	< 0.0010	0.0010	v1	mg/L	1	3/1/2006 3:35:26 PM
Cadmium	< 0.0010	0.0010		mg/L	1	3/1/2006 3:35:26 PM
Chromium	< 0.0010	0.0010		mg/L	1	3/1/2006 3:35:26 PM
Lead	0.0041	0.0010		mg/L	1	3/1/2006 3:35:26 PM
Nickel	0.0033	0.0010		mg/L	1	3/1/2006 3:35:26 PM
Selenium	< 0.0020	0.0020		mg/L	1	3/1/2006 3:35:26 PM
Thallium	< 0.0010	0.0010		mg/L	1	3/1/2006 3:35:26 PM
MERCURY, TOTAL		E245.1				Analyst: PC
Mercury	< 0.0005	0.0005		mg/L	1	3/6/2006

Footnote: All analyses performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Knudsen Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.

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Aerotech Environmental

Analytical Report

Date: 09-Mar-08

CLIENT:	Pima County Flood Control	Client Sample ID:	HP-1
Lab Order:	06020153	Tag Number:	
Project:	MID-ERP/Monthly-Qtly	Collection Date:	3/27/2008 2:10:00 PM
Lab ID:	06020153-02C	Matrix:	DRINKING WATER

Analysis	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate/Nitrite Total	2.8	0.40		mg/L	1	3/3/2008 8:38:00 PM Analyst: LB
NITROGEN, TOTAL KJELDAHL AS N						
Nitrogen, Total Kjeldahl	< 1.3	1.3		mg/L	1	3/3/2008 12:15:00 PM Analyst: AT
NITROGEN, TOTAL						
Nitrogen, Total	2.8	1.7		mg/L	1	3/3/2008 Analyst: AC

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Knudsen Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



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Aerotech Environmental

Analytical Report

Date: 09-16-06

CLIENT: Pima County Flood Control
Lab Order: 06020155
Project: MHP-ERP/Monday-Qrly
Lab ID: 06020155-02D

Client Sample ID: HP-1
Tag Number:
Collection Date: 3/27/2006 3:10:00 PM
Matrix: DRINKING WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B		Analyst: SP		
1,1,1-Trichloroethane	<1.0	1.0		ug/L	1	3/2/2006
1,1,2-Trichloroethane	<1.0	1.0		ug/L	1	3/2/2006
1,1-Dichloroethene	<1.0	1.0		ug/L	1	3/2/2006
1,2-Dichlorobenzene	<1.0	1.0		ug/L	1	3/2/2006
1,2-Dichloroethane	<1.0	1.0		ug/L	1	3/2/2006
1,2-Dichloropropane	<1.0	1.0		ug/L	1	3/2/2006
1,4-Dichlorobenzene	<1.0	1.0		ug/L	1	3/2/2006
Benzene	<1.0	1.0		ug/L	1	3/2/2006
Carbon tetrachloride	<1.0	1.0		ug/L	1	3/2/2006
Chlorobenzene	<1.0	1.0		ug/L	1	3/2/2006
cis-1,2-Dichloroethane	<1.0	1.0		ug/L	1	3/2/2006
Ethylbenzene	<1.0	1.0		ug/L	1	3/2/2006
Styrene	<1.0	1.0		ug/L	1	3/2/2006
Tetrahaloethene	<1.0	1.0		ug/L	1	3/2/2006
Toluene	<1.0	1.0	L1	ug/L	1	3/2/2006
trans-1,2-Dichloroethane	<1.0	1.0		ug/L	1	3/2/2006
Trichloroethene	<1.0	1.0		ug/L	1	3/2/2006
Totalhaloethenes, Total	<1.0	1.0		ug/L	1	3/2/2006
Vinyl chloride	<1.0	1.0		ug/L	1	3/2/2006
Xylenes, Total	<2.0	2.0		ug/L	1	3/2/2006
Sum: 4-Bromodibromobenzene	95.0	99.9-108		NREC	1	3/2/2006
Sum: Dibromodibromobenzene	93.9	76.1-115		NREC	1	3/2/2006
Sum: Triene-48	98.4	74.9-110		NREC	1	3/2/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Knudsen Laboratory

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(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

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Aerotech Environmental

Analytical Report

Date: 09-Mar-06

CLIENT: Pima County Flood Control
Lab Order: 06020133
Project: MHP-ERP/Monthly-Qrty
Lab ID: 06020133-03D

Client Sample ID: Trip Blank
Tag Number:
Collection Date: 3/27/2006
Matrix: TRIP BLANK

Analysis	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B		Analyst: SP		
1,1,1-Trichloroethane	<1.0	1.0		µg/L	1	3/1/2006
1,1,2-Trichloroethane	<1.0	1.0		µg/L	1	3/1/2006
1,1-Dichloroethene	<1.0	1.0		µg/L	1	3/1/2006
1,2-Dichlorobenzene	<1.0	1.0		µg/L	1	3/1/2006
1,3-Dichlorobenzene	<1.0	1.0		µg/L	1	3/1/2006
1,2-Dichloropropane	<1.0	1.0		µg/L	1	3/1/2006
1,4-Dichlorobenzene	<1.0	1.0		µg/L	1	3/1/2006
Benzene	<1.0	1.0		µg/L	1	3/1/2006
Carbon tetrachloride	<1.0	1.0		µg/L	1	3/1/2006
Chlorobenzene	<1.0	1.0		µg/L	1	3/1/2006
cis-1,2-Dichloroethene	<1.0	1.0		µg/L	1	3/1/2006
Ethylbenzene	<1.0	1.0		µg/L	1	3/1/2006
Styrene	<1.0	1.0		µg/L	1	3/1/2006
Tetrachloroethene	<1.0	1.0		µg/L	1	3/1/2006
Toluene	<1.0	1.0		µg/L	1	3/1/2006
trans-1,2-Dichloroethene	<1.0	1.0		µg/L	1	3/1/2006
Trichloroethene	<1.0	1.0		µg/L	1	3/1/2006
Toluene, Total	<1.0	1.0		µg/L	1	3/1/2006
Vinyl chloride	<1.0	1.0		µg/L	1	3/1/2006
Xylenes, Total	<2.0	2.0		µg/L	1	3/1/2006
Sum 4-Bromofluorobenzene	104	89.9-106		%REC	1	3/1/2006
Sum 6-Bromofluorobenzene	100	76.1-110		%REC	1	3/1/2006
Sum Toluene-#8	100	74.6-110		%REC	1	3/1/2006

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes

- (1) AEL - Tucson Laboratory
- (2) AEL - Kaufman Laboratory

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(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

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Aerotech Environmental

09-16-06

Lab Order: 0602151
Client: Pima County Flood Control
Project: MSP-ERP/Monitory-Only

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	ICLP Date	Prog Date	Analysis Date
0602151-01B	Storm Water	10/20/06 10:01:00 AM	Water/Water	ICPMS METALS, TOTAL, RECOVERABLE	10/20/06 4:21:39 AM	10/20/06 4:21:39 AM	10/20/06 3:01:27 PM
				MERCURY IN WATER	10/20/06 10:30:00 AM		10/20/06
0602151-01C				ARSENIC by ICP-MS/AS-SCORAPIRY			10/20/06 4:21:39 PM
				TOTAL RELIABLE NITROGEN			10/20/06 12:11:00 PM
				Total Nitrogen (Calculated)			10/20/06
0602151-01D				VIOLATES by GCMS			10/20/06
0602151-02B	SP-1	10/20/06 2:30:00 PM	Drinking Water	ICPMS METALS, TOTAL, RECOVERABLE	10/20/06 4:21:39 AM	10/20/06 4:21:39 AM	10/20/06 3:01:26 PM
				MERCURY IN WATER	10/20/06 10:30:00 AM		10/20/06
0602151-02C				ARSENIC by ICP-MS/AS-SCORAPIRY			10/20/06 4:21:39 PM
				TOTAL RELIABLE NITROGEN			10/20/06 12:11:00 PM
				Total Nitrogen (Calculated)			10/20/06
0602151-02D				VIOLATES by GCMS			10/20/06
0602151-02E	Tap Water	10/20/06	Tap Water	VIOLATES by GCMS			10/20/06



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental

Date: 09-16-08

CLIENT: Pima County Flood Control
Work Order: 06020153
Project: MSP-ERP Monthly-Only

ANALYTICAL QC SUMMARY REPORT

Test Code: 200.8

Sample ID: MS-24778	Sample Type: MSLR	Test Code: 200.8	Units: mg/L	Prog Date: 9/15/08	Run No: 10018						
Client ID:	Batch ID: 24778	Tester: E200.8		Analysis Date: 9/15/08	Seq No: 048501						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	Low Limit	Hgh Limit	RPD Ref Val	NRPD	RPD Limit	Qual
Antimony	<0.000	0.000									
Arsenic	<0.000	0.000									
Barium	<0.000	0.000									
Beryllium	<0.000	0.000									WT
Cadmium	<0.000	0.000									
Chromium	<0.000	0.000									
Cobalt	<0.000	0.000									
Copper	<0.000	0.000									
Lead	<0.000	0.000									
Manganese	<0.000	0.000									
Mercury	<0.000	0.000									
Nickel	<0.000	0.000									
Selenium	<0.000	0.000									
Thallium	<0.000	0.000									

Sample ID: LCS-24778	Sample Type: LCS	Test Code: 200.8	Units: mg/L	Prog Date: 9/15/08	Run No: 10018						
Client ID:	Batch ID: 24778	Tester: E200.8		Analysis Date: 9/15/08	Seq No: 048502						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	Low Limit	Hgh Limit	RPD Ref Val	NRPD	RPD Limit	Qual
Antimony	0.0504	0.000	0.1	0	95.3	85	115				
Arsenic	0.0940	0.000	0.1	0	94.4	85	115				
Barium	0.1029	0.000	0.1	0	103	85	115				
Beryllium	0.1102	0.000	0.1	0	113	85	115				WT
Cadmium	0.1005	0.000	0.1	0	100	85	115				
Chromium	0.1000	0.000	0.1	0	103	85	115				
Cobalt	0.0940	0.000	0.1	0	95.4	85	115				
Copper	0.0950	0.000	0.1	0	95.8	85	115				
Selenium	0.1001	0.000	0.1	0	100	85	115				
Thallium	0.0974	0.000	0.1	0	98.7	85	115				

Qualifiers: Q - Value above quantitative range E - Blending error for preparation or analysis essential F - Analyte detected below quantitative limit
 ND - Not Detected or in Reporting Limit R - RPD method exceeded recovery limits S - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

A Division of Aerotech Laboratories, Inc.

CLIENT: Pinx County Flood Control
Work Order: 06020115
Project: MSP-ERPMonthly-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: 206.8

Sample ID:	LC30-3478	Sample:	LC30	TestCode:	206.8	Units:	mg/L	Prep Date:	3/12/06	RunNo:	7898
Client ID:		Batch ID:	3478	TestNo:	236.8			Analysis Date:	3/12/06	Depth:	04000
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	LowLimit	HighLimit	RPO Ref Val	NRPO	RPOLimit	Qual
Antimony	0.0000	0.0030	0.1	0	95.8	85	115	0.0024	0.541	20	
Arsenic	0.0040	0.0010	0.1	0	94.9	85	115	0.0044	0.519	20	
Boron	0.1022	0.0010	0.1	0	132	85	115	0.1029	0.122	20	
Beryllium	0.0111	0.0010	0.1	0	111	85	115	0.1102	0.794	20	Y1
Cadmium	0.0008	0.0010	0.1	0	99.2	85	115	0.1005	1.28	20	
Chromium	0.0237	0.0010	0.1	0	124	85	115	0.1032	0.281	20	
Cobalt	0.0001	0.0010	0.1	0	99.3	85	115	0.0094	0.068	20	
Copper	0.0000	0.0010	0.1	0	90.8	85	115	0.0020	0.804	20	
Selenium	0.1041	0.0030	0.1	0	101	85	115	0.1001	1.11	20	
Thallium	0.0070	0.0010	0.1	0	97.8	85	115	0.0074	1.15	20	

Sample ID:	0402028-810 MS	Sample:	MS	TestCode:	206.8	Units:	mg/L	Prep Date:	3/12/06	RunNo:	7898
Client ID:		Batch ID:	3478	TestNo:	236.8			Analysis Date:	3/12/06	Depth:	04000
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	LowLimit	HighLimit	RPO Ref Val	NRPO	RPOLimit	Qual
Antimony	0.000	0.0030	0.1	0	101	70	130				
Arsenic	0.0406	0.0010	0.1	0.04085	99.9	70	130				
Boron	0.1013	0.0010	0.1	0.00154	100	70	130				
Beryllium	0.1209	0.0010	0.1	0	121	70	130				Y1
Cadmium	0.00173	0.0010	0.1	0	91.7	70	130				
Chromium	0.1080	0.0010	0.1	0	108	70	130				
Cobalt	0.0002	0.0010	0.1	0	99.9	70	130				
Copper	0.0029	0.0010	0.1	0	92.1	70	130				
Selenium	0.0044	0.0030	0.1	0.00750	92.7	70	130				
Thallium	0.00474	0.0010	0.1	0	94.7	70	130				

Qualifiers: 1 - Value above quantitative range 2 - Holding time for preparation or analysis exceeded 3 - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit 4 - RPD which exceeded recovery limits 5 - Spike Recovery which exceeded recovery limits



Aerotech Environmental Laboratories

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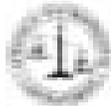
CLIENT: Pima County Flood Control
Work Order: 6400151
Project: MSP-EXP/Moddy-Only

ANALYTICAL QC SUMMARY REPORT

Test Code: 200.8

Sample ID: 6400151-018-MSC	Sample Type: MSC	Test Code: 200.8	Units: mg/L	Prep Date: 3/1/2004	Run No: 78818						
Client ID:	Batch ID: 24770	Technic: E204.8		Analysis Date: 3/1/2004	Depth: 045021						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
Antimony	0.1018	0.0030	0.1	0	100	70	130	0.1000	0.997	15	
Arsenic	0.1425	0.0010	0.1	0.04000	95.0	70	130	0.1400	0.0751	15	
Barium	0.1608	0.0010	0.1	0.00154	99.0	70	130	0.1610	0.423	15	
Beryllium	0.1247	0.0010	0.1	0	126	70	130	0.1200	3.08	15	BT
Cadmium	0.00028	0.0010	0.1	0	83.3	70	130	0.00170	1.64	15	
Chromium	0.1087	0.0010	0.1	0	120	70	130	0.1000	0.108	15	
Lead	0.00118	0.0010	0.1	0	91.2	70	130	0.00050	2.36	15	
Nickel	0.00069	0.0010	0.1	0	92.7	70	130	0.00050	0.949	15	
Selenium	0.00060	0.0020	0.1	0.002700	94.1	70	130	0.00044	1.37	15	
Thallium	0.00710	0.0010	0.1	0	87.1	70	130	0.00474	2.78	15	

Qualifiers: E Value above quantitation range W Holding time for preparation or analysis exceeded Z Analytical method below quantitation limits
 ND Not Detected in the Reporting Limit X RPO outside acceptance range Y Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06020153
Project: MSP-EXP/Monthly-Qty

ANALYTICAL QC SUMMARY REPORT

TestCode: 245.1_W

Sample ID: MS-24527	Sample Type: MSLK	TestCode: 245.1_W	Units: mg/L	Prep Date: 2/6/2008	RunNo: 71096						
Client ID:	Batch ID: 24527	Technic: E245.1		Analyse Date: 2/6/2008	SeqNo: 848481						
Analyte	Result	PCL	SPK value	SPK Ref Val	%REC	LowLim	HighLim	RPO Ref Val	%RPO	RPOLim	Qual
Mercury	0.00020	0.00020									

Sample ID: LCS-24527	Sample Type: LCS	TestCode: 245.1_W	Units: mg/L	Prep Date: 2/6/2008	RunNo: 71096						
Client ID:	Batch ID: 24527	Technic: E245.1		Analyse Date: 2/6/2008	SeqNo: 848482						
Analyte	Result	PCL	SPK value	SPK Ref Val	%REC	LowLim	HighLim	RPO Ref Val	%RPO	RPOLim	Qual
Mercury	0.00010	0.00020	0.01	0	101	85	115				

Sample ID: LCSO-24527	Sample Type: LCSO	TestCode: 245.1_W	Units: mg/L	Prep Date: 2/6/2008	RunNo: 71096						
Client ID:	Batch ID: 24527	Technic: E245.1		Analyse Date: 2/6/2008	SeqNo: 848483						
Analyte	Result	PCL	SPK value	SPK Ref Val	%REC	LowLim	HighLim	RPO Ref Val	%RPO	RPOLim	Qual
Mercury	0.01020	0.00020	0.01	0	101	85	115	0.01000	0.965	20	

Sample ID: M020166-4108105	Sample Type: MS	TestCode: 245.1_W	Units: mg/L	Prep Date: 2/6/2008	RunNo: 71096						
Client ID: Source Water	Batch ID: 24527	Technic: E245.1		Analyse Date: 2/6/2008	SeqNo: 848485						
Analyte	Result	PCL	SPK value	SPK Ref Val	%REC	LowLim	HighLim	RPO Ref Val	%RPO	RPOLim	Qual
Mercury	0.02070	0.00020	0.01	0	87.0	86.4	122				BT

Sample ID: M020166-4108103	Sample Type: MSO	TestCode: 245.1_W	Units: mg/L	Prep Date: 2/6/2008	RunNo: 71096						
Client ID: Source Water	Batch ID: 24527	Technic: E245.1		Analyse Date: 2/6/2008	SeqNo: 848486						
Analyte	Result	PCL	SPK value	SPK Ref Val	%REC	LowLim	HighLim	RPO Ref Val	%RPO	RPOLim	Qual
Mercury	0.00670	0.00020	0.01	0	86.7	86.4	122	0.00070	1.94	20	

Qualifiers: 1 - Value above quantitative range 2 - Blanking done for preparation or analysis recorded 3 - Analyte detected below quantitative limit
 ND - Not Detected or in Reporting Limit 4 - RPO within accepted recovery limits 5 - Spike Recovery within accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pinal County Flood Control
Work Order: 0600153
Project: MSP-ERP(Mobile-Only)

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W

Sample ID: MS-R71001	Sample Type: MSLA	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 71001						
Client ID:	Batch ID: R71001	TestNo: E300		Analysis Date: 3/2/2006	SeqNo: 040424						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPCLimit	Qual
Nitrogen, Nitrate/Nitrite Total	<0.40	0.40									

Sample ID: LCS-R71001	Sample Type: LCS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 71001						
Client ID:	Batch ID: R71001	TestNo: E300		Analysis Date: 3/2/2006	SeqNo: 040425						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPCLimit	Qual
Nitrogen, Nitrate/Nitrite Total	7.000	0.40	0	0	99.2	0	110				

Sample ID: LCSD-R71001	Sample Type: LCSD	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 71001						
Client ID:	Batch ID: R71001	TestNo: E300		Analysis Date: 3/2/2006	SeqNo: 040444						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPCLimit	Qual
Nitrogen, Nitrate/Nitrite Total	7.000	0.40	0	0	99.1	0	110	7.000	2.44	20	

Sample ID: 0600021-010A002	Sample Type: MS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 71001						
Client ID:	Batch ID: R71001	TestNo: E300		Analysis Date: 3/2/2006	SeqNo: 040441						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPCLimit	Qual
Nitrogen, Nitrate/Nitrite Total	17.40	0.40	0	10.10	91.3	0	120				

Sample ID: 0600021-010A003	Sample Type: MSD	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 71001						
Client ID:	Batch ID: R71001	TestNo: E300		Analysis Date: 3/2/2006	SeqNo: 040442						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPCLimit	Qual
Nitrogen, Nitrate/Nitrite Total	17.40	0.40	0	10.10	91.3	0	120	17.40	0	20	

Qualifiers: E - Value above quantitative range B - Blanking Error for preparation or analysis recorded F - Analyte detected below quantitative limits
 ND - Not Detected in the Reporting Limit C - RPD outside accepted recovery limits G - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

A Division of Ametek Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06000153
Project: MSP-ERP Monthly-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID: MS-82600	CompType: WBLK	TestCode: 8260_W	Units: ppbL	Prep Date:	RunNo: 78832						
Client ID:	Batch ID: 878832	Technic: SMC0008		Analyse Date: 3/1/2004	SeqNo: 040008						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	LowLimit	HighLimit	RPO Ref Val	NRPO	RPOLimit	Qual
1,1,1-Trichloroethane	<1.0	1.0									
1,1,2-Trichloroethane	<1.0	1.0									
1,2-Dichloroethane	<1.0	1.0									
1,2-Dichlorobenzene	<1.0	1.0									
1,2-Dichloroethane	<1.0	1.0									
1,2-Dichloropropane	<1.0	1.0									
1,4-Dichlorobenzene	<1.0	1.0									
Benzene	<1.0	1.0									
Carbon tetrachloride	<1.0	1.0									
Chlorobenzene	<1.0	1.0									
cis-1,2-Dichloroethane	<1.0	1.0									
Ethylbenzene	<1.0	1.0									
Styrene	<1.0	1.0									
Tetrachloroethane	<1.0	1.0									
Toluene	<1.0	1.0									
trans-1,2-Dichloroethane	<1.0	1.0									
Trichloroethane	<1.0	1.0									
Trichlorofluorene, Total	<1.0	1.0									
Vinylchloride	<1.0	1.0									
Xylenes, Total	<2.0	2.0									
Sum: 4-Bromofluorobenzene	27.28	0	25	0	108	10.7	108				
Sum: Dibromofluorobenzene	26.21	0	25	0	108	11.1	102				
Sum: Toluene-d8	26.64	0	25	0	107	15.6	108				

Sample ID: MS-82600	CompType: WBLK	TestCode: 8260_W	Units: ppbL	Prep Date:	RunNo: 78892						
Client ID:	Batch ID: 878892	Technic: SMC0008		Analyse Date: 3/2/2004	SeqNo: 040007						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	LowLimit	HighLimit	RPO Ref Val	NRPO	RPOLimit	Qual
1,1,1-Trichloroethane	<1.0	1.0									

Qualifiers: 1. Value above quantitative range 2. Holding time for preparation or analysis exceeded 3. Analyte detected below quantitative limits
 ND: Not Detected in the Reporting Limit 4. RPO value exceeded recovery limits 5. Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

A Division of American Laboratories, Inc.

CLIENT: Pinellas County Flood Control
Work Order: 06020133
Project: MSP-2021 Mouldy-Only

ANALYTICAL QC SUMMARY REPORT

Test Code: 8260_W

Sample ID: MS-8260W	Samp Type: MSLK	Test Code: 8260_W	Units: µg/L	Prep Date:	Run No: 7886						
Client ID:	Batch ID: 8260W	Technic: 5062008		Analysis Date: 10/20/06	Sample: 848407						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	<1.0	1.0									
1,1-Dichloroethane	<1.0	1.0									
1,2-Dichlorobenzene	<1.0	1.0									
1,2-Dichloroethane	<1.0	1.0									
1,2-Dichloropropane	<1.0	1.0									
1,4-Dichlorobenzene	<1.0	1.0									
Benzene	<1.0	1.0									
Carbon tetrachloride	<1.0	1.0									
Chlorobenzene	<1.0	1.0									
o-1,2-Dichloroethane	<1.0	1.0									
Ethylbenzene	<1.0	1.0									
Styrene	<1.0	1.0									
Tetrachloroethene	<1.0	1.0									
Toluene	<1.0	1.0									
Sum 1,2-Dichloroethane	<1.0	1.0									
Trichloroethene	<1.0	1.0									
Vinyl chloride	<1.0	1.0									
Sum: 4-Bromobenzene	24.23	0	25	0	96.9	73.7	100				
Sum: Dibromofluorobenzene	21.78	0	25	0	87.1	77.5	100				
Sum: Toluene-d8	22.90	0	25	0	91.6	75.8	100				

Sample ID: LCS-8260W	Samp Type: LCS	Test Code: 8260_W	Units: µg/L	Prep Date:	Run No: 7902						
Client ID:	Batch ID: 8260W	Technic: 5062008		Analysis Date: 10/20/06	Sample: 848408						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	27.08	1.0	25	0	108	73.9	120				
1,1,2-Trichloroethane	25.29	1.0	25	0	101	74.7	120				
1,1-Dichloroethane	25.22	1.0	25	0	101	71.2	120				
1,2-Dichlorobenzene	24.22	1.0	25	0	97.3	71.8	120				

Qualifiers: 1. Value above quantitation range 11. Editing errors in preparation or analysis recorded 2. Analyte detected below quantitation limits
 103. Not Detected in the Reporting Limit 12. EDTI outside accepted recovery limits 3. Value Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06020015
Project: MRP-ERP Monthly-Qaly

ANALYTICAL QC SUMMARY REPORT

TestCode: 8268_W

Sample ID: LCS-87882	Sample Type: LCS	Test Code: 8268_W	Units: µg/L	Prog Date:	Run No: 7882						
Client ID:	Batch ID: 87882	Technician: SMC2008		Analysis Date: 3/12/08	Day No: 84588						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	Low Limit	High Limit	RPO Ref Val	NRPO	RPO Limit	Qual
1,2-Dichlorobenzene	26.81	1.0	26	0	100	20.1	126				
1,2-Dichloropropane	26.47	1.0	26	0	100	20.4	122				
1,4-Dichlorobenzene	24.40	1.0	24	0	87.8	7.1	120				
Benzene	24.27	1.0	24	0	87.5	20.4	122				
Carbon tetrachloride	23.85	1.0	24	0	100	20.6	126				
Chlorobenzene	24.02	1.0	24	0	88.5	22.0	122				
cis-1,2-Dichloroethane	24.21	1.0	24	0	88.8	22.6	122				
Ethylbenzene	25.24	1.0	25	0	100	20.0	126				
Styrene	25.22	1.0	25	0	100	22.6	122				
Tetrachloroethene	26.86	1.0	26	0	100	22.4	122				
Toluene	25.81	1.0	26	0	100	8.0	126				
trans-1,2-Dichloroethane	26.28	1.0	26	0	100	22.8	126				
Trichloroethene	26.78	1.0	26	0	100	20.6	122				
Vinyl chloride	26.22	1.0	26	0	100	20.6	122				
Sum: 4-Bromofluorobenzene	26.86	0	26	0	100	20.7	126				
Sum: Dibromofluoroethane	26.86	0	26	0	100	22.1	122				
Sum: Toluene-d8	26.84	0	26	0	100	22.6	126				

Sample ID: LCS-87886	Sample Type: LCS	Test Code: 8268_W	Units: µg/L	Prog Date:	Run No: 7886						
Client ID:	Batch ID: 87886	Technician: SMC2008		Analysis Date: 3/20/08	Day No: 84596						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	Low Limit	High Limit	RPO Ref Val	NRPO	RPO Limit	Qual
1,1,1-Trichloroethane	26.22	1.0	26	0	100	22.6	126				
1,1,2-Trichloroethane	26.81	1.0	26	0	100	24.7	126				
1,1-Dichloroethane	26.43	1.0	26	0	100	21.2	122				
1,2-Dichlorobenzene	27.41	1.0	27	0	110	21.8	122				
1,2-Dichloroethane	26.04	1.0	26	0	104	20.0	126				
1,2-Dichloropropane	27.12	1.0	27	0	108	20.4	122				
1,4-Dichlorobenzene	24.25	1.0	24	0	100	7.1	120				

Qualifiers: 1. Value above quantitation range 2. Holding time for preparation or analysis exceeded 3. Analyte detected below quantitation limit
 ND: Not Detected at the Reporting Limit 4. RPO outside acceptable recovery limits 5. Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pinal County Flood Control
Work Order: 06000115
Project: MSP-22FMiscible-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: 8268_W

Sample ID: LCS-RT6888	Sample Type: LCS	Test Code: 8268_W	Units: µg/L	Prep Date:	RunNo: 7888						
Client ID:	Batch ID: RT6888	Technician: SWE2008		Analysis Date: 2/2/2008	SeqNo: 84878						
Analyte	Result	PCL	SPK value	SPK Ref Val	NRCC	LowLimit	HighLimit	SPD Ref Val	NRPD	RPCLimit	Qual
Benzene	26.06	1.0	26	0	108	79.4	120				
Carbon tetrachloride	24.71	1.0	25	0	88.8	75.9	120				
Chlorobenzene	25.40	1.0	25	0	103	73.3	120				
o,p-1,2-Dichlorobenzene	26.46	1.0	26	0	128	75.9	120				
Ethylbenzene	27.27	1.0	28	0	111	78.2	120				
Styrene	26.03	1.0	26	0	124	73.8	120				
Tetrachloroethene	28.75	1.0	29	0	115	72.4	120				
Toluene	28.34	1.0	28	0	117	80	120				11
trans-1,2-Dichlorobenzene	25.94	1.0	26	0	102	73.8	120				
Trichloroethene	28.38	1.0	28	0	108	76.9	120				
Vinyl chloride	28.12	1.0	28	0	124	88.8	120				
Sum: 4-Bromofluorobenzene	26.85	0	26	0	103	70.7	120				
Sum: Dibromofluorobenzene	24.31	0	25	0	81.2	71.1	120				
Sum: Toluene-d8	24.10	0	25	0	100	75.8	120				

Sample ID: LCSO-RT6822	Sample Type: LCSO	Test Code: 8268_W	Units: µg/L	Prep Date:	RunNo: 7822						
Client ID:	Batch ID: RT6822	Technician: SWE2008		Analysis Date: 2/1/2008	SeqNo: 84822						
Analyte	Result	PCL	SPK value	SPK Ref Val	NRCC	LowLimit	HighLimit	SPD Ref Val	NRPD	RPCLimit	Qual
1,1,1-Trichloroethane	24.27	1.0	25	0	117	75.9	120	27.08	1.77	25	
1,1,2-Trichloroethane	25.55	1.0	26	0	102	74.7	120	25.28	1.88	25	
1,1-Dichloroethene	27.83	1.0	28	0	111	71.2	120	25.30	9.40	25	
1,2-Dichlorobenzene	25.03	1.0	25	0	101	71.8	120	24.20	3.01	25	
1,2-Dichloroethane	28.70	1.0	29	0	103	70.1	120	28.81	7.58	25	
1,2-Dichloropropane	28.23	1.0	29	0	104	78.4	120	25.47	2.17	25	
1,4-Dichlorobenzene	25.27	1.0	25	0	104	71	120	24.40	6.23	25	
Benzene	28.29	1.0	28	0	105	79.4	120	24.37	1.38	25	
Carbon tetrachloride	29.45	1.0	30	0	118	75.9	120	28.83	8.21	25	
Chlorobenzene	28.01	1.0	28	0	104	73.3	120	24.83	2.48	25	

Qualifiers: 1: Value above quantitative limit 2: Editing time for preparation or analysis recorded 3: Analyte detected below quantitative limit
 ND: Not Detected at the Reporting Level 4: STD outside accepted recovery limits 5: Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

A Division of Ametek Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06020113
Project: MSP-ERP Monthly-Qty

ANALYTICAL QC SUMMARY REPORT

Test Code: 8268_W

Sample ID: LC06-RT0009	Sample Name: LC00	Test Code: 8268_W	Units: µg/L	Prep Date:	Run No: 70002						
Client ID:	Batch ID: RT0002	Trailer: 0400000		Analysis Date: 3/1/2006	Sample: 040001						
Analyte	Result	PQL	SPK value	SPK Ref Val	WREC	Low Limit	High Limit	RPO Ref Val	WAFD	RPO Limit	Qual
o,p'-1,2-Dichlorobenzene	26.28	1.0	25	0	100	75.0	100	24.21	0.12	0	0
Ethylbenzene	26.80	1.0	25	0	100	76.2	100	26.24	0.20	0	0
Styrene	26.85	1.0	25	0	100	70.6	107	26.02	0.24	0	0
Tetrahaloethene	26.32	1.0	25	0	113	72.4	104	26.86	0.26	0	0
Toluene	26.50	1.0	25	0	100	80	100	26.01	2.04	0	0
trans-1,2-Dichloroethene	26.79	1.0	25	0	107	70.6	100	26.25	0.02	0	0
Trichloroethene	26.62	1.0	25	0	107	76.5	100	26.78	0.00	0	0
Vinyl chloride	26.62	1.0	25	0	110	69.9	107	26.72	11.4	0	0
Sum: 4-Bromofluorobenzene	26.21	0	25	0	100	70.7	100	26.88	0	0	0
Sum: Dibromofluorobenzene	26.36	0	25	0	104	77.1	100	26.88	0	0	0
Sum: Toluene-d8	26.22	0	25	0	100	75.8	100	26.84	0	0	0

Sample ID: LC06-RT0008	Sample Name: LC00	Test Code: 8268_W	Units: µg/L	Prep Date:	Run No: 70000						
Client ID:	Batch ID: RT0008	Trailer: 0400000		Analysis Date: 3/1/2006	Sample: 040007						
Analyte	Result	PQL	SPK value	SPK Ref Val	WREC	Low Limit	High Limit	RPO Ref Val	WAFD	RPO Limit	Qual
1,1,1-Trichloroethane	22.86	1.0	25	0	62.0	75.0	100	26.22	0.20	0	0
1,1,2-Trichloroethane	26.27	1.0	25	0	100	74.7	100	26.01	0.04	0	0
1,1-Dichloroethane	22.58	1.0	25	0	60.2	71.2	100	26.43	10.0	0	0
1,2-Dichlorobenzene	26.16	1.0	25	0	101	71.6	107	27.45	0.48	0	0
1,2-Dichloroethane	24.02	1.0	25	0	60.7	70.1	100	26.04	4.40	0	0
1,2-Dichloropropane	26.25	1.0	25	0	100	76.4	100	27.02	7.14	0	0
1,4-Dichlorobenzene	22.07	1.0	25	0	62.3	71	100	26.25	0.02	0	0
Benzene	24.22	1.0	25	0	66.6	70.4	100	26.36	0.46	0	0
Carbon tetrachloride	22.27	1.0	25	0	66.1	70.6	100	24.70	10.4	0	0
Chlorobenzene	22.85	1.0	25	0	61.8	73.0	100	26.42	10.0	0	0
o,p'-1,2-Dichlorobenzene	24.20	1.0	25	0	67.0	70.0	100	26.86	0.02	0	0
Ethylbenzene	24.46	1.0	25	0	66.0	76.2	100	27.77	12.6	0	0
Styrene	22.85	1.0	25	0	61.4	70.6	107	26.02	10.0	0	0

Qualifiers: 1 - Value above quantitation range
 2 - Missing from the preparation or analysis protocol
 3 - Analyte detected below quantitation limits
 4 - Not Detected at the Reporting Limit
 5 - RPO outside accepted recovery limits
 6 - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

A Division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06020113
Project: MSP-EXPMonhly-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID: LCSD-87888	Sample Type: LCSD	Test Code: 8260_W	Units: µg/L	Prep Date:	RunNo: 7888						
Client ID:	Batch ID: 87888	Technic: SW8260B		Analysis Date: 02/20/08	Sample: 848767						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Trichloroethene	24.28	1.0	25	0	97.9	72.4	124	28.75	14.0	25	25
Toluene	26.28	1.0	25	0	124	83	115	28.24	11.8	25	25
trans-1,2-Dichloroethene	23.15	1.0	25	0	92.6	73.8	120	24.54	9.62	25	25
Trichloroethane	23.58	1.0	25	0	94.3	76.5	120	28.28	10.8	25	25
Vinylchloride	22.14	1.0	25	0	88.8	88.8	127	26.12	10.5	25	25
Sum: 4-Bromofluorobenzene	24.88	0	25	0	98.8	72.7	108	25.88	0	0	0
Sum: Dibromofluoromethane	23.88	0	25	0	97.8	71.1	112	21.21	0	0	0
Sum: Toluene-d8	24.28	0	25	0	97.4	75.8	108	25.12	0	0	0

Sample ID: 8821818-81088	Sample Type: MS	Test Code: 8260_W	Units: µg/L	Prep Date:	RunNo: 7882						
Client ID:	Batch ID: 87882	Technic: SW8260B		Analysis Date: 01/20/08	Sample: 848342						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
1,1,1-Trichloroethane	28.28	1.0	25	0	113	73.8	120				
1,1,2-Trichloroethane	24.78	1.0	25	0	98.1	72.5	120				
1,1-Dichloroethane	28.94	1.0	25	0	107	73.8	120				
1,2-Dichlorobenzene	23.82	1.0	25	0	95.2	88.7	122				
1,2-Dichloroethane	27.62	1.0	25	0	111	72.4	120				
1,2-Dichloropropane	24.82	1.0	25	0	98.8	74.7	120				
1,4-Dichlorobenzene	24.42	1.0	25	0	97.8	67	122				
Benzene	28.02	1.0	25	4.270	99.2	73.8	120				
Carbon tetrachloride	28.82	1.0	25	0	114	75.1	120				
Chlorobenzene	24.44	1.0	25	0	97.8	71.8	120				
cis-1,2-Dichloroethane	24.28	1.0	25	0	98.8	74	124				
Ethylbenzene	48.87	1.0	25	25.02	97.0	78	128				
Diprene	24.82	1.0	25	0	102	86.1	120				
Tetrachloroethene	27.12	1.0	25	0	108	72.5	122				
Toluene	26.81	1.0	25	0	108	81.8	112				
trans-1,2-Dichloroethane	25.81	1.0	25	0	102	72.5	120				

Qualifiers: 1: Value above quantitation range 2: Missing time for preparation or analysis recorded 3: Analyte detected before quantitation limits
 103: Not Detected at the Reporting Level 8: RPO outside accepted recovery limits 9: Spike Recovery outside accepted recovery limits



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CLIENT: Pima County Flood Control
Work Order: 06020115
Project: MSP-ESPMMonthly-Qty

ANALYTICAL QC SUMMARY REPORT

TestCode: 8268_W

Sample ID: 06021106-01095	Sample Type: MS	TestCode: 8268_W	Units: µg/L	Prep Date:	RunNo: 39952						
Client ID:	Batch ID: 070852	Tranche: 0602095		Analysis Date: 2/10/09	SeqNo: 044802						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRFC	LowLimit	HighLimit	RPO Ref Val	NRPO	RPOLimit	Qual
Dichloroethane	26.01	1.0	25	0	100	22.1	120				
Vinyl chloride	27.47	1.0	25	0	110	70	140				
Sum: 4-Bromofluorobenzene	26.04	0	25	0	104	89.9	100				
Sum: Dibromofluoromethane	26.27	0	25	0	100	76.1	110				
Sum: Toluene-d8	26.41	0	25	0	100	74.9	110				

Sample ID: 06021106-010 WS	Sample Type: MS	TestCode: 8268_W	Units: µg/L	Prep Date:	RunNo: 39952						
Client ID:	Batch ID: 070895	Tranche: 0602095		Analysis Date: 2/10/09	SeqNo: 044708						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRFC	LowLimit	HighLimit	RPO Ref Val	NRPO	RPOLimit	Qual
1,1,1-Trichloroethane	26.04	1.0	25	0	100	75.9	120				
1,1,2-Trichloroethane	27.38	1.0	25	0	110	72.5	120				
1,1-Dichloroethane	27.40	1.0	25	0	110	70.9	120				
1,2-Dichlorobenzene	27.40	1.0	25	0	110	86.7	120				
1,2-Dichloroethane	26.20	1.0	25	0	101	72.4	110				
1,2-Dichloropropane	26.50	1.0	25	0	100	74.7	110				
1,4-Dichlorobenzene	26.26	1.0	25	0	101	67	120				
Benzene	26.70	1.0	25	0	107	70.9	110				
Carbon tetrachloride	26.57	1.0	25	0	100	76.1	110				
Chlorobenzene	26.71	1.0	25	0	100	71.9	110				
cis-1,2-Dichloroethane	26.57	1.0	25	0	100	74	110				
Ethylbenzene	26.20	1.0	25	0	117	70	110				NS
Styrene	26.80	1.0	25	0	100	86.1	110				
Tetrachloroethane	26.70	1.0	25	0	110	72.5	120				
Toluene	26.40	1.0	25	0	114	81.8	110				
trans-1,2-Dichloroethane	26.52	1.0	25	0	100	72.5	110				
Trichloroethane	27.20	1.0	25	0	100	72.1	120				
Vinyltoluene	26.68	1.0	25	0	110	70	140				
Sum: 4-Bromofluorobenzene	26.44	0	25	0	100	89.9	100				

Qualifiers: 1 - Value above quantitative range 2 - Blanking time for preparation or analysis exceeded 3 - Analyte detected before quantitative limits
 ND - Not Detected at the Reporting Level 4 - RPO results accepted recovery limits 5 - Spike Recovery results accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 0602152
Project: MSP-EXP/Weekly-Only

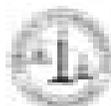
ANALYTICAL QC SUMMARY REPORT

TestCode: 8268_W

Sample ID: 8002152-IND 85	CompType: MS	TestCode: 8268_W	Units: µg/L	Prog Date:	RunNo: 70884						
Client ID:	Batch ID: 870886	Techn: 2982608		Analysis Date: 2/20/08	Depth: 846700						
Analyte	Result	PQL	SPK value	SPK Ref Val	MREC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOUnit	Qual
Sum: Dibromofluoromethane	21.48	0	25	0	80.0	76.1	110				
Sum: Trifluoro-ol	24.53	0	25	0	80.0	74.9	110				

Sample ID: 8002152-IND850	CompType: MSD	TestCode: 8268_W	Units: µg/L	Prog Date:	RunNo: 70882						
Client ID:	Batch ID: 870882	Techn: 2982608		Analysis Date: 2/20/08	Depth: 846600						
Analyte	Result	PQL	SPK value	SPK Ref Val	MREC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOUnit	Qual
1,1,1-Trichloroethane	26.25	1.0	25	0	108	75.8	100	26.25	6.71	05	05
1,1,2-Trichloroethane	24.28	1.0	25	0	87.0	72.9	100	24.28	2.10	05	05
1,1-Dichloroethane	24.94	1.0	25	0	90.8	70.8	100	24.94	0.58	05	05
1,2-Dichlorobenzene	23.48	1.0	25	0	80.8	68.7	100	23.48	1.36	05	05
1,2-Dichloroethane	26.88	1.0	25	0	108	72.4	100	27.80	2.54	05	05
1,2-Dichloropropane	24.48	1.0	25	0	87.8	74.7	100	24.88	1.88	05	05
1,4-Dichlorobenzene	23.87	1.0	25	0	94.7	87	100	24.47	0.80	05	05
Benzene	27.44	1.0	25	4.270	80.7	76.9	100	26.07	0.77	05	05
Carbon tetrachloride	26.88	1.0	25	0	108	75.4	100	26.80	0.10	05	05
Chlorobenzene	23.00	1.0	25	0	94.1	71.8	100	24.66	2.76	05	05
o-1,2-Dichlorobenzene	23.00	1.0	25	0	80.0	74	100	24.00	2.70	05	05
Ethylbenzene	47.28	1.0	25	25.00	87.0	78	100	48.87	0.16	05	05
Styrene	24.00	1.0	25	0	88.7	86.1	100	25.40	2.70	05	05
Tetrachloroethene	26.00	1.0	25	0	108	72.0	100	27.10	3.00	05	05
Toluene	24.00	1.0	25	0	80.0	81.6	100	25.00	1.88	05	05
trans-1,2-Dichloroethane	23.88	1.0	25	0	80.8	72.0	100	25.80	0.90	05	05
Trichloroethene	26.28	1.0	25	0	108	72.1	100	26.00	2.70	05	05
Vinyl chloride	24.88	1.0	25	0	100	80	100	27.40	1.26	05	05
Sum: 4-Bromofluorobenzene	26.00	0	25	0	108	88.8	88	26.04	0	0	0
Sum: Dibromofluoromethane	23.71	0	25	0	108	78.1	110	26.07	0	0	0
Sum: Trifluoro-ol	27.00	0	25	0	108	74.9	110	26.00	0	0	0

Qualifiers: 0 Value above qualification range 1 Missing/Blank for preparation or analysis recorded 2 Analyte detected before qualification tests
 YD Not Detected at the Reporting Level 3 RPO outside accepted recovery limits 4 Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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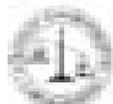
CLIENT: Pima County Flood Control
Work Order: 06020153
Project: MSP-EPDMassdy-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: 8200_W

Sample ID: 06020153-410 W50	Sample Type: W50	Test Code: 8200_W	Units: ppb	Prep Date:	Run#: 7000						
Client ID:	Batch ID: 07000	Technic: 0602000		Analysis Date: 032006	Sample: 060700						
Analyte	Result	PQL	SPK value	SPK Ref Val	MSDC	Low Limit	High Limit	RPO Ref Val	NRPO	RPO Limit	Qual
1,1,1-Trichloroethane	24.28	1.0	18	0	97.0	75.9	100	28.24	9.98	18	18
1,1,2-Trichloroethane	26.50	1.0	18	0	100	72.5	100	27.38	2.93	18	18
1,1-Dichloroethane	24.26	1.0	18	0	97.2	75.9	100	27.46	10.2	18	18
1,2-Dichlorobenzene	27.03	1.0	18	0	100	99.7	100	27.46	1.4	18	18
1,2-Dichloroethane	24.78	1.0	18	0	96.1	74.4	100	26.03	2.00	18	18
1,2-Dichloropropane	25.30	1.0	18	0	100	74.7	100	26.03	4.00	18	18
1,4-Dichlorobenzene	24.47	1.0	18	0	97.8	87	100	26.26	3.14	18	18
Benzene	24.71	1.0	18	0	96.6	76.9	100	26.72	7.03	18	18
Carbon tetrachloride	23.03	1.0	18	0	93.3	75.1	100	26.27	12.2	18	18
Chlorobenzene	24.91	1.0	18	0	96.6	74.6	100	26.71	3.18	18	18
cis-1,3-Dichloroethane	25.03	1.0	18	0	100	74	100	26.07	4.00	18	18
Ethylbenzene	27.42	1.0	18	0	110	89	100	29.00	9.93	18	18
Styrene	25.01	1.0	18	0	100	90.1	100	25.86	3.34	18	18
Tetrachloroethene	27.00	1.0	18	0	110	73.5	100	26.79	7.03	18	18
Toluene	26.97	1.0	18	0	100	89.6	100	26.40	0.24	18	18
trans-1,2-Dichloroethane	24.28	1.0	18	0	97.1	73.0	100	26.00	8.00	18	18
Trichloroethene	25.38	1.0	18	0	100	73.1	100	27.00	7.00	18	18
Very trace	25.38	1.0	18	0	100	75	100	26.86	12.0	18	18
Sum: 4-Bromofluorobenzene	26.80	0	18	0	100	99.6	100	26.44	0	0	0
Sum: Dibromofluorobenzene	21.03	0	18	0	90.0	76.1	100	27.46	0	0	0
Sum: Toluene-02	24.41	0	18	0	97.6	74.6	100	24.13	0	0	0

Qualifiers: 0 None above qualitative limits
 10 None Detected at the Reporting Level
 11 Nothing tests for preparation or analysis needed
 12 RPO value accepted necessary limits
 1 Analyte detected below qualitative limits
 8 Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

A Division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06020151
Project: MSP-ESP/Moddy-Only

ANALYTICAL QC SUMMARY REPORT

Test Code: N_TKN_WW

Sample ID	Sample Type	Test Code	Units	Prep Date	Run No						
Client ID	Batch ID	Test No		Analysis Date	Depth						
Analyte	Result	POI	SPK value	SPK Ref Val	NADC	Low Limit	High Limit	RPO Ref Val	NAPD	RPO Limit	Qual
Sample ID: MB-R71002	Sample Type: WBLA	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 71002						
Client ID:	Batch ID: R71002	Test No: E2814		Analysis Date: 10/09/08	Depth: 040701						
Nitrogen, Total Kjeldahl	<1.3	1.3									
Sample ID: LCS-R71002	Sample Type: LCS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 71002						
Client ID:	Batch ID: R71002	Test No: E2814		Analysis Date: 10/09/08	Depth: 040702						
Nitrogen, Total Kjeldahl	26.72	1.3	25	0	107	85	115				
Sample ID: LCSD-R71002	Sample Type: LCSD	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 71002						
Client ID:	Batch ID: R71002	Test No: E2814		Analysis Date: 10/09/08	Depth: 040707						
Nitrogen, Total Kjeldahl	25.58	1.3	25	0	102	85	115	26.72	440	20	
Sample ID: 06020151-ESPMS	Sample Type: WS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 71002						
Client ID: HP-1	Batch ID: R71002	Test No: E2814		Analysis Date: 10/09/08	Depth: 040708						
Nitrogen, Total Kjeldahl	26.20	1.3	25	0	110	70	130				
Sample ID: 06020151-SPMS	Sample Type: WS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 71002						
Client ID:	Batch ID: R71002	Test No: E2814		Analysis Date: 10/09/08	Depth: 040709						
Nitrogen, Total Kjeldahl	41.25	1.3	25	15.25	108	70	130				

Qualifiers: 1. Value above quantitation limit 2. Missing data for preparation or analysis recorded 3. Analyte detected below quantitation limit
ND: Not Detected at the Reporting Level 4. RPO value exceeded recovery limits 5. Spike Recovery value exceeded recovery limits



Aerotech Environmental Laboratories

A Division of Ametek Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06020115
Project: MSF-E270Monthly-Qtrly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: 06020108-40C060	Sample Type: MSF	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 11602						
Client ID: WP-1	Batch ID: RT1602	TestNo: E281A		Analysis Date: 03/20/04	SeqNo: 04079						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRIC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPO Limit	Qual
Nitrogen, Total Kjeldahl	28.00	1.0	25	0	104	70	130	28.00	1.11	25	

Sample ID: 06020108-40C060	Sample Type: MSF	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 11602						
Client ID:	Batch ID: RT1602	TestNo: E281A		Analysis Date: 03/20/04	SeqNo: 04079						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRIC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPO Limit	Qual
Nitrogen, Total Kjeldahl	42.00	1.0	25	15.25	115	70	130	42.00	1.58	25	

Qualifiers: 1 - Value above qualification range 2 - Holding time for preparation or analysis exceeded 3 - Analysis started before qualification trials
 N/D - Not Detected at the Reporting Level 4 - RPO exceeds accepted recovery limits 5 - Spike Recovery exceeds accepted recovery limits

Laboratory Number: <u>0602-D155</u>	Checklist completed by: <u>[Signature]</u>
Client Name: <u>Pima County FC</u>	Signature/Date
Matrix: <u>WW/BW</u> Carrier Name: <u>Client</u>	Date/Time Rec'd: <u>2/27/06 1503</u> By: <u>JF</u>

Temperatures of Samples? 11.6 °C Circle one: (500 to) Wet Ice Not Present

	Yes	No*	Not Present	Soil Containers:
Shipping container/cooler in good condition?	X			Brass Sleeve _____
Custody seals intact on shipping container/cooler?			X	Glass Jar _____
Custody seals intact on sample containers?			X	Methanol _____
Chain of Custody present and relinquished/received properly?	X			Plastic Bag _____
Chain of Custody agrees with sample labels?	X			Decorative Samples _____
Samples in proper containers/bottles?	X			
Sample containers intact?	X			
All samples received within holding time?	X			**See Comment about Chlorine and pH
Is there sufficient sample volume to perform the tests?	X			
40mL vials for volatiles & SOCs received with zero headspace?	X			

Total number of bottles received: 13 (H) sample media:

If applicable, how many sample bottles were shipped from AEL-Tucson? 13 N/A

Number of containers received by preservative and by sample number. If more than 15 samples are rec'd, please continue on separate sheet(s)

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General															
B-HNO3															
C-H2SO4															
D-HCl	3	3	1TB												
E-Na2S2O3															
F-NaOH															
G-Sulfide															
H-Na Sulfite															
I-MCAA															
J-Methanol															
K-HAA															
L-Other															

Water-pH acceptable upon receipt? Yes No N/A

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and reagent ID, number
Metals <2	<2	
Nutrients <2	<2	
Total Phos <2		
413 (O&G) <2		
418 (TTH) <2		
Cyanide >12		
Sulfide >9		

*Any No responses must be detailed in the comments section below. Contact the PM immediately to determine how to proceed. Refer to SOP 11-001.04, Section 1.8.8. Continue on back if additional space is needed.

**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments:

Corrective Action:



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Wednesday, April 12, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX (520) 205-8360

RE: MIIPERP

Order No.: 06030217

Dear David Scalero:

Aerotech Environmental, Inc. received 2 sample(s) on 3/30/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Korby Vault
Service Center Manager



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 12-Apr-08

CLIENT: Pima County Flood Control
Project: MHPERP
Lab Order: 06030217

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06030217-01C	Source Water		3/30/2006 10:20:00 AM	3/30/2006
06030217-02C	HP-1		3/30/2006 12:00:00 PM	3/30/2006



Aerotech Environmental Laboratories

A Division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 12-Apr-08

CLIENT: Pima County Flood Control
Lab Order: 06000217
Project: MRIPER2
Lab ID: 06000217-01C

Client Sample ID: Source Water
Tag Number:
Collection Date: 3/30/2008 10:20:00 AM
Matrix: WASTE WATER

Analysis	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY		E300				Analyst: LB
Nitrogen, Nitrate/Nitrite Total	1.4	0.40		mg/L	1	4/1/2008 12:18:00 PM
NITROGEN, TOTAL KJELDAHL AS N		E351.4				Analyst: AT
Nitrogen, Total Kjeldahl	23	1.0		mg/L	1	4/1/2008 2:00:00 PM
NITROGEN, TOTAL		CALC				Analyst: AC
Nitrogen, Total	30	1.7		mg/L	1	4/1/2008

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Kowalski Laboratory

Page 1 of 3

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 12-Apr-08

CLIENT: Pima County Flood Control
Lab Order: 06030217
Project: MHPERP
Lab ID: 06030217-03C

Client Sample ID: HP-1
Tag Number:
Collection Date: 3/20/2008 12:00:00 PM
Matrix: DRINKING WATER

Analytes	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY		E300				Analyst: LB
Nitrogen, Nitrate-Nitrite Total	2.8	0.40		mg/L	1	4/11/2008 12:32:00 PM
NITROGEN, TOTAL KJELDAHL, AS N		E251.4				Analyst: AT
Nitrogen, Total Kjeldahl	< 1.3	1.3		mg/L	1	4/11/2008 2:00:00 PM
NITROGEN, TOTAL		CALC				Analyst: AC
Nitrogen, Total	2.8	1.7		mg/L	1	4/13/2008

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Knudsen Laboratory

Page 2 of 2

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 12-Apr-06

CLIENT: Pima County Flood Control
Project: MIIPERP
Lab Order: 06030217

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.

Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.

40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.

NIOSH Manual of Analytical Methods, Fourth Edition, 1994.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610 and AEL-Tucson holds Arizona certification no. AZ0609.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

12-Apr-08

Lab Order: 06000217
Client: Pima County Flood Control
Project: M3P/CRP

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	DCLP Date	Prep Date	Analysis Date
060002149C	Sewer Water	3/30/08 10:26:00 AM	Waste Water	ANIONIC by ION-CHROMATOGRAPHY			4/10/08 12:16:00 PM
				TOTAL RELEASE NITROGEN			4/10/08 1:00:00 PM
				Total Nitrogen (Calculated)			4/10/08
060002140C	BP-1	3/30/08 12:48:00 PM	Drinking Water	ANIONIC by ION-CHROMATOGRAPHY			4/10/08 12:12:00 PM
				TOTAL RELEASE NITROGEN			4/10/08 1:00:00 PM
				Total Nitrogen (Calculated)			4/10/08



Aerotech Environmental Laboratories

a division of Ametek Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 12-19-08

CLIENT: Pima County Flood Control
Work Order: 06000117
Project: MDCFRP

ANALYTICAL QC SUMMARY REPORT

Test Code: 300_W

Sample ID: MB-R72501	Sample Type: MBLK	Test Code: 300_W	Units: mg/L	Prep Date:	Run#: 12501						
Client ID:	Batch ID: R72501	Test No: E300		Analysis Date: 4/15/2008	Seq#: 00088						
Analyte	Result	PQL	SPK value	SPK Ref Use	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 0.40 0.40

Sample ID: LCB-R72501	Sample Type: LCB	Test Code: 300_W	Units: mg/L	Prep Date:	Run#: 12501						
Client ID:	Batch ID: R72501	Test No: E300		Analysis Date: 4/15/2008	Seq#: 00087						
Analyte	Result	PQL	SPK value	SPK Ref Use	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 1.60 0.40 0 0 97.5 90 110

Sample ID: LCSD-R72501	Sample Type: LCSD	Test Code: 300_W	Units: mg/L	Prep Date:	Run#: 12501						
Client ID:	Batch ID: R72501	Test No: E300		Analysis Date: 4/15/2008	Seq#: 00086						
Analyte	Result	PQL	SPK value	SPK Ref Use	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 1.40 0.40 0 0 92.9 90 110 1.60 0.38 30

Sample ID: 26040903-RTAMRS	Sample Type: MS	Test Code: 300_W	Units: mg/L	Prep Date:	Run#: 12501						
Client ID:	Batch ID: R72501	Test No: E300		Analysis Date: 4/15/2008	Seq#: 00048						
Analyte	Result	PQL	SPK value	SPK Ref Use	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 11.67 0.40 0 4.40 90.8 90 120

Sample ID: 26040903-RTAMSD	Sample Type: MSD	Test Code: 300_W	Units: mg/L	Prep Date:	Run#: 12501						
Client ID:	Batch ID: R72501	Test No: E300		Analysis Date: 4/15/2008	Seq#: 00049						
Analyte	Result	PQL	SPK value	SPK Ref Use	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 11.72 0.40 0 4.40 91.4 90 120 11.67 0.428 30

Qualifiers: 0 Value above quantitative range 1 Holding time for preparation or analysis recorded 2 Analyte detected below quantitative limit
 ND Not Detected in the Reporting Limit 3 RPD results accepted recovery limits 5 Spill Recovery results accepted recovery limits



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control

Work Order: 06030217

Project: M03P002

ANALYTICAL QC SUMMARY REPORT

Test Code: N_TKN_WW

Sample ID: M0-072008	Sample Type: MBLK	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 7208						
Client ID:	Batch ID: 072008	Technic: E201.4		Analysis Date: 4/11/2008	Seq No: 00107						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl 1.2 1.2

Sample ID: LCS-072008	Sample Type: LCS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 7208						
Client ID:	Batch ID: 072008	Technic: E201.4		Analysis Date: 4/11/2008	Seq No: 00108						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl 25.30 1.2 25 0 100 85 115

Sample ID: LCS0-072008	Sample Type: LCS0	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 7208						
Client ID:	Batch ID: 072008	Technic: E201.4		Analysis Date: 4/11/2008	Seq No: 00109						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl 26.72 1.2 25 0 107 85 115 26.30 1.00 20

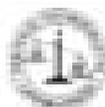
Sample ID: 06000017-02000	Sample Type: M0	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 7208						
Client ID: NP-1	Batch ID: 072008	Technic: E201.4		Analysis Date: 4/11/2008	Seq No: 00141						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl 21.30 1.2 25 0 85.2 70 100

Sample ID: 06000002-01000	Sample Type: M0	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 7208						
Client ID:	Batch ID: 072008	Technic: E201.4		Analysis Date: 4/11/2008	Seq No: 00161						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl 20.50 1.2 25 0 80.2 70 100

Qualifiers: 0 - Value above quantitative range 1 - Holding time for preservative or analyte exceeded 2 - Analyte detected below quantitative limits
 ND - Not Detected or in Reporting Limit 3 - RPO within accepted recovery limits 4 - Spike Recovery - within accepted recovery limits



Aerotech Environmental Laboratories

a division of Ametek Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06030217
Project: MGPERS

ANALYTICAL QC SUMMARY REPORT

Test Code: N_TKN_WW

Sample ID: 06040725-01CM30	Sample Type: MS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 7208						
Client ID:	Batch ID: R72138	Test No: E301.4		Analysis Date: 4/19/2008	Seq No: 802139						
Analyte	Result	PQL	SPH value	SPH Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl	21.85	1.3	25	1.550	85.4	70	100				
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Sample ID: 06030211-03CM30	Sample Type: MS0	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 7208						
Client ID: HP-4	Batch ID: R72138	Test No: E301.4		Analysis Date: 4/19/2008	Seq No: 802142						
Analyte	Result	PQL	SPH value	SPH Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl	17.63	1.3	25	0	76.5	70	100	21.30	15.9	20	
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Sample ID: 06040402-01CM30	Sample Type: MS0	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 7208						
Client ID:	Batch ID: R72138	Test No: E301.4		Analysis Date: 4/19/2008	Seq No: 802142						
Analyte	Result	PQL	SPH value	SPH Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl	21.10	1.3	25	0	84.6	70	100	22.55	6.41	20	
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Sample ID: 06040725-01CM30	Sample Type: MS0	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 7208						
Client ID:	Batch ID: R72138	Test No: E301.4		Analysis Date: 4/19/2008	Seq No: 802171						
Analyte	Result	PQL	SPH value	SPH Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl	22.38	1.3	25	1.550	82.3	70	100	21.85	3.29	20	
--------------------------	-------	-----	----	-------	------	----	-----	-------	------	----	--

Qualifiers: E - Value above quantitative range
ND - Not Detected as per Reporting Limit

H - Holding time for preservative or analysis exceeded
B - RPO outside accepted recovery limits

L - Analyte detected below quantitative limits
S - Spike Recovery outside accepted recovery limits

Aerotech Environmental Laboratories Sample Receipt Checklist

Project Checked By: *[Signature]*

Laboratory Number: <u>06030217</u>	Checklist completed by: <u>J. Bal</u>
Client Name: <u>Pima County Flood</u>	Signature: <u>3-31-06</u>
Matrix: <u>W/P/Water</u> / Center Name: <u>Client</u>	Date/Time Rec'd: <u>3-31-06 / 13:45</u> By: <u>JB</u>

Temperature of Samples? Not °C Circle one: On Ice Wet Ice Not Present

	Yes	No	Not Present	Soil Containers:
Shipping container/cooler in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Brass Tins: _____
Custody seals intact on shipping container/cooler?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Glass Jar: _____
Custody seals intact on sample containers?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Methanol: _____
Chain of Custody present and relinquished/received property?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plastic Bag: _____
Chain of Custody agrees with sample labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Excuse Samples: _____
Samples in proper containers/bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sample containers intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
All samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	**See Comment about Chlorine and pH
Is there sufficient sample volume to perform the tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
40mL vials for volatiles & SOCs received with zero headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Total number of bottles received: 7 of sample media: _____
 If applicable, how many sample bottles were shipped from AEL-Tucson? 4 N/A

Number of containers received by preservative and by sample number. If more than 15 samples are rec'd, please continue on separate sheet(s)

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General	1	1													
B-HNO3															
C-H2SO4	1	1													
D-HCl															
E-H2O203	<u>1</u>														
F-NaOH															
G-Sulfide															
H-Ha Sulfur															
I-MCAA															
J-Methanol															
K-HAA															
L-Other															

Water pH acceptable upon receipt? Yes No N/A (93)

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and reagent ID, number
Metals <2		
Nutrients <2	<u>2.2</u>	
Total Phosph <2		
412 (OSG) <2		
418 (TPH) <2		
Cyanide >12		
Sulfide >2		

*Any No response must be detailed in the comments section below. Contact the FBI immediately to determine how to proceed. Refer to SOP 11-001.04, Section 1.4.4. Continue on back if additional space is needed.

**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments: Feet Run in Tucson (93)
 Corrective Action:



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Thursday, May 11, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX: (520) 205-8360

RE: MHP-ERP/Monthly

Order No.: 06040210

Dear David Scalero:

Aerotech Environmental, Inc. received 2 sample(s) on 4/28/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed
- QC Summary Report

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Korky Vault
Service Center Manager



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 11-May-06

CLIENT: Pima County Flood Control
Project: MHP-CRP/Monthly
Lab Order: 06040210

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06040210-01C	Source Water		4/28/2006 11:30:00 AM	4/28/2006
06040210-02C	SD-1		4/28/2006 1:00:00 PM	4/28/2006



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 11-May-05

CLIENT: Pima County Flood Control

Project: MDP-IRP/Monthly

Lab Order: 06040210

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.

Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.

40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.

NIOSH Manual of Analytical Methods, Fourth Edition, 1994.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610 and AEL-Tucson holds Arizona certification no. AZ0609.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 11-May-06

CLIENT:	Pima County Flood Control	Client Sample ID:	Source Water
Lab Order:	06040210	Tag Number:	
Project:	MSP-ERP/Monthly	Collection Date:	4/28/2006 11:20:00 AM
Lab ID:	06040210-01C	Matrix:	WASTE WATER

Analysis	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate/Nitrite Total	0.82	0.40		mg/L	1	Analyst: LB 5/5/2006 5:55:00 AM
NITROGEN, TOTAL KJELDAHL AS N						
Nitrogen, Total Kjeldahl	37	1.3		mg/L	1	Analyst: AT 5/5/2006
NITROGEN, TOTAL						
Nitrogen, Total	38	1.7		mg/L	1	Analyst: LMc 5/5/2006

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Kingman Laboratory

Page 1 of 2

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 11-May-06

CLIENT:	Pima County Flood Control	Client Sample ID:	HP-1
Lab Order:	00040210	Tag Number:	
Project:	MHP-ERP/Monthly	Collection Date:	4/26/2006 1:00:00 PM
Lab ID:	00040210-02C	Matrix:	WASTE WATER

Analysis	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate/Nitrite Total	2.4	0.40		mg/L	1	Analyst: LB 05/02/06 8:12:00 AM
NITROGEN, TOTAL NIELDAHL AS N						
Nitrogen, Total Kjeldahl	< 1.3	1.3		mg/L	1	Analyst: AT 05/02/06
NITROGEN, TOTAL						
Nitrogen, Total	2.4	CALC		mg/L	1	Analyst: LMc 05/02/06

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes

- (1) AEL - Tucson Laboratory
- (2) AEL - Knudsen Laboratory

Page 2 of 2

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

17-169-00

Lab Order: 96040210
Client: Pima County Flood Control
Project: MHP-ERP/Monthly

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCCLP Date	Prep Date	Analysis Date
96040210-10C	Swine Ponds	4/28/2006 12:20:00 AM	Waste Water	APCORN by ION CHROMATOGRAPHY			5/5/2006 1:11:00 PM
				TOTAL KJELDHAL NITROGEN			5/5/2006
				Total Nitrogen (Calculated)			5/5/2006
96040210-10C	EF-1	4/28/2006 1:05:00 PM		APCORN by ION CHROMATOGRAPHY			5/5/2006 6:12:00 PM
				TOTAL KJELDHAL NITROGEN			5/5/2006
				Total Nitrogen (Calculated)			5/5/2006



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 11-May-08

CLIENT: Pima County Flood Control

Work Order: 06040200

Project: MSP-ERP/Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W

Sample ID: 06040204	Sample Type: WBLK	Test Code: 300_W	Units: mg/L	Prep Date:	RunNo: 11248						
Client ID:	Batch ID: 073148	TestNo: E388		Analysis Date: 05/20/08	SeqNo: 076608						
Analyte	Result	POI	SPK value	SPK Ref Val	MREC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total	0.40	0.40									
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Sample ID: LC040204	Sample Type: LCS	Test Code: 300_W	Units: mg/L	Prep Date:	RunNo: 11248						
Client ID:	Batch ID: 073148	TestNo: E388		Analysis Date: 05/20/08	SeqNo: 076608						
Analyte	Result	POI	SPK value	SPK Ref Val	MREC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total	7.200	0.40	8	0	99.4	90	110				
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Sample ID: LC040204	Sample Type: LCSD	Test Code: 300_W	Units: mg/L	Prep Date:	RunNo: 11248						
Client ID:	Batch ID: 073148	TestNo: E388		Analysis Date: 05/20/08	SeqNo: 076607						
Analyte	Result	POI	SPK value	SPK Ref Val	MREC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total	7.700	0.40	8	0	98.8	90	110	7.000	2.00	20	
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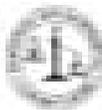
Sample ID: 06040205-SAMS	Sample Type: MS	Test Code: 300_W	Units: mg/L	Prep Date:	RunNo: 11248						
Client ID:	Batch ID: 073248	TestNo: E388		Analysis Date: 05/20/08	SeqNo: 076610						
Analyte	Result	POI	SPK value	SPK Ref Val	MREC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total	11.40	4.0	90	0	98.8	90	100				
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Sample ID: 06040205-SAMS0	Sample Type: MSD	Test Code: 300_W	Units: mg/L	Prep Date:	RunNo: 11248						
Client ID:	Batch ID: 073248	TestNo: E388		Analysis Date: 05/20/08	SeqNo: 076614						
Analyte	Result	POI	SPK value	SPK Ref Val	MREC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total	11.30	4.0	90	0	98.8	90	100	11.40	0.009	20	
---------------------------------	-------	-----	----	---	------	----	-----	-------	-------	----	--

Qualifiers: 1. Value above specification range 2. Missing value for preparation or analysis recorded 3. Analyte detection/confirmation quantitative levels
 ND: Not Detected within Reporting Limit 4. RPD value(s) accepted/exceeded limits 5. Spike Recovery results accepted/exceeded recovery levels



Aerotech Environmental Laboratories

A Division of American Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06740210
Project: MSP-ERP/Moddy

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: MS-R73832	Sample Type: MBLM	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 73832						
Client ID:	Batch ID: R73832	TestNo: E3814		Analysis Date: 08/20/06	SeqNo: 87788						
Analyte	Result	POI	SPC value	SPC Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl 41.3 1.3

Sample ID: LCS-R73832	Sample Type: LCS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 73832						
Client ID:	Batch ID: R73832	TestNo: E3814		Analysis Date: 08/20/06	SeqNo: 87789						
Analyte	Result	POI	SPC value	SPC Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl 25.08 1.3 25 0 100 85 110

Sample ID: LCS0-R73832	Sample Type: LCS0	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 73832						
Client ID:	Batch ID: R73832	TestNo: E3814		Analysis Date: 08/20/06	SeqNo: 87792						
Analyte	Result	POI	SPC value	SPC Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl 25.45 1.3 25 0 97.8 85 110 25.38 8.70 20

Sample ID: 88000864-R73832	Sample Type: WS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 73832						
Client ID:	Batch ID: R73832	TestNo: E3814		Analysis Date: 08/20/06	SeqNo: 87789						
Analyte	Result	POI	SPC value	SPC Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl 22.25 1.3 25 0.850 82.5 70 130

Sample ID: 88000704-R73832	Sample Type: WS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 73832						
Client ID:	Batch ID: R73832	TestNo: E3814		Analysis Date: 08/20/06	SeqNo: 87789						
Analyte	Result	POI	SPC value	SPC Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl 25.88 1.3 25 0.850 98.1 70 130

Qualifiers: **Q** - Value above quantitative range **R** - Holding time for preparation of analysis exceeded **J** - Analysis detected below quantitative level
ND - Not Detected at the Reporting Level **E** - STD outside accepted recovery limits **S** - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Jernstedt Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 60040310
Project: MSP-ERP/Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: 00000006-#PCW00	Sample Type: WSD	TestCode: N_TKN_WW	Units: mg/L	Prog Date:	RunNo: 75022						
Client ID:	Batch ID: RT0022	Techn: E5014		Analysis Date: 08/2008	SeqNo: 07709						
Analyte	Result	POC	SPK value	SPK Ref Val	NRDC	LowLim	HighLim	RPO Ref Val	NRPO	RPOLim	Qual
Nitrogen, Total Kjeldahl	22.45	1.0	25	1.000	10.4	70	130	22.35	0.488	20	

Sample ID: 00000072-#PCW00	Sample Type: WSD	TestCode: N_TKN_WW	Units: mg/L	Prog Date:	RunNo: 75022						
Client ID:	Batch ID: RT0022	Techn: E5014		Analysis Date: 08/2008	SeqNo: 07709						
Analyte	Result	POC	SPK value	SPK Ref Val	NRDC	LowLim	HighLim	RPO Ref Val	NRPO	RPOLim	Qual
Nitrogen, Total Kjeldahl	27.22	1.0	25	1.000	10.1	70	130	25.88	4.35	20	

Qualifiers: 0 - Value above quantitative range 1 - Sampling time or preparation or analysis exceeded 2 - Analyte detected below quantitative limits
 50 - Not Detected at the Reporting Limit 6 - RPO exceeds acceptable recovery limits 3 - Spike Recovery outside accepted recovery limits

Laboratory Number: <u>06040210</u>	Checklist completed by: <u>[Signature]</u> <u>4/28/06</u>
Client Name: <u>Pima County, AZ</u>	Signature/Date
Matrix: <u>N/A</u> Carrier Name: <u>Client</u>	Date/Time Rec'd: <u>4/28/06 1345</u> <u>rcf</u>

Temperature of Samples? 13.3 °C Circle one: Blue Ice Wet Ice Not Present

	Yes	No*	Not Present	Soil Containers:
Shipping container/cooler in good condition?	X			Brass Sleeve _____
Custody seals intact on shipping container/cooler?			X	Glass Jar _____
Custody seals intact on sample containers?			X	Method _____
Chain of Custody present and relinquished/received properly?	X			Plastic Bag _____
Chain of Custody agrees with sample labels?	X			Encore Samples _____
Samples in proper containers/bottles?	X			
Sample containers intact?	X			
All samples received within holding time?	X			**See Comment about Chlorine and pH
Is there sufficient sample volume to perform the tests?	X			
40mL vials for volatiles & SOCs received with zero headspace?	X			<u>DIT</u>

Total number of bottles received: 2 (H) sample media: _____
 If applicable, how many sample bottles were shipped from AEL-Tucson? 2 N/A

Number of containers received by preservative and by sample number. If more than 15 samples are rec'd, please continue on separate sheet(s)

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General															
B-HNO3															
C-H2SO4															
D-HCl															
E-NaOH															
F-NaOH															
G-Sulfide															
H-Ha Sulfide															
I-MCAA															
J-Methanol															
K-HAA															
L-Other															

Water-pH acceptable upon receipt? Yes No N/A

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and reagent ID number
Metals <2		
Nutrients <2	<u><2</u>	
Total Phosph <2		
413 (OSG) <2		
418 (TPH) <2		
Cyanide >12		
Sulfide >9		

*Any No response must be detailed in the comments section below. Contact the PM immediately to determine how to proceed. Refer to SOP 11-001.04, Section 1.4.4. Continue on back if additional space is needed.

**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments: _____
 Corrective Action: _____



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Wednesday, June 14, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX (520) 205-8360

RE: MIHPERP Monthly

Order No.: 06050138

Dear David Scalero:

Aerotech Environmental, Inc. received 2 sample(s) on 5/31/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Kerky Vault
Service Center Manager



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 14-Jun-08

CLIENT: Pima County Flood Control
Project: MHPERP Monthly
Lab Order: 06050138

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06050138-01C	Source Water		5/31/2006 9:25:00 AM	5/31/2006
06050138-02C	HP-1		5/31/2006 11:05:00 AM	5/31/2006



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 11-Jun-08

CLIENT: Pima County Flood Control
Project: MHPERP Monthly
Lab Order: 06050138

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.

Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.

40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.

NIOSH Manual of Analytical Methods, Fourth Edition, 1994.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610 and AEL-Tucson holds Arizona certification no. AZ0609.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 14-Jun-09

CLIENT: Pima County Flood Control
 Lab Order: 06050138
 Project: MBPERP Monthly
 Lab ID: 06050138-01C

Client Sample ID: Source Water
 Tag Number:
 Collection Date: 5/31/2008 9:25:00 AM
 Matrix: WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate/Nitrite Total	0	E300	0.40	mg/L	1	Analyst: LB 5/30/2008 9:38:00 PM
NITROGEN, TOTAL KJELDAHL AS N						
Nitrogen, Total Kjeldahl	20	E351.4	1.3	mg/L	1	Analyst: JLS 5/8/2008
NITROGEN, TOTAL						
Nitrogen, Total	20	CALC	1.7	mg/L	1	Analyst: LMc 5/12/2008

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Kinsden Laboratory

Page 1 of 2

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 14-Jun-06

CLIENT: Faza County Flood Control
Lab Order: 06050138
Project: MHPERP Monthly
Lab ID: 06050138-03C

Client Sample ID: HP-1
Tag Number:
Collection Date: 5/31/2006 11:03:00 AM
Matrix: DRINKING WATER

Analysis	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY		E300				Analysis: LB
Nitrogen, Ammoniacal Total	0.8	0.40		mg/L	1	5/30/2006 9:57:00 PM
NITROGEN, TOTAL NITROGEN AS N		E351.4				Analysis: JLS
Nitrogen, Total Kjeldahl	1.0	1.3		mg/L	1	5/30/2006
NITROGEN, TOTAL		CALC				Analysis: LMC
Nitrogen, Total	1.4	1.7		mg/L	1	5/30/2006

Parameter: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Krueger Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

14-Jun-06

Lab Order: 06050128
Client: Pima County Flood Control
Project: MRP/ERP Monthly

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	ICLP Date	Prep Date	Analysis Date
06050128-001	Source Water	6/13/2006 8:21:00 AM	Water/Water	ANDEK by ION-CHROMATOGRAPHY			6/13/2006 9:24:00 PM
				TOTAL KJELDAHL NITROGEN			6/13/2006
				Total Nitrogen (Calculated)			6/13/2006
06050128-002	RP-1	6/13/2006 11:25:00 AM	Drinking Water	ANDEK by ION-CHROMATOGRAPHY			6/13/2006 9:21:00 PM
				TOTAL KJELDAHL NITROGEN			6/13/2006
				Total Nitrogen (Calculated)			6/13/2006



Aerotech Environmental Laboratories

division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 14-Jun-08

CLIENT: Pinal County Flood-Control
Work Order: 06000138
Project: MSRPCP Monthly

ANALYTICAL QC SUMMARY REPORT

Test Code: 306_W

Sample ID: MB-R75123	Sample Type: BULK	Test Code: 306_W	Units: mg/L	Prep Date:	Run No: 75123						
Client ID:	Batch ID: R75123	Test No: E306		Analysis Date: 6/9/2008	Seq No: 882113						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 0.40 0.40

Sample ID: LCS-R75123	Sample Type: LCS	Test Code: 306_W	Units: mg/L	Prep Date:	Run No: 75123						
Client ID:	Batch ID: R75123	Test No: E306		Analysis Date: 6/9/2008	Seq No: 882114						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 7.873 0.40 0 0 91.7 0 100

Sample ID: LCSS-R75123	Sample Type: LCSS	Test Code: 306_W	Units: mg/L	Prep Date:	Run No: 75123						
Client ID:	Batch ID: R75123	Test No: E306		Analysis Date: 6/9/2008	Seq No: 882124						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 7.861 0.40 0 0 98.3 0 100 7.861 0 20

Sample ID: 06000013-16AMS	Sample Type: WS	Test Code: 306_W	Units: mg/L	Prep Date:	Run No: 75123						
Client ID:	Batch ID: R75123	Test No: E306		Analysis Date: 6/9/2008	Seq No: 882121						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 11.58 0.40 0 0.102 98.5 0 100

Sample ID: 06000013-16AMS2	Sample Type: WS	Test Code: 306_W	Units: mg/L	Prep Date:	Run No: 75123						
Client ID:	Batch ID: R75123	Test No: E306		Analysis Date: 6/9/2008	Seq No: 882122						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual

Nitrogen, Nitrate/Nitrite Total 11.80 0.40 0 0.102 90.6 0 100 11.80 2.38 20

Qualifiers: 1. Value above quantitation limit 2. Sampling error for preparation or analysis recorded 3. Analyte detected below quantitation limits
 ND Not Detected at the Reporting Limit 4. RPD exceeds accepted recovery limits 5. Spike Recovery exceeds accepted recovery limits



Aerotech Environmental Laboratories

a Division of Analytical Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 0605138
Project: MSPEEP Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: MS-R75007	Sample Type: MSLM	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 75007						
Client ID:	Batch ID: R75007	TestNo: E351.4		Analysis Date: 6/8/2006	SeqNo: 891668						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPQLimit	Qual
Nitrogen, Total Kjeldahl	41.3	1.3									

Sample ID: LCS-R75007	Sample Type: LCS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 75007						
Client ID:	Batch ID: R75007	TestNo: E351.4		Analysis Date: 6/8/2006	SeqNo: 891668						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPQLimit	Qual
Nitrogen, Total Kjeldahl	28.92	1.3	25	0	108	85	115				

Sample ID: LCSD-R75007	Sample Type: LCSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 75007						
Client ID:	Batch ID: R75007	TestNo: E351.4		Analysis Date: 6/8/2006	SeqNo: 891668						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPQLimit	Qual
Nitrogen, Total Kjeldahl	25.00	1.3	25	0	192	85	115	25.00	1.41	25	

Sample ID: 06051374-030RS	Sample Type: MS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 75007						
Client ID:	Batch ID: R75007	TestNo: E351.4		Analysis Date: 6/8/2006	SeqNo: 891668						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPQLimit	Qual
Nitrogen, Total Kjeldahl	22.25	1.3	25	1.76	82.8	85	130				

Sample ID: 06050118-010NS	Sample Type: MS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 75007						
Client ID:	Batch ID: R75007	TestNo: E351.4		Analysis Date: 6/8/2006	SeqNo: 891678						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPQLimit	Qual
Nitrogen, Total Kjeldahl	24.88	1.3	25	2.76	88.6	85	130				

Qualifiers: 0 - Value above quantitation limit
ND - Not Detected at the Reporting Level

W - Missing steps for preparation of analysis recorded
R - RPD results accepted recovery limits

F - Analyte detected below quantitation limits
I - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Ametek Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 04050138
Project: MCFERP Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID:	Sample Type:	TestCode:	Units:	Prep Date:	RunNo:						
06001573-00C050	MSD	N_TKN_WW	mg/L		15007						
Client ID:	Batch ID:	TestNo:		Analysis Date:	SeqNo:						
	075007	E2814		08/2008	091605						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Total Kjeldahl	21.18	1.0	20	1.700	77.5	70	130	20.25	5.40	20	

Sample ID:	Sample Type:	TestCode:	Units:	Prep Date:	RunNo:						
06000018-01C050	MSD	N_TKN_WW	mg/L		15007						
Client ID:	Batch ID:	TestNo:		Analysis Date:	SeqNo:						
	075007	E2814		08/2008	091678						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Total Kjeldahl	25.30	1.0	20	2.700	93.7	70	130	24.00	2.30	20	

Qualifiers: Q - Value above quantitation limit
ND - Not Detected at the Reporting Limit

H - Holding time for preservative or analysis exceeded
R - RPD outside accepted recovery limits

S - Analyte detected before quantitation limit
T - Spike Recovery outside accepted recovery limits

Page 1 of 1



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Wednesday, July 05, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX: (520) 205-8360

RE: MHP-ERP/Monthly Quarterly

Order No.: 06060831

Dear David Scalero:

Aerotech Environmental, Inc. received 3 sample(s) on 6/21/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Kerky Vault
Service Center Manager



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 05-Jul-06

CLIENT: *Pima County Flood Control*
Project: *MSP-ERP Monthly Quarterly*
Lab Order: *06060831*

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06060831-01B	Source Water		6/21/2006 9:00:00 AM	6/21/2006
06060831-01C	Source Water		6/21/2006 9:00:00 AM	6/21/2006
06060831-01D	Source Water		6/21/2006 9:00:00 AM	6/21/2006
06060831-02B	HP-1		6/21/2006	6/21/2006
06060831-02C	HP-1		6/21/2006	6/21/2006
06060831-02D	HP-1		6/21/2006	6/21/2006
06060831-03D	Trip Blank		6/21/2006	6/21/2006



Aerotech Environmental Laboratories

A Division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 05-Jul-09

CLIENT: Pima County Flood Control
Project: MIP-EOP Monthly Quarterly
Lab Order: 06060831

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.

Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.

40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.

NIOSH Manual of Analytical Methods, Fourth Edition, 1994.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610 and AEL-Tucson holds Arizona certification to AZ0609.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.

Data Qualifiers:

Listed below are the data qualifiers used in your analytical report to explain any analytical or quality control issues. You will find them noted in your report under the column header "QUAL". Any quality control deficiencies that cannot be adequately described by these qualifiers will be addressed in the analytical comments section of this case narrative.

- D1 Sample required dilution due to matrix.
- S12 Surrogate recovery was low. Data reported per ADEQ policy 0154.000.



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Project: MIEP-ESUP/Weekly Quarterly
Lab Order: 0606031

CASE NARRATIVE

VI - CCV recovery was above method acceptance limits. This target analyte was not detected in the sample.

D1- Method 300 (Additional Comment):

Sample required dilution due to interference from a non-target analyte.



Aerotech Environmental Laboratories

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Aerotech Environmental, I

Analytical Report

Date: 01-26-08

CLIENT: Pima County Flood Control

Client Sample ID: Source Water

Lab Order: 06060831

Tag Number:

Project: MHP-ERP/Messdy Quarterly

Collection Date: 6/21/2006 9:03:00 AM

Lab ID: 06060831-01B

Matrix: WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICPMS METALS, TOTAL RECOVERABLE		E268.8				Analyst: TD
Antimony	< 0.0030	0.0030		mg/L	1	6/26/2006 3:38:36 PM
Arsenic	0.0008	0.0010		mg/L	1	6/26/2006 3:38:36 PM
Barium	0.071	0.010		mg/L	1	6/26/2006 3:38:36 PM
Beryllium	< 0.0010	0.0010	V1	mg/L	1	6/26/2006 3:38:36 PM
Cadmium	< 0.0010	0.0010		mg/L	1	6/26/2006 3:38:36 PM
Chromium	0.0017	0.0010		mg/L	1	6/26/2006 3:38:36 PM
Lead	0.0020	0.0010		mg/L	1	6/26/2006 3:38:36 PM
Nickel	0.0048	0.0010		mg/L	1	6/26/2006 3:38:36 PM
Selenium	0.0035	0.0020		mg/L	1	6/26/2006 3:38:36 PM
Thallium	< 0.0010	0.0010		mg/L	1	6/26/2006 3:38:36 PM
MERCURY, TOTAL		E248.1				Analyst: PC
Mercury	< 0.00020	0.00020		mg/L	1	6/26/2006

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Kandler Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

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Aerotech Environmental, I

Analytical Report

Date: 05-Jul-08

CLIENT:	Pima County Flood Control	Client Sample ID:	Storm Water
Lab Order:	06060831	Tag Number:	
Project:	MHP-ERP/Monthly Quarterly	Collection Date:	6/21/2008 9:03:00 AM
Lab ID:	06060831-01C	Matrix:	WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate/Nitrite Total	1.8	E300		mg/L	1	Analyst: LB 6/26/2008 9:21:00 PM
NITROGEN, TOTAL KJELDAHL AS N						
Nitrogen, Total Kjeldahl	27	E301.4		mg/L	1	Analyst: AC 6/26/2008
NITROGEN, TOTAL						
Nitrogen, Total	29	CALC		mg/L	1	Analyst: AC 7/02/2008

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Kasilero Laboratory

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(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



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Aerotech Environmental, I

Analytical Report

Date: 05-Jul-06

CLIENT: Pima County Flood Control
Lab Order: 06060831
Project: MDP-ERP/Monthly Quarterly
Lab ID: 06060831-01D

Client Sample ID: Source Water
Tag Number:
Collection Date: 6/21/2006 9:05:00 AM
Matrix: WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW02008		Analyst: k.m		
1,1,1-Trichloroethane	< 1.0	1.0		ug/L	1	6/21/2006
1,1,2-Trichloroethane	< 1.0	1.0		ug/L	1	6/21/2006
1,1-Dichloroethane	< 1.0	1.0		ug/L	1	6/21/2006
1,2-Dichloroethane	< 1.0	1.0		ug/L	1	6/21/2006
1,2-Dichloropropane	< 1.0	1.0		ug/L	1	6/21/2006
1,4-Dichlorobenzene	< 1.0	1.0		ug/L	1	6/21/2006
Benzene	< 1.0	1.0		ug/L	1	6/21/2006
Carbon tetrachloride	< 1.0	1.0		ug/L	1	6/21/2006
Chlorobenzene	< 1.0	1.0		ug/L	1	6/21/2006
o-1,2-Dichlorobenzene	< 1.0	1.0		ug/L	1	6/21/2006
Ethylbenzene	< 1.0	1.0		ug/L	1	6/21/2006
Styrene	< 1.0	1.0		ug/L	1	6/21/2006
Tetrahydrofuran	< 1.0	1.0		ug/L	1	6/21/2006
Toluene	< 1.0	1.0		ug/L	1	6/21/2006
trans-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	6/21/2006
Trichloroethene	< 1.0	1.0		ug/L	1	6/21/2006
Trichloroethanes, Total	< 1.0	1.0		ug/L	1	6/21/2006
Vinyl chloride	< 1.0	1.0		ug/L	1	6/21/2006
Xylenes, Total	< 2.0	2.0		ug/L	1	6/21/2006
Sum: 4-Bromofluorobenzene	73.8	89.8-108		NRDC	1	6/21/2006
Sum: Dibromofluoromethane	81.1	76.1-115		NRDC	1	6/21/2006
Sum: Toluene-d8	80.3	74.9-110		NRDC	1	6/21/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Knudsen Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

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Aerotech Environmental, I

Analytical Report

Date: 05-Jul-08

CLIENT: Pima County Flood Control

Client Sample ID: HP-1

Lab Order: 06060831

Tag Number:

Project: MSD-ERP/Monthly Quarterly

Collection Date: 6/21/2008

Lab ID: 06060831-02B

Matrix: DRINKING WATER

Analysis	Result	Limit	Qual	Units	DF	Date Analyzed
ICPMS METALS, TOTAL RECOVERABLE		E200.8				Analyst: TD
Arsimony	< 0.0030	0.0030		mg/L	1	6/26/2008 9:42:38 PM
Arsenic	0.0020	0.0010		mg/L	1	6/26/2008 9:42:38 PM
Barium	0.17	0.0010		mg/L	1	6/26/2008 9:42:38 PM
Beryllium	< 0.0010	0.0010	V1	mg/L	1	6/26/2008 9:42:38 PM
Cadmium	< 0.0010	0.0010		mg/L	1	6/26/2008 9:42:38 PM
Chromium	< 0.0010	0.0010		mg/L	1	6/26/2008 9:42:38 PM
Lead	0.0012	0.0010		mg/L	1	6/26/2008 9:42:38 PM
Nickel	0.0008	0.0010		mg/L	1	6/26/2008 9:42:38 PM
Selenium	0.0024	0.0020		mg/L	1	6/26/2008 9:42:38 PM
Thallium	< 0.0010	0.0010		mg/L	1	6/26/2008 9:42:38 PM
MERCURY, TOTAL		E248.1				Analyst: PC
Mercury	< 0.00020	0.00020		mg/L	1	6/26/2008

Footnote: All analysis performed at AEL Phoenix Laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Nogales Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.

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Aerotech Environmental Laboratories

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Aerotech Environmental, I

Analytical Report

Date: 05-Jul-06

CLIENT: Pima County Flood Control
Lab Order: 06060831
Project: MHP-ERP/Monthly Quarterly
Lab ID: 06060831-02C

Client Sample ID: HP-1
Tag Number:
Collection Date: 6/21/2006
Matrix: DRINKING WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate/Nitrite Total	3.2	E308 0.80	01	mg/L	2	Analyst: LB 7/10/2006 12:42:00 AM
NITROGEN, TOTAL KJELDAHL AS N						
Nitrogen, Total Kjeldahl	< 1.3	E351.4 1.3		mg/L	1	Analyst: AC 6/29/2006
NITROGEN, TOTAL						
Nitrogen, Total	3.2	CALC 1.7		mg/L	1	Analyst: AC 7/3/2006

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Kasilpa Laboratory

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(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

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Aerotech Environmental, I

Analytical Report

Date: 01-Jul-08

CLIENT: Pima County Flood Control
Lab Order: 06060811
Project: MDP-ERP/Monthly Quantity
Lab ID: 06060811-01D

Client Sample ID: HP-1
Tag Number:
Collection Date: 6/21/2008
Matrix: DRINKING WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW9250B		Analyst: k m		
1,1,1-Trichloroethane	< 1.0	1.0		µg/L	1	6/27/2008
1,1,2-Trichloroethane	< 1.0	1.0		µg/L	1	6/27/2008
1,1-Dichloroethane	< 1.0	1.0		µg/L	1	6/27/2008
1,2-Dichlorobenzene	< 1.0	1.0		µg/L	1	6/27/2008
1,2-Dichloroethane	< 1.0	1.0		µg/L	1	6/27/2008
1,2-Dichloropropane	< 1.0	1.0		µg/L	1	6/27/2008
1,4-Dichlorobenzene	< 1.0	1.0		µg/L	1	6/27/2008
Benzene	< 1.0	1.0		µg/L	1	6/27/2008
Carbon tetrachloride	< 1.0	1.0		µg/L	1	6/27/2008
Chlorobenzene	< 1.0	1.0		µg/L	1	6/27/2008
cis-1,2-Dichloroethane	< 1.0	1.0		µg/L	1	6/27/2008
Ethylbenzene	< 1.0	1.0		µg/L	1	6/27/2008
Dyrene	< 1.0	1.0		µg/L	1	6/27/2008
Tetrachloroethane	< 1.0	1.0		µg/L	1	6/27/2008
Toluene	< 1.0	1.0		µg/L	1	6/27/2008
trans-1,2-Dichloroethane	< 1.0	1.0		µg/L	1	6/27/2008
Trichloroethane	< 1.0	1.0		µg/L	1	6/27/2008
Trihalomethanes, Total	< 1.0	1.0		µg/L	1	6/27/2008
Vinyl chloride	< 1.0	1.0		µg/L	1	6/27/2008
Xylenes, Total	< 2.0	2.0		µg/L	1	6/27/2008
Sum: 4-Bromofluorobenzene	74.8	88.8-108		NRDC	1	6/27/2008
Sum: Dibromofluoromethane	82.3	76.1-115		NRDC	1	6/27/2008
Sum: Toluene-d8	76.4	74.8-110		NRDC	1	6/27/2008

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Krasden Laboratory

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(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

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Aerotech Environmental, I

Analytical Report

Date: 05-Jul-06

CLIENT: Pinx County Flood Control
Lab Order: 06060831
Project: MHP-ERP/Monthly Quarterly
Lab ID: 06060831-01D

Client Sample ID: Trip Blank
Tag Number:
Collection Date: 6/31/2006
Matrix: TRIP BLANK

Analytes	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		DW92608		Analyst: k m		
1,1,1-Trichloroethane	< 1.0	1.0		ug/L	1	6/27/2006
1,1,2-Trichloroethane	< 1.0	1.0		ug/L	1	6/27/2006
1,1-Dichloroethane	< 1.0	1.0		ug/L	1	6/27/2006
1,2-Dichloroethane	< 1.0	1.0		ug/L	1	6/27/2006
1,2-Dichlorobenzene	< 1.0	1.0		ug/L	1	6/27/2006
1,2-Dichloroethane	< 1.0	1.0		ug/L	1	6/27/2006
1,4-Dichlorobenzene	< 1.0	1.0		ug/L	1	6/27/2006
Benzene	< 1.0	1.0		ug/L	1	6/27/2006
Carbon tetrachloride	< 1.0	1.0		ug/L	1	6/27/2006
Chlorobenzene	< 1.0	1.0		ug/L	1	6/27/2006
cis-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	6/27/2006
Ethylbenzene	< 1.0	1.0		ug/L	1	6/27/2006
Styrene	< 1.0	1.0		ug/L	1	6/27/2006
Tetrachloroethane	< 1.0	1.0		ug/L	1	6/27/2006
Toluene	< 1.0	1.0		ug/L	1	6/27/2006
trans-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	6/27/2006
Trichloroethane	< 1.0	1.0		ug/L	1	6/27/2006
Totalmethanes, Total	< 1.0	1.0		ug/L	1	6/27/2006
Vinyl chloride	< 1.0	1.0		ug/L	1	6/27/2006
Xylenes, Total	< 2.0	2.0		ug/L	1	6/27/2006
Sum: 4-Bromofluorobenzene	72.5	89.6-106		%REC	1	6/27/2006
Sum: Dibromofluoromethane	83.0	76.1-118		%REC	1	6/27/2006
Sum: Toluene-d8	79.2	74.9-110		%REC	1	6/27/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Keesler Laboratory

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(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental, Inc.

01-Jul-08

Lab Order: 06060211
Client: Pima County Flood Control
Project: MSP-ERP-Monthly Quarterly

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCDF Date	Prog Date	Analysis Date
06060211-01B	Storm Water	6/21/2008 9:01:00 AM	Storm Water	ICPMS METALS TOTAL RECOVERABLE	6/22/2008 8:01:31 PM	6/22/2008	6/25/2008 2:28:26 PM
06060211-01C				MERCURY IN WATER	6/20/2008 9:00:00 AM	6/20/2008	
				ARSENIC by ICP CHROMATOGRAPHY			6/24/2008 9:51:00 PM
				TOTAL KILDEHL NITROGEN			6/20/2008
				Total Nitrogen (Calculated)			7/3/2008
06060211-01D				VOLATILES by GCMS			6/27/2008
06060211-02B	SP-1	6/24/2008	Drinking Water	ICPMS METALS TOTAL RECOVERABLE	6/25/2008 8:01:31 PM	6/25/2008	6/24/2008 2:40:38 PM
06060211-02C				MERCURY IN WATER	6/20/2008 9:00:00 AM	6/20/2008	
				ARSENIC by ICP CHROMATOGRAPHY			7/1/2008 12:42:00 AM
				TOTAL KILDEHL NITROGEN			6/20/2008
				Total Nitrogen (Calculated)			7/3/2008
06060211-02D				VOLATILES by GCMS			6/27/2008
06060211-02E	Tap Water		Tap Water	VOLATILES by GCMS			6/27/2008



Aerotech Environmental Laboratories

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Aerotech Environmental, Inc.

Date: 07-Jul-08

CLIENT: Pima County Flood Control
Work Order: 00000811
Project: MDP-ERP/Monthly Quarterly

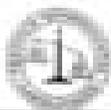
ANALYTICAL QC SUMMARY REPORT

Test Code: 200.8

Sample ID: WS-2008	Sample Type: WSLA	Test Code: 200.8	Units: mg/L	Prep Date: 6/22/2008	Run No: 75985						
Client ID:	Batch ID: 2008	Test No: 0200.8		Analysis Date: 6/20/2008	Seq No: 00000						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	Hgh Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Antimony	<0.0010	0.0010									
Arsenic	<0.0010	0.0010									
Barium	<0.0010	0.0010									
Beryllium	<0.0010	0.0010									VI
Calcium	<0.0010	0.0010									
Chromium	<0.0010	0.0010									
Lead	<0.0010	0.0010									
Nickel	<0.0010	0.0010									
Selenium	<0.0020	0.0020									
Thallium	<0.0010	0.0010									

Sample ID: LCS-2008	Sample Type: LCS	Test Code: 200.8	Units: mg/L	Prep Date: 6/22/2008	Run No: 75985						
Client ID:	Batch ID: 2008	Test No: 0200.8		Analysis Date: 6/20/2008	Seq No: 00000						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	Hgh Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Antimony	0.1040	0.0010	0.1	0	104	00	110				
Arsenic	0.1056	0.0010	0.1	0	106	00	110				
Barium	0.1104	0.0010	0.1	0	110	00	110				
Calcium	0.1001	0.0010	0.1	0	100	00	110				
Chromium	0.1064	0.0010	0.1	0	106	00	110				
Lead	0.1032	0.0010	0.1	0	103	00	110				
Nickel	0.1070	0.0010	0.1	0	107	00	110				
Selenium	0.1090	0.0020	0.1	0	109	00	110				
Thallium	0.0918	0.0010	0.1	0	91.2	00	110				

Qualifiers: **D** Value above quantitation range **F** Holding times for preparation or analysis exceeded **H** Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit **R** RPD outside accepted recovery limits **S** Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 0606201
Project: MSP-E201 Monthly Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: 200L

Sample ID: LCS-24008	Sample Type: LCS	Test Code: 200L	Units: mg/L	Prep Date: 6/22/2008	Run No: 75777						
Client ID:	Batch ID: 24008	Test No: E200L		Analysis Date: 6/26/2008	Seq No: 89044						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Beryllium	0.106	0.0010	0.1	0	110	85	110				Y1

Sample ID: LCS0-24008	Sample Type: LCS0	Test Code: 200L	Units: mg/L	Prep Date: 6/22/2008	Run No: 75833						
Client ID:	Batch ID: 24008	Test No: E200L		Analysis Date: 6/26/2008	Seq No: 89200						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Antimony	0.1085	0.0000	0.1	0	108	85	110	0.1040	4.15	20	
Arsenic	0.1051	0.0010	0.1	0	105	85	110	0.1058	0.522	20	
Barium	0.1115	0.0000	0.1	0	112	85	110	0.1104	1.21	20	
Beryllium	0.1130	0.0000	0.1	0	113	85	110	0.1159	2.50	20	Y1
Cadmium	0.1101	0.0010	0.1	0	110	85	110	0.1081	1.82	20	
Chromium	0.1054	0.0010	0.1	0	105	85	110	0.1064	0.889	20	
Cobalt	0.1044	0.0010	0.1	0	104	85	110	0.1002	0.742	20	
Nickel	0.1090	0.0010	0.1	0	109	85	110	0.1079	0.403	20	
Selenium	0.1072	0.0000	0.1	0	107	85	110	0.1085	2.07	20	
Thallium	0.10600	0.0010	0.1	0	99.9	85	110	0.09978	0.725	20	

Sample ID: LCS0-24008	Sample Type: LCS0	Test Code: 200L	Units: mg/L	Prep Date: 6/22/2008	Run No: 75777						
Client ID:	Batch ID: 24008	Test No: E200L		Analysis Date: 6/26/2008	Seq No: 89044						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Beryllium	0.1100	0.0010	0.1	0	110	85	110	0.1095	0.437	20	Y1

Sample ID: 06060710-02A MS	Sample Type: MS	Test Code: 200L	Units: mg/L	Prep Date: 6/22/2008	Run No: 75833						
Client ID:	Batch ID: 24008	Test No: E200L		Analysis Date: 6/26/2008	Seq No: 89204						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Antimony	0.1108	0.0000	0.1	0	110	75	130				

Qualifiers: E Value above quantitation range H Holding time for preparation or analysis exceeded J Analyte detected below quantitation limit
 ND Not Detected at the Reporting Limit K RPD outside accepted recovery limits L Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Amersol Laboratories, Inc.

CLIENT: Pine County Flood Control
Work Order: 06002831
Project: MCP-EDP Monthly Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: 200.8

Sample ID: 06002710-03A.00	Sample Type: M3	Test Code: 200.8	Units: mg/L	Prep Date: 6/22/2006	Run No: 7500						
Client ID:	Batch ID: 2000	Test No: E200.8		Analysis Date: 6/22/2006	Depth: 0.0004						
Analyte	Result	PQL	SPK value	SPK Ref Val	MPQC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
Arsenic	0.1016	0.0010	0.1	0.02280	100	70	130				
Barium	0.2360	0.0010	0.1	0.1279	111	70	130				
Beryllium	0.1202	0.0010	0.1	0	102	70	130				
Cadmium	0.1031	0.0010	0.1	0	103	70	130				VI
Chromium	0.1372	0.0010	0.1	0.02191	106	70	130				
Lead	0.00021	0.0010	0.1	0	90.0	70	130				
Nickel	0.1016	0.0010	0.1	0.00176	99.0	70	130				
Selenium	0.1030	0.0020	0.1	0.00189	103	70	130				
Thallium	0.00102	0.0010	0.1	0	91.7	70	130				

Sample ID: 06002710-03B.000	Sample Type: M3D	Test Code: 200.8	Units: mg/L	Prep Date: 6/22/2006	Run No: 7500						
Client ID:	Batch ID: 2000	Test No: E200.8		Analysis Date: 6/22/2006	Depth: 0.0020						
Analyte	Result	PQL	SPK value	SPK Ref Val	MPQC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
Antimony	0.1102	0.0010	0.1	0	110	70	130	0.1102	0.248	0.5	05
Arsenic	0.1030	0.0010	0.1	0.02280	111	70	130	0.1029	1.21	0.5	05
Barium	0.2360	0.0010	0.1	0.1279	108	70	130	0.2360	1.32	0.5	05
Beryllium	0.1202	0.0010	0.1	0	102	70	130	0.1202	2.26	0.5	VI
Cadmium	0.1030	0.0010	0.1	0	104	70	130	0.1030	0.070	0.5	05
Chromium	0.1360	0.0010	0.1	0.02191	107	70	130	0.1372	1.31	0.5	05
Lead	0.00005	0.0010	0.1	0	90.0	70	130	0.00001	1.02	0.5	05
Nickel	0.1047	0.0010	0.1	0.00176	103	70	130	0.1016	0.04	0.5	05
Selenium	0.1123	0.0020	0.1	0.00189	106	70	130	0.1030	2.09	0.5	05
Thallium	0.00207	0.0010	0.1	0	92.0	70	130	0.00189	1.02	0.5	05

Qualifiers: 0 - Value above quantitative range
 ND - Not Detected at the Reporting Limit
 B - Blanking Error for preparation or analysis recorded
 R - RPO outside accepted recovery limits
 F - Analysis detected before quantitative limits
 S - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 00000811
Project: MSD-ERP Monthly Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: 245.1_W

Sample ID: MS-2000	Sample Type: BBLK	Test Code: 245.1_W	Units: mg/L	Prep Date: 6/29/2006	Run No: 75789						
Client ID:	Batch ID: 2000	Test No: E245.1		Analysis Date: 6/29/2006	Seq No: 80040						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Mercury -0.00000 -0.00000

Sample ID: LCS-2000	Sample Type: LCS	Test Code: 245.1_W	Units: mg/L	Prep Date: 6/29/2006	Run No: 75789						
Client ID:	Batch ID: 2000	Test No: E245.1		Analysis Date: 6/29/2006	Seq No: 80040						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Mercury 0.00000 0.00000 0.01 0 97.2 85 110

Sample ID: LCSD-2000	Sample Type: LCSD	Test Code: 245.1_W	Units: mg/L	Prep Date: 6/29/2006	Run No: 75789						
Client ID:	Batch ID: 2000	Test No: E245.1		Analysis Date: 6/29/2006	Seq No: 80040						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Mercury 0.01010 0.00000 0.01 0 100 85 110 0.00000 3.73 20

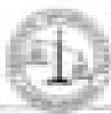
Sample ID: 00000004-02000	Sample Type: MS	Test Code: 245.1_W	Units: mg/L	Prep Date: 6/29/2006	Run No: 75789						
Client ID:	Batch ID: 2000	Test No: E245.1		Analysis Date: 6/29/2006	Seq No: 80040						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Mercury 0.00000 0.00000 0.01 0 90.8 88.4 122

Sample ID: 00000004-02000D	Sample Type: MSD	Test Code: 245.1_W	Units: mg/L	Prep Date: 6/29/2006	Run No: 75789						
Client ID:	Batch ID: 2000	Test No: E245.1		Analysis Date: 6/29/2006	Seq No: 80040						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Mercury 0.00000 0.00000 0.01 0 98.2 88.4 122 0.00000 2.47 20

Qualifiers: E Value above quantitation range
 ND Not Detected at the Reporting Limit
 R Retention times for preparation or analysis recorded
 S RPO outside accepted recovery limits
 T Analyte detected below quantitation limits
 W Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 0606031
Project: MSP-022/Monthly Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: 300_W

Sample ID: MS-R75843	Samp Type: MSLA	Test Code: 300_W	Units: mg/L	Prep Date:	Run No: T5843						
Client ID:	Batch ID: R75843	Test No: E300		Analysis Date: 6/29/2006	Seq No: 801134						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
Nitrogen, Nitrate/Nitrite Total	0.40	0.40									

Sample ID: LCS-R75843	Samp Type: LCS	Test Code: 300_W	Units: mg/L	Prep Date:	Run No: T5843						
Client ID:	Batch ID: R75843	Test No: E300		Analysis Date: 6/29/2006	Seq No: 801135						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
Nitrogen, Nitrate/Nitrite Total	1.483	0.40	0	0	63.1	00	110				

Sample ID: LCSD-R75843	Samp Type: LCSD	Test Code: 300_W	Units: mg/L	Prep Date:	Run No: T5843						
Client ID:	Batch ID: R75843	Test No: E300		Analysis Date: 6/29/2006	Seq No: 801136						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
Nitrogen, Nitrate/Nitrite Total	1.508	0.40	0	0	63.1	00	110	1.483	0.307	30	

Sample ID: 06061021-02AM03	Samp Type: NS	Test Code: 300_W	Units: mg/L	Prep Date:	Run No: T5843						
Client ID:	Batch ID: R75843	Test No: E300		Analysis Date: 6/29/2006	Seq No: 801144						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
Nitrogen, Nitrate/Nitrite Total	11.70	0.40	0	4.088	93.0	00	120				

Sample ID: 06061021-02AM00	Samp Type: NSD	Test Code: 300_W	Units: mg/L	Prep Date:	Run No: T5843						
Client ID:	Batch ID: R75843	Test No: E300		Analysis Date: 6/29/2006	Seq No: 801145						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
Nitrogen, Nitrate/Nitrite Total	11.04	0.40	0	4.088	94.1	00	120	11.70	0.488	30	

Qualifiers: E: Value above quantitative range I: Holding time for preparation or analysis exceeded J: Analyte detected below quantitative limits
 ND: Not Detected at the Reporting Limit K: SPD outside accepted recovery limits S: Spike Recovery outside accepted recovery limits



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CLIENT: Pima County Flood Control
Work Order: 0606031
Project: MSP-ERP Monthly Quarterly

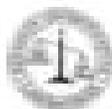
ANALYTICAL QC SUMMARY REPORT

Test Code: 8268_W

Sample ID: MS-875942	Samp Type: WBLA	Test Code: 8268_W	Units: ppb	Prep Date:	Run No: 75942						
Client ID:	Batch ID: 875942	Test No: 8982608		Analysis Date: 6/27/2008	Seq No: 898428						
Analyte	Result	PCL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	<1.0	1.0									
1,1,2-Trichloroethane	<1.0	1.0									
1,1-Dichloroethane	<1.0	1.0									
1,2-Dichlorobenzene	<1.0	1.0									
1,2-Dichloroethane	<1.0	1.0									
1,3-Dichloropropane	<1.0	1.0									
1,4-Dichlorobenzene	<1.0	1.0									
Benzene	<1.0	1.0									
Carbon tetrachloride	<1.0	1.0									
Chlorobenzene	<1.0	1.0									
cis-1,2-Dichloroethane	<1.0	1.0									
Ethylbenzene	<1.0	1.0									
Styrene	<1.0	1.0									
Tetrachloroethene	<1.0	1.0									
Toluene	<1.0	1.0									
trans-1,2-Dichloroethane	<1.0	1.0									
Trichloroethene	<1.0	1.0									
Vinyl chloride	<1.0	1.0									
Sum 4-Bromofluorobenzene	18.17	0	25	0	72.7	70.7	100				
Sum Dibromofluoromethane	20.48	0	25	0	81.9	71.1	112				
Sum Toluene-08	19.90	0	25	0	79.6	75.8	108				

Sample ID: LCS-875942	Samp Type: LCS	Test Code: 8268_W	Units: ppb	Prep Date:	Run No: 75942						
Client ID:	Batch ID: 875942	Test No: 8982608		Analysis Date: 6/27/2008	Seq No: 898429						
Analyte	Result	PCL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	25.86	1.0	25	0	100	74.8	129				
1,1,2-Trichloroethane	25.83	1.0	25	0	107	74.7	123				
1,1-Dichloroethane	25.85	1.0	25	0	107	71.2	127				

Qualifiers: E Value above quantitation range
 ND Not Detected at Reporting Limit
 N Missing Data for preparation or analysis recorded
 E RPD outside accepted recovery limits
 J Analyte detected below quantitation limits
 R Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pinellas County Flood Control
Work Order: 04000071
Project: MGP-EOP Monthly Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 8268_W

Sample ID: LC80-RT3842	SampType: LC8	TestCode: 8268_W	Units: ug/L	Prog Date:	RunNo: 7582						
Client ID:	Batch ID: RT3842	Traffic: 0802008		Analyte Date: 6/27/2004	Depth: 00600						
Analyte	Result	PCB	SPK value	SPK Ref Val	%RSD	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOUnit	Qual
1,3-Dichlorobenzene	21.02	1.0	33	0	88.4	71.8	121				
1,3-Dichlorobenzene	25.81	1.0	33	0	104	73.1	158				
1,3-Dichloropropane	25.89	1.0	33	0	103	76.4	153				
1,4-Dichlorobenzene	22.09	1.0	33	0	88.4	71	121				
Benzene	25.78	1.0	33	0	103	78.4	153				
Carbon tetrachloride	26.47	1.0	33	0	106	78.8	153				
Chlorobenzene	22.88	1.0	33	0	87.9	73.3	121				
o-1,2-Dichlorobenzene	26.00	1.0	33	0	106	75.8	153				
Styrene	23.71	1.0	33	0	88.4	78.2	121				
Styrene	22.07	1.0	33	0	85.0	73.8	121				
Tetrachloroethene	26.34	1.0	33	0	108	72.4	153				
Toluene	25.48	1.0	33	0	101	81	121				
trans-1,2-Dichloroethene	26.88	1.0	33	0	108	73.8	153				
Trichloroethene	25.47	1.0	33	0	103	75.3	153				
Vinyl chloride	26.34	1.0	33	0	101	88.4	121				
Sum: 4-Bromofluorobenzene	17.38	0	33	0	71.9	73.7	100				
Sum: Dibromofluorobenzene	18.88	0	33	0	76.1	73.1	100				
Sum: Toluene-d8	19.21	0	33	0	78.8	75.8	100				

Sample ID: LC80-RT3842	SampType: LC80	TestCode: 8268_W	Units: ug/L	Prog Date:	RunNo: 7582						
Client ID:	Batch ID: RT3842	Traffic: 0802008		Analyte Date: 6/27/2004	Depth: 00600						
Analyte	Result	PCB	SPK value	SPK Ref Val	%RSD	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOUnit	Qual
1,1-Trichloroethene	27.28	1.0	33	0	109	75.8	121	25.88	6.18	25	
1,1,2-Trichloroethene	26.00	1.0	33	0	107	78.7	121	28.03	0.673	25	
1,1-Dichloroethene	27.58	1.0	33	0	110	71.2	121	28.88	2.88	25	
1,2-Dichlorobenzene	22.87	1.0	33	0	88.4	71.8	121	27.02	4.48	25	
1,2-Dichloroethane	26.42	1.0	33	0	106	73.1	121	25.91	2.70	25	
1,2-Dichloropropane	26.34	1.0	33	0	105	76.4	121	25.88	2.88	25	

Qualifiers: E Value above qualification range
 ND Not Detected at the Reporting Limit
 N Missing data for preparation or analysis recorded
 R RPO within accepted recovery limits
 F Analyte detected below qualification limits
 S Spike Recovery results accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: **Pinal County Flood Control**
Work Order: **05000831**
Project: **MSP-ESP Monthly Quarterly**

ANALYTICAL QC SUMMARY REPORT

Test Code: **8268_W**

Sample ID: LC80-RT08A2	Sample Type: LC80	Test Code: 8268_W	Units: ug/L	Prep Date:	Ref No: T5862						
Client ID:	Batch ID: 875982	Test No: 880268		Analyz Date: 6/27/2006	Depth: 88628						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	Low Limit	Hgh Limit	RPD Ref Val	NRPD	RPD Limit	Qual
1,4-Dichlorobenzene	22.94	1.0	M	0	87.8	71	120	22.09	3.78	25	
Benzene	26.94	1.0	M	0	107	78.4	120	25.78	4.00	25	
Carbon tetrachloride	27.88	1.0	M	0	111	78.8	120	26.67	4.26	25	
Chlorobenzene	22.88	1.0	M	0	94.8	72.3	120	22.88	3.67	25	
cis-1,2-Dichloroethene	27.88	1.0	M	0	108	78.8	120	28.28	3.88	25	
Ethylbenzene	24.07	1.0	M	0	85.0	78.2	120	22.71	4.07	25	
Heptane	24.23	1.0	M	0	88.0	73.8	120	22.87	3.78	25	
Tetrahydrofuran	26.88	1.0	M	0	105	77.4	120	28.24	1.17	25	
Toluene	25.98	1.0	M	0	103	83	120	28.86	1.88	25	
trans-1,2-Dichloroethene	27.88	1.0	M	0	112	72.8	120	28.88	3.88	25	
Trichloroethene	26.74	1.0	M	0	100	78.8	120	28.67	1.88	25	
Vinyl chloride	27.88	1.0	M	0	112	88.8	120	28.88	4.88	25	
Sum: 4-Bromofluorobenzenes	17.87	0	M	0	77.8	78.7	108	17.88	0	0	
Sum: Dibromofluorobenzenes	21.24	0	M	0	84.8	77.1	120	18.88	0	0	
Sum: Toluene-88	18.84	0	M	0	78.8	72.8	120	18.81	0	0	

Sample ID: 05000831-010 MS	Sample Type: MS	Test Code: 8268_W	Units: ug/L	Prep Date:	Ref No: T5862						
Client ID: Source Water	Batch ID: 875982	Test No: 880268		Analyz Date: 6/27/2006	Depth: 88621						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRCC	Low Limit	Hgh Limit	RPD Ref Val	NRPD	RPD Limit	Qual
1,1,1-Trichloroethane	24.38	1.0	M	0	87.8	71.8	120				
1,1,2-Trichloroethane	26.73	1.0	M	0	103	72.8	120				
1,1-Dichloroethane	27.82	1.0	M	0	111	78.8	120				
1,2-Dichlorobenzene	21.68	1.0	M	0	88.0	88.7	120				
1,2-Dichloroethane	25.78	1.0	M	0	101	72.4	120				
1,2-Dichloropropane	24.83	1.0	M	0	88.3	74.7	120				
1,4-Dichlorobenzene	21.84	1.0	M	0	88.8	87	120				
Benzene	26.88	1.0	M	0	103	78.8	120				
Carbon tetrachloride	27.84	1.0	M	0	111	72.1	120				

Qualifiers: **E** Values above quantitative range
ND Not Detected at the Reporting Limit

1 Working time for preparation or analysis exceeded
2 RPD within accepted recovery limits

3 Analyte detected below quantitative limits
4 Spike Recovery outside accepted recovery limits

Page 8 of 12



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06000831
Project: MGP-ERP Monthly Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: 8268_W

Sample ID: 06000831-010 MS	Sample Type: MS	Test Code: 8268_W	Units: µg/L	Prep Date:	Run No: 75882						
Client ID: Source Water	Batch ID: 871882	Technic: SPS2008		Analysis Date: 6/27/2008	Depth: 899431						
Analyte	Result	PQL	SPK value	SPK Ref Val	UREC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPD Limit	Qual
Chlorobenzene	21.74	1.0	25	0	91.0	71.8	118				
cis-1,2-Dichloroethane	25.88	1.0	25	0	103	79	124				
Ethylbenzene	23.01	1.0	25	0	93.4	79	118				
Styrene	17.82	1.0	25	0	70.8	58.1	111				
Tetrachloroethene	25.98	1.0	25	0	104	73.9	111				
Toluene	25.28	1.0	25	0	100	81.8	118				
trans-1,2-Dichloroethane	27.27	1.0	25	0	109	72.9	117				
Trichloroethene	25.54	1.0	25	0	91	71.1	111				
Vinyl chloride	28.83	1.0	25	0	119	70	98				
Sum: 4-Bromofluorobenzene	18.22	0	25	0	72.1	68.8	98				
Sum: Dibromofluorobenzene	18.38	0	25	0	73.4	78.1	111				
Sum: Toluene-d8	20.13	0	25	0	91.5	74.9	118				912

Sample ID: 06000831-010 MS0	Sample Type: MS0	Test Code: 8268_W	Units: µg/L	Prep Date:	Run No: 75882						
Client ID: Source Water	Batch ID: 871882	Technic: SPS2008		Analysis Date: 6/27/2008	Depth: 899432						
Analyte	Result	PQL	SPK value	SPK Ref Val	UREC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	25.18	1.0	25	0	101	75.8	110	24.38	3.23	25	
1,1,2-Trichloroethane	25.82	1.0	25	0	102	72.9	110	25.73	6.438	25	
1,1-Dichloroethane	28.48	1.0	25	0	108	78.8	110	27.82	6.01	25	
1,2-Dichlorobenzene	30.88	1.0	25	0	92.9	68.7	110	27.48	2.88	25	
1,2-Dichloroethane	24.72	1.0	25	0	98.8	72.4	111	28.18	1.88	25	
1,2-Dichloropropane	24.53	1.0	25	0	98.1	74.7	111	24.83	1.23	25	
1,4-Dichlorobenzene	21.00	1.0	25	0	94.0	87	111	27.84	3.00	25	
Benzene	24.78	1.0	25	0	91.0	78.8	111	28.88	3.87	25	
Carbon tetrachloride	29.89	1.0	25	0	103	78.1	111	27.84	8.03	25	
Chlorobenzene	21.88	1.0	25	0	95.8	71.8	118	22.74	4.88	25	
cis-1,2-Dichloroethane	24.72	1.0	25	0	98.8	79	118	25.88	4.47	25	
Ethylbenzene	21.80	1.0	25	0	87.8	79	118	23.71	5.38	25	

Qualifiers: 1 - Value above specification range
 2 - Holding time for preparation or analysis exceeded
 3 - Analyte detected below specification limits
 4 - RPD results outside accepted recovery limits
 5 - Spike recovery outside accepted recovery limits
 ND - Not Detected at the Reporting Limit



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

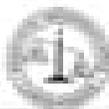
CLIENT: Pima County Flood Control
 Work Order: 00000811
 Project: MSP-ERP Monthly Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: 8260_W

Sample ID: 00000811-010-8930	Sample Type: 8930	Test Code: 8260_W	Units: µg/L	Prep Date:	Run No: 70942						
Client ID: Source Water	Batch ID: 826082	Tester: 08102008		Analysis Date: 8/27/2008	Sup No: 899432						
Analyte	Result	PQL	SPK value	SPK Ref Val	LRCC	Low Limit	High Limit	RPD Ref Val	LRPO	RPD Limit	Qual
Styrene	17.08	1.0	25	0	88.5	56.1	121	17.62	1.11	25	
Tetrahydrofuran	24.85	1.0	25	0	88.7	73.5	121	25.96	1.58	25	
Toluene	20.89	1.0	25	0	85.8	81.8	121	25.29	4.80	25	
trans-1,2-Dichloroethane	25.87	1.0	25	0	104	72.5	121	27.27	3.25	25	
Trichloroethane	24.05	1.0	25	0	86.2	72.1	121	25.24	1.22	25	
Vinyl chloride	27.44	1.0	25	0	119	70	141	28.63	4.24	25	
Sum: 4-Bromofluorobenzene	18.21	0	25	0	72.8	68.8	121	18.62	0	0	
Sum: Dibromofluorobenzene	20.80	0	25	0	82.4	78.1	121	10.71	0	0	
Sum: Toluene-d8	20.70	0	25	0	81.4	74.9	121	20.23	0	0	

Qualifiers: E: Value above quantitation range H: Holding times for preparation or analysis exceeded J: Analyte detected before quantitation limits
 ND: Not Detected at the Reporting Limit K: RPD outside accepted recovery limits S: Spike Recovery outside accepted recovery limits



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CLIENT: Pima County Flood Control
Work Order: 0600031
Project: MSF-E32 Monthly Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: N_TKN_WW

Sample ID: MS-E32790	Samp Type: MSLE	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run#: 75790						
Client ID:	Batch ID: E32790	Test#: E32790		Analysis Date: 6/26/2008	Seq#: 00079						
Analyte	Result	PCB	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	11.3	1.3									

Sample ID: LCS-E32790	Samp Type: LCS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run#: 75790						
Client ID:	Batch ID: E32790	Test#: E32790		Analysis Date: 6/26/2008	Seq#: 00082						
Analyte	Result	PCB	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	26.30	1.3	20	0	158	85	110				

Sample ID: LCSD-E32790	Samp Type: LCSD	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run#: 75790						
Client ID:	Batch ID: E32790	Test#: E32790		Analysis Date: 6/26/2008	Seq#: 00083						
Analyte	Result	PCB	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	27.32	1.3	20	0	159	85	110	25.35	1.28	20	

Sample ID: MS00710-E32085	Samp Type: MS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run#: 75790						
Client ID:	Batch ID: E32790	Test#: E32790		Analysis Date: 6/26/2008	Seq#: 00081						
Analyte	Result	PCB	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	23.85	1.3	20	1.825	84.8	70	130				

Sample ID: MS0082-E32085	Samp Type: MS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run#: 75790						
Client ID:	Batch ID: E32790	Test#: E32790		Analysis Date: 6/26/2008	Seq#: 00082						
Analyte	Result	PCB	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	16.35	1.3	20	26.70	121	70	130				

Qualifiers: E Value above specification range
 ND No Detected at the Reporting Level
 K Holding time for preparation or analysis exceeded
 F RPD within accepted recovery limits
 J Analyte detected before specification limits
 R Spike Recovery results accepted recovery limits



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Pinal County Flood Control
Work Order: 06060811
Project: MHP-ERP/Monality Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: 06060811-01CM30	Sample Type: WSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 21798						
Client ID:	Batch ID: R18798	TestNo: E2814		Analysis Date: 6/28/08	SeqNo: 90882						
Analyte	Result	PCB	SPK value	SPK RefVal	%REC	LowLimit	HighLimit	RPO RefVal	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	24.10	1.2	25	1.50	91.3	70	150	23.65	1.68	20	

Sample ID: 06060811-01CM30	Sample Type: WSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 21798						
Client ID:	Batch ID: R18798	TestNo: E2814		Analysis Date: 6/28/08	SeqNo: 90884						
Analyte	Result	PCB	SPK value	SPK RefVal	%REC	LowLimit	HighLimit	RPO RefVal	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	51.82	1.2	25	24.70	100	70	150	38.85	9.23	20	

Qualifiers: E - Value above specification range H - Holding times for preparation or analysis exceeded J - Analyte detected below specification limits
 ND - Not Detected at the Reporting Limit I - RPO outside accepted recovery limits K - Spike Recovery outside accepted recovery limits

Laboratory Number: 06-06-0831 Analytical completed by: James Gravlin
 Client Name: Lincoln County Fire District Signature: [Signature] Date: 6/22/06
 Matrix: W/W Carrier Name: IZ-Exp. Date/Time Rec'd: 6/22/06 01:08 by: R.F.

Temperature of Samples? 1.5 °C Circle one: Blue Ice Wet Ice Not Present

	Yes	No	Not Present	Soil Containers:
Shipping container/cooler in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Brass Shave _____
Custody seals intact on shipping container/cooler?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Glass Jar _____
Custody seals intact on sample containers?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Methanol _____
Chain of Custody present and relinquished/received properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plastic Bag _____
Chain of Custody agrees with sample labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Enclose Samples _____
Samples in proper containers/bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sample containers intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
All samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>See Comment about Chlorine and pH</i>
Is there sufficient sample volume to perform the tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
40mL vials for volatiles & BOCs received with zero headspace?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Total number of bottles received: 11 (H sample media: N/A)
 If applicable, how many sample bottles were shipped from AEL-Tucson? 11 (N/A)

Number of containers received by preservative and by sample number. (If more than 15 samples are rec'd, please continue on separate sheet(s))

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General															
B-HNO3	1	1													
C-H2SO4	1	1													
D-HCl	3	3	1												
E-H2O200															
F-NaOH															
G-Sulfide															
H-No bottle															
I-MCAA															
J-Methanol															
K-HVA															
L-Other															

Water pH acceptable upon receipt? Yes No N/A

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and reagent ID, number
Metals <2	<u>2 2</u>	
Nutrients <2	<u>2 2</u>	
Total Phos <2		
413 (OMG) <2		
418 (TPH) <2		
Cyanide >12		
Sulfide >8		

*May No response must be detailed in the comments section below. Contact the PM immediately to determine how to proceed. Refer to SOP 11-001.04, Section 1.1.5. Continue on back if additional space is needed.

**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments: _____
 Corrective Action: _____



Aerotech Environmental Laboratories

an affiliate of Green Tech Laboratories, Inc.

1 | Jackson - 1017 W. 17th Street, Tampa, AZ 80011 (800) 967-4274 FAX (800) 967-4274
 2 | North Phoenix - 1001 W. Broadway, Phoenix, AZ 85027 (602) 796-4700 FAX (602) 796-2000
 3 | Tucson - 4650 S. Park Ave. Suite 110, Tucson, AZ 85714 (520) 867-2881 FAX (520) 867-2822
 www.aerotech.com or call toll free 1-800-777-ALAB (7-466-772-5227)

Contract #2011

Lab Number:
 06-06-0834

Default Type Codes

DW - Drinking Water A-40
 WW - Waste Water B-200
 PW - Recreational Water

Other _____

Customer Number: 157812 Page 1 of 1

Customer: PIMA COUNTY FLOOD CONTROL DISTRICT Sampler: David Scobers

Address: 201 N. STONE AVE. 4TH FLOOR Project Name: MHP-ERP / Monthly-Only

City, State, Zip: Tucson AZ 85701 Project Number:

Contact: David Scobers P.O. Number:

Phone: (520) 746-4200 Fax: (520) 746-4240 Fax Results:

E-Mail Address: david.scobers@pfc.pima.gov E-Mail Results:

Sample Storage

Temperature: 1.5 °C

Container Type: Yes No K

Container Seal: Yes No N/A

Total # of Containers: 11

Time Allowed Temporarily

24 Hours _____ 48 Hours _____

72 Hours _____

1 Working Day _____

Standard 10 Working Days
Select availability & conditions on request.

Sample Information					Analytes Requested															
Label	Sample Identification	Date	Time	Type	Nitrate/Nitrite as N	Total Kjeldahl Nitrogen (TKN)	Total Nitrogen	Metals (Pb, Cr, Cu, Fe)	As, Ba, Cd, Co, Cr, Hg	Mn, Ni, Se, Tl, Zn	Mercury	pesticides								
1	Source Water	6-21-06	9:05	Initial																
2	HP-1	6-21-06	11:00	Plu																
3	Triph Blank																			

Instructions / Special Requirements:

Date: 6-21-06 1225 Sample Received By: David Scobers Received By: M. V. [Signature]

6/21/06 1630 [Signature] [Signature]

6/22/06 1008 [Signature]

Analysis performed is subject to the Terms & Conditions available at www.aerotech.com or call 1-800-777-ALAB for request a copy



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

PG RFGD

AUG 07 2006

3:00 pm JB

Wednesday, August 02, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX: (520) 205-8360

RE: MHP-ERP/Monthly

Order No.: 06070610

Dear David Scalero:

Aerotech Environmental, Inc. received 1 sample(s) on 7/18/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Korky Vault
Service Center Manager



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 02-Aug-08

CLIENT: Pima County Flood Control
Project: MHP-ERP Monthly
Lab Order: 06070610

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06070610-01C	Source Water MHPERP		7/18/2006 9:50:00 AM	7/18/2006



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 02-Aug-06

CLIENT: Pima County Flood Control
Project: MHP-ERP Monthly
Lab Order: 06070610

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.

Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.

40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.

NIOSH Manual of Analytical Methods, Fourth Edition, 1994.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610 and AEL-Tucson holds Arizona certification no. AZ0609.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.

Data Qualifiers:

Listed below are the data qualifiers used in your analytical report to explain any analytical or quality control issues. You will find them noted in your report under the column header "QUAL". Any quality control deficiencies that cannot be adequately described by these qualifiers will be addressed in the analytical comments section of this case narrative.

D1 Sample required dilution due to matrix.

Sample required dilution due to interference from a non-target analyte.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Project: MHP/ERP/Monthly
Lab Order: 06070610

CASE NARRATIVE

The sample selected as the duplicate and matrix spike contained high concentrations of chloride and/or sulfate. The analyte concentration in the sample is disproportionate to the spike level and it was not practical to analyze the sample at a dilution, as the spike would be diluted out. The LCS/LCSD were recovered acceptably demonstrating that the analytical process was in control.

M7 Matrix spike recovery was low. Data reported per ADEQ policy 0154.000.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 02-Aug-06

CLIENT:	Pima County Flood Control	Client Sample ID:	Source Water MHPERP
Lab Order:	06070610	Tag Number:	
Project:	MHP-ERP/Monthly	Collection Date:	7/18/2006 9:50:00 AM
Lab ID:	06070610-01C	Matrix:	WASTE WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY		E300				Analyst: LB
Nitrogen, Nitrate/Nitrite Total	1.8	0.80	01	mg/L	2	7/19/2006 10:42:00 PM
NITROGEN, TOTAL KJELDAHL AS N		E381.4				Analyst: AT
Nitrogen, Total Kjeldahl	22	1.5		mg/L	1	7/28/2006
NITROGEN, TOTAL		CALC				Analyst: LMc
Nitrogen, Total	28	1.7		mg/L	1	8/1/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Knudson Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.

Page 1 of 1



Aerotech Environmental, Inc.

02-Aug-08

Lab Order: 06070610
Client: Pima County Flood Control
Project: MIF-ERP Monthly

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	DCLP Date	Prog Date	Analysis Date
06070610-01	Source: River MIF-ERP	7/28/2008 9:29:00 AM	Water: Water	AMENITY by ION CHROMATOGRAPHY			7/31/2008 10:42:00 PM
				TOTAL AMMONIUM NITROGEN			7/28/2008
				Total Nitrogen (Calculated)			8/1/2008



Aerotech Environmental Laboratories

a division of Ametek Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 07-Aug-08

CLIENT: Pima County Flood Control

Work Order: 06170620

Project: MHP-EXP Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W

Sample ID: MB-877629	SampType: MBLK	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 17629						
Client ID:	Batch ID: 877629	TestNo: E300		Analysis Date: 7/31/2008	SeqNo: 915740						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	<0.40	0.40									

Sample ID: LCS-877629	SampType: LCS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 17629						
Client ID:	Batch ID: 877629	TestNo: E300		Analysis Date: 7/31/2008	SeqNo: 915741						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	1.340	0.40	8	0	91.8	90	110				

Sample ID: LCSD-877629	SampType: LCSD	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 17629						
Client ID:	Batch ID: 877629	TestNo: E300		Analysis Date: 8/1/2008	SeqNo: 915742						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	1.340	0.40	8	0	92.8	90	110	1.340	0.272	20	

Sample ID: 06070680-06AMMS	SampType: MS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 17629						
Client ID:	Batch ID: 877629	TestNo: E300		Analysis Date: 7/31/2008	SeqNo: 915743						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	16.54	0.80	16	5.160	71.1	80	120				MT

Sample ID: 06070680-06AMSD	SampType: MSD	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 17629						
Client ID:	Batch ID: 877629	TestNo: E300		Analysis Date: 8/1/2008	SeqNo: 915744						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	16.40	0.80	16	5.160	82.8	80	120	16.54	10.8	20	

Qualifiers: E - Value above quantitative range
 ND - Not Detected at the Reporting Limit

H - Holding time for preparation or analysis exceeded
 R - RPO exceeds accepted recovery limits

J - Analyte detected below quantitative limits
 S - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06070610
Project: MS2-ERP-Miscddy

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: MB-R76910	SampType: WBLK	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 78910						
Client ID:	Batch ID: R76910	TestNo: E351.4		Analysis Date: 7/28/2008	SeqNo: 014351						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	<1.3	1.3									
--------------------------	------	-----	--	--	--	--	--	--	--	--	--

Sample ID: LCS-R76910	SampType: LCS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 78910						
Client ID:	Batch ID: R76910	TestNo: E351.4		Analysis Date: 7/28/2008	SeqNo: 014352						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	27.38	1.3	25	0	112	65	115				
--------------------------	-------	-----	----	---	-----	----	-----	--	--	--	--

Sample ID: LCS0-R76910	SampType: LCS0	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 78910						
Client ID:	Batch ID: R76910	TestNo: E351.4		Analysis Date: 7/28/2008	SeqNo: 014353						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	25.20	1.3	25	0	101	65	115	27.38	104	20	
--------------------------	-------	-----	----	---	-----	----	-----	-------	-----	----	--

Sample ID: 06070610-01CMS	SampType: MS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 78910						
Client ID:	Batch ID: R76910	TestNo: E351.4		Analysis Date: 7/28/2008	SeqNo: 014354						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	52.62	1.3	25	26.70	94.5	70	130				BT
--------------------------	-------	-----	----	-------	------	----	-----	--	--	--	----

Sample ID: 06070610-01CMS0	SampType: MS0	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 78910						
Client ID:	Batch ID: R76910	TestNo: E351.4		Analysis Date: 7/28/2008	SeqNo: 014355						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	54.32	1.3	25	26.70	70.5	70	130	52.62	2.60	20	
--------------------------	-------	-----	----	-------	------	----	-----	-------	------	----	--

Qualifiers: E - Value above quantitative range H - Holding times for preparation or analysis exceeded J - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit I - RPO exceeds accepted recovery limits K - Spike Recovery exceeds accepted recovery limits

Laboratory Number: 06-07-0610		Checklist completed by: _____
Client Name: Pima County Flood		Signature: 7-19-06
Matrix: WW	Center Name: J2	Date/Time Rec'd: 7-19-06 1120 By: JK

Temperature of Samples? **2.9 °C** Circle one: Blank **Wet Ice** Not Present

	Yes	No*	Not Present	Seal Containers:
Shipping container/cooler in good condition?	✓			Beats Sleeve _____
Custody seals intact on shipping container/cooler?	✓			Glass Jar _____
Custody seals intact on sample containers?			0	Methanol _____
Chain of Custody present and relinquished/received properly?	✓			Plastic Bag _____
Chain of Custody agrees with sample labels?	✓			Evacuate Samples _____
Samples in proper containers/bottles?	✓			
Sample containers intact?	✓			
All samples received within holding time?	✓			
Is there sufficient sample volume to perform the tests?	✓			*See Comment about Chlorine and pH
40mL vials for volatiles & SOCs received with zero headspace?			✓	

Total number of bottles received: _____ All sample media: _____
 If applicable, how many sample bottles were shipped from AEL-Tucson? _____ N/A

Number of containers received by preservative and by sample number? (If more than 15 samples are rec'd, please continue on separate sheet(s))

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General															
B-HNO3															
C-H2SO4	1														
D-HCl															
E-H2O2O3															
F-NaOH															
G-Sulfide															
H-Na Sulfite															
I-NCAA															
J-Methanol															
K-HAA															
L-Other															

Water pH acceptable upon receipt? Yes No N/A

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and original ID number
Metals <2		
Nitrates <2	✓	
Total Phos <2		
413 (OSG) <2		
418 (TPH) <2		
Cyanide >12		
Sulfide >9		

*Any No response must be detailed in the comments section below. Contact the PM immediately to determine how to proceed. Refer to SOP 11-001.04, Section 1.8.3. Continue on back if additional space is needed.

**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments: _____
 Corrective Action: _____



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

PC RFCD

AUG 16 2006

Tuesday, August 15, 2006

David Scalerò
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX: (520) 205-8360

RE: MHP-ERP/Monthly

Order No.: 06071013

Dear David Scalerò:

Aerotech Environmental, Inc. received 1 sample(s) on 7/28/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Korky Vault
Service Center Manager



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 16-Aug-06

CLIENT: Pima County Flood Control
Project: MHP-CRP Monthly
Lab Order: 06071013

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06071013-01C	HP-1 Monitor Well		7/28/2006 10:31:00 AM	7/28/2006



Aerotech Environmental, Inc.

Date: 16-Aug-06

CLIENT: Pima County Flood Control
Project: MHP-ERP Monthly
Lab Order: 06071013

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

- Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.
- Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.
- Test Methods for Evaluating Solid Waste, Physical-Chemical Methods, SW846, 3rd Edition.
- 40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.
- NIOSH Manual of Analytical Methods, Fourth Edition, 1994.
- Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.

Data Qualifiers:

Listed below are the data qualifiers used in your analytical report to explain any analytical or quality control issues. You will find them noted in your report under the column header "QUAL". Any quality control deficiencies that cannot be adequately described by these qualifiers will be addressed in the analytical comments section of this case narrative.

D1 Sample required dilution due to matrix.

Sample required dilution due to interference from a non-target analyte.

The sample selected as the duplicate and matrix spike contained high concentrations of chloride and/or sulfate. The analyte concentration in the sample is disproportionate to the spike level and it was not practical to analyze the sample at a dilution, as the spike would be diluted out. The LCS/LCSD were recovered acceptably demonstrating that the analytical process was in control.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 7/6-Aug-06

CLIENT: Pima County Flood Control
Lab Order: 06071013
Project: MHP-ERP Monthly
Lab ID: 06071013-01C

Client Sample ID: HP-1 Monitor Well
Tag Number:
Collection Date: 7/28/2006 10:31:00 AM
Matrix: DRINKING WATER

Analysis	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate/Nitrite Total	3.2	0.00	D1	mg/L	2	8/14/2006 2:52:00 AM Analyst: LB
NITROGEN, TOTAL KJELDAHL AS N						
Nitrogen, Total Kjeldahl	< 1.3	1.3		mg/L	1	8/8/2006 2:00:00 PM Analyst: AT
NITROGEN, TOTAL						
Nitrogen, Total	3.2	1.7	CALC	mg/L	1	8/15/2006 Analyst: A E

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Knudsen Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



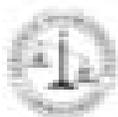
Aerotech Environmental, Inc.

24-Aug-09

Lab Order: 06071013
Client: Pima County Flood Control
Project: MSP-ERP Monthly

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prog Date	Analysis Date
06071013-001	SP-1 Monitor Well	7/28/09 10:11:00 AM	Drinking Water	AMEN by ION CHROMATOGRAPHY			8/14/09 2:32:00 AM
				TOTAL KJELDAHL NITROGEN			8/10/09 2:00:00 PM
				Total Nitrogen (Calculated)			8/10/09



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 16-Aug-09

CLIENT: Pima County Flood Control
Work Order: 06071013
Project: MS2P-ERP Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: 308_W

Sample ID: BB-R71957	Sample Type: WBLK	TestCode: 308_W	Units: mg/L	Prep Date:	RunNo: 71957						
Client ID:	Batch ID: R71957	TestNo: E300		Analysis Date: 8/14/2009	SeqNo: 921929						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	<0.40	0.40									

Sample ID: LCS-R71957	Sample Type: LCS	TestCode: 308_W	Units: mg/L	Prep Date:	RunNo: 71957						
Client ID:	Batch ID: R71957	TestNo: E300		Analysis Date: 8/14/2009	SeqNo: 921930						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	1.970	0.40	0	0	99.8	90	110				

Sample ID: LCSD-R71957	Sample Type: LCSD	TestCode: 308_W	Units: mg/L	Prep Date:	RunNo: 71957						
Client ID:	Batch ID: R71957	TestNo: E300		Analysis Date: 8/14/2009	SeqNo: 921931						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	1.960	0.40	0	0	99.8	90	110	1.970	0.125	20	

Sample ID: 06071013-094915	Sample Type: WS	TestCode: 308_W	Units: mg/L	Prep Date:	RunNo: 71957						
Client ID:	Batch ID: R71957	TestNo: E300		Analysis Date: 8/14/2009	SeqNo: 921932						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	23.16	0.80	16	1.260	99.4	90	120				

Sample ID: 06071013-094930	Sample Type: WSD	TestCode: 308_W	Units: mg/L	Prep Date:	RunNo: 71957						
Client ID:	Batch ID: R71957	TestNo: E300		Analysis Date: 8/14/2009	SeqNo: 921934						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Nitrate/Nitrite Total	23.74	0.80	16	1.260	100	90	120	23.16	2.47	20	

Qualifiers: E Value above quantitative range
ND Not Detected at the Reporting Limit

H Holding time for preparation or analysis exceeded
B RPO outside accepted recovery limits

J Analyte detected below quantitative limits
K Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

A Division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06071813
Project: MSW-ERP Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: WS-RTT250	SampType: WBLA	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 77250						
Client ID:	Batch ID: RTT250	TestNo: E351.4		Analysis Date: 8/8/2006	SeqNo: 918747						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	41.3	1.3									
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Sample ID: LCS-RTT250	SampType: LCS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 77250						
Client ID:	Batch ID: RTT250	TestNo: E351.4		Analysis Date: 8/8/2006	SeqNo: 918748						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	27.80	1.3	25	0	111	83	113				
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Sample ID: LCSD-RTT250	SampType: LCSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 77250						
Client ID:	Batch ID: RTT250	TestNo: E351.4		Analysis Date: 8/8/2006	SeqNo: 918749						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	25.86	1.3	25	0	104	83	113	27.80	6.79	20	
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Sample ID: 06071801-E20KMS	SampType: MS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 77250						
Client ID:	Batch ID: RTT250	TestNo: E351.4		Analysis Date: 8/8/2006	SeqNo: 918754						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	25.79	1.3	25	1,350	89.7	70	130				
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Sample ID: 06071801-E20KSD	SampType: MSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 77250						
Client ID:	Batch ID: RTT250	TestNo: E351.4		Analysis Date: 8/8/2006	SeqNo: 918755						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	26.20	1.3	25	1,350	91.4	70	130	25.79	1.64	20	
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Qualifiers: E: Value above quantitative range H: Holding time for preparation or analysis exceeded J: Analyte detected below quantitative limits
 ND: Not Detected as per Reporting Limit K: RPO outside accepted recovery limits S: Spike Recovery outside accepted recovery limits

Laboratory Number: 06-07-1013 Checklist completed by: James Gravlin
 Client Name: Pima County Flood Co. [Signature] Date/Time Rec'd: 7/31/06
 Matrix: D.W. Container Name: 32-Exp. Date/Time Rec'd: 7/31/06 12:00 by: J.G.

Temperature of Samples? 2.0 °C Circle one: Blue Ice **Wet Ice** Not Present

	Yes	No*	Not Present	Soil Containers:
Shipping container/cooler in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Brass Shovel _____
Custody seals intact on shipping container/cooler?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Glass Jar _____
Custody seals intact on sample containers?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Metal can _____
Chain of Custody present and unquashed/received properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Plastic Bag _____
Chain of Custody agrees with sample labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Excess Samples _____
Samples in proper containers/bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Sample containers intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
All samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> *See Comment about Chlorine and pH	
Is there sufficient sample volume to perform the tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
40ml. vials for volatiles & SOCs received with zero headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Total number of bottles received: 1 #1 sample media: N/A
 If applicable, how many sample bottles were shipped from AEL-Tucson? 1 N/A 7/31/06 J.G.

Number of containers received by preservative and by sample number: (if more than 15 samples are rec'd please continue on separate sheet(s))

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General															
B-HNO3															
C-H2SO4	<u>1</u>														
D-HCl															
E-H2O200															
F-NaOH															
G-Sulfide															
H-H2 Sulfide															
I-MCAA															
J-Methanol															
K-HMA															
L-Other															

Water-pH acceptable upon receipt? Yes No N/A

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and suggest EI number
Metals <2		
Nutrients <2	<u>< 2</u>	
Total Phosphi <2		
413 (OMG) <2		
418 (TPH) <2		
Cyanide >12		
Sulfide >9		

*Any No response must be detailed in the comments section below. Contact the PM immediately to determine how to proceed. Refer to SOP 11-001.04, Section 1.1.4. Continue on back if additional space is needed.

**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments:

Corrective Action:



Aerotech Environmental Laboratories

an affiliate of Severn Trent Laboratories, Inc.

| Phoenix - 1781 W. Camelback, Phoenix, AZ 85015 (602) 967-5200 FAX (602) 967-6210
 | North Phoenix - 1521 W. Kinnaman, Phoenix, AZ 85027 (602) 766-4700 FAX (602) 766-2004
 | Tucson - 4000 S. Park Ave, Suite 110, Tucson, AZ 85714 (520) 607-8811 FAX (520) 607-8822
 www.aerotech.com or call toll-free 1-800-774-LABS (1-800-774-5227)

Quotation #0211

Lab Number:	
06071013	
Sample Type Codes	
DW - Drinking Water	A - Air
WW - Waste Water	S - Soil
HW - Hazardous Waste	
Other: _____	

Customer Number: 1209913	Page 1 of 1
Customer: PIMA COUNTY FLOOD CONTROL DISTRICT	Sampler: David Scallero
Address: 201 N. STONE AVE. 4TH FLOOR	Project Name: MHP-ERP / Monthly
City, State, Zip: Tucson AZ 85711	Project Number:
Contact: David Scallero	P.O. Number:
Phone: (520) 746-4350 Fax: (520) 746-4748	Fast Results: <input type="checkbox"/> Y <input type="checkbox"/> N
E-Mail Address: david.scallero@dcf.pima.gov	E-Mail Results: <input type="checkbox"/> Y <input type="checkbox"/> N

Sample Receipt	Turn Around Request
Temperature: 2.0 °C <i>w/</i>	<input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours
Cooling Seal: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<input type="checkbox"/> 72 Hours
Cooling Seal Intact: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<input type="checkbox"/> 5 Working Days
Total # of Containers: 1	<input checked="" type="checkbox"/> Standard 10 Working Days

Analysis Requested										# of sample Containers
Nitrate/Nitrite as N	Total Kjeldahl Nitrogen (TKN)	Total Nitrogen								
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								1

Sample Information

Lab #	Sample Identification	Date	Time	Type	Nitrate/Nitrite as N	Total Kjeldahl Nitrogen (TKN)	Total Nitrogen								# of sample Containers
1	MHP-ERP / Monthly	7/28/09	12:10	DW	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								1

Instructions / Special Requirements:

Date:	Time:	Sampler Relinquished By:	Received By:
7/28/09	12:10	David Scallero	[Signature]
7/28/09	0800	[Signature]	[Signature]
7/28/09	12:00	[Signature]	[Signature]

Analysis performed is subject to the Terms & Conditions available at www.aerotechlabs.com or call 888.722.5227 to request a copy.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

PC BFGD
SEP 15 2006

Wednesday, September 06, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX: (520) 205-8360

RE: MHP-ERP Monthly

Order No.: 06080844

Dear David Scalero:

Aerotech Environmental, Inc. received 1 sample(s) on 8/22/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Lawrie Heelan
Project Manager



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 06-Sep-06

CLIENT: Pima County Flood Control
Project: MHP-ERP Monthly
Lab Order: 0608044

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

- Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.
- Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.
- 40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.
- NIOSH Manual of Analytical Methods, Fourth Edition, 1994.
- Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.

Data Qualifiers:

Listed below are the data qualifiers used in your analytical report to explain any analytical or quality control issues. You will find them noted in your report under the column header "QUAL". Any quality control deficiencies that cannot be adequately described by these qualifiers will be addressed in the analytical comments section of this case narrative.

D1 Sample required dilution due to matrix.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 06-Sep-06

CLIENT: Pima County Flood Control
Project: MHP-ERP Monthly
Lab Order: 06080844

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06080844-01C	HP-1 MHP-ERP		8/22/2006 10:55:00 AM	8/22/2006



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 06-Sep-06

CLIENT: Pima County Flood Control
 Lab Order: 06080844
 Project: MHP-ERP Monthly
 Lab ID: 06080844-01C

Client Sample ID: HP-1 MHP-ERP
 Tag Number:
 Collection Date: 8/22/2006 10:55:00 AM
 Matrix: DRINKING WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY						
Nitrogen, Nitrate/Nitrite Total	3.3	0.80	D1	mg/L	2	8/22/2006 11:11:00 PM Analyst: AT
NITROGEN, TOTAL KJELDAHL AS N						
Nitrogen, Total Kjeldahl	< 1.3	1.3		mg/L	1	8/23/2006 Analyst: JLS
NITROGEN, TOTAL						
Nitrogen, Total	3.3	CALC		mg/L	1	8/23/2006 Analyst: LMc

Footnotes: All analysis performed at AEL Phoenix Laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Kinsden Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental, Inc.

06-Sep-08

Lab Order: 06262844
Client: Pima County Flood Control
Project: MSP-ERP Monthly

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	DCLP Date	Prog. Date	Analysis Date
06262844-01C	SP-C MSP-ERP	8/22/2008 10:31:00 AM	Drinking Water	NITROGEN by ION CHROMATOGRAPHY			9/1/2008 11:11:00 PM
				TOTAL KJELDHAHL NITROGEN			8/29/2008
				Total Nitrogen (Calculated)			9/3/2008



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 06-Sep-08

CLIENT: Pima County Flood Control

Work Order: 06080844

Project: MSP-EP2 Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W

Sample ID: MS-R7008	Sample Type: WBLK	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: T038						
Client ID:	Batch ID: R7008	TestNo: E300		Analysis Date: 8/12/08	SeqNo: 801428						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total

0.40

0.40

Sample ID: LCS-R7008	Sample Type: LCS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: T038						
Client ID:	Batch ID: R7008	TestNo: E300		Analysis Date: 8/12/08	SeqNo: 801428						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total

0.010

0.40

0

0

100

80

110

Sample ID: LCS0-R7008	Sample Type: LCS0	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: T038						
Client ID:	Batch ID: R7008	TestNo: E300		Analysis Date: 8/22/08	SeqNo: 801428						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total

0.080

0.40

0

0

101

80

110

0.010

0.070

20

Sample ID: 06080821-08485	Sample Type: MS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: T038						
Client ID:	Batch ID: R7008	TestNo: E300		Analysis Date: 8/12/08	SeqNo: 801424						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total

0.450

0.40

0

0

108

80

120

Sample ID: 06080821-084850	Sample Type: MS0	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: T038						
Client ID:	Batch ID: R7008	TestNo: E300		Analysis Date: 8/12/08	SeqNo: 801425						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total

0.480

0.40

0

0

108

80

120

0.450

0.254

20

Qualifiers: E Value above quantitative range
ND Not Detected at the Reporting Limit

H Holding time for preparation or analysis exceeded
R RPO outside accepted recovery limits

1 Analyte detected below quantitative limits
5 Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Ametek Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 0600044
Project: MSP-EP2 Monthly

ANALYTICAL QC SUMMARY REPORT

Test Code: N_TKN_WW

Sample ID: 95-R78187	Sample Type: MBLK	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 78187						
Client ID:	Batch ID: R78187	Test No: E2814		Analysis Date: 8/29/2006	Seq No: 82042						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl	41.3	1.3									
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Sample ID: LCS-R78187	Sample Type: LCS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 78187						
Client ID:	Batch ID: R78187	Test No: E2814		Analysis Date: 8/29/2006	Seq No: 82042						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl	24.28	1.3	25	0	97.1	85	115				
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Sample ID: LCS0-R78187	Sample Type: LCS0	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 78187						
Client ID:	Batch ID: R78187	Test No: E2814		Analysis Date: 8/29/2006	Seq No: 82048						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl	23.80	1.3	25	0	94.8	85	115	24.28	3.24	20	
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Sample ID: 96080727-810285	Sample Type: MS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 78187						
Client ID:	Batch ID: R78187	Test No: E2814		Analysis Date: 8/29/2006	Seq No: 82048						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl	22.88	1.3	25	0	91.2	70	100				
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Sample ID: 96080810-810285	Sample Type: MS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 78187						
Client ID:	Batch ID: R78187	Test No: E2814		Analysis Date: 8/29/2006	Seq No: 82037						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual

Nitrogen, Total Kjeldahl	88.02	1.3	25	38.85	104	70	100				
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Qualifiers: 1 - Value above quantitation range 2 - Holding time for preparation of analysis exceeded 3 - Analyte detected below quantitation limit
 ND - Not Detected at the Reporting Limit 4 - RPO outside accepted recovery limits 5 - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06080844
Project: MSP-EP2 Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: 06080727-01CM50	SamgType: WSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 78187						
Client ID:	Batch ID: R78187	TestNo: E381.4		Analysis Date: 8/29/2004	SeqNo: 828348						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	22.22	1.3	25	0	84.9	70	130	22.55	1.45	20	

Sample ID: 06080819-01CM50	SamgType: WSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 78187						
Client ID:	Batch ID: R78187	TestNo: E381.4		Analysis Date: 8/29/2004	SeqNo: 828358						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	61.90	1.3	25	26.35	95.8	70	130	66.00	3.27	20	

- Qualifiers: 1 - Value above quantitative range 2 - Holding time for preparation or analysis exceeded 3 - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit 4 - RPO outside accepted recovery limits 5 - Spike Recovery outside accepted recovery limits

Laboratory Number: <u>06-08-0844</u>	Checked/Completed by: <u>James Gravlin</u>
Client Name: <u>Pima County Flood Control</u>	Signature: <u>[Signature]</u> Date: <u>8/23/04</u>
Matrix: <u>D.W.</u> Container Name: <u>J2-Exp</u>	Date/Time Rec'd: <u>8/23/04 11:10</u> By: <u>J.G.</u>

Temperature of Samples? 0.8 °C | Circle one: Blue Ice Wet Ice Not Present

	Yes	No*	Not Present	Soil Containers:
Shipping containers/cooler in good condition?	<input checked="" type="checkbox"/>			Brass Shovel _____
Cooldry seals intact on shipping container/cooler?	<input checked="" type="checkbox"/>			Glass Jar _____
Cooldry seals intact on sample containers?			<input checked="" type="checkbox"/>	Methanol _____
Chain of Custody present and relinquished/received properly?	<input checked="" type="checkbox"/>			Plastic Bag _____
Chain of Custody agrees with sample labels?	<input checked="" type="checkbox"/>			Environ Samples _____
Samples in proper containers/bottles?	<input checked="" type="checkbox"/>			
Sample containers intact?	<input checked="" type="checkbox"/>			
All samples received within holding time?	<input checked="" type="checkbox"/>			**See Comment about Chlorine and pH
Is there sufficient sample volume to perform the tests?	<input checked="" type="checkbox"/>			
40ml. vials for volatiles & DOCs received with zero headspace?			<input checked="" type="checkbox"/>	

Total number of bottles received: 1 | #1 sample media: N/A

If applicable, how many sample bottles were shipped from AEL-Tucson? 1 | N/A

Number of containers received by preservative and by sample number: (If more than 15 samples are rec'd, please continue on separate sheet(s))

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General															
B-HNO3															
C-H2SO4	1														
D-HCl															
E-H2O200															
F-NaOH															
G-Sulfide															
H-H2 Sulfide															
I-MCAA															
J-Methanol															
K-HAA															
L-Other															

Water pH acceptable upon receipt? Yes No N/A

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and assigned BL number
Metals <2		
Nutrients <2	< 2	
Total Phos <2		
413 (DMG) <2		
418 (IPM) <2		
Cyanide >12		
Sulfide >9		

*Any No response must be detailed in the comments section below. Contact the PM immediately to determine how to proceed. Refer to SOP 11001.04, Section 1.8.E. Continue on back if additional space is needed.

**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments:

Correction Action:



Aerotech Environmental Laboratories

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70 WFOO

10/13/06

Friday, October 13, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (520) 205-8353

FAX (520) 205-8360

RE: MHP-ERP / Monthly-Qtrly

Order No.: 06100041

Dear David Scalero:

Aerotech Environmental, Inc. received 1 sample(s) on 9/29/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Lawnie Heelan
Project Manager



Aerotech Environmental Laboratories

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Aerotech Environmental, I

Analytical Report

Date: 11-Oct-06

CLIENT: Pima County Flood Control
Lab Order: 06100041
Project: MDP-ERP / Monthly-Qrly
Lab ID: 06100041-010

Client Sample ID: HP-1
Tag Number:
Collection Date: 9/29/2006 10:40:00 AM
Matrix: DRINKING WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP/MS METALS, TOTAL RECOVERABLE		E200.8				Analyst: TD
Arsimony	< 0.0030	0.0030		mg/L	1	10/11/2006 9:43:37 AM
Arsenic	0.0020	0.0010		mg/L	1	10/11/2006 9:43:37 AM
Barium	0.15	0.0010		mg/L	1	10/11/2006 9:43:37 AM
Beryllium	< 0.0010	0.0010		mg/L	1	10/11/2006 9:43:37 AM
Cadmium	< 0.0010	0.0010		mg/L	1	10/11/2006 9:43:37 AM
Chromium	< 0.0010	0.0010		mg/L	1	10/11/2006 9:43:37 AM
Lead	0.0040	0.0010		mg/L	1	10/11/2006 9:43:37 AM
Nickel	0.011	0.0010		mg/L	1	10/11/2006 9:43:37 AM
Selenium	< 0.0020	0.0020		mg/L	1	10/11/2006 9:43:37 AM
Thallium	< 0.0010	0.0010		mg/L	1	10/11/2006 9:43:37 AM
MERCURY, TOTAL		E245.1				Analyst: PC
Mercury	< 0.00020	0.00020		mg/L	1	10/9/2006

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Knolls Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



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Aerotech Environmental, Inc.

Date: 13-Oct-06

CLIENT: Pima County Flood Control
Project: MRP-ERP / Monthly-Qtrly
Lab Order: 06100041

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06100041-01B	HP-1		9/29/2006 10:40:00 AM	10/2/2006
06100041-01C	HP-1		9/29/2006 10:40:00 AM	10/2/2006
06100041-01D	HP-1		9/29/2006 10:40:00 AM	10/2/2006



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Aerotech Environmental, Inc.

Date: 13-Oct-08

CLIENT: Pima County Flood Control
Project: MHP-ERP / Monthly-Qtrly
Lab Order: 06100041

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

- Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.
- Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition, 40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.
- NIOSH Manual of Analytical Methods, Fourth Edition, 1994.
- Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.



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Aerotech Environmental, I

Analytical Report

Date: 13-Oct-06

CLIENT: Pima County Flood Control
Lab Order: 06100041
Project: MSP-ERP / Monthly-Qrly
Lab ID: 06100041-01C

Client Sample ID: HP-1
Tag Number:
Collection Date: 9/29/2006 10:40:00 AM
Matrix: DRINKING WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NITROGEN, TOTAL KJELDAHL AS N Nitrogen, Total Kjeldahl	+ 1.2	E351.4 1.2		mg/L	1	Analyst: AC 10/9/2006

Footnote: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Kansas Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.

Page 2 of 3



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Aerotech Environmental, I

Analytical Report

Date: 13-Oct-06

CLIENT: Pima County Flood Control
Lab Order: 06100041
Project: MHP-ERP / Monthly-Qtly
Lab ID: 06100041-01D

Client Sample ID: HP-1
Tag Number:
Collection Date: 9/29/2006 10:40:06 AM
Matrix: DRINKING WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B		Analyst: JZ		
1,1,1-Trichloroethane	< 1.0	1.0		ug/L	1	10/6/2006
1,1,2-Trichloroethane	< 1.0	1.0		ug/L	1	10/6/2006
1,1-Dichloroethane	< 1.0	1.0		ug/L	1	10/6/2006
1,2-Dichlorobenzene	< 1.0	1.0		ug/L	1	10/6/2006
1,2-Dichloroethane	< 1.0	1.0		ug/L	1	10/6/2006
1,2-Dichloropropane	< 1.0	1.0		ug/L	1	10/6/2006
1,4-Dichlorobenzene	< 1.0	1.0		ug/L	1	10/6/2006
Benzene	< 1.0	1.0		ug/L	1	10/6/2006
Carbon tetrachloride	< 1.0	1.0		ug/L	1	10/6/2006
Chlorobenzene	< 1.0	1.0		ug/L	1	10/6/2006
cis-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	10/6/2006
Ethylbenzene	< 1.0	1.0		ug/L	1	10/6/2006
Styrene	< 1.0	1.0		ug/L	1	10/6/2006
Tetrachloroethane	< 1.0	1.0		ug/L	1	10/6/2006
Toluene	< 1.0	1.0		ug/L	1	10/6/2006
trans-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	10/6/2006
Trichloroethane	< 1.0	1.0		ug/L	1	10/6/2006
Trihalomethanes, Total	< 1.0	1.0		ug/L	1	10/6/2006
Vinyl chloride	< 1.0	1.0		ug/L	1	10/6/2006
Xylenes, Total	< 2.0	2.0		ug/L	1	10/6/2006
Sum: 4-Bromofluorobenzene	101	63.0-123		%REC	1	10/6/2006
Sum: Dibromofluoromethane	100	62.0-120		%REC	1	10/6/2006
Sum: Toluene-d8	101	60-122		%REC	1	10/6/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

- (1) AEL - Tucson Laboratory
- (2) AEL - Knolls Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental, Inc.

13-Oct-06

Lab Order: 06100041
Client: Pima County Flood Control
Project: MSP-ERP / Muddy-Only

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	DCFP Date	Prep Date	Analysis Date
06100041-408	EP-1	10/10/2006 10:40:00 AM	Drinking Water	ICP/MS METALS, TOTAL RECOVERABLE MERCURY IN WATER		10/10/2006 2:06:00 PM	10/10/2006 9:42:17 AM
06100041-407				TOTAL AMMONIA NITROGEN		10/10/2006 10:16:00 AM	10/10/2006
06100041-409				ISOLATE/IS by GC/MS			10/10/2006



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Aerotech Environmental, Inc.

Date: 11-Oct-06

CLIENT: Pima County Flood Control

Work Order: 0610004

Project: MHP-ERP / Monthly-Qdly

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8

Sample ID: MB-27223	Sample Type: MBLK	TestCode: 200.8	Units: mg/L	Prep Date: 10/9/2006	RunNo: 78847						
Client ID:	Batch ID: 27223	TestNo: E200.8		Analysis Date: 10/11/2006	SeqNo: 948800						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPQLimit	Qual
Antimony	<0.0030	0.0030									
Arsenic	<0.0010	0.0010									
Barium	<0.0010	0.0010									
Beryllium	<0.0010	0.0010									
Cadmium	<0.0010	0.0010									
Chromium	<0.0010	0.0010									
Lead	<0.0010	0.0010									
Nickel	<0.0010	0.0010									
Selenium	<0.0020	0.0020									
Thallium	<0.0010	0.0010									

Sample ID: LCS-27223	Sample Type: LCS	TestCode: 200.8	Units: mg/L	Prep Date: 10/9/2006	RunNo: 78847						
Client ID:	Batch ID: 27223	TestNo: E200.8		Analysis Date: 10/11/2006	SeqNo: 948800						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPQLimit	Qual
Antimony	0.0643	0.0030	0.1	0	98.4	65	110				
Arsenic	0.1007	0.0010	0.1	0	101	65	110				
Barium	0.1000	0.0010	0.1	0	100	65	110				
Beryllium	0.0610	0.0010	0.1	0	95.1	65	110				
Cadmium	0.0900	0.0010	0.1	0	90.0	65	110				
Chromium	0.1013	0.0010	0.1	0	101	65	110				
Lead	0.0900	0.0010	0.1	0	90.0	65	110				
Nickel	0.1001	0.0010	0.1	0	100	65	110				
Selenium	0.0900	0.0020	0.1	0	89.0	65	110				
Thallium	0.0871	0.0010	0.1	0	88.7	65	110				

Qualifiers: E Value above quantitative range W Holding times for preparation or analysis exceeded F Analyte detected below quantitative limits
 ND Not Detected at the Reporting Level R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits



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CLIENT: Pima County Flood Control

Work Order: 0610004

Project: MHP-EXP / Monthly-Qualy

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8

Sample ID: LC50-2722	SampType: LC50	TestCode: 200.8	Units: mg/L	Prep Date: 10/5/2008	RunNo: 79847						
Client ID:	Batch ID: 2722	TestNo: E200.8		Analysis Date: 10/11/2008	SeqNo: 148889						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Antimony	0.0053	0.0030	0.1	0	98.3	85	115	0.0043	0.507	20	
Arsenic	0.1006	0.0010	0.1	0	101	85	115	0.1007	0.118	20	
Barium	0.1001	0.0010	0.1	0	100	85	115	0.1000	0.2140	20	
Beryllium	0.00475	0.0010	0.1	0	94.7	85	115	0.0045	0.374	20	
Cadmium	0.0006	0.0010	0.1	0	80.1	85	115	0.0000	0.020	20	
Chromium	0.1019	0.0010	0.1	0	102	85	115	0.1013	0.550	20	
Lead	0.0018	0.0010	0.1	0	95.2	85	115	0.0002	0.750	20	
Nickel	0.1013	0.0010	0.1	0	101	85	115	0.1005	1.11	20	
Selenium	0.0002	0.0020	0.1	0	99.9	85	115	0.0003	0.890	20	
Thallium	0.0007	0.0010	0.1	0	99.0	85	115	0.0011	0.271	20	

Sample ID: 06100041-01BMS	SampType: MS	TestCode: 200.8	Units: mg/L	Prep Date: 10/5/2008	RunNo: 79847						
Client ID: HP-1	Batch ID: 2722	TestNo: E200.8		Analysis Date: 10/11/2008	SeqNo: 148890						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Antimony	0.1009	0.0030	0.1	0	100	70	130				
Arsenic	0.1089	0.0010	0.1	0.002019	107	70	130				
Barium	0.2518	0.0010	0.1	0.1040	97.8	70	130				
Beryllium	0.0002	0.0010	0.1	0	89.8	70	130				
Cadmium	0.1022	0.0010	0.1	0	102	70	130				
Chromium	0.0005	0.0010	0.1	0	85.1	70	130				
Lead	0.0020	0.0010	0.1	0.000571	95.3	70	130				
Nickel	0.1022	0.0010	0.1	0.01139	93.8	70	130				
Selenium	0.1089	0.0020	0.1	0	100	70	130				
Thallium	0.0005	0.0010	0.1	0	98.0	70	130				

Qualifiers: E - Value above quantitative range H - Holding time for preparation or analysis exceeded J - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit R - RPO outside accepted recovery limits S - Spike Recovery outside accepted recovery limits



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CLIENT: Pima County Flood Control
Work Order: 0600041
Project: MSP-ERP / Monthly-Qtrly

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8

Sample ID: 06100104-020015	Sample Type: MS	TestCode: 200.8	Units: mg/L	Prep Date: 10/5/2008	RunNo: 79947						
Client ID:	Batch ID: 27223	TestNo: E200.8		Analysis Date: 10/15/2008	SeqNo: 548890						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Antimony	0.1080	0.0030	0.1	0	108	70	130				
Arsenic	0.1107	0.0010	0.1	0.01009	109	70	130				
Boron	0.2074	0.0010	0.1	0.1023	102	70	130				
Beryllium	0.00108	0.0010	0.1	0	91.1	70	130				
Cadmium	0.1007	0.0010	0.1	0	101	70	130				
Chromium	0.1035	0.0010	0.1	0.000170	97.4	70	130				
Lead	0.1050	0.0010	0.1	0.000007	95.9	70	130				
Nickel	0.1044	0.0010	0.1	0.01504	95.4	70	130				
Selenium	0.1142	0.0020	0.1	0.000345	111	70	130				
Thallium	0.1038	0.0010	0.1	0	104	70	130				

Sample ID: 06100041-0100032	Sample Type: MSD	TestCode: 200.8	Units: mg/L	Prep Date: 10/5/2008	RunNo: 79947						
Client ID: HP-1	Batch ID: 27223	TestNo: E200.8		Analysis Date: 10/15/2008	SeqNo: 548891						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Antimony	0.1055	0.0030	0.1	0	105	70	130	0.1059	0.380	15	
Arsenic	0.1089	0.0010	0.1	0.000019	107	70	130	0.1089	0.0028	15	
Boron	0.2058	0.0010	0.1	0.1540	95.8	70	130	0.2018	0.421	15	
Beryllium	0.1003	0.0010	0.1	0	100	70	130	0.0990	0.507	15	
Cadmium	0.1034	0.0010	0.1	0	103	70	130	0.1000	1.10	15	
Chromium	0.09940	0.0010	0.1	0	99.4	70	130	0.09000	0.558	15	
Lead	0.0975	0.0010	0.1	0.000071	95.8	70	130	0.09000	0.488	15	
Nickel	0.1007	0.0010	0.1	0.01139	94.3	70	130	0.1000	0.408	15	
Selenium	0.1083	0.0020	0.1	0	108	70	130	0.1089	0.403	15	
Thallium	0.09916	0.0010	0.1	0	99.2	70	130	0.09000	0.110	15	

Qualifiers: 0 Value above quantitative range 1 Holding time for preparation or analysis exceeded 2 Analyte detected below quantitative limits
 ND Not Detected at the Reporting Limit 3 RPO outside accepted/recovery limits 4 Spike Recovery outside accepted/recovery limits



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CLIENT: Pima County Flood Control
Work Order: 06100041
Project: MFP-ERP: Monthly-Qrly

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8

Sample ID: 06100124-028950	SampType: MSO	TestCode: 200.8	Units: mg/L	Prep Date: 10/5/2008	RunNo: 79847						
Client ID:	Batch ID: 27323	Truffler: E200.8		Analysis Date: 10/11/2008	SeqNo: 948891						
Analyte	Result	PQL	SPK value	SPK Ref Val	UREC	LowLimit	HighLimit	RPO-Ref Val	URPO	RPOLimit	Qual
Antimony	0.1072	0.0030	0.1	0	107	70	130	0.1080	0.691	10	
Arsenic	0.1183	0.0010	0.1	0.01005	108	70	130	0.1197	1.15	10	
Boron	0.2064	0.0010	0.1	0.1053	101	70	130	0.2074	0.485	10	
Beryllium	0.00030	0.0010	0.1	0	30.3	70	130	0.00108	0.660	10	
Cadmium	0.00667	0.0010	0.1	0	66.9	70	130	0.1007	0.837	10	
Chromium	0.1037	0.0010	0.1	0.000116	103.7	70	130	0.1035	0.243	10	
Lead	0.1050	0.0010	0.1	0.000007	105.0	70	130	0.1050	0.0152	10	
Nickel	0.1062	0.0010	0.1	0.01504	106.2	70	130	0.1044	0.705	10	
Selenium	0.1129	0.0020	0.1	0.003045	110	70	130	0.1142	1.13	10	
Thallium	0.1035	0.0010	0.1	0	104	70	130	0.1038	0.264	10	

Qualifiers:
 0 Value above quantitative range
 ND Not Detected at the Reporting Limit
 1 Blanking times for preparation or analysis exceeded
 2 Analyte detected below quantitative limits
 3 RPO outside accepted recovery limits
 4 Spike Recovery outside accepted recovery limits



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CLIENT: Pima County Flood Control
Work Order: 06100041
Project: MHP-EOP / Monthly-Qtrly

ANALYTICAL QC SUMMARY REPORT

TestCode: 245.1_W

Sample ID: MB-27342	SampType: MBLR	TestCode: 245.1_W	Units: mg/L	Prep Date: 10/9/2008	RunNo: 79726						
Client ID:	Batch ID: 27342	TestNo: E245.1		Analysis Date: 10/9/2008	SeqNo: 848875						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Mercury <0.00020 0.00020

Sample ID: LCS-27342	SampType: LCS	TestCode: 245.1_W	Units: mg/L	Prep Date: 10/9/2008	RunNo: 79726						
Client ID:	Batch ID: 27342	TestNo: E245.1		Analysis Date: 10/9/2008	SeqNo: 848877						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Mercury 0.000780 0.00020 0.01 0 97.8 85 110

Sample ID: LCSD-27342	SampType: LCSD	TestCode: 245.1_W	Units: mg/L	Prep Date: 10/9/2008	RunNo: 79726						
Client ID:	Batch ID: 27342	TestNo: E245.1		Analysis Date: 10/9/2008	SeqNo: 848878						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Mercury 0.000900 0.00020 0.01 0 98.5 85 115 0.000780 1.72 20

Sample ID: 04100104-03885	SampType: MS	TestCode: 245.1_W	Units: mg/L	Prep Date: 10/9/2008	RunNo: 79726						
Client ID:	Batch ID: 27342	TestNo: E245.1		Analysis Date: 10/9/2008	SeqNo: 848883						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Mercury 0.000050 0.00020 0.01 0 99.3 80.4 122

Sample ID: 04100076-01885	SampType: MS	TestCode: 245.1_W	Units: mg/L	Prep Date: 10/9/2008	RunNo: 79763						
Client ID:	Batch ID: 27342	TestNo: E245.1		Analysis Date: 10/9/2008	SeqNo: 847281						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Mercury 0.01010 0.00020 0.01 0 101 80.4 122

Qualifiers: E Value above quantitation range H Holding time for preparation or analysis exceeded J Analyte detected below quantitation limits
 ND Not Detected at the Reporting Limit R RPO outside accepted recovery limits S Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control

Work Order: 06100041

Project: MSIP-EOP / Monthly-Qonly

ANALYTICAL QC SUMMARY REPORT

TestCode: 245.1_W

Sample ID: 06100041-0188950	SampType: MSIP	TestCode: 245.1_W	Units: mg/L	Prep Date: 10/9/2006	RunNo: 19728						
Client ID:	Batch ID: 27242	TestNo: E245.1		Analysis Date: 10/9/2006	SeqNo: 948884						
Analyte:	Result	PQL	SPK value	SPK RefVal	%REC	LowLimit	HighLimit	RPD RefVal	%RPD	RPQLimit	Qual

Mercury	0.0100	0.00020	0.01	0	100	88.4	122	0.000050	5.38	20	
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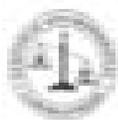
Sample ID: 06100041-0188950	SampType: MSIP	TestCode: 245.1_W	Units: mg/L	Prep Date: 10/9/2006	RunNo: 19762						
Client ID:	Batch ID: 27242	TestNo: E245.1		Analysis Date: 10/9/2006	SeqNo: 947362						
Analyte:	Result	PQL	SPK value	SPK RefVal	%REC	LowLimit	HighLimit	RPD RefVal	%RPD	RPQLimit	Qual

Mercury	0.00900	0.00020	0.01	0	88.8	88.4	122	0.00010	2.10	20	
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Qualifiers: E Value above quantitation range
ND Not Detected at the Reporting Limit

W Holding times for preparation or analysis exceeded
R RPD exceeds accepted recovery limits

F Analyte detected before quantitation limits
S Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 0630046
Project: MSP-ERP / Monthly-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_M

Sample ID: MB-R79723	Sample Type: MBLK	TestCode: 8260_M	Units: µg/L	Prep Date:	RunNo: 79723						
Client ID:	Batch ID: R79723	TestNo: SW02608		Analysis Date: 10/6/2008	SeqNo: 946327						
Analyte	Result	PQL	SPK value	SPK Ref'val	%REC	LowLimit	HighLimit	RPD Ref'val	%RPD	RPQLimit	Qual
1,1,1-Trichloroethane	<1.0	1.0									
1,1,2-Trichloroethane	<1.0	1.0									
1,1-Dichloroethane	<1.0	1.0									
1,2-Dichlorobenzene	<1.0	1.0									
1,2-Dichloroethane	<1.0	1.0									
1,2-Dichloropropane	<1.0	1.0									
1,4-Dichlorobenzene	<1.0	1.0									
Benzene	<1.0	1.0									
Carbon tetrachloride	<1.0	1.0									
Chlorobenzene	<1.0	1.0									
cis-1,2-Dichloroethane	<1.0	1.0									
Ethylbenzene	<1.0	1.0									
Styrene	<1.0	1.0									
Tetrachloroethane	<1.0	1.0									
Toluene	<1.0	1.0									
trans-1,2-Dichloroethane	<1.0	1.0									
Trichloroethene	<1.0	1.0									
Tetralomethanes, Total	<1.0	1.0									
Vinyl chloride	<1.0	1.0									
Xylenes, Total	<1.0	2.0									
Sum: 4-Bromofluorobenzene	24.54	0	25	0	99.4	01.0	124				
Sum: Dibromofluoromethane	25.34	0	25	0	101	02.1	110				
Sum: Toluene-d8	25.47	0	25	0	102	01.8	120				

Sample ID: LCS-R79723	Sample Type: LCS	TestCode: 8260_M	Units: µg/L	Prep Date:	RunNo: 79723						
Client ID:	Batch ID: R79723	TestNo: SW02608		Analysis Date: 10/6/2008	SeqNo: 946328						
Analyte	Result	PQL	SPK value	SPK Ref'val	%REC	LowLimit	HighLimit	RPD Ref'val	%RPD	RPQLimit	Qual
1,1,1-Trichloroethane	26.73	1.0	25	0	107	72.5	121				

Qualifiers: E Value above quantitative range H Holding time for preparation or analysis exceeded J Analyte detected below quantitative limits
 ND Not Detected at the Reporting Limit R RPD exceeds accepted recovery limits S Spike Recovery exceeds accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 0610064
Project: MSP-ERP / Monthly-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: 8268_W

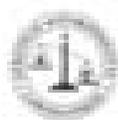
Sample ID: LCS-RT9723	Sample Type: LCS	TestCode: 8268_W	Units: µg/L	Prep Date:	RunNo: 79723						
Client ID:	Batch ID: RT9723	TestNo: SW02608		Analysis Date: 10/6/2006	SeqNo: 94628						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

1,1,2-Trichloroethane	25.74	1.0	25	0	100	78.2	100				
1,1-Dichloroethane	26.89	1.0	25	0	100	76.1	100				
1,2-Dichlorobenzene	23.70	1.0	25	0	94.8	78	115				
1,2-Dichloroethane	25.40	1.0	25	0	100	84	100				
1,2-Dichloropropane	25.06	1.0	25	0	100	82.2	115				
1,4-Dichlorobenzene	23.30	1.0	25	0	93.4	77.4	115				
Benzene	26.06	1.0	25	0	104	75.9	104				
Carbon tetrachloride	26.38	1.0	25	0	100	73	104				
Chlorobenzene	24.00	1.0	25	0	96.2	82.8	110				
cis-1,2-Dichloroethane	25.80	1.0	25	0	100	78.9	110				
Ethylbenzene	24.20	1.0	25	0	97.0	81.4	115				
Styrene	24.70	1.0	25	0	99.0	80.8	110				
Tetrachloroethene	24.70	1.0	25	0	99.9	76.6	100				
Toluene	24.77	1.0	25	0	99.1	80.8	110				
trans-1,2-Dichloroethane	25.40	1.0	25	0	100	77.7	100				
Trichloroethene	25.10	1.0	25	0	101	80.7	110				
Vinyl chloride	27.20	1.0	25	0	100	74.4	100				
Sum: 4-Bromofluorobenzene	25.52	0	25	0	100	81.8	104				
Sum: Dibromofluoroethane	25.70	0	25	0	100	80.1	110				
Sum: Toluene-d0	25.00	0	25	0	100	81.8	100				

Sample ID: LCS0-RT9723	Sample Type: LCS0	TestCode: 8268_W	Units: µg/L	Prep Date:	RunNo: 79723						
Client ID:	Batch ID: RT9723	TestNo: SW02608		Analysis Date: 10/6/2006	SeqNo: 94628						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

1,1,1-Trichloroethane	24.81	1.0	25	0	99.2	72.5	101	26.70	7.45	25	
1,1,2-Trichloroethane	23.40	1.0	25	0	93.6	76.2	100	26.74	8.50	25	
1,1-Dichloroethane	24.79	1.0	25	0	99.1	76.1	100	26.89	8.17	25	
1,2-Dichlorobenzene	22.80	1.0	25	0	90.4	78	115	23.70	4.75	25	

Qualifiers: 0 - Value above quantitative range 01 - Holding time for preparation or analysis exceeded 1 - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit 02 - RPO outside accepted recovery limits 2 - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 0618004
Project: MSP-ERP / Monthly-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID: LCSD-R79721	Sample Type: LCSD	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 79721						
Client ID:	Batch ID: R79721	Technic: SW8260B		Analysis Date: 10/6/2006	SeqNo: 048828						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
1,2-Dichloroethane	24.47	1.0	25	0	97.9	54	137	25.45	7.81	25	25
1,2-Dichloropropane	23.20	1.0	25	0	93.2	82.2	115	25.06	7.28	25	25
1,4-Dichlorobenzene	22.44	1.0	25	0	89.8	77.4	113	23.38	4.82	25	25
Benzene	24.05	1.0	25	0	95.2	75.9	124	24.04	8.82	25	25
Carbon tetrachloride	24.50	1.0	25	0	95.0	71	124	24.38	7.39	25	25
Chlorobenzene	22.89	1.0	25	0	91.8	82.5	119	24.04	4.73	25	25
cis-1,2-Dichloroethane	24.32	1.0	25	0	97.3	76.9	119	25.85	5.91	25	25
Ethylbenzene	23.71	1.0	25	0	92.4	81.4	115	24.26	4.85	25	25
Styrene	24.07	1.0	25	0	95.3	85.8	119	24.75	2.79	25	25
Tetrachloroethene	24.00	1.0	25	0	95.0	76.9	123	24.73	2.86	25	25
Toluene	23.45	1.0	25	0	93.8	85.8	118	24.77	5.47	25	25
trans-1,2-Dichloroethane	23.30	1.0	25	0	94.0	77.7	122	25.45	7.71	25	25
Trichloroethene	23.54	1.0	25	0	94.2	80.7	115	25.18	6.65	25	25
Vinyl chloride	24.58	1.0	25	0	95.2	74.4	126	27.26	10.4	25	25
Sum: 4-Bromofluorobenzene	25.30	0	25	0	100	81.8	124	25.05	0	0	0
Sum: Dibromofluorobenzene	25.23	0	25	0	101	82.1	119	25.25	0	0	0
Sum: Toluene-d8	25.08	0	25	0	100	81.8	123	25.05	0	0	0

Sample ID: 04180213-010045	Sample Type: MS	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 79721						
Client ID:	Batch ID: R79721	Technic: SW8260B		Analysis Date: 10/6/2006	SeqNo: 048828						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
1,1,1-Trichloroethane	27.11	1.0	25	0	108	73.1	130				
1,1,2-Trichloroethane	23.82	1.0	25	0	95.3	73.8	115				
1,1-Dichloroethene	27.89	1.0	25	0	112	73.2	134				
1,2-Dichlorobenzene	23.24	1.0	25	0	93.0	73.8	113				
1,2-Dichloroethane	24.28	1.0	25	0	97.4	80.7	122				
1,2-Dichloropropane	24.88	1.0	25	0	98.8	78.4	113				
1,4-Dichlorobenzene	23.64	1.0	25	0	94.8	72.7	112				

Qualifiers: 0 Value above quantitation range
 ND Not Detected at the Reporting Level
 H Holding time for preparation or analysis exceeded
 R RPO outside accepted recovery limits
 I Analyte detected below quantitation limits
 S Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06200641
Project: MSP-ERP / Monthly-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID: 06100213-010MS	Sample Type: MS	TestCode: 8260_W	Units: µg/L	Prep Date:	RunNo: 79721						
Client ID:	Batch ID: 079723	Technic: SW8260B		Analysis Date: 10/6/2006	SeqNo: 94800						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Benzene	25.14	1.0	25	0	100	59.3	128				
Carbon tetrachloride	25.20	1.0	25	0	100	73.5	124				
Chlorobenzene	25.14	1.0	25	0	100	78.4	109				
cis-1,2-Dichloroethane	25.86	1.0	25	0	100	57.9	128				
Ethylbenzene	25.12	1.0	25	0	100	77.2	118				
Styrene	24.87	1.0	25	0	99.5	50.2	122				
Tetrachloroethene	24.92	1.0	25	0	99.7	73.8	126				
Toluene	25.28	1.0	25	0	100	75.6	119				
trans-1,2-Dichloroethene	25.22	1.0	25	0	100	76.8	123				
Trichloroethene	25.22	1.0	25	0	100	65.2	120				
Vinyl chloride	27.30	1.0	25	0	110	94.8	140				
Sum: 4-Bromofluorobenzene	25.72	0	25	0	100	63.1	123				
Sum: Dibromofluoromethane	25.41	0	25	0	100	62.8	122				
Sum: Toluene-d8	24.62	0	25	0	99.5	60	122				

Sample ID: 06100213-010MS0	Sample Type: MS0	TestCode: 8090_W	Units: µg/L	Prep Date:	RunNo: 79723						
Client ID:	Batch ID: 079723	Technic: SW8260B		Analysis Date: 10/6/2006	SeqNo: 94801						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
1,1,1-Trichloroethane	26.21	1.0	25	0	100	73.1	120	27.01	3.00	25	
1,1,2-Trichloroethane	25.25	1.0	25	0	100	73.9	119	23.82	5.43	25	
1,1-Dichloroethene	26.80	1.0	25	0	107	73.2	124	27.89	3.88	25	
1,2-Dichlorobenzene	23.18	1.0	25	0	92.7	73.8	112	23.24	0.259	25	
1,2-Dichloroethane	25.42	1.0	25	0	100	60.7	122	24.25	4.20	25	
1,2-Dichloropropane	24.62	1.0	25	0	99.2	78.4	112	24.68	0.607	25	
1,4-Dichlorobenzene	22.78	1.0	25	0	91.1	72.7	112	23.64	3.71	25	
Benzene	25.42	1.0	25	0	100	69.3	128	26.14	2.79	25	
Carbon tetrachloride	26.79	1.0	25	0	107	73.5	124	26.95	0.620	25	
Chlorobenzene	23.81	1.0	25	0	95.2	78.4	109	25.14	5.42	25	

Qualifiers: E: Value above quantitative range M: Missing data for preparation or analysis recorded F: Analyte detected below quantitative limits
 ND: Not Detected at the Reporting Limit R: RPD/Recovery outside accepted recovery limits S: Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06000049
Project: MSEP-ERP / Monthly-Qrly

ANALYTICAL QC SUMMARY REPORT

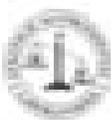
Test Code: 8260_W

Sample ID: 06100213-010W02	Sample Type: MSO	Test Code: 8260_W	Units: µg/L	Prep Date:	Run#: 78723						
Client ID:	Batch ID: R79121	Tran #: SW62502		Analysis Date: 10/6/2008	Seq#: 04001						
Analyte	Result	PQL	SPK value	SPK Ref Val	TRSD	LowLimit	HighLimit	RPO Ref Val	TRPO	RPOLimit	Qual
o-x-1,2-Dichlorobenzene	25.15	1.0	15	0	101	17.8	138	25.65	101	15	15
Ethylbenzene	23.62	1.0	15	0	85.3	77.2	119	25.13	5.25	15	15
Styrene	24.08	1.0	15	0	85.3	80.2	132	24.67	1.03	15	15
Tetrachloroethene	24.91	1.0	15	0	85.3	73.8	135	24.62	0.0401	15	15
Toluene	24.94	1.0	15	0	85.4	75.8	119	25.28	1.75	15	15
m-x-1,2-Dichlorobenzene	25.55	1.0	15	0	102	78.8	132	25.33	1.01	15	15
Trichloroethene	24.62	1.0	15	0	85.1	85.2	135	25.13	1.24	15	15
Vinyl chloride	27.35	1.0	15	0	102	94.8	135	27.38	0.145	15	15
Sum: 4-Bromofluorobenzene	25.75	0	15	0	102	83.3	132	25.72	0	n	n
Sum: Dibromofluorobenzene	26.41	0	15	0	85	12.8	132	26.31	0	n	n
Sum: Toluene-01	25.21	0	15	0	102	85	132	24.62	0	n	n

Qualifiers: Q - Value above quantitation range
ND - Not Detected at the Reporting Limit

H - Holding time for preparation or analysis exceeded
R - RPO outside accepted/recovery limits

J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06100041
Project: MSIP-ERP / Monthly-Qtrly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: MB-R79687	SampType: MBLA	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 79687						
Client ID:	Batch ID: R79687	TestNo: E351.4		Analysis Date: 10/5/2008	SeqNo: 84628						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl <1.0 1.0

Sample ID: LCS-R79687	SampType: LCS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 79687						
Client ID:	Batch ID: R79687	TestNo: E351.4		Analysis Date: 10/5/2008	SeqNo: 84642						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl 26.95 1.0 25 0 108 85 110

Sample ID: LCSD-R79687	SampType: LCSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 79687						
Client ID:	Batch ID: R79687	TestNo: E351.4		Analysis Date: 10/5/2008	SeqNo: 84642						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl 22.88 1.0 25 0 91.5 85 110 26.95 16.4 20

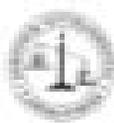
Sample ID: 9810041-810MS	SampType: MS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 79687						
Client ID: HP-1	Batch ID: R79687	TestNo: E351.4		Analysis Date: 10/5/2008	SeqNo: 84628						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl 24.20 1.0 25 0 96.8 70 130

Sample ID: 98100139-820MS	SampType: MS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 79687						
Client ID:	Batch ID: R79687	TestNo: E351.4		Analysis Date: 10/5/2008	SeqNo: 84640						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl 59.08 1.0 25 35.88 93.5 70 130

Qualifiers: 1. Value above quantitative range 2. Holding time for preparation or analysis exceeded 3. Analyte detected below quantitative limit
 ND Not Detected at the Reporting Limit 4. RPO/initial accepted recovery limits 5. Spike Recovery result-accepted recovery limits



Aerotech Environmental Laboratories

a division of Ametek Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06100041
Project: MSP-ERP / Monthly-Only

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: 06100041-01CM50	Sample Type: MSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 79687						
Client ID: NP-1	Batch ID: 879687	TestNo: E281.4		Analysis Date: 10/5/2008	SeqNo: 34038						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	25.10	1.3	25	0	101	70	130	24.20	3.95	20	

Sample ID: 06100028-02CM50	Sample Type: MSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 79687						
Client ID:	Batch ID: 879687	TestNo: E281.4		Analysis Date: 10/5/2008	SeqNo: 34011						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	55.05	1.3	25	25.68	93.5	70	130	59.05	0	20	

Qualifiers: E Value above quantitative range H Holding times for preparation or analysis exceeded J Analyte detected below quantitative limits
 ND Not Detected at the Reporting Limit K RPO outside accepted recovery limits S Spike Recovery outside accepted recovery limits

Aerotek Environmental Laboratories Sample Receipt Checklist

Project checked by _____

Laboratory Number: <u>06-10-0041</u>		Checklist completed by: <u>[Signature]</u> <u>10/1/06</u>	
Client Name: <u>Pima County</u>		Signature/Date	
Matrix: <u>DW</u>	Carrier Name: <u>529</u>	Date/Time Rec'd: <u>10/3/06 1124</u>	By: <u>RF</u>

Temperature of Samples? 1.1 °C Circle one: Blue Ice White Ice Not Present

	Yes	No	Not Present	Soil Containers:
Shipping container/cooler in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Brass Sleeve _____
Custody seals intact on shipping container/cooler?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Glass Jar _____
Custody seals intact on sample containers?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Methanol _____
Chain of Custody present and relinquished/received properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plastic Bag _____
Chain of Custody agrees with sample labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Excess Samples _____
Samples in proper containers/bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sample containers intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
All samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	**See Comment about Chlorine and pH
Is there sufficient sample volume to perform the tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
40ml. vials for volatiles & SOCs received with zero headspace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Total number of bottles received: 6 IH sample media: _____
 If applicable, how many sample bottles were shipped from AEL-Tucson? N/A

Number of containers received by preservative and by sample number (if more than 15 samples are rec'd, please continue on separate sheet(s))

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General															
B-HNO3	<u>1</u>														
C-H2SO4	<u>2</u>														
D-HCl	<u>3</u>														
E-H2O2O3	<u>2</u>	<u>2</u>	<u>1</u>												
F-NaOH															
G-Sulfide															
H-No Sulfide															
I-MCAA															
J-Methanol															
K-HAA															
L-Other															

Water-pH acceptable upon receipt? Yes No N/A

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and reagent (E) number
Metals <3	<u>7.2</u>	
Nutrients <3	<u>7.2</u>	
Total Phosph <3		
413 (DMG) <3		
418 (TPH) <3		
Cyanide >12		
Sulfide >9		

*Any No response must be detailed in the comments section below. Contact the PM immediately to determine how to proceed. Refer to SOP 11-001.04, Section 1.8.6. Continue on back if additional space is needed.

**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments: _____



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Thursday, November 09, 2006

David Scalero
Pima County Flood Control
201 N. Stone, 4th Floor
Tucson, AZ 85701

TEL: (320) 740-6350

FAX

RE: MHP-ERP Monthly

Order No.: 06100924

Dear David Scalero:

Aerotech Environmental, Inc. received 2 sample(s) on 10/24/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Lawrie Hoelan
Project Manager



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 09-Nov-06

CLIENT: Pima County Flood Control
Project: MDEP-ERP Monthly
Lab Order: 06100924

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

- Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.
- Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition.
- 40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.
- NIOSH Manual of Analytical Methods, Fourth Edition, 1994.
- Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 09-Nov-06

CLIENT: Pima County Flood Control
Project: MDP-GRP Monthly
Lab Order: 06100924

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06100924-01C	Source Water		10/24/2006 10:00:00 AM	10/24/2006
06100924-02C	HP-1		10/24/2006 12:30:00 PM	10/24/2006



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental, I

Analytical Report

Date: 09-Nov-06

CLIENT: Pima County Flood Control
Project: MDP-ERP Monthly

Lab Order: 06100024

Lab ID: 06100024-01C
Client Sample ID: Source Water

Collection Date: 10/24/2006 10:00:00 AM
Matrix: WASTE WATER

Tag Number:

Analytes	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY Nitrogen, Nitrate/Nitrite Total	0.7	E300 0.40		mg/L	1	11/02/06 12:00:00 AM Analyst: AT
NITROGEN, TOTAL KJELDAHL AS N Nitrogen, Total Kjeldahl	23	E351.4 1.3		mg/L	1	10/31/2006 Analyst: JLS
NITROGEN, TOTAL Nitrogen, Total	27	CALC 1.7		mg/L	1	11/02/06 Analyst: LMc

Lab ID: 06100024-02C
Client Sample ID: NP-1

Collection Date: 10/24/2006 12:30:00 PM
Matrix: DRINKING WATER

Tag Number:

Analytes	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY Nitrogen, Nitrate/Nitrite Total	2.8	E300 0.40		mg/L	1	11/02/06 12:37:00 AM Analyst: AT
NITROGEN, TOTAL KJELDAHL AS N Nitrogen, Total Kjeldahl	3.0	E351.4 1.3		mg/L	1	10/31/2006 Analyst: JLS
NITROGEN, TOTAL Nitrogen, Total	3.8	CALC 1.7		mg/L	1	11/02/06 Analyst: LMc

Remarks: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Kowden Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.

Page 1 of 1



Aerotech Environmental Laboratories

a division of Jamieson Laboratories, Inc.

Aerotech Environmental, Inc.

09-Nov-08

Lab Order: 0400024
Client: Pinal County Flood Control
Project: MSEP-ESP Monthly

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prog Date	Analysis Date
0400024-00C	Sewer Water	11/04/08 10:00:00 AM	Waste Water	ARNDT by ION CHROMATOGRAPHY			11/02/08 11:09:00 AM
				TOTAL KJELDAHL NITROGEN			10/02/08
				Total Nitrogen (Calculated)			11/02/08
0400024-00C	SP-1	11/04/08 12:30:00 PM	Drinking Water	ARNDT by ION CHROMATOGRAPHY			11/02/08 12:21:00 AM
				TOTAL KJELDAHL NITROGEN			10/02/08
				Total Nitrogen (Calculated)			11/02/08



Aerotech Environmental Laboratories

a division of Amcott Laboratories, Inc.

Aerotech Environmental, Inc.

Date: 09-Nov-08

CLIENT: Fowl County Flood Control
Work Order: 06100024
Project: MSP-EXP Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W

Sample ID: MB-880744	Sample Type: MBLA	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 880744						
Client ID:	Batch ID: 880744	Technic: E300		Analysis Date: 11/02/08	SeqNo: 880260						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate-Nitrite Total	0.40	0.40									

Sample ID: LCS-880744	Sample Type: LCS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 880744						
Client ID:	Batch ID: 880744	Technic: E300		Analysis Date: 11/02/08	SeqNo: 880274						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate-Nitrite Total	7.004	0.40	0	0	87.3	0	10				

Sample ID: LCSD-880744	Sample Type: LCSD	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 880744						
Client ID:	Batch ID: 880744	Technic: E300		Analysis Date: 11/02/08	SeqNo: 880275						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate-Nitrite Total	7.740	0.40	0	0	92.8	0	10	7.004	0.788	20	

Sample ID: 06100024-01A002	Sample Type: MB	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 880744						
Client ID:	Batch ID: 880744	Technic: E300		Analysis Date: 11/02/08	SeqNo: 880284						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate-Nitrite Total	0.000	0.40	0	0	14	0	10				

Sample ID: 06100024-01A003	Sample Type: MB	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 880744						
Client ID:	Batch ID: 880744	Technic: E300		Analysis Date: 11/02/08	SeqNo: 880285						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate-Nitrite Total	0.014	0.40	0	0	10	0	10	0.000	2.94	20	

Qualifiers: E Yellow shows quantitative range B Missing data for preparation or analysis recorded J Analyte detected below quantitative limits
 ND Not Detected at the Reporting Limit C RPD outside accepted recovery limits K Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: **Polk County Flood Control**
Work Order: **6000924**
Project: **MSP-ESF Monthly**

ANALYTICAL QC SUMMARY REPORT

Test Code: **N_TKN_WW**

Sample ID: NS-R00002	Sample Type: NBLK	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 00002						
Client ID:	Batch ID: R00002	Test No: E201.4		Analysis Date: 10/21/2006	Seq No: 00001						
Analyte	Result	PQL	SPK value	SPK Ref Val	MPD	Low Limit	Hgh Limit	RPD Ref Val	MRPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	41.3	1.3									

Sample ID: LCS-R00002	Sample Type: LCS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 00002						
Client ID:	Batch ID: R00002	Test No: E201.4		Analysis Date: 10/21/2006	Seq No: 00006						
Analyte	Result	PQL	SPK value	SPK Ref Val	MPD	Low Limit	Hgh Limit	RPD Ref Val	MRPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	27.66	1.3	25	0	110	65	110				

Sample ID: LCS0-R00002	Sample Type: LCS0	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 00002						
Client ID:	Batch ID: R00002	Test No: E201.4		Analysis Date: 10/21/2006	Seq No: 00008						
Analyte	Result	PQL	SPK value	SPK Ref Val	MPD	Low Limit	Hgh Limit	RPD Ref Val	MRPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	24.48	1.3	25	0	87.9	65	110	27.66	10.3	20	

Sample ID: 06100009-01CWS	Sample Type: MS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 00002						
Client ID:	Batch ID: R00002	Test No: E201.4		Analysis Date: 10/21/2006	Seq No: 00009						
Analyte	Result	PQL	SPK value	SPK Ref Val	MPD	Low Limit	Hgh Limit	RPD Ref Val	MRPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	77.60	1.3	25	47.10	100	70	100				

Sample ID: 06100004-02CWS	Sample Type: MS	Test Code: N_TKN_WW	Units: mg/L	Prep Date:	Run No: 00002						
Client ID:	Batch ID: R00002	Test No: E201.4		Analysis Date: 10/21/2006	Seq No: 00010						
Analyte	Result	PQL	SPK value	SPK Ref Val	MPD	Low Limit	Hgh Limit	RPD Ref Val	MRPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	23.08	1.3	25	1.25	69.0	70	100				

Qualifiers: **1** - Value above quantitation range **2** - Missing data for preparation or analysis recorded **3** - Analyte detected below quantitation limits
NO - Not Detected at the Reporting Limit **4** - RPD outside accepted recovery limits **5** - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

CLIENT: Pinx County Flood Control

Work Order: 06100024

Project: MSD-ESP Monthly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: 06100024-01CR02	Sample Type: MSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 80852						
Client ID:	Batch ID: R00002	TestNo: E0014		Analysis Date: 10/21/2008	SeqNo: 00401						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	71.28	1.3	25	47.70	105	70	130	77.80	5.75	20	

Sample ID: 06100024-02CR02	Sample Type: MSD	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 80852						
Client ID:	Batch ID: R00002	TestNo: E0014		Analysis Date: 10/21/2008	SeqNo: 00402						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Nitrogen, Total Kjeldahl	24.78	1.3	25	1.725	69.8	70	130	23.80	0.821	20	

Qualifiers:	1. Value above quantitative range	4. Holding times for preparation or analysis exceeded	7. Analyte detected below quantitative limits
	NO Not Detected at the Reporting Level	8. 870 results accepted recovery limits	8. Spike Recovery results accepted recovery limits

Page 2 of 3



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

PC RFCO

FEB 01 2007

Wednesday, January 31, 2007

David Scalero
Pima County Flood Control
97 E. Congress St., 3rd Floor
Tucson, AZ 85701

TEL: (520) 740-6350

FAX

RE: MHP-ERP / Monthly-Quarterly

Order No.: 06120322

Dear David Scalero:

Aerotech Environmental Laboratories received 3 sample(s) on 12/11/2006 for the analyses presented in the following report.

This report includes the following information:

- Case Narrative.
- Analytical Report: includes test results, report limit (Limit), any applicable data qualifier (Qual), units, dilution factor (DF), and date analyzed.
- QC Summary Report.

This communication is intended only for the individual or entity to whom it is directed. It may contain information that is privileged, confidential, or otherwise exempt from disclosure under applicable law. Dissemination, distribution, or copying of this communication by anyone other than the intended recipient, or a duly designated employee or agent of such recipient, is prohibited. If you have received this communication in error, please notify us immediately and destroy this message and all attachments thereto. If you have any questions regarding these test results, please do not hesitate to call.

Sincerely,

Lawrie Heelan
Project Manager



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental Laboratories

Date: 31-Jan-07

CLIENT: Pima County Flood Control
Project: MHP-ERP / Monthly-Quarterly
Lab Order: 06120322

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
06120322-01B	Source Water		12/11/2006 9:15:00 AM	12/11/2006
06120322-01C	Source Water		12/11/2006 9:15:00 AM	12/11/2006
06120322-01D	Source Water		12/11/2006 9:15:00 AM	12/11/2006
06120322-02B	HP-1		12/11/2006 11:55:00 AM	12/11/2006
06120322-02C	HP-1		12/11/2006 11:55:00 AM	12/11/2006
06120322-02D	HP-1		12/11/2006 11:55:00 AM	12/11/2006
06120322-03D	Trip Blank		12/11/2006	12/11/2006



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental Laboratories

Date: 11-Jan-07

CLIENT: Pima County Flood Control
Project: MBP-ERP / Monthly-Quarterly
Lab Order: 06120323

CASE NARRATIVE

Samples were analyzed using methods outlined in references such as:

- Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983.
- Methods for the Determination of Organic Compounds in Drinking Water: Supplement III, EPA/600/R-95/131, August 1995.
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition, 40 CFR, Part 136, Revised 1998. Appendix A to Part 136 - Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.
- NIOSH Manual of Analytical Methods, Fourth Edition, 1994.
- Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, 1999.

Aerotech Environmental Laboratories (AEL) holds Arizona certification no. AZ0610.

Aerotech Environmental Laboratories (Laboratory ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation.

Analytical Comments:

All method blanks and laboratory control spikes met EPA method and/or laboratory quality control objectives for the analyses included in this report.

Data Qualifiers:

Listed below are the data qualifiers used in your analytical report to explain any analytical or quality control issues. You will find them noted in your report under the column header "QUAL". Any quality control deficiencies that cannot be adequately described by these qualifiers will be addressed in the analytical comments section of this case narrative.

D1 Sample required dilution due to matrix.

M6 Matrix spike recovery was high. Data reported per ADEQ policy 0154.00.



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental L.

Analytical Report

Date: 11-Jan-07

CLIENT: Pima County Flood Control
Project: MHP-ERP / Monthly-Quarterly

Lab Order: 06120322

Lab ID: 06120322-01B

Collection Date: 12/11/2006 9:15:00 AM

Client Sample ID: Source Water

Matrix: WASTE WATER

Tag Number:

Analytes	Result	Limit	Qual	Units	DF	Date Analyzed
ICPMS METALS, TOTAL RECOVERABLE		E200.8				Analyst: TD
Arsimony	< 0.0030	0.0030		mg/L	1	12/13/2006 10:37:12 AM
Arsenic	0.0042	0.0010		mg/L	1	12/13/2006 10:37:12 AM
Barium	0.060	0.0010		mg/L	1	12/13/2006 10:37:12 AM
Beryllium	< 0.0010	0.0010		mg/L	1	12/13/2006 10:37:12 AM
Cadmium	< 0.0010	0.0010		mg/L	1	12/13/2006 10:37:12 AM
Chromium	0.0013	0.0010		mg/L	1	12/13/2006 10:37:12 AM
Lead	0.0019	0.0010		mg/L	1	12/13/2006 10:37:12 AM
Nickel	0.0048	0.0010		mg/L	1	12/13/2006 10:37:12 AM
Selenium	< 0.0020	0.0020		mg/L	1	12/13/2006 10:37:12 AM
Thallium	< 0.0010	0.0010		mg/L	1	12/13/2006 10:37:12 AM
MERCURY, TOTAL		E245.1				Analyst: PC
Mercury	< 0.00020	0.00020		mg/L	1	12/13/2006

Lab ID: 06120322-01C

Collection Date: 12/11/2006 9:15:00 AM

Client Sample ID: Source Water

Matrix: WASTE WATER

Tag Number:

Analytes	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY		E300				Analyst: AT
Nitrogen, Nitrate/Nitrite Total	2.8	0.80	01	mg/L	2	12/27/2006 1:15:00 PM
NITROGEN, TOTAL KJELDAHL AS N		E351.4				Analyst: JLS
Nitrogen, Total Kjeldahl	19	1.2		mg/L	1	12/14/2006
NITROGEN, TOTAL		CALC				Analyst: RF
Nitrogen, Total	23	1.7		mg/L	1	12/29/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Kinsden Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.

Page 1 of 3



Aerotech Environmental Laboratories

a Division of Aerotech Laboratories, Inc.

Aerotech Environmental L.

Analytical Report

Date: 11-Jan-07

CLIENT: Pima County Flood Control
Project: MHP-ERP / Monthly-Quarterly

Lab Order: 06120322

Lab ID: 06120322-01D

Collection Date: 12/11/2006 9:15:09 AM

Client Sample ID: Source Water

Matrix: WASTE WATER

Tag Number:

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B		Analyst: k m		
1,1,1-Trichloroethane	< 1.0	1.0		µg/L	1	12/13/2006
1,1,2-Trichloroethane	< 1.0	1.0		µg/L	1	12/13/2006
1,1-Dichloroethane	< 1.0	1.0		µg/L	1	12/13/2006
1,2-Dichlorobenzene	< 1.0	1.0		µg/L	1	12/13/2006
1,2-Dichloroethane	< 1.0	1.0		µg/L	1	12/13/2006
1,2-Dichloropropane	< 1.0	1.0		µg/L	1	12/13/2006
1,4-Dichlorobenzene	< 1.0	1.0		µg/L	1	12/13/2006
Benzene	< 1.0	1.0		µg/L	1	12/13/2006
Carbon tetrachloride	< 1.0	1.0		µg/L	1	12/13/2006
Chlorobenzene	< 1.0	1.0		µg/L	1	12/13/2006
cis-1,2-Dichloroethane	< 1.0	1.0		µg/L	1	12/13/2006
Ethylbenzene	< 1.0	1.0		µg/L	1	12/13/2006
Styrene	< 1.0	1.0		µg/L	1	12/13/2006
Tetrachloroethene	< 1.0	1.0		µg/L	1	12/13/2006
Toluene	< 1.0	1.0		µg/L	1	12/13/2006
trans-1,2-Dichloroethane	< 1.0	1.0		µg/L	1	12/13/2006
Trichloroethene	< 1.0	1.0		µg/L	1	12/13/2006
Totalmethanes, Total	< 1.0	1.0		µg/L	1	12/13/2006
Vinyl chloride	< 1.0	1.0		µg/L	1	12/13/2006
Xylenes, Total	< 2.0	2.0		µg/L	1	12/13/2006
Sum: 4-Bromofluorobenzene	97.8	63.3-123		%REC	1	12/13/2006
Sum: Dibromofluoromethane	117	62.8-120		%REC	1	12/13/2006
Sum: Toluene-d8	101	60-123		%REC	1	12/13/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Knudsen Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

a division of Aerotech Laboratories, Inc.

Aerotech Environmental L

Analytical Report

Date: 11-Jan-07

CLIENT: Pima County Flood Control
Project: MHP-ERP / Monthly-Quarterly

Lab Order: 06120322

Lab ID: 06120322-02H

Collection Date: 12/11/2006 11:55:00 AM

Client Sample ID: HP-1

Matrix: DRINKING WATER

Tag Number:

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP/MS METALS, TOTAL RECOVERABLE		E200.8				Analyst: TD
Antimony	< 0.0030	0.0030		mg/L	1	12/13/2006 10:25:07 AM
Arsenic	0.0014	0.0010		mg/L	1	12/13/2006 10:25:07 AM
Barium	0.15	0.0010		mg/L	1	12/13/2006 10:25:07 AM
Beryllium	< 0.0010	0.0010		mg/L	1	12/13/2006 10:25:07 AM
Cadmium	< 0.0010	0.0010		mg/L	1	12/13/2006 10:25:07 AM
Chromium	< 0.0010	0.0010		mg/L	1	12/13/2006 10:25:07 AM
Lead	< 0.0010	0.0010		mg/L	1	12/13/2006 10:25:07 AM
Nickel	0.0092	0.0010		mg/L	1	12/13/2006 10:25:07 AM
Selenium	< 0.0020	0.0020		mg/L	1	12/13/2006 10:25:07 AM
Thallium	< 0.0010	0.0010		mg/L	1	12/13/2006 10:25:07 AM
MERCURY, TOTAL		E245.1				Analyst: PC
Mercury	< 0.00020	0.00020		mg/L	1	12/13/2006

Lab ID: 06120322-02C

Collection Date: 12/11/2006 11:55:00 AM

Client Sample ID: HP-1

Matrix: DRINKING WATER

Tag Number:

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY		E300				Analyst: AT
Nitrogen, Nitrate/Nitrite Total	2.3	0.40		mg/L	1	12/22/2006 4:28:00 PM
NITROGEN, TOTAL KJELDAHL, AS N		E351.4				Analyst: JLS
Nitrogen, Total Kjeldahl	< 1.3	1.3		mg/L	1	12/14/2006
NITROGEN, TOTAL		CALC				Analyst: RF
Nitrogen, Total	2.3	1.7		mg/L	1	12/28/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Kinsler Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.

Page 3 of 5



Aerotech Environmental Laboratories

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Aerotech Environmental L

Analytical Report

Date: 1/1-Jan-07

CLIENT: Pima County Flood Control
Project: MDP-ERP / Monthly-Quarterly

Lab Order: 06120322

Lab ID: 06120322-02D

Collection Date: 12/11/2006 11:55:00 AM

Client Sample ID: HP-1

Matrix: DRINKING WATER

Tag Number:

Analytes	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW6260B		Analyst: k.m		
1,1,1-Trichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
1,1,2-Trichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
1,1-Dichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
1,2-Dichlorobenzene	< 1.0	1.0		ug/L	1	12/13/2006
1,2-Dichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
1,2-Dichloropropane	< 1.0	1.0		ug/L	1	12/13/2006
1,4-Dichlorobenzene	< 1.0	1.0		ug/L	1	12/13/2006
Benzene	< 1.0	1.0		ug/L	1	12/13/2006
Carbon tetrachloride	< 1.0	1.0		ug/L	1	12/13/2006
Chlorobenzene	< 1.0	1.0		ug/L	1	12/13/2006
cis-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
Ethylbenzene	< 1.0	1.0		ug/L	1	12/13/2006
Styrene	< 1.0	1.0		ug/L	1	12/13/2006
Tetrachloroethane	< 1.0	1.0		ug/L	1	12/13/2006
Toluene	< 1.0	1.0		ug/L	1	12/13/2006
trans-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
Trichloroethene	< 1.0	1.0		ug/L	1	12/13/2006
Trihalomethanes, Total	< 1.0	1.0		ug/L	1	12/13/2006
Vinyl chloride	< 1.0	1.0		ug/L	1	12/13/2006
Xylenes, Total	< 2.0	2.0		ug/L	1	12/13/2006
Sum: 4-Bromofluorobenzene	99.1	63.3-123		%REC	1	12/13/2006
Sum: Dibromofluoromethane	116	62.8-120		%REC	1	12/13/2006
Sum: Toluene-d8	101	60-122		%REC	1	12/13/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Kinsden Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

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Aerotech Environmental L.

Analytical Report

Date: 31-Jan-07

CLIENT: Pima County Flood Control
Project: MHP-ERP / Monthly-Quarterly

Lab Order: 06120322

Lab ID: 06120322-01D

Collection Date: 12/11/2006

Client Sample ID: Trip Blank

Matrix: TRIP BLANK

Tag Number:

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
		SW8260B		Analyst: k m		
VOLATILES BY GC/MS						
1,1,1-Trichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
1,1,2-Trichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
1,1-Dichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
1,2-Dichlorobenzene	< 1.0	1.0		ug/L	1	12/13/2006
1,2-Dichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
1,3-Dichlorobenzene	< 1.0	1.0		ug/L	1	12/13/2006
1,4-Dichlorobenzene	< 1.0	1.0		ug/L	1	12/13/2006
Benzene	< 1.0	1.0		ug/L	1	12/13/2006
Carbon tetrachloride	< 1.0	1.0		ug/L	1	12/13/2006
Chlorobenzene	< 1.0	1.0		ug/L	1	12/13/2006
cis-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
Ethylbenzene	< 1.0	1.0		ug/L	1	12/13/2006
Styrene	< 1.0	1.0		ug/L	1	12/13/2006
Tetrachloroethane	< 1.0	1.0		ug/L	1	12/13/2006
Toluene	< 1.0	1.0		ug/L	1	12/13/2006
trans-1,2-Dichloroethane	< 1.0	1.0		ug/L	1	12/13/2006
Trichloroethene	< 1.0	1.0		ug/L	1	12/13/2006
Tribromomethanes, Total	< 1.0	1.0		ug/L	1	12/13/2006
Vinyl chloride	< 1.0	1.0		ug/L	1	12/13/2006
Xylenes, Total	< 2.0	2.0		ug/L	1	12/13/2006
Sum: 4-Bromofluorobenzene	98.7	63.3-123		%REC	1	12/13/2006
Sum: Dibromofluoromethane	111	62.8-120		%REC	1	12/13/2006
Sum: Toluene-d8	98.2	60-122		%REC	1	12/13/2006

Footnotes: All analysis performed at AEL Phoenix laboratory unless indicated by footnotes.

(1) AEL - Tucson Laboratory

(2) AEL - Kinsler Laboratory

(3) The holding time for pH analysis is immediate. For the most accurate result, the pH should be taken in the field within 15 minutes of sampling.



Aerotech Environmental Laboratories

31-Jan-07

Lab Order: 06120322
 Client: Pima County Flood Control
 Project: MHP-ERP / Monthly-Quarterly

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	DCSP Date	Prog Date	Analysis Date
06120322-01B	Source Water	12/11/2006 9:13:00 AM	Water/Water	ICP-MS METALS, TOTAL RECOVERABLE	12/12/2006 3:06:57 PM	12/13/2006 08:37:12 AM	
				MERCURY IN WATER	12/21/2006 10:00:00 AM	12/21/2006	
06120322-01C				ANIONS by ION CHROMATOGRAPHY		12/27/2006 1:10:00 PM	
				TOTAL KJELDAHL NITROGEN		12/14/2006	
				Total Nitrogen (Calculated)		12/26/2006	
06120322-01D				VOLATILES by GC/MS		12/13/2006	
06120322-02B	SP-1	12/11/2006 11:55:00 AM	Drinking Water	ICP-MS METALS, TOTAL RECOVERABLE	12/12/2006 3:06:57 PM	12/13/2006 08:21:07 AM	
				MERCURY IN WATER	12/21/2006 10:00:00 AM	12/21/2006	
06120322-02C				ANIONS by ION CHROMATOGRAPHY		12/27/2006 4:20:00 PM	
				TOTAL KJELDAHL NITROGEN		12/14/2006	
				Total Nitrogen (Calculated)		12/26/2006	
06120322-02D				VOLATILES by GC/MS		12/13/2006	
06120322-03B	Top Blank	12/11/2006	Top Blank	VOLATILES by GC/MS		12/13/2006	



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Aerotech Environmental Laboratories

Date: 11-Jan-07

CLIENT: Pima County Flood Control
Work Order: 06120122
Project: MSP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8

Sample ID: MB-27980	Sample Type: MBLK	TestCode: 200.8	Units: mg/L	Prep Date: 12/12/2006	RunNo: 82987						
Client ID:	Batch ID: 27980	TestNo: E200.8		Analysis Date: 12/12/2006	SeqNo: 875210						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Antimony	<0.000	0.000									
Arsenic	<0.010	0.010									
Barium	<0.010	0.010									
Beryllium	<0.010	0.010									
Cadmium	<0.010	0.010									
Chromium	<0.010	0.010									
Lead	<0.010	0.010									
Nickel	<0.010	0.010									
Selenium	<0.000	0.000									
Thallium	<0.010	0.010									

Sample ID: LCS-27980	Sample Type: LCS	TestCode: 200.8	Units: mg/L	Prep Date: 12/12/2006	RunNo: 82987						
Client ID:	Batch ID: 27980	TestNo: E200.8		Analysis Date: 12/12/2006	SeqNo: 875211						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Antimony	0.1020	0.000	0.1	0	102	85	115				
Arsenic	0.0860	0.010	0.1	0	86.8	85	115				
Barium	0.1074	0.010	0.1	0	107	85	115				
Beryllium	0.1065	0.010	0.1	0	106	85	115				
Cadmium	0.1047	0.010	0.1	0	105	85	115				
Chromium	0.0908	0.010	0.1	0	90.8	85	115				
Lead	0.0978	0.010	0.1	0	98.0	85	115				
Nickel	0.0921	0.010	0.1	0	92.2	85	115				
Selenium	0.1001	0.020	0.1	0	100	85	115				
Thallium	0.0240	0.010	0.1	0	24	85	115				

Qualifiers: 0 - Value above quantitation range 10 - Holding time for preparation or analysis exceeded 1 - Analyte detected below quantitation limits
 ND - Not Detected at the Reporting Limit 8 - RPO outside accepted recovery limits 9 - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: **Pinellas County Flood Control**
Work Order: **06130322**
Project: **MHP-ESP / Monthly-Quarterly**

ANALYTICAL QC SUMMARY REPORT

TestCode: **200.8**

Sample ID:	LC50-27988	Sample Type:	LC50	TestCode:	200.8	Units:	mg/L	Prep Date:	12/12/2004	RunNo:	82897
Client ID:		Batch ID:	27988	TestNo:	E200.8			Analysis Date:	12/13/2004	SeqNo:	975212
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	LRPO	RPOLimit	Qual
Antimony	0.1038	0.0010	0.1	0	104	85	115	0.1020	1.00	30	30
Arsenic	0.28038	0.0010	0.1	0	98.4	85	115	0.28850	0.288	30	30
Barium	0.1071	0.0010	0.1	0	108	85	115	0.1074	0.280	30	30
Beryllium	0.1071	0.0010	0.1	0	108	85	115	0.1088	0.704	30	30
Cadmium	0.1059	0.0010	0.1	0	108	85	115	0.1047	1.00	30	30
Chromium	0.09754	0.0010	0.1	0	97.9	85	115	0.09689	0.773	30	30
Lead	0.09754	0.0010	0.1	0	97.5	85	115	0.09708	0.448	30	30
Nickel	0.09891	0.0010	0.1	0	99.9	85	115	0.09921	0.300	30	30
Selenium	0.09923	0.0010	0.1	0	99.2	85	115	0.1001	0.897	30	30
Thallium	0.09918	0.0010	0.1	0	99.2	85	115	0.09240	3.08	30	30

Sample ID:	06130322-028 MS	Sample Type:	MS	TestCode:	200.8	Units:	mg/L	Prep Date:	12/12/2004	RunNo:	82897
Client ID:	HP-1	Batch ID:	27988	TestNo:	E200.8			Analysis Date:	12/13/2004	SeqNo:	975194
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	LRPO	RPOLimit	Qual
Antimony	0.1064	0.0010	0.1	0	108	70	120				
Arsenic	0.1040	0.0010	0.1	0.001433	103	70	120				
Barium	0.2528	0.0010	0.1	0.1492	104	70	120				
Beryllium	0.1138	0.0010	0.1	0	120	70	120				
Cadmium	0.1038	0.0010	0.1	0	104	70	120				
Chromium	0.0940	0.0010	0.1	0	98.4	70	120				
Lead	0.09514	0.0010	0.1	0	95.1	70	120				
Nickel	0.1002	0.0010	0.1	0.009190	93.0	70	120				
Selenium	0.1009	0.0010	0.1	0	101	70	120				
Thallium	0.08701	0.0010	0.1	0	87.0	70	120				

Qualifiers: E - Value above quantitative range W - Wasting time for preparation or analysis recorded J - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit S - RPO outside accepted recovery limits F - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

Division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06120322
Project: MHP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8

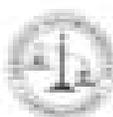
Sample ID: 06120340-028 MS	SampType: MS	TestCode: 200.8	Units: mg/L	Prep Date: 12/13/2008	RunNo: 82997						
Client ID:	Batch ID: 27990	TestNo: E200.8		Analysis Date: 12/13/2008	SeqNo: 871208						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	LRPO	RPOLimit	Qual

Antimony	0.1079	0.0000	0.1	0	108	70	130				
Arsenic	0.1120	0.0010	0.1	0.01120	101	70	130				
Barium	0.2603	0.0010	0.1	0.1088	105	70	130				
Beryllium	0.1130	0.0010	0.1	0	110	70	130				
Cadmium	0.1081	0.0010	0.1	0	108	70	130				
Chromium	0.06488	0.0010	0.1	0	65.0	70	130				
Lead	0.06094	0.0010	0.1	0	60.9	70	130				
Nickel	0.06542	0.0010	0.1	0	65.4	70	130				
Selenium	0.1007	0.0000	0.1	0	101	70	130				
Thallium	0.06006	0.0010	0.1	0	60.1	70	130				

Sample ID: 06120320-028 MS0	SampType: MS0	TestCode: 200.8	Units: mg/L	Prep Date: 12/13/2008	RunNo: 82997						
Client ID: WP-1	Batch ID: 27990	TestNo: E200.8		Analysis Date: 12/13/2008	SeqNo: 871195						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	LRPO	RPOLimit	Qual

Antimony	0.1071	0.0000	0.1	0	107	70	130	0.1064	0.650	10
Arsenic	0.1045	0.0010	0.1	0.001420	100	70	130	0.1042	0.280	10
Barium	0.2605	0.0010	0.1	0.1482	111	70	130	0.2628	3.00	10
Beryllium	0.1229	0.0010	0.1	0	123	70	130	0.1186	2.79	10
Cadmium	0.1041	0.0010	0.1	0	104	70	130	0.1036	0.494	10
Chromium	0.1019	0.0010	0.1	0	102	70	130	0.09642	0.62	10
Lead	0.06016	0.0010	0.1	0	60.2	70	130	0.05914	0.0000	10
Nickel	0.1021	0.0010	0.1	0.000090	62.9	70	130	0.1022	0.105	10
Selenium	0.1009	0.0000	0.1	0	104	70	130	0.1009	2.62	10
Thallium	0.06078	0.0010	0.1	0	60.8	70	130	0.06701	0.270	10

Qualifiers: E - Value above quantitative range H - Holding times for preparation or analysis exceeded J - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit K - RPO outside accepted recovery limits L - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06130322
Project: MHP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: 200.8

Sample ID: 04120340-020 MS0	Sample Type: MS0	Test Code: 200.8	Units: mg/L	Print Date: 12/12/2008	Run No: 82097						
Client ID:	Batch ID: 27880	Test No: E200.8		Analysis Date: 12/15/2008	Seq No: 871281						
Analyte	Result	PQL	SPK value	SPK Ref Val	MREC	LowLimit	HghLimit	RPO Ref Val	%RPO	RPOLimit	Qual
Antimony	0.1073	0.0030	0.1	0	107	70	130	0.1079	0.588	15	
Arsenic	0.1128	0.0010	0.1	0.01128	101	70	130	0.1120	0.691	15	
Beryllium	0.2853	0.0010	0.1	0.1559	105	70	130	0.2853	0.0108	15	
Bismuth	0.1140	0.0010	0.1	0	114	70	130	0.1135	0.414	15	
Cadmium	0.1057	0.0010	0.1	0	105	70	130	0.1061	0.397	15	
Chromium	0.09088	0.0010	0.1	0	90.9	70	130	0.09408	0.917	15	
Lead	0.09773	0.0010	0.1	0	97.7	70	130	0.09804	0.908	15	
Nickel	0.09524	0.0010	0.1	0	95.2	70	130	0.09542	0.189	15	
Selenium	0.1010	0.0020	0.1	0	101	70	130	0.1007	0.290	15	
Thallium	0.09969	0.0010	0.1	0	99.7	70	130	0.09928	0.482	15	

Qualifiers: E - Value above quantitative range W - Winding lines for preparation or analysis recorded F - Analyte detected below quantitative limits
 ND - Not Detected as per Reporting Limit S - RPT-internal accepted recovery limits N - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

a Division of Ametek Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06120322
Project: MDP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 245.1_W

Sample ID: WB-28068	Sample Type: WBLA	TestCode: 245.1_W	Units: mg/L	Prep Date: 12/21/2008	RunNo: 82484						
Client ID:	Batch ID: 28068	TestNo: E245.1		Analysis Date: 12/21/2008	SeqNo: 879012						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury	<0.00020	0.00020									
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Sample ID: LCS-28068	Sample Type: LCS	TestCode: 245.1_W	Units: mg/L	Prep Date: 12/21/2008	RunNo: 82484						
Client ID:	Batch ID: 28068	TestNo: E245.1		Analysis Date: 12/21/2008	SeqNo: 879012						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury	0.00970	0.00020	0.01	0	96.7	85	115				
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Sample ID: LCSD-28068	Sample Type: LCSD	TestCode: 245.1_W	Units: mg/L	Prep Date: 12/21/2008	RunNo: 82484						
Client ID:	Batch ID: 28068	TestNo: E245.1		Analysis Date: 12/21/2008	SeqNo: 879014						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury	0.00930	0.00020	0.01	0	93.1	85	115	0.00970	0.79	20	
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Sample ID: 24120319-01895	Sample Type: MS	TestCode: 245.1_W	Units: mg/L	Prep Date: 12/21/2008	RunNo: 82484						
Client ID:	Batch ID: 28068	TestNo: E245.1		Analysis Date: 12/21/2008	SeqNo: 879016						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury	0.00940	0.00020	0.01	0	94.1	70	120				
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Sample ID: 24120319-01895	Sample Type: MS	TestCode: 245.1_W	Units: mg/L	Prep Date: 12/21/2008	RunNo: 82484						
Client ID:	Batch ID: 28068	TestNo: E245.1		Analysis Date: 12/21/2008	SeqNo: 879028						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury	0.00970	0.00020	0.01	0	91.7	70	120				
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Qualifiers: E - Value above quantitative range H - Holding time for preparation or analysis exceeded J - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit R - RPD outside accepted recovery limits S - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06120021
Project: MSP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 245.1_W

Sample ID: 06120025-018M50	SamplType: W50	TestCode: 245.1_W	Units: mg/L	Prep Date: 12/21/2006	RunNo: 82454						
Client ID:	Batch ID: 28048	TestNo: 8245.1		Analysis Date: 12/21/2006	SeqNo: 879027						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Mercury	0.00020	0.00020	0.01	0	92.0	70	130	0.00010	2.04	20	
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Sample ID: 06120019-018M50	SamplType: W50	TestCode: 245.1_W	Units: mg/L	Prep Date: 12/21/2006	RunNo: 82454						
Client ID:	Batch ID: 28048	TestNo: 8245.1		Analysis Date: 12/21/2006	SeqNo: 879028						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Mercury	0.00050	0.00020	0.01	0	95.0	70	130	0.00010	3.54	20	
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- Qualifiers: E Value above quantitative range W Wasting time for preparation or analysis exceeded 1 Analyte detected before quantitative limits
 ND Not Detected at the Reporting Limit R RPO outside accepted recovery limits 5 Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06120022
Project: MSP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W

Sample ID: MS-R02405	SampType: MBLK	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 02405						
Client ID:	Batch ID: R02405	TestNo: E300		Analysis Date: 12222008	SeqNo: 00013						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	<0.40	0.40									
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Sample ID: MS-R02528	SampType: MBLK	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 02528						
Client ID:	Batch ID: R02528	TestNo: E300		Analysis Date: 12222008	SeqNo: 00018						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	<0.40	0.40									
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Sample ID: LCS-R02495	SampType: LCS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 02495						
Client ID:	Batch ID: R02495	TestNo: E300		Analysis Date: 12222008	SeqNo: 00014						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	1.305	0.40	0	0	99.9	90	110				
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Sample ID: LCS-R02528	SampType: LCS	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 02528						
Client ID:	Batch ID: R02528	TestNo: E300		Analysis Date: 12222008	SeqNo: 00019						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	0.304	0.40	0	0	100	90	110				
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Sample ID: LCS0-R02495	SampType: LCS0	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 02495						
Client ID:	Batch ID: R02495	TestNo: E300		Analysis Date: 12222008	SeqNo: 00027						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	1.302	0.40	0	0	99.9	90	110	7.905	0.0375	20	
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Qualifiers: E Value above quantitative range H Holding time for preparation or analysis exceeded J Analyte detected below quantitative limits
 ND Not Detected at the Reporting Limit S SPT outside accepted recovery limits Y Spike Recovery outside accepted recovery limits



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CLIENT: Pima County Flood Control
Work Order: 06120321
Project: MHP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W

Sample ID: LC30-R32528	SamplType: LC30	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 82528						
Client ID:	Batch ID: R32528	TestNo: E300		Analysis Date: 12/27/2008	SeqNo: 98079						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	8.051	0.40	8	0	101	80	120	8.004	0.585	20	
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Sample ID: 98120671-01AM85	SamplType: 85	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 82485						
Client ID:	Batch ID: R32485	TestNo: E300		Analysis Date: 12/23/2008	SeqNo: 980523						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	10.37	0.40	8	2.491	98.8	80	120				
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Sample ID: 98120685-01AM85	SamplType: 85	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 82528						
Client ID:	Batch ID: R32528	TestNo: E300		Analysis Date: 12/27/2008	SeqNo: 980797						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	11.35	0.40	8	0	142	80	120				MS
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Sample ID: 98120671-01AM80	SamplType: 80	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 82485						
Client ID:	Batch ID: R32485	TestNo: E300		Analysis Date: 12/23/2008	SeqNo: 980524						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	10.39	0.40	8	2.491	98.7	80	120	10.37	0.183	20	
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Sample ID: 98120685-01AM80	SamplType: 80	TestCode: 300_W	Units: mg/L	Prep Date:	RunNo: 82528						
Client ID:	Batch ID: R32528	TestNo: E300		Analysis Date: 12/27/2008	SeqNo: 980798						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Nitrate/Nitrite Total	15.91	0.40	8	0	126	80	120	11.35	4.21	20	MS
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Qualifiers: 1 - Value above quantitative range 2 - Holding time for preparation or analysis exceeded 3 - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit 4 - RPO outside accepted recovery limits 5 - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06120322
Project: MHP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID: MS-882127	Sample Type: MBLK	TestCode: 8260_W	Units: ug/L	Prep Date:	RunNo: 82127						
Client ID:	Batch ID: 882127	Technic: SW8260B		Analysis Date: 12/13/2008	SeqNo: 878828						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
1,1,1-Trichloroethane	<1.0	1.0									
1,1,2-Trichloroethane	<1.0	1.0									
1,1-Dichloroethane	<1.0	1.0									
1,2-Dichlorobenzene	<1.0	1.0									
1,2-Dichloroethane	<1.0	1.0									
1,2-Dichloropropane	<1.0	1.0									
1,4-Dichlorobenzene	<1.0	1.0									
Benzene	<1.0	1.0									
Carbon tetrachloride	<1.0	1.0									
Chlorobenzene	<1.0	1.0									
o-1,2-Dichloroethane	<1.0	1.0									
Ethylbenzene	<1.0	1.0									
Styrene	<1.0	1.0									
Tetrachloroethane	<1.0	1.0									
Toluene	<1.0	1.0									
trans-1,2-Dichloroethane	<1.0	1.0									
Trichloroethene	<1.0	1.0									
Tetralomethanes, Total	<1.0	1.0									
Vinyl chloride	<1.0	1.0									
Xylenes, Total	<2.0	2.0									
Sum: 4-Bromofluorobenzene	25.64	0	25	0	100	81.8	124				
Sum: Dibromofluoromethane	27.74	0	25	0	111	83.1	119				
Sum: Toluene-oil	24.42	0	25	0	97.7	81.8	120				

Sample ID: LCS-882127	Sample Type: LCS	TestCode: 8260_W	Units: ug/L	Prep Date:	RunNo: 82127						
Client ID:	Batch ID: 882127	Technic: SW8260B		Analysis Date: 12/13/2008	SeqNo: 878840						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual
1,1,1-Trichloroethane	28.17	1.0	25	0	113	72.0	121				

Qualifiers: 0 - Value above quantitative range W - Holding time for preparation or analysis exceeded J - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit E - RPD outside accepted recovery limits S - Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

A Division of Aerotech Laboratories, Inc.

CLIENT: Pima County Flood Control
Work Order: 06120322
Project: MHP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: 8260_W

Sample ID: LCS-R82127	Samp Type: LCS	Test Code: 8260_W	Units: µg/L	Prep Date:	Run No: 82127						
Client ID:	Batch ID: R82127	Test No: SW82608		Analysis Date: 12/13/2008	Sample: 875848						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,2-Trichloroethane	25.92	1.0	25	0	104	78.2	120				
1,1-Dichloroethane	24.48	1.0	25	0	87.9	76.1	127				
1,2-Dichlorobenzene	24.91	1.0	25	0	99.0	78	110				
1,2-Dichloroethane	29.87	1.0	25	0	119	64	127				
1,3-Dichloropropane	25.91	1.0	25	0	100	82.2	110				
1,4-Dichlorobenzene	23.21	1.0	25	0	82.8	77.4	113				
Benzene	25.92	1.0	25	0	100	73.8	124				
Carbon tetrachloride	28.58	1.0	25	0	110	72	124				
Chlorobenzene	24.26	1.0	25	0	96.2	82.0	110				
cis-1,2-Dichloroethane	25.92	1.0	25	0	100	78.8	118				
Ethylbenzene	28.58	1.0	25	0	100	87.4	110				
Styrene	26.71	1.0	25	0	100	80.8	118				
Tetrachloroethane	24.47	1.0	25	0	97.8	78.8	123				
Toluene	23.84	1.0	25	0	94.8	80.8	118				
trans-1,2-Dichloroethane	24.79	1.0	25	0	99.2	77.7	123				
Trichloroethane	23.92	1.0	25	0	95.7	80.7	110				
Vinyl chloride	25.12	1.0	25	0	100	74.4	128				
Sum: 4-Bromofluorobenzene	28.88	0	25	0	104	87.8	124				
Sum: Dibromofluoromethane	28.37	0	25	0	113	83.1	118				
Sum: Toluene-d8	25.00	0	25	0	100	87.8	120				

Sample ID: LCS8-R82127	Samp Type: LCS8	Test Code: 8260_W	Units: µg/L	Prep Date:	Run No: 82127						
Client ID:	Batch ID: R82127	Test No: SW82608		Analysis Date: 12/13/2008	Sample: 875848						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	29.38	1.0	25	0	117	72.8	121	28.17	1.46	25	
1,1,2-Trichloroethane	29.87	1.0	25	0	127	78.2	120	25.92	2.85	25	
1,1-Dichloroethane	25.80	1.0	25	0	102	76.1	127	24.48	4.47	25	
1,2-Dichlorobenzene	25.24	1.0	25	0	101	78	110	24.91	3.23	25	

Qualifiers: E - Value above quantitative range H - Holding times for preparation or analysis exceeded J - Analyte detected below quantitative limit
 ND - Not Detected at the Reporting Limit R - RPD outside accepted recovery limits S - Spike Recovery outside accepted recovery limits



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CLIENT: Pima County Flood Control
Work Order: 06120322
Project: MSIP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 8268_W

Sample ID: LCSD-R82127	SampType: LCSD	TestCode: 8268_W	Units: µg/L	Prep Date:	RunNo: 82127						
Client ID:	Batch ID: R82127	TestNo: SW8268B		Analysis Date: 12/13/2008	SeqNo: 878841						
Analyte	Result	PCL	SPK value	SPK Ref Val	UREC	LowLimit	HighLimit	RPO Ref Val	LRPO	RPOLimit	Qual
1,2-Dichloroethane	28.82	1.0	25	0	118	84	137	25.87	0.188	25	25
1,2-Dichloropropane	28.24	1.0	25	0	108	82.2	118	25.81	2.02	25	25
1,4-Dichlorobenzene	24.18	1.0	25	0	88.8	77.4	113	25.21	4.01	25	25
Benzene	25.19	1.0	25	0	101	75.8	124	25.02	1.28	25	25
Carbon tetrachloride	28.30	1.0	25	0	117	72	134	28.08	4.02	25	25
Chlorobenzene	25.15	1.0	25	0	101	82.5	118	24.08	4.87	25	25
cis-1,2-Dichloroethane	28.83	1.0	25	0	122	78.8	118	25.02	1.02	25	25
Ethylbenzene	28.32	1.0	25	0	103	81.4	118	25.08	4.82	25	25
Styrene	27.18	1.0	25	0	108	85.8	118	25.71	3.28	25	25
Tetrachloroethene	28.84	1.0	25	0	123	78.8	133	24.81	0.48	25	25
Toluene	25.03	1.0	25	0	108	85.8	118	25.84	3.71	25	25
trans-1,2-Dichloroethane	28.77	1.0	25	0	123	77.7	133	24.78	3.88	25	25
Trichloroethene	28.00	1.0	25	0	124	85.7	118	25.82	8.33	25	25
Vinyl chloride	28.88	1.0	25	0	128	74.8	138	25.12	7.18	25	25
Sum: 4-Bromofluorobenzene	28.27	0	25	0	128	81.8	134	25.98	0	0	0
Sum: Dibromofluoromethane	27.83	0	25	0	111	83.1	118	28.17	0	0	0
Sum: Toluene-d8	28.20	0	25	0	101	81.8	130	25.00	0	0	0

Sample ID: 06120307-07 MS	SampType: MS	TestCode: 8268_W	Units: µg/L	Prep Date:	RunNo: 82127						
Client ID:	Batch ID: R82127	TestNo: SW8268B		Analysis Date: 12/13/2008	SeqNo: 878842						
Analyte	Result	PCL	SPK value	SPK Ref Val	UREC	LowLimit	HighLimit	RPO Ref Val	LRPO	RPOLimit	Qual
1,1,1-Trichloroethane	28.18	1.0	25	0	121	73.1	132				
1,1,2-Trichloroethane	28.04	1.0	25	0	104	73.8	118				
1,1-Dichloroethane	27.84	1.0	25	0	111	73.3	134				
1,2-Dichlorobenzene	24.81	1.0	25	0	88.8	73.8	113				
1,2-Dichloroethane	28.82	1.0	25	0	118	80.7	132				
1,2-Dichloropropane	28.89	1.0	25	0	104	78.4	113				
1,4-Dichlorobenzene	24.21	1.0	25	0	88.8	72.7	112				

Qualifiers: 1 Value above quantitative range 2 Holding time for preparation or analysis exceeded 3 Analyte detected below quantitative limit
 ND Not Detected at the Reporting Limit 4 RPD outside accepted recovery limits 5 Spike Recovery outside accepted recovery limits



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CLIENT: Pima County Flood Control
Work Order: 06120522
Project: MHP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

Test Code: 8260_W

Sample ID: 06120507-07 MS	Sample Type: MS	Test Code: 8260_W	Units: µg/L	Prep Date:	Run No: 82127						
Client ID:	Batch ID: 062127	Test No: 0902008		Analysis Date: 12/13/2008	Seq No: 075042						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
Benzene	24.26	1.0	25	0	105	69.3	128				
Carbon tetrachloride	30.73	1.0	25	0	123	73.5	134				
Chlorobenzene	24.80	1.0	25	0	99.2	78.4	108				
cis-1,2-Dichloroethane	26.41	1.0	25	0	108	57.8	128				
Ethylbenzene	26.31	1.0	25	0	108	77.2	118				
Styrene	18.12	1.0	25	0	72.5	50.3	102				
Tetrachloroethane	26.30	1.0	25	0	108	73.8	128				
Toluene	23.20	1.0	25	0	101	75.8	119				
trans-1,2-Dichloroethane	26.81	1.0	25	0	107	78.8	122				
Trichloroethane	25.95	1.0	25	0	104	65.2	120				
Vinyl chloride	26.21	1.0	25	0	117	64.8	120				
Sum 4-Bromofluorobenzene	26.42	0	25	0	108	63.3	122				
Sum Dibromofluoromethane	27.24	0	25	0	108	62.8	120				
Sum Toluene-d8	25.08	0	25	0	100	60	122				

Sample ID: 06120507-07D MSD	Sample Type: MSD	Test Code: 8260_W	Units: µg/L	Prep Date:	Run No: 82127						
Client ID:	Batch ID: 062127	Test No: 0902008		Analysis Date: 12/13/2008	Seq No: 075042						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPO Ref Val	%RPO	RPO Limit	Qual
1,1,1-Trichloroethane	27.78	1.0	25	0	111	73.1	120	30.15	8.18	25	
1,1,2-Trichloroethane	25.62	1.0	25	0	102	73.8	118	28.04	1.83	25	
1,1-Dichloroethane	25.29	1.0	25	0	101	73.3	124	27.84	8.88	25	
1,2-Dichlorobenzene	24.28	1.0	25	0	99.3	73.8	113	24.91	3.38	25	
1,2-Dichloroethane	26.84	1.0	25	0	115	65.7	122	29.82	3.38	25	
1,2-Dichloropropane	25.34	1.0	25	0	101	78.4	113	25.88	2.15	25	
1,4-Dichlorobenzene	23.22	1.0	25	0	92.8	72.7	112	24.21	4.17	25	
Benzene	25.33	1.0	25	0	101	69.3	128	28.28	3.81	25	
Carbon tetrachloride	26.76	1.0	25	0	115	73.5	124	30.73	6.82	25	
Chlorobenzene	23.79	1.0	25	0	95.1	78.4	108	24.80	4.20	25	

Qualifiers: E - Value above quantitative range W - Wading times for preparation or analysis recorded J - Analyte detected below quantitative limits
 ND - Not Detected at the Reporting Limit B - RPO outside accepted recovery limits S - Spike Recovery outside accepted recovery limits



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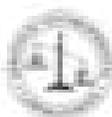
CLIENT: Pima County Flood Control
Work Order: 0612022
Project: MHP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: 8268_W

Sample ID: 04120197-070 MS0	Sample Type: MS0	TestCode: 8268_W	Units: µg/L	Pres Date:	RunNo: 82127						
Client ID:	Batch ID: R82127	TestNo: SW8268B		Analysis Date: 12/13/2008	SeqNo: 875545						
Analyte	Result	PQL	SPK value	SPK Ref Val	NRQC	LowLimit	HighLimit	RPO Ref Val	LRPO	RPOLimit	Qual
o,p-1,2-Dichlorobenzene	25.19	1.0	0	0	101	27.8	138	28.41	4.73	25	
Ethylbenzene	25.07	1.0	0	0	100	77.2	118	28.31	4.83	25	
Styrene	19.27	1.0	0	0	77.1	90.2	122	18.12	8.19	25	
Tetrachloroethene	24.88	1.0	0	0	88.3	73.8	128	28.30	5.58	25	
Toluene	24.18	1.0	0	0	85.7	75.8	118	25.20	4.13	25	
trans-1,2-Dichloroethene	25.30	1.0	0	0	101	78.8	123	28.81	5.80	25	
Trichloroethene	24.91	1.0	0	0	88.3	85.2	120	25.95	5.71	25	
Vinyl chloride	27.20	1.0	0	0	100	84.8	140	29.21	7.13	25	
Sum: 4-Bromofluorobenzene	26.21	0	0	0	100	83.3	123	28.42	0	0	
Sum: Dibromofluorobenzene	27.88	0	0	0	112	82.8	120	27.24	0	0	
Sum: Toluene-d8	25.36	0	0	0	101	80	122	25.08	0	0	

Qualifiers: **1** Value above quantitative range **0** Holding time for preparation or analysis exceeded **2** Analyte detected below quantitative limit
ND Not Detected at the Reporting Limit **8** RPO outside accepted recovery limits **3** Spike Recovery outside accepted recovery limits



Aerotech Environmental Laboratories

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CLIENT: Pima County Flood Control
Work Order: 06120322
Project: MHP-ERP / Monthly-Quarterly

ANALYTICAL QC SUMMARY REPORT

TestCode: N_TKN_WW

Sample ID: MB-R02229	SampType: MBUA	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 02229						
Client ID:	Batch ID: R02229	TestNo: E301.4		Analysis Date: 12/14/2008	SeqNo: 076606						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	<1.0	1.0									
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Sample ID: LCS-R02229	SampType: LCS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 02229						
Client ID:	Batch ID: R02229	TestNo: E301.4		Analysis Date: 12/14/2008	SeqNo: 076606						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	23.82	1.0	25	0	95.3	65	110				
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Sample ID: LCS0-R02229	SampType: LCS0	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 02229						
Client ID:	Batch ID: R02229	TestNo: E301.4		Analysis Date: 12/14/2008	SeqNo: 076607						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	22.48	1.0	25	0	95.3	65	110	23.82	5.83	20	
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Sample ID: 06120204-05CWS	SampType: WS	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 02229						
Client ID:	Batch ID: R02229	TestNo: E301.4		Analysis Date: 12/14/2008	SeqNo: 076608						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	21.48	1.0	25	24.90	106	70	130				
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Sample ID: 06120204-09CWS0	SampType: WS0	TestCode: N_TKN_WW	Units: mg/L	Prep Date:	RunNo: 02229						
Client ID:	Batch ID: R02229	TestNo: E301.4		Analysis Date: 12/14/2008	SeqNo: 076609						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPO Ref Val	%RPO	RPOLimit	Qual

Nitrogen, Total Kjeldahl	52.85	1.0	25	24.90	116	70	130	21.48	4.42	20	
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Qualifiers: E - Value above quantitation range N - Missing data for progressive or analysis cancelled J - Analyte detected below quantitation limits
 ND - Not Detected at the Reporting Limit S - STD outside accepted recovery limits T - Spike Recovery outside accepted recovery limits

Aerotech Environmental Laboratories Sample Receipt Checklist

Project checked by _____

Laboratory Number: <u>0617-0322</u>	Checked/ completed by: <u>[Signature]</u>
Client Name: <u>Pima County Fire Center</u>	Date/Time Rec'd: <u>11/20/08</u> By: <u>W</u>
Matrix: <u>AQ</u> Carrier Name: <u>LEL</u>	

Temperature of Samples? 14 °C Circle one: Blue Ice Wet Ice Not Present

	Yes	No	Not Present	Soil Containers:
Shipping container/cooler in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Brass Skewer _____
Custody seals intact on shipping container/cooler?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Glass Jar _____
Custody seals intact on sample containers?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Methanol _____
Chain of Custody present and relinquished/received properly?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plastic Bag _____
Chain of Custody agrees with sample labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ercosam Samplers _____
Samples in proper containers/bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sample containers intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
All samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there sufficient sample volume to perform the tests?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	**See Comment about Chlorine and pH
40mL vials for volatiles & SOC's received with zero headspace?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>12-17-08</u>

Total number of bottles received: 11 pH sample media: NA

If applicable, how many sample bottles were shipped from AEL-Tucson? 11 N/A

Number of containers received by preservative and by sample number. (If more than 15 samples are rec'd, please continue on separate sheet(s))

Preservative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A-General															
B-HNO3	1	1													
C-H2SO4	1	1													
D-HCl	3	3	1												
E-H2O2															
F-NaOH															
G-Sulfide															
H-Na Sulfite															
I-MCAA															
J-Methanol															
K-HAA															
L-Other															

Water-pH acceptable upon receipt? Yes No N/A

Preservative & pH	pH of samples upon receipt	If pH requires adjustment, list sample number, and reagent ID number
Metals <2	<u>5.2</u>	
Nutrients <2	<u>6.2</u>	
Total Phosph <2		
413 (OMG) <2		
418 (TPH) <2		
Cyanide >12		
Sulfide >9		

*Any No response must be detailed in the comments section below. Contact the PM immediately to determine how to proceed. Refer to SOP 11-001.04, Section 1.8.2. Continue on back if additional space is needed.

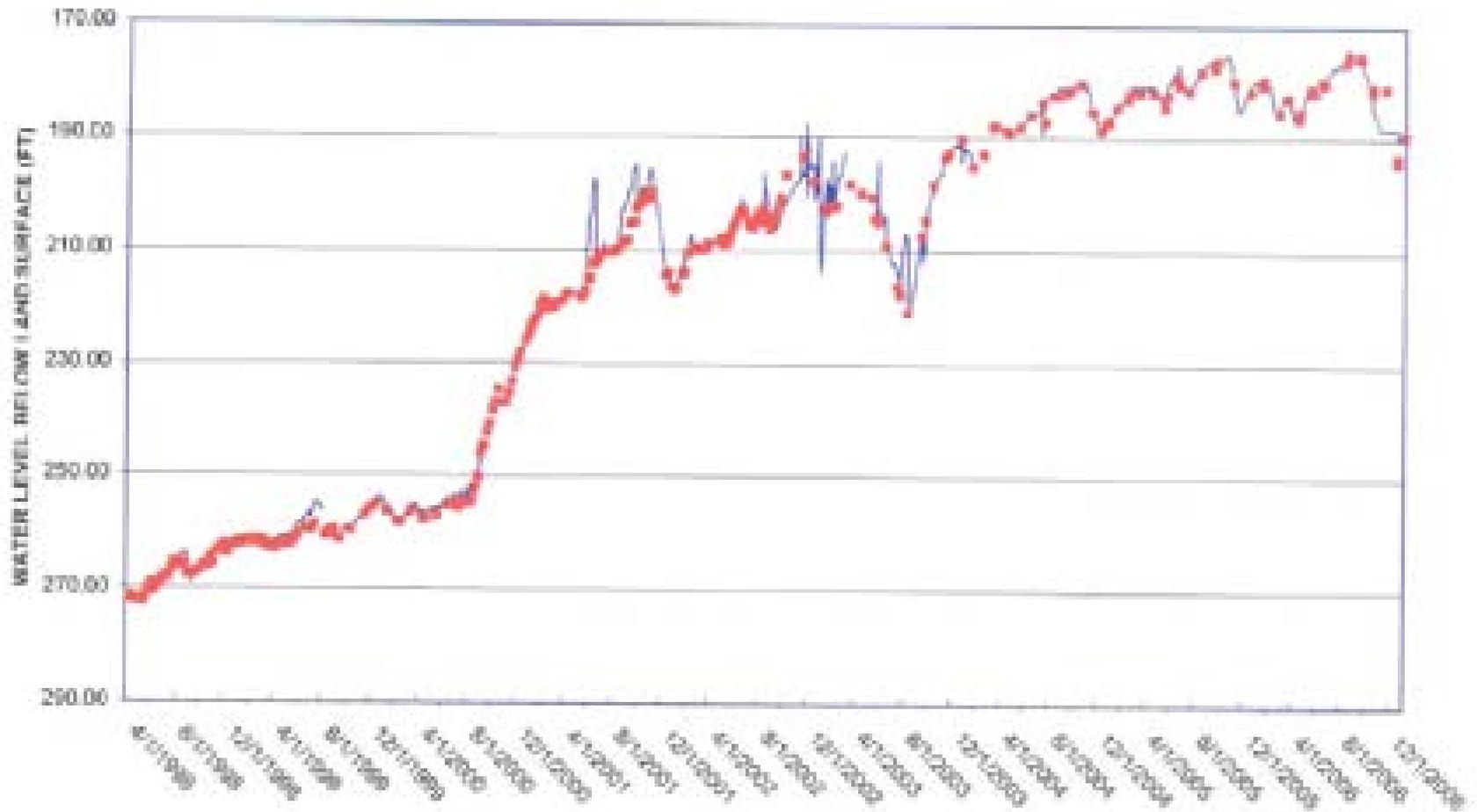
**The holding time for pH and Total Residual Chlorine analysis is immediate. For the most accurate result, the pH and Total Residual Chlorine should be taken in the field within 15 minutes of sampling.

Comments:

Corrective Action:

APPENDIX E

WELL HYDROGRAPHS FOR OFF-SITE WELLS



**APPENDIX E
DEPTH TO WATER HYDROGRAPH
MONITOR WELL AVMW-1**

D(12-11)03cbb



APPENDIX F

MOUNDING ANALYSIS

RECHARGE RATE = .6 FT/DAY
 TRANSMISSIVITY = 16700 SQ.FT/DAY
 SPECIFIC YIELD = .18
 BEGINNING TIME = 1460 DAYS
 FINAL TIME = 7300 DAYS
 TIME INCREMENT = 1460 DAYS
 TIME OF CUT OFF = 7300 DAYS
 BEGINNING DISTANCE = 0 FT
 FINAL DISTANCE = 10560 FT
 DISTANCE INCREMENT = 660 FT
 DEPTH = 185 FT
 WIDTH = 350 FT
 LENGTH = 350 FT
 ANGLE = 0 DEGREES

Marana High Plains
 20-year Mounding
 Simulation

TIME (DAYS)	DISTANCE (FT)	HEIGHT (FT)
1460	0.0	3.481
1460	660.0	2.294
1460	1320.0	1.809
1460	1980.0	1.524
1460	2640.0	1.324
1460	3300.0	1.172
1460	3960.0	1.050
1460	4620.0	0.947
1460	5280.0	0.859
1460	5940.0	0.782
1460	6600.0	0.713
1460	7260.0	0.652
1460	7920.0	0.598
1460	8580.0	0.548
1460	9240.0	0.503
1460	9900.0	0.462
1460	10560.0	0.425
2920	0.0	3.724
2920	660.0	2.536
2920	1320.0	2.051
2920	1980.0	1.765
2920	2640.0	1.565
2920	3300.0	1.412
2920	3960.0	1.287
2920	4620.0	1.183
2920	5280.0	1.093
2920	5940.0	1.013
2920	6600.0	0.942
2920	7260.0	0.879
2920	7920.0	0.821
2920	8580.0	0.768
2920	9240.0	0.720
2920	9900.0	0.675
2920	10560.0	0.634
4380	0.0	3.866
4380	660.0	2.678
4380	1320.0	2.193
4380	1980.0	1.907
4380	2640.0	1.706
4380	3300.0	1.552
4380	3960.0	1.428
4380	4620.0	1.322

4380	5280.0	1.232
4380	5940.0	1.151
4380	6600.0	1.080
4380	7260.0	1.015
4380	7920.0	0.956
4380	8580.0	0.903
4380	9240.0	0.853
4380	9900.0	0.807
4380	10560.0	0.764
5840	0.0	3.967
5840	660.0	2.779
5840	1320.0	2.294
5840	1980.0	2.008
5840	2640.0	1.807
5840	3300.0	1.653
5840	3960.0	1.528
5840	4620.0	1.422
5840	5280.0	1.331
5840	5940.0	1.250
5840	6600.0	1.178
5840	7260.0	1.113
5840	7920.0	1.054
5840	8580.0	0.999
5840	9240.0	0.949
5840	9900.0	0.903
5840	10560.0	0.859
7300	0.0	4.045
7300	660.0	2.857
7300	1320.0	2.371
7300	1980.0	2.085
7300	2640.0	1.884
7300	3300.0	1.730
7300	3960.0	1.605
7300	4620.0	1.500
7300	5280.0	1.408
7300	5940.0	1.327
7300	6600.0	1.255
7300	7260.0	1.190
7300	7920.0	1.130
7300	8580.0	1.075
7300	9240.0	1.025
7300	9900.0	0.978
7300	10560.0	0.934

APPENDIX G

DATA SHARING AGREEMENT

AGREEMENT BETWEEN THE CENTRAL ARIZONA WATER
CONSERVATION DISTRICT AND PIMA COUNTY

1. PARTIES.

This Agreement is made and entered by and into this first day of July, 1996, between the Central Arizona Water Conservation District ("CAWCD"), and Pima County. For purposes of this agreement, Pima County is divided into and identified by the following Departments: Pima County Wastewater Management Department ("PCWMD"), Pima County Solid Waste Management Department ("PCSWMC"), and Pima County Department of Transportation and Flood Control District ("PCPCD"). CAWCD and Pima County will be collectively referred to in this Agreement as the Parties.

2. RECITALS.

- 2.1 CAWCD is constructing the Avra Valley Pilot Recharge Facility and CAWCD will operate this facility when construction is complete.
- 2.2 Pima County has initiated a feasibility study for the Lower Santa Cruz River Flood Control and Replenishment Project.
- 2.3 The Parties are or will be subject to groundwater monitoring requirements imposed by the Arizona Department of Water Resources ("ADWR") under permits issued by ADWR for Underground Water Storage Facilities.
- 2.4 The Parties desire to establish a program to coordinate their groundwater monitoring requirements and to share data among themselves.

3. PURPOSE.

The purpose of this Agreement is to establish a coordinated groundwater monitoring and data sharing program between the Parties. Hydrologic data collected in the vicinity of CAWCD's Avra Valley Pilot Recharge Project and Pima County's Lower Santa Cruz River Flood Control and Replenishment Project will be exchanged between the Parties so that the Parties can comply with the Arizona Department of Water Resources groundwater monitoring requirements for Underground Water Storage Facility Permits. Coordination of groundwater monitoring efforts utilizing a network of existing monitoring wells will result in a more comprehensive evaluation of the effect of recharge on the aquifer and reduce project costs.

4. GROUNDWATER LEVEL MONITORING.

4.1 The Parties will measure groundwater level elevations in the regional aquifer using a network of monitoring wells to evaluate changes in groundwater levels and direction of groundwater movement in accordance with Section 4.3 below.

4.2 The following table lists seven monitoring wells that will be monitored under this Agreement.

Regional Aquifer Groundwater Level Monitoring Wells			
WELL NUMBER	CADASTRAL	IDENTIFIER	WELL OWNER
1	D(12-11)02abb	TAN-1	Pina County
2	D(12-11)02abc	TAN-2	Pina County
3	D(12-11)02ada	TAN-4	Pina County
4	D(12-11)03ood	TA-47	Reclamation
5	D(12-11)03bbc	ASPM-01	CANCD
6	D(11-11)33beb	SC-10	Pina County
7	D(11-11)34cbc	SC-09	Pina County

4.3 Each Party's responsibility for measuring groundwater level elevations as follows:

- a. PCSWMD will measure groundwater level elevations monthly in wells 1, 2 and 3.
- b. PCWMD will measure groundwater level elevations monthly in wells 6 and 7.
- c. CANCD will measure groundwater level elevations monthly in well 4 and weekly in well 5.
- d. In the event that staffing constraints preclude measurements from being taken on schedule, the responsible Party will notify the other Parties and allow access to the subject well.

5. GROUNDWATER QUALITY SAMPLING AND CHEMICAL ANALYSIS.

5.1 The Parties will conduct comprehensive groundwater quality sampling and analysis to characterize the ambient chemical quality of groundwater and to assess any water quality transformations resulting from recharge operations in accordance with Section 5.2 below.

5.2 Each Party's responsibility for conducting groundwater quality sampling and analysis is as follows:

- a. PCSWMD will continue to collect groundwater samples for chemical analysis from wells 1, 2, and 3 two times per year as part of ongoing operations at the Tangerine Road Landfill. Sample collection and analysis will be in accordance with the Tangerine Landfill Facilities Plan and EPA requirements.
- b. PCWMD will collect at least one set of groundwater samples for chemical analysis from wells 6 and 7 no later than August 1, 1996; thereafter, PCWMD will collect groundwater samples two times per year. PCWMD will notify CAWCD prior to sampling efforts so CAWCD can be present. CAWCD will accept custody of groundwater samples and deliver samples to a state certified laboratory. PCWMD will provide CAWCD with the results of the groundwater sampling conducted in May 1996.
- c. CAWCD will collect two groundwater samples from well 5 prior to August 1, 1996; thereafter, sample collection and analysis will be conducted four times per year by CAWCD.

5.3 The Parties agree that analytical chemical analysis of groundwater samples will be performed only by state certified environmental laboratories licensed with the Arizona Department of Health Services.

5.4 At a minimum, groundwater samples from wells 5, 6, and 7 will be analyzed for the following list of constituents:

Common Constituents:

Bicarbonate, Calcium, Carbonate, Chloride, Fluoride, Magnesium, Nitrate, Potassium, Sodium, Sulfate.

Inorganic Chemicals:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Cyanide, Iron, Lead, Mercury, Manganese, Nickel, Selenium, Silver, Thallium, Zinc.

Organic Chemicals:

Chlorinated Pesticides (EPA 508), Chlorinated Herbicides (EPA 515.1), VOC (EPA 524), TPH (418.1A2).

Others:

Total Dissolved Solids, pH.

6. DATA DISSEMINATION.

- 6.1 PCSWMD and PCWMD will provide CAWCD with a written summary of groundwater level measurements and groundwater quality analysis for wells 1-3 and 6-7.
- 6.2 CAWCD will provide PCPCD with a written summary of groundwater level measurements for wells 4 and 5, groundwater quality analysis results for well 5, and copies of data received from PCSWMD and PCWMD for wells 1-3 and 6-7 respectively.
- 6.3 Data will be exchanged on a quarterly basis, during the first week of January, April, July, and October.
- 6.4 PCPCD will provide PCSWMD and PCWMD with data from any of the other participants upon request.
- 6.5 Shared information will be mailed to the other Party's as follows:

CAWCD: Tom Harbour, Engineer/Hydrologist
Central Arizona Water Conservation District
Planning and Analysis Branch
23636 North 7th Street
Phoenix, AZ 85024

Pima
County: Julia Fonseca, Principal Hydrologist
Pima County Department of Transportation and Flood
Control District
Flood Control Planning Division
Public Works Building
201 North Stone Avenue, 4th Floor
Tucson, AZ 85701-1207

7. COST DISTRIBUTION.

- 7.1 CAWCD will pay laboratory costs for analysis of groundwater samples from wells 6 and 7. PCWMD will pay all personnel and equipment costs necessary to sample the wells.
- 7.2 CAWCD will incur all costs for design, construction, and equipping of well 5, and pay all costs associated with collection and analysis of groundwater samples from well 5.

8. AMENDMENT OF AGREEMENT.

8.1 This Agreement may be amended but only upon the mutual written consent of the Parties.

9. TERM AND TERMINATION.

9.1 This Agreement shall become effective upon execution by the Parties. It shall remain in effect until terminated pursuant to the terms of the Agreement.

9.2 Any Party may terminate this Agreement by giving the other Party 30 days advance written notice of its intent to terminate this Agreement.

Central Arizona Water Conservation District

By: 

John D. Newman

Title: Assistant General Manager

Pima County

By:  7/1/96

C.H. Huckelberry

Title: County Administrator

APPENDIX H

WELL CONSTRUCTION INFORMATION FOR OFF-SITE MONITOR WELLS

MONITOR WELL AVMW-1

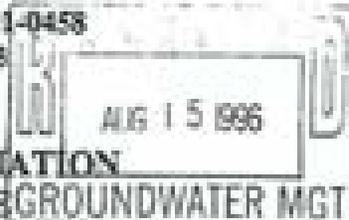
ARIZONA DEPARTMENT OF WATER RESOURCES

GROUNDWATER MANAGEMENT SUPPORT SECTION

MAIL TO: P.O. BOX 458 - PHOENIX, ARIZONA 85001-0458

500 North Third Street, Phoenix, Arizona 85004-3903

Phone (602) 417-2470 Fax (602) 417-2422



REQUEST FORM TO CHANGE WELL INFORMATION

OWNERSHIP * DRILLER * VARIANCE

GROUNDWATER MGT

Please complete the appropriate section of this request form and return to P.O. Box 458, Phoenix, Arizona 85001-0458 or hand deliver to the above address with applicable fee. **NOTE:** A.R.S. §45-593.C requires that the Department be notified of change of well ownership and that the new owner is required to keep the Department's Well Registration records current and accurate. Well data and ownership changes must be submitted within thirty days after changes take place.

SAVE THIS FORM TO REPORT FUTURE CHANGES IN OWNERSHIP, CHANGES IN ADDRESS, OR CHANGE IN WELL DATA SUCH AS PUMP CAPACITY, CORRECTION OF LEGAL DESCRIPTION, CHANGE OF WELL DRILLER AND AMENDING INFORMATION PREVIOUSLY FILED.

1. CHANGE OF WELL INFORMATION: (NO FEE REQUIRED)

NOTE: If the location of the proposed well changes after drilling authority has been issued, attach a \$10.00 release fee for each well.

WELL REGISTRATION NO. 59- 557544 FILE NO: D (12-11) 3 cbb

If known, I/We request the following well information be changed: The well was used for hydrologic testing under Permit No. 59-557543. The well is now used to monitor groundwater levels at the Avra Valley Pilot Recharge Project, Permit No. 71-551092.

Date 8/14/96 Signature of Current Well Owner Tom Harbour - Central Ariz. Project
TOM HARBOUR, ENGINEER/HYDROLOGIST

2. STATEMENT OF CHANGE OF WELL OWNERSHIP: (\$10.00 FEE REQUIRED)

NOTE: If this change consists of more than one well and the names are common, attach a \$10.00 fee. **ENTERED AUG 15 1996**
RECORDED 9/2/96
 requires a separate fee of \$10.00.

I, N/A, state that I am the Previous/New Owner of the well described below:

10 ^{1/4} 40 ^{1/4} 160 ^{1/4} of Section _____ Township _____ Range _____
10 Acres 40 Acres 160 Acres

Well Registration No. 59- _____ File No. _____ (if known)

PRINT Previous Owner's Name _____

PRINT New Owner's Name _____

Mailing Address _____

Mailing Address _____

City _____ State _____ Zip _____

City _____ State _____ Zip _____

Telephone Number _____

Telephone Number _____

Signature of Previous/New Well Owner _____ Date _____

ARIZONA DEPARTMENT OF WATER RESOURCES
GROUNDWATER MANAGEMENT SUPPORT SECTION
MAIL TO: P.O. BOX 458 - PHOENIX, ARIZONA 85001-0458
500 North Third Street, Phoenix, Arizona 85004-3903
Phone (602) 417-2470 Fax (602) 417-2422

3. REQUEST TO CHANGE WELL DRILLER \$10.00 FEE REQUIRED FOR EACH WELL

This request must be received by this Department and the Drill Card issued to the new drilling firm prior to the drilling or completion of any well.

Well Registration No. 55- N/A File No. _____

Original Well Driller _____

New Well Driller _____

Mailing Address _____

Mailing Address _____

Telephone Number _____

Telephone Number _____

ADWR License Number _____

ADWR License Number _____

R.O.C. License Category _____

R.O.C. License Category _____

Typed or Printed Name of Well Owner _____

Signature of Well Owner _____

Date _____

The fee charge for well ownership and release of drill card is authorized by R12-15-151, effective June 30, 1994.

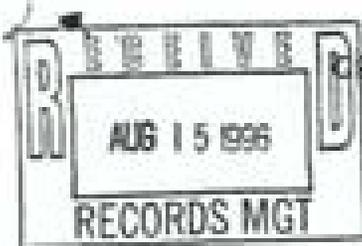
4. REISSUE OF DRILLING AUTHORITY FOR VARIANCE REQUEST: (\$10.00 EACH WELL)

NOTE: If extraordinary or unusual conditions exist, after the initial drilling authority has been issued, the well owner or well driller may request a variance from the provisions of R12-15-811.

WELL REGISTRATION NO. 55- N/A FILE NO: _____

I/WE REQUEST THE FOLLOWING WELL DRILLING AUTHORITY BE REISSUED PER THE ATTACHED VARIANCE REQUEST:

Signature of Well Owner/Well Driller _____ Date _____



STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
GROUNDWATER MANAGEMENT SUPPORT SECTION
 500 North Third Street, Phoenix, Arizona 85004-3903
 Phone (602) 417-2470 Fax (602) 417-2422

COMPLETION REPORT
(Pump Installation Report)

1. Per A.R.S. § 45-600, The completion report is to be filed with the Department within 30 days after installation of pump equipment by the registered well owner.
2. Drawdown of the water level for a non-flowing well should be measured in feet after not less than 4 hours of continuous operation. For a flowing well the shut-in pressure should be measured in feet above the land or in pounds per square inch at the land surface.
3. The static groundwater level should be measured in feet from the land surface immediately prior to the well capacity test.
4. The tested pumping capacity of the well in gallons per minute for a non-flowing well should be determined by measuring the discharge of the pump after continuous operation for at least 4 hours and for a flowing well by measuring the natural flow at the land surface.

REGISTRATION NO: 55- 557544 FILE NO: D (13 - 11) 3 cbb

LOCATION OF THE WELL:

12 South Township 11 East Range 3 Section 1/4 EW 10-acre 1/4 SW 40-acre 1/4 NW 160-acre

EQUIPMENT INSTALLED:

Kind of Pump Submersible Kind of Power Electric Generator
 (Turbine, Submersible, Centrifugal, etc.) (Electric, Natural Gas, Gasoline, etc.)

H.P. Rating of Motor 3 Pumping Capacity 32 gpm Date Pump Installed 6/25/96

WELL TEST:

Test Pumping Capacity 35.3 Date Well Tested 6/20/96
 (Gallons per minute)

Method of Discharge Measurement totalizing flow meter
 (Weir, orifice, current meter, bucket, etc.)

Static Groundwater Level 287.98' ft. Drawdown 42.89' (after 19 hours) ft.
 Total Pumping Lift 380' ft. Drawdown N/A ft.
 (Flowing Well)

I HEREBY CERTIFY that the above statements are true to the best of my knowledge and belief.

CENTRAL ARIZONA PROJECT 23636 North 7th Street Phoenix AZ 85024
 Print Well Owner's Name Address City State Zip

Tom Harbour 870-2107 8/14/96
 Signature of Well Owner Name Phone Number Date

DWR 52-24 (Rev. 10/92)

ENTERED AUG 19 1996



ERROL L. MONTGOMERY & ASSOCIATES, INC.

LOG A-1. LITHOLOGIC DESCRIPTIONS OF
DRILL CUTTINGS SAMPLES FOR MONITOR WELL AVMW-1
AVRA VALLEY PILOT RECHARGE PROJECT
PIMA COUNTY, ARIZONA

<u>DEPTH (feet)</u>	<u>DESCRIPTION</u>
0 - 6	GRAVELLY SAND; reddish brown 5YR5/4; very fine to very coarse sand 70%, gravel 30%; non-lithified. Gravel fraction: predominantly granules to fine pebbles, some coarse pebbles, angular to subrounded. Reaction to acid: none.
6 - 11	GRAVELLY SAND; light brown 7.5YR6/4; very fine and very coarse sand 55%, gravel 40%, silt and clay 5%; non-lithified. Gravel fraction: granules to coarse pebbles, subangular to subrounded. Reaction to acid: moderate.
11 - 16	GRAVELLY SAND; reddish brown 5YR5/4; very fine to fine sand and coarse to very coarse sand 65%, gravel 30%, silt and clay <5%; non-lithified. Gravel fraction: granules to coarse pebbles, subangular to subrounded. Reaction to acid: moderate to strong.
16 - 21	GRAVELLY SAND; light brown 7.5YR6/4; very fine to fine sand and coarse sand 70%, gravel 25%, silt and clay <5%; non-lithified. Gravel fraction: granules, subangular to subrounded. Reaction to acid: moderate.
21 - 26	SANDY GRAVEL; light brown 7.5YR6/4; gravel 70%, medium to coarse sand 30%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: weak.
26 - 31	SANDY, SILTY CLAY/CLAYEY SILT; reddish brown 5YR4/4; silt and clay 75%, fine to very fine sand 25%; moderately plastic; non-lithified. Reaction to acid: weak.
31 - 41	SANDY, SILTY CLAY/CLAYEY SILT; reddish brown 5YR4/4; silt and clay 75%, very fine to fine sand 25%; moderately plastic; non-lithified. Reaction to acid: none.
41 - 46	SANDY GRAVEL AND CLAYEY SILT; reddish brown 5YR4/4; gravel 75%, very fine to coarse sand 15%, silt and clay 10%; non-lithified. Gravel fraction: granules to very coarse pebbles, subrounded. Reaction to acid: none. Some red oxidation staining.
46 - 51	SANDY GRAVEL; brown 7.5YR5/4; gravel 90%, medium to coarse sand 10%; non-lithified. Gravel fraction: granules to very coarse pebbles, subrounded. Reaction to acid: none.



LOG A-1. LITHOLOGIC DESCRIPTIONS OF DRILL CUTTINGS SAMPLES
FOR MONITOR WELL AVMW-1
AVRA VALLEY PILOT RECHARGE PROJECT
PIMA COUNTY, ARIZONA
Page 2 of 6

<u>DEPTH (feet)</u>	<u>DESCRIPTION</u>
51 - 56	SANDY GRAVEL; brown 7.5YR5/4; gravel 80%, fine to very coarse sand 15%, silt and clay <5%; sand fraction becoming finer-grained with depth; non-lithified. Gravel fraction: granules to very coarse pebbles, subrounded. Reaction to acid: none.
56 - 66	SANDY GRAVEL; brown 7.5YR5/4; gravel 75%, fine to very coarse sand 20%, silt and clay 5%; sand fraction becoming finer-grained with depth; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
66 - 71	SANDY GRAVEL; brown 7.5YR5/4; gravel 90%, fine to coarse sand 10%; non-lithified. Gravel fraction: granules to coarse pebbles, subangular to subrounded. Reaction to acid: weak.
71 - 76	SANDY GRAVEL AND SANDY, CLAYEY SILT; brown 7.5YR5/4; gravel 60%, silt and clay 25%, very fine to fine sand 15%; sandy, clayey silt is moderately plastic; non-lithified. Gravel fraction: fine pebbles to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
76 - 106	SANDY GRAVEL AND CLAYEY, SILTY SAND; brown 7.5YR5/4; gravel 85%, very fine to coarse sand 10%, silt and clay 5%; non-lithified. Gravel fraction: granules to coarse pebbles, subangular to subrounded. Reaction to acid: none.
106 - 111	SANDY GRAVEL AND SILTY, CLAYEY SAND; brown 7.5YR5/4; gravel 85%, very fine to coarse sand 10%, silt and clay 5%; silty, clayey sand is slightly plastic; non-lithified. Gravel fraction: granules to coarse pebbles, subangular to subrounded. Reaction to acid: none.
111 - 116	SANDY GRAVEL AND SILTY, CLAYEY SAND; brown 7.5YR5/4; gravel 70%, very fine to fine sand 15%, silt and clay 15%; silty, clayey sand is slightly plastic; non-lithified. Gravel fraction: granules to coarse pebbles, subangular to subrounded. Reaction to acid: none.



LOG A-1. LITHOLOGIC DESCRIPTIONS OF DRILL CUTTINGS SAMPLES
FOR MONITOR WELL AVMW-1
AVRA VALLEY PILOT RECHARGE PROJECT
PIMA COUNTY, ARIZONA
Page 3 of 6

<u>DEPTH (feet)</u>	<u>DESCRIPTION</u>
116 - 121	SANDY GRAVEL AND SANDY, CLAYEY SILT; brown 7.5YR5/4; gravel 60%, silt and clay 25%, very fine to fine sand 15%; sandy, clayey silt is moderately plastic; non-lithified. Gravel fraction: granules to coarse pebbles, subangular to subrounded. Reaction to acid: none.
121 - 156	SANDY GRAVEL AND SANDY, CLAYEY SILT; brown 7.5YR5/4; gravel 50%, very fine to fine sand and coarse sand 25%, silt and clay 25%; sandy, clayey silt is slightly plastic; non-lithified. Gravel fraction: granules to coarse pebbles, subangular to subrounded. Reaction to acid: none.
156 - 161	SANDY, CLAYEY SILT AND GRAVELLY SAND; brown 7.5YR5/4; silt and clay 40%, very fine to fine sand 35%, gravel 25%; sandy, clayey silt is moderately plastic; non-lithified. Gravel fraction: granules to coarse pebbles, subangular to subrounded. Reaction to acid: none.
161 - 176	CLAYEY, SILTY SAND/SANDY SILT AND GRAVELLY SAND; brown 7.5YR5/4; very fine to fine sand 40%, silt and clay 30%, gravel 30%; clayey, silty sand/sandy silt is slightly plastic; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
176 - 191	SANDY GRAVEL AND SANDY, CLAYEY SILT; brown 7.5YR5/4; very fine to fine sand 35%, gravel 35%, silt and clay 30%; sandy, clayey silt is slightly plastic; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
191 - 201	GRAVELLY SAND; brown to dark brown 7.5YR4/4; very fine to fine sand 60%, gravel 35%, silt and clay 5%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
201 - 211	SANDY GRAVEL AND SANDY, CLAYEY SILT; brown 7.5YR5/4; gravel 40%, very fine to fine sand and coarse sand 30%, silt and clay 30%; sandy, clayey silt is slightly to moderately plastic; coarse sand is <5% of sample; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.



LOG A-1. LITHOLOGIC DESCRIPTIONS OF DRILL CUTTINGS SAMPLES
FOR MONITOR WELL AVMW-1
AVRA VALLEY PILOT RECHARGE PROJECT
PIMA COUNTY, ARIZONA
Page 4 of 6

<u>DEPTH (feet)</u>	<u>DESCRIPTION</u>
211 - 221	SANDY GRAVEL AND SANDY, CLAYEY SILT; brown 7.5YR5/4; gravel 35%, silt and clay 35%, very fine to fine sand 30%; sandy, clayey silt is slightly to moderately plastic; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
221 - 231	GRAVELLY SAND; brown to dark brown 7.5YR4/4; very fine to coarse sand 60%; gravel 35%, silt and clay 5%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
231 - 236	SANDY GRAVEL AND SANDY, CLAYEY SILT; brown 7.5YR5/4; gravel 40%, very fine to fine and coarse sand 30%, silt and clay 30%; coarse sand is <5% of sample; sandy, clayey silt is slightly to moderately plastic; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
236 - 241	SANDY GRAVEL; SILTY SAND; AND SANDY, CLAYEY SILT; brown to dark brown 7.5YR4/4; gravel 40%, very fine to medium sand 40%, silt and clay 20%; sandy, clayey silt is moderately plastic; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
241 - 246	GRAVELLY SAND; SILTY SAND; AND SANDY, CLAYEY SILT; brown to dark brown 7.5YR4/4; very fine to medium sand 50%, gravel 30%, silt and clay 20%; sandy, clayey silt is moderately plastic; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
246 - 251	GRAVELLY SAND; SILTY SAND; AND SANDY, CLAYEY SILT; brown to dark brown 7.5YR4/4; very fine to medium sand 40%, gravel 30%, silt and clay 30%; sandy, clayey silt is moderately plastic; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
251 - 256	GRAVELLY SAND; SILTY SAND; AND SANDY, CLAYEY SILT; brown to dark brown 7.5YR4/4; very fine to medium sand 40%, gravel 40%, silt and clay 20%; sandy, clayey silt is moderately plastic; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.



LOG A-1. LITHOLOGIC DESCRIPTIONS OF DRILL CUTTINGS SAMPLES
FOR MONITOR WELL AVMW-1
AVRA VALLEY PILOT RECHARGE PROJECT
PIMA COUNTY, ARIZONA
Page 5 of 6

DEPTH (feet)	DESCRIPTION
256 - 261	SANDY GRAVEL AND CLAYEY, SILTY SAND; brown to dark brown 7.5YR4/4; gravel 50%, very fine to fine sand 30%, silt and clay 20%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
261 - 266	SANDY GRAVEL; SANDY, CLAYEY SILT; AND SANDY, SILTY CLAY; brown to dark brown 7.5YR4/4; gravel 50%, silt and clay 35%, very fine to fine sand 15%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
266 - 271	SANDY GRAVEL AND CLAYEY, SILTY SAND; brown to dark brown 7.5YR4/4; gravel 50%, very fine to fine sand 30%, silt and clay 20%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
271 - 286	SANDY GRAVEL AND SANDY, CLAYEY SILT; brown to dark brown 7.5YR4/4; gravel 40%, silt and clay 35%, very fine to coarse sand 25%; sandy, clayey silt is slightly to moderately plastic; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
286 - 306	SILTY, SANDY GRAVEL; brown to dark brown 7.5YR4/4; gravel 50%, very fine to fine sand and coarse to very coarse sand 35%, silt and clay 15%; non-lithified. Gravel fraction: granules to very coarse pebbles, predominantly fine pebbles, subangular to subrounded. Reaction to acid: none.
306 - 311	SILTY, SANDY GRAVEL; brown to dark brown 7.5YR4/4; gravel 60%, very fine to fine sand and coarse to very coarse sand 20%, silt and clay 20%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
311 - 326	SILTY, SANDY GRAVEL; brown to dark brown 7.5YR4/4; gravel 50%, very fine to fine sand 40%, silt and clay 10%; non-lithified. Gravel fraction: granules to very coarse pebbles, predominantly granules and fine pebbles, subangular to subrounded. Reaction to acid: none.



LOG A-1. LITHOLOGIC DESCRIPTIONS OF DRILL CUTTINGS SAMPLES
FOR MONITOR WELL AVMW-1
AVRA VALLEY PILOT RECHARGE PROJECT
PIMA COUNTY, ARIZONA
Page 6 of 6

<u>DEPTH (feet)</u>	<u>DESCRIPTION</u>
326 - 341	SILTY, SANDY GRAVEL; brown to dark brown 7.5YR4/4; gravel 50%, very fine to fine sand 30%, silt and clay 20%; non-lithified. Gravel fraction: granules to very coarse pebbles, predominantly granules and fine pebbles, subangular to subrounded. Reaction to acid: weak to moderate.
341 - 351	SILTY, SANDY GRAVEL; brown to dark brown 7.5YR4/4; gravel 50%, medium to coarse sand 45%, silt and clay 5%; non-lithified. Gravel fraction: granules to fine pebbles, subangular to subrounded. Reaction to acid: none.
351 - 361	SILTY, SANDY GRAVEL; brown to dark brown 7.5YR4/4; gravel 60%, fine to coarse sand 30%, silt and clay 10%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
361 - 366	CLAYEY, SILTY, SANDY GRAVEL; brown to dark brown 7.5YR4/4; gravel 65%, very fine to coarse sand 25%, silt and clay 10%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
366 - 371	SILTY, SANDY GRAVEL; brown to dark brown 7.5YR4/4; gravel 65%, very fine to coarse sand 30%, silt and clay 5%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
371 - 381	SILTY, SANDY GRAVEL; brown to dark brown 7.5YR4/4; gravel 65%, very fine to coarse sand 30%, silt and clay 5%; non-lithified. Gravel fraction: granules to very coarse pebbles, subangular to subrounded. Reaction to acid: none.
381 - 410	GRAVELLY, CLAYEY SAND; brown to dark brown 7.5YR4/4; very fine to coarse sand 50%, silt and clay 40%, gravel 10%; slightly to moderately plastic; non-lithified. Gravel fraction: granules to fine pebbles, subangular to subrounded. Reaction to acid: none.

TOTAL DEPTH DRILLED: 410 FEET

*

FOR HYDROLOGIC TESTING PURPOSES
WITHIN AN ACTIVE MANAGEMENT AREA

55-Copy

I. INSTRUCTIONS

1. COMPLETE ALL APPROPRIATE ITEMS ON THIS APPLICATION AND SIGN IN DESIGNATED PLACE
2. Mail to: 15 South 15th Ave., Phoenix, Arizona 85007.
3. Application fee is \$30.00.
4. Permit fee of \$50.00 will be requested prior to issuance of permit.
5. Use explanatory section on back for clarification, if necessary.

DO NOT WRITE IN THIS SPACE
OFFICE RECORD

Application No. 24-557543

Permit No. _____

Filed by 4-30-96 by PR

Input _____ By _____

Mailed _____ By _____

AMA TUCS 5015 WS C3

II. GENERAL DATA

1. NAME OF APPLICANT Central Arizona Water Conservation District - Attn: Tom Harbour

Mailing address 23636 North 7th Street

Phoenix AZ 85024 870-2333

City State Zip Code Telephone number

2. NAME OF LAND OWNER State of Arizona Land Department

Mailing address 1416 West Adams Street

Phoenix AZ 85007 342-1704

City State Zip Code Telephone number

3. PURPOSE OF THIS TESTING PERMIT (check only one box)

- To obtain groundwater samples not exceeding 3 acre feet per annum for testing groundwater quality in order to comply with applicable environmental controls for a period of up to 10 years. - A.R.S. § 45-319.01.A.
- To test hydrologic characteristics and conditions, including groundwater quality. Groundwater withdrawn shall not exceed 10 acre feet per year during the period of withdrawal except 90 days. - A.R.S. § 45-319.01.B.
- To withdraw more than 10 acre feet of groundwater for hydrologic testing purposes, and/or for a period greater than 90 days - include specifics of testing circumstances that require such withdrawal and/or period. - A.R.S. § 45-319.01.D.
- To withdraw groundwater to test the hydrologic characteristics of a potential artificial groundwater recharge project site, or a potential underground storage and recovery project site. The period of withdrawal may not exceed 1 year. - A.R.S. § 45-319.01.E.

4. Groundwater will be withdrawn within the AVES Valley sub-basin of the Tucson Active Management Area.

5. Please specify how the groundwater withdrawn will be put to beneficial use and the groundwater right number for that use. Groundwater will not be put to a beneficial use. Please refer to the attached letter describing the proposed test.

6. If applicant cannot reasonably put the withdrawn groundwater to a beneficial use or provide it to a rightholder, explain why. Well site is remote and no conveyance system exists to transport water to a rightholder.

DWR-0578-001



DEPTH BELOW
LAND SURFACE,
IN FEET

REMOVABLE PROTECTIVE
SHELTER

CONCRETE PAD

17-INCH BOREHOLE

14-INCH BLANK STEEL
CASING

8-INCH BLANK STEEL CASING

CASING CENTRALIZER

12 1/4-INCH BOREHOLE

CEMENT

SAND

8-INCH WELL SCREEN

GRAVEL

8-INCH BLANK STEEL CASING

BOREHOLE SLOUGH

0

19

215

217

239

288

300

305

403

410



NON-PUMPED
WATER LEVEL
(JUNE 23, 1994)

SCHEMATIC DIAGRAM OF CONSTRUCTION FOR GROUNDWATER MONITOR
WELL (D-12-11)3ebb[AVMW-1], AVRA VALLEY PILOT RECHARGE PROJECT,
PIMA COUNTY, ARIZONA





**STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
GROUNDWATER MANAGEMENT SUPPORT SECTION**
500 North Third Street - Phoenix, Arizona 85004-3903
Phone (602) 417-3470 Fax (602) 417-3423

WELL DRILLER REPORT

This report should be prepared by the Driller in all detail and filed with the Department within 30 days following completion of the well.

- Owner's Name: Central AZ Water Conservation District
Address: 23636 N. 7th ST Phoenix AZ 8 602-920-2333
Street City State Zip Telephone Number
- Drilling Firm: AZ Beeman Drilling LLC
Address: P.O. Box 3370 Apache Jct AZ 85217 602-983-2542
Street City State Zip Telephone Number
- Location: NW 1/4 NW 1/4 SW 1/4 of Section 3 Township 12S Range 11E
10 Acre 40 Acre 160 Acre
- Well Registration No. 55-552544 (Required) 0(12-11)3 CBB
- Permit No. _____ (if issued)

DESCRIPTION OF WELL

- Total Depth of Hole 405 ft
- Type of Casing Nominal 6" Steel, 1/4" wall thickness
- Diameter and length of casing 6" inches from 0 to 339 EC b/s in 390 to 390'
- Method of sealing at reduction points None
- Perforated from 339 to 390 from _____ to _____
- Size of cuts _____ Number of cuts per foot _____
- If screen was installed: Length 151 feet Diameter 6" inches Type See Remarks
- Method of construction Air Rotary Drilled / Mud Rotary Drilled
(drilled, dug, driven, bored, jetted, etc.)
- Date started June 10 1996
Month Day Year
- Date completed June 14 1996
Month Day Year
- Depth to water 288 ft. (if flowing well, so state)
- Describe point from which depth measurements were made, and give sea-level elevation if available _____
- If flowing well, state method of flow regulation _____

- Remarks: Three different screens installed
 - 239-308 b/s to 6" Keller Mass 1/2" Flow Control Screen
.075 slot
 - 308-360 b/s to 6" Keller Mass 1/2" Flow Control
Screen .04 slot
 - 360-390 b/s to 6" Johnson stainless wire wrap
.02" slot- Drilled pilot hole w/ Air Rotary to 111 b/s
- Reamed to 410' b/s, had 5' of fill

DO NOT WRITE IN THIS SPACE
OFFICE RECORD

Registration No. _____

File No. _____

Received _____ By _____

ENTERED JUL 18 1996

Entered _____

7. The specific purpose for the hydrologic testing is To conduct a pump test to determine the transmissivity of the aquifer.
8. Total amount of groundwater for which application is being made: 1 acre feet.
9. Proposed duration of the hydrologic testing 2 Days 0 Months.
10. State the testing circumstances that require withdrawal in excess of 10 acre feet or a testing period for more than 90 days: The test is planned to last 48 hours, 24 hours pumping and 24 hours recovery. Less than 0.5 acre-feet will be pumped.
11. Indicate the system by which the groundwater withdrawn for a test involving a potential recharge or storage and recovery project will be added back to the aquifer. Groundwater will be added to a dry wash which is tributary to the Santa Cruz River.

12. Groundwater to be withdrawn by means of:

A. Existing wells:

Registration No.	Location	Depth	Casing	Cas Type
SS-_____	_____	_____	_____	_____
SS-_____	_____	_____	_____	_____

B. New wells:

Registration No.	Location	Depth	Casing	Cas Type
SS- <u>557544</u>	<u>D(12-11)03.CWB</u>	<u>345</u>	<u>6 inch</u>	<u>steel</u>
SS-_____	_____	_____	_____	_____
SS-_____	_____	_____	_____	_____

13. State your plans for the well(s) after testing is completed: The well will be used to monitor water levels and sample aquifer water quality as required in ONWD's Underground Storage Facility Permit No. 71-551092.

14. If new well(s) is to be drilled, complete the following information relating to the driller:

Driller's name AE BEEMAN DRILLING, L.L.C. DWR License No. 360

Address 1341 E. US Highway 60 City Apache Junction State AZ Zip Code 85219

It is understood that the Permit, if granted, will be in accordance with the Groundwater Management Code (Title 43, Chapter 2). The permittee will be bound by the provisions of such law and the applications of the Permit issued.

I hereby certify, under penalty of perjury, that the information contained in this application is, to the best of my knowledge and belief, true, correct and complete. Tom Beeman

MONITOR WELL SC-09

DEPARTMENT OF WATER RESOURCES
99 East Virginia
Phoenix, Arizona 85004

Registration No. 35-320182

File No. D(11-11)34cbc

COMPLETION REPORT

1. Per A.R.S. 845-600, the Completion Report to be filed with the Department within 30 days after installation of pump equipment by the registered well owner.
2. Drawdown of the water level for a non-flowing well should be measured in feet after not less than 4 hours of continuous operation and while still in operation and for a flowing well the shut-in pressure should be measured in feet above the land or in pounds per square inch at the land surface.
3. The static groundwater level should be measured in feet from the land surface immediately prior to the well capacity test.
4. The tested pumping capacity of the well in gallons per minute for a non-flowing well should be determined by measuring the discharge of the pump after continuous operation for at least 4 hours and for a flowing well by measuring the natural flow at the land surface.

LOCATION OF THE WELL:

11S 11E 34 2nd NW 3rd
Township Range Section T T T

EQUIPMENT INSTALLED:

Kind of pump SUBMERSIBLE
Turbine, centrifugal, etc.

Kind of power Electric H.P. Rating of Motor 1.5
Electric, natural gas, gasoline, etc.

Pumping Capacity 52 Date installed 10-7-88
Gallons per minute

WELL TEST:

Test pumping capacity 10 Date Well Tested 7-28-88
Gallons per minute

Method of Discharge Measurement flow meter
Orifice, current meter, etc.

Static Groundwater Level 294.8 ft. Drawdown 0.5 ft.

Total Pumping Lift 295.3 ft. Drawdown _____ lbs
(Flowing Well)

I HEREBY CERTIFY that the above statements are true to the best of my knowledge and belief.

DATE Jan 9, 1989, 19__

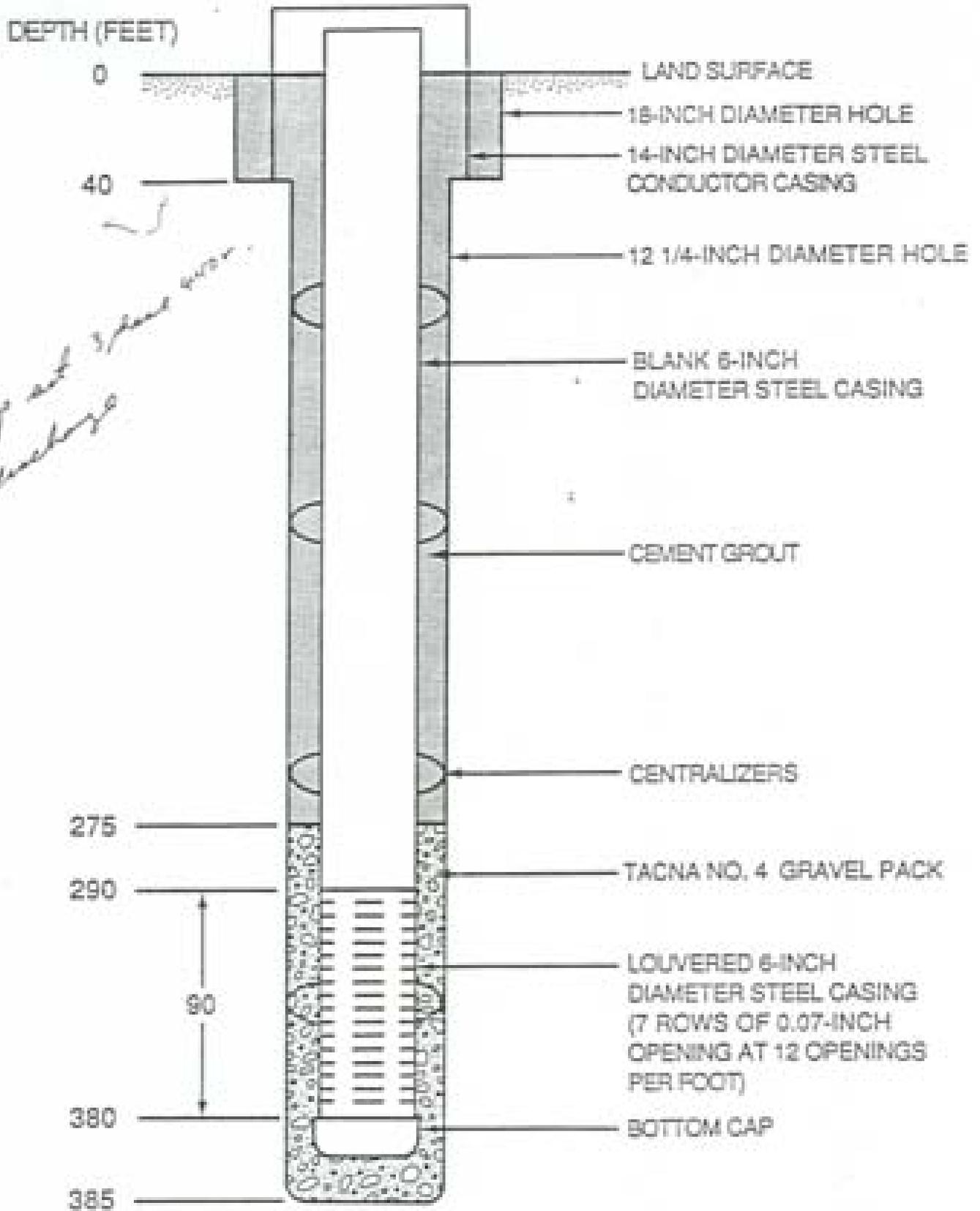
[Signature]
Signature
130 W. Congress
Address
Tucson AZ 85701
City State Zip



13. Is this well to monitor existing contamination? _____ Potential contamination? X
 Please explain Well is intended to monitor potential impacts of our wastewater treatment facilities.
14. If construction plans have been coordinated with Ar. Dept. Health Services, Environmental Health Division, who is the agency contact? _____
 If construction plans have been coordinated with Ar. Dept. Water Resources, Hydrology/ Remedial Action Division, who is the division contact? _____
15. WELL CONSTRUCTION PLAN
- a) Drilling method (mud rotary, hollow-stem auger, etc.) reverse circulation rotary
- b) Borehole diameters:
- | | | | | |
|--------------|------|------------|----|------------|
| _____ inches | from | _____ feet | to | _____ feet |
| _____ inches | from | _____ feet | to | _____ feet |
| _____ inches | from | _____ feet | to | _____ feet |
- c) Casing materials (PVC, steel, stainless steel, etc.):
- | | | | | | | |
|-----------------------|----------|--------------|------|------------|----|------------|
| material <u>steel</u> | diameter | _____ inches | from | _____ feet | to | _____ feet |
| material <u>PVC</u> | diameter | _____ inches | from | _____ feet | to | _____ feet |
| material _____ | diameter | _____ inches | from | _____ feet | to | _____ feet |
- d) Method of sealing at reductions _____
- e) Annular seal materials (cement, grout, etc.) and method of placement (tremied, circulated):
- | | | | | | |
|------------------------|-------------------------------|------|------------|----|------------|
| material <u>cement</u> | method <u>premix grouting</u> | from | _____ feet | to | _____ feet |
| material <u>cement</u> | method <u>tremied</u> | from | _____ feet | to | _____ feet |
| material _____ | method _____ | from | _____ feet | to | _____ feet |
- f) Gravel packs (state material, and whether natural or artificial):
- | | | | | |
|---------------------------------------|------|------------|----|------------|
| material <u>natural, Tacoma No. 3</u> | from | _____ feet | to | _____ feet |
| material _____ | from | _____ feet | to | _____ feet |
- g) Perforations (if pre-manufactured, please give specs of perforations or screens):
- | | | | | |
|--|------|------------|----|------------|
| type <u>slot size 0.03"; spacing 0.125"</u> | from | _____ feet | to | _____ feet |
| type <u>slots per foot - 72; rows per foot - 8</u> | from | _____ feet | to | _____ feet |
- h) Method of well development (ball, air lift, surge) air lift and surge
- i) Will surface or conductor casing extending above grade be used to protect the aquifer from additional surface contaminants during drilling and construction?
16. Include detailed construction diagram, if available: _____
17. Is the proposed well site within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials? Yes No
 If yes, a request for a variance must accompany this application pursuant to R12-15-820.

CONDITIONS

- I. Construction and abandonment standards for all wells shall be in accordance with DWR rules R12-15-811 and R12-15-814.
- II. Drilling of the well shall be completed within one (1) year after the date of Notice.
- III. A Well Driller Report, DWR-83-4-3/83, is required within 30 days of completion of drilling. A Completion Report, DWR-83-7-3/83, is required to be filed with the Department within 10 days after installation of pump equipment for monitor wells.
- IV. Pump equipment may not be installed on a well drilled for piezometer purposes. If a monitor well is pumped, pumping is limited to the minimum amount required for monitor purposes, but in no case may exceed 35 gallons per minute and an annual amount of 10 acre feet total.
- V. Special construction standards required pursuant to R12-15-871: _____



SCHMATIC DIAGRAM OF INTERMEDIATE MONITOR WELL SC-9

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
99 EAST VIRGINIA AVENUE
PHOENIX, ARIZONA 85004

#9

WELL DRILLER REPORT



This report should be prepared by the driller in all detail and filed with the Department within 30 days following completion of the well.

1. Owner Pima County Wastewater Management Dept.
130 W. Congress Tucson, AZ 85701-1317
Mailing Address
2. Driller Western Well & Pump, Inc.
120 N. 44th Street, #100 Phoenix, AZ 85034
Mailing Address
3. Location of well: Sandario Road & Santa Cruz River
4. Permit No. NONE
(if issued)

DESCRIPTION OF WELL

5. Total depth of hole 368 ft.
6. Type of casing PVC & Steel
7. Diameter and length of casing 16 in. from 0 to 35, 6 in from +1' to 380'
8. Method of sealing at reduction points Cement grout
9. Perforated from --- to ---, from --- to ---, from --- to ---
10. Size of cuts --- Number of cuts per foot ---
11. If screen was installed: Length 90 ft. Diam 6 in. Type Roscoe-Moss - 0.020"
12. Method of construction Drilled reverse rotary
drilled, dug, driven, bored, jetted, etc.
13. Date started July 11, 1988
Month Day Year
14. Date completed July 19, 1988
Month Day Year
15. Depth to water 250' and ft. (If flowing well, so state.)
16. Describe point from which depth measurements were made, and give sea-level elevation if available top at 6" Steel Casing
17. If flowing well, state method of flow regulation: N/A
18. Remarks: None

DO NOT WRITE IN THIS SPACE
OFFICE RECORD

REG. NO. 14-430183

File No. D(11-11)34cbe

ENTERED AUG 08 1988
Entered _____ By _____

MONITOR WELL SC-10

DEPARTMENT OF WATER RESOURCES
99 East Virginia
Phoenix, Arizona 85004

Registration No. 35-320129

File No. b(11-11)336cb

COMPLETION REPORT

1. Per A.R.S. 845-600, the Completion Report to be filed with the Department within 30 days after installation of pump equipment by the registered well owner.
2. Drawdown of the water level for a non-flowing well should be measured in feet after not less than 4 hours of continuous operation and while still in operation and for a flowing well the shut-in pressure should be measured in feet above the land or in pounds per square inch at the land surface.
3. The static groundwater level should be measured in feet from the land surface immediately prior to the well capacity test.
4. The tested pumping capacity of the well in gallons per minute for a non-flowing well should be determined by measuring the discharge of the pump after continuous operation for at least 4 hours and for a flowing well by measuring the natural flow at the land surface.

LOCATION OF THE WELL:

115 Township 11E Range 33 Section NE1/4NW1/4 T T T

EQUIPMENT INSTALLED:

Kind of pump Submersible
Turbine, centrifugal, etc.

Kind of power Electric (portable generator) H.P. Rating of Motor 5
Electric, natural gas, gasoline, etc.

Pumping Capacity 33 Gallons per minute Date installed _____

WELL TEST:

Test pumping capacity 20 20 Gallons per minute Date Well Tested 10-7-88

Method of Discharge Measurement flow meter
Weir, orifice, current meter, etc.

Static Groundwater Level 281.1 ft. Drawdown 0.4' ft.

Total Pumping Lift 281.5 ft. Drawdown _____ lbs
(Flowing Well)

I HEREBY CERTIFY that the above statements are true to the best of my knowledge and belief.

January 10, 1989, 19 _____

David P. Stalder
Signature

130 W. Congress
Address

Tucson AZ 85701
City State Zip

DWR-35-7-3/84



ENTERED JAN 25 1989

MONITOR/Piezometer Well
FILING FEE \$10.00

DEPARTMENT OF WATER RESOURCES
NOTICE OF INTENTION TO DRILL
MONITOR/Piezometer Well



Section 43-396, Arizona Revised Statutes and Rule R17-15-809 provide that before drilling a monitor or piezometer well, the well owner or lessee shall file a Notice of Intention to Drill on a form provided by the Department.

WELL/LAND LOCATION

1. Township 11 NW3
Range 11 E4M
Section 33

List 10-acre subdivision
SW 4, SW 4, SW 4

2. County Pima

3. Applicant:
Pima County Wastewater Management Department
Name

130 W. Congress
Address

Tucson Arizona 85701-1317
City State Zip

4. David Baker
NAME OF CONTACT PERSON

Phone: 792-8815
Pima County Wastewater Agency: Management Department

5. Owner of well:
Pima County Wastewater Management Department
Name

130 W. Congress
Address

Tucson Arizona 85701-1317
City State Zip

6. Purpose of well drilled pursuant to this Notice:
Monitor
Piezometer

7. Owner of land:
Pima County
Name

1313 E. Mission Road
Address

Tucson Arizona
City State Zip

792-8815
Telephone number

8. Construction will start:
1 4 88
Month Day Year

9. Period well will remain in use: 30 months/years

DO NOT WRITE IN THIS SPACE
OFFICE RECORD
File No. D(11-11)33 Sub
Filed 1-20-88 By ak
Input ENTERED JAN 26 1988 By
Duplicate
Mailed 1-22-88 By ak
Registration No. 55-520/29
AMA/IRA Tucson
W/S 07 - 3/8 15

GENERAL INSTRUCTIONS

Fill out this form in duplicate and mail to Department of Water Resources, Suite 1000, Virginia, Phoenix, Arizona 85004. Filing fee must accompany Notice.

I state that this Notice is filed in compliance with Rule R17-15-809 and is correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

DATE 1-15-88

David Baker
Signature of Applicant

10. For monitoring wells, is pump equipment to be installed? yes

(a) If so, what will be the design pump capacity?
30 gallons per minute

(b) Type of pump (submersible, turbine, etc.)
submersible

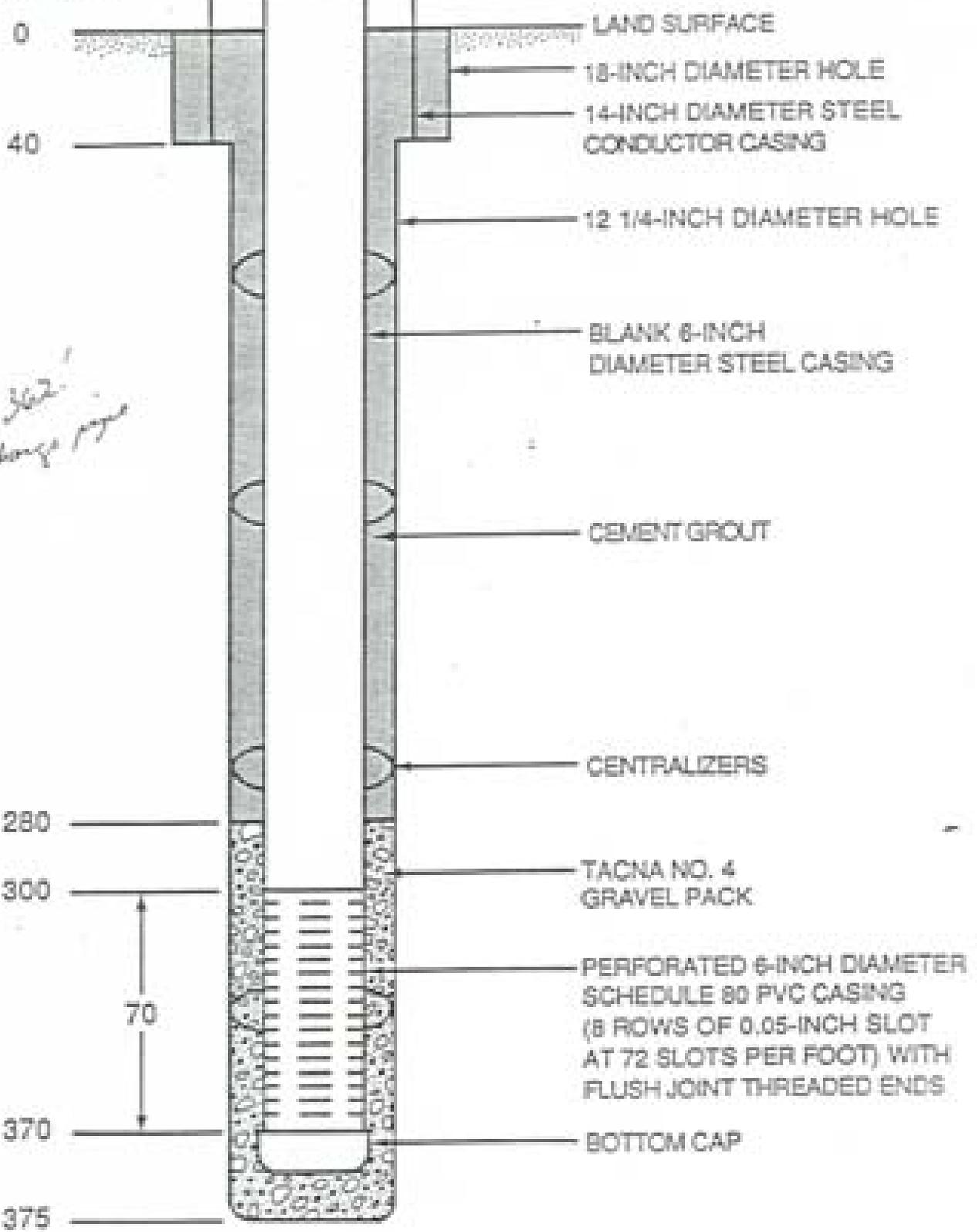
(c) What use will be made of the water?
groundwater samples

11. Proposed method of abandonment of well after project is completed:
According to Arizona Administrative Rules and Regulations

12. Drilling firm:
Western Well & Pump
Name
130 E. 44th Street #100
Address
Phoenix, Arizona 85034
City State Zip



DEPTH (FEET)



SCHMATIC DIAGRAM OF INTERMEDIATE MONITOR WELL SC-10

STATE OF ARIZONA
DEPARTMENT OF WATER RESOURCES
95 EAST VIRGINIA AVENUE
PHOENIX, ARIZONA 85004



WELL DRILLER REPORT

This report should be prepared by the driller in all detail and filed with the Department within 30 days following completion of the well.

1. Owner Pima County Wastewater Management Dept.
130 W. Congress Tucson, AZ 85701-1317
Name
Mailing Address

2. Driller Western Well & Pump, Inc.
120 N. 44th St. #100 Phoenix, AZ 85034
Name
Mailing Address

3. Location of well: Sanders Road & Santa Cruz River

4. Permit No. N/A
(if issued)

DESCRIPTION OF WELL

5. Total depth of hole 375' ft.

6. Type of casing PVC & Steel

7. Diameter and length of casing 14 in. from 0 to 40', 6 in from 0 to 370'.

8. Method of sealing at reduction points Cement grout

9. Perforated from --- to ---, from --- to ---, from --- to ---.

10. Size of cuts --- Number of cuts per foot ---

11. If screen was installed: Length 70 ft. Diam 6 in. Type PVC - Roscoe-Moss - 0.020"

12. Method of construction Drilled reverse rotary
drilled, dug, driven, bored, jacked, etc.

13. Date started April 25 1988
Month Day Year

14. Date completed May 3 1988
Month Day Year

15. Depth to water 280.55 ft. (If flowing well, so state.)

16. Describe point from which depth measurements were made, and give sea-level elevation if available Top of 6" Steel casing

17. If flowing well, state method of flow regulation: N/A

18. Remarks: None

DO NOT WRITE IN THIS SPACE
OFFICE RECORD
REC. NO. 55-520129
File No. D(11-11)33bod
Entered **ENTERED JUN 14 1988** by _____