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BEFORE THE ARIZONA CORPORATION COMMISSION

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AZ CORP COMMISSION
DOCUMENT CONTROL

COMMISSIONERS
Marc Spitzer, Chairman
William A. Mundell
Jeff Hatch-Miller
Mike Gleason
Kristin K. Mayes

IN THE MATTER OF THE APPLICATION OF PALO VERDE UTILITIES COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY.	Docket No. SW-03575A-03-0586
IN THE MATTER OF THE APPLICATION OF SANTA CRUZ WATER COMPANY FOR AN EXTENSION OF ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY.	Docket No. W-03576A-03-0586

NOTICE OF COMPLIANCE WITH DECISION NO. 67240

In compliance with Decision No. 67240 in the above-captioned dockets, Palo Verde Utilities Company submits a copy of the approved CAAG § 208 Plan amendment that covers the extension area in this docket.

RESPECTFULLY submitted this 5th day of October 2004.

ROSHKA HEYMAN & DEWULF, PLC

By _____

Raymond S. Heyman
Michael W. Patten
One Arizona Center
400 East Van Buren Street, Suite 800
Phoenix, Arizona 85004
(602) 256-6100

Original + 15 copies of the foregoing filed this 5th day of October 2004, with:

Docket Control
ARIZONA CORPORATION COMMISSION
1200 West Washington
Phoenix, Arizona 85007

Copies of the foregoing hand-delivered/mailed this 5th day of October 2004, to:

Chairman Marc Spitzer
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Phoenix, Arizona 85007

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Commissioner Jeff Hatch-Miller
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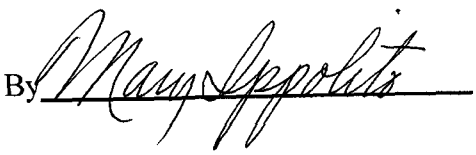
By 

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1

ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.adeq.state.az.us

Janet Napolitano
Governor

Stephen A. Owens
Director

January 20, 2004

Ms. Alexis Strauss, Director
EPA Region IX, Water Division
75 Hawthorne Street (WTR-1)
San Francisco, CA 94105

Dear Ms. Strauss:

Pursuant to Section 208 of the Clean Water Act and 40 CFR 130.6(e), I certify that the 208 Plan Amendment for the Palo Verde Utilities Company, L.L.C. is consistent with both the State of Arizona's and the Central Arizona Association of Governments' Water Quality Management Plans.

As the Governor's designee for the State's Water Quality Management Program, I hereby transmit this amendment to EPA for review.

Sincerely,

for Stephen A. Owens
Director

Enclosure

cc: Cheryl McGovern, Water Division, EPA Region IX, (WTR-4)
Edwina Vogan, Watershed Management Unit, ADEQ

PINAL COUNTY
BOARD OF SUPERVISORS

November 4, 2003

Ms. Maxine Leather
Executive Director
Central Arizona Association of Governments
271 Main Street
Superior, Arizona 85273

Dear Ms. Leather,

Pinal County has reviewed the plans for the Palo Verde Utilities Company. We concur with their efforts and recommend CAAG proceed with the public 208 Amendment process.

Sincerely,

Stanley D. Griffis, Ph.D.
Pinal County Manager

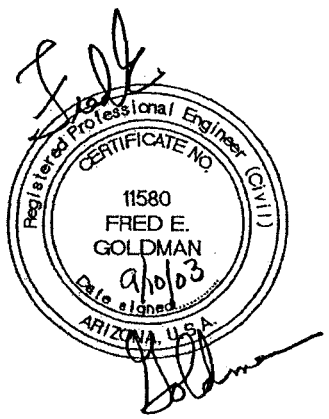
SDG/rp

CAAG 208 WATER QUALITY PLAN AMENDMENT

FOR

PALO VERDE UTILITIES COMPANY, L.L.C.

PINAL COUNTY, ARIZONA



Prepared by:

GTA ENGINEERING, INC.

Consulting Engineers

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September 12, 2003

GTA No. 00260

CAAG 208 WATER QUALITY PLAN AMENDMENT
FOR
PALO VERDE UTILITIES COMPANY, L.L.C.

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1.0 OVERVIEW

The report is an amendment to the CAAG 208 Area Wide Quality Management Plan and will provide planning information on the expansion of the existing Water Reclamation Plant (WRP) and service area for Palo Verde Utilities Company. The proposed plant is located one and a half miles east of Arizona Highway 347 (Maricopa Highway), and is one quarter of a mile south of the Gila River Indian Community. The 25 square mile service area is in the Maricopa area. Most of the service area is north of the Union Pacific Railroad, south of the Gila River Indian Community, and extends about six miles west and seven miles east of Arizona Highway 347 (Maricopa Highway). See Exhibit 1.

A CAAG 208 Plan Amendment for Palo Verde Utility Company was approved in September 1997. That plan included a 300,000 GPD aerated lagoon followed by mechanical plants up to a capacity of 2.25 MGD. The service area included the Rancho El Dorado Project and an additional 3750 dwelling units within 3 miles.

The proposed service area in general encompasses approximately 25 square miles with an estimated 71,600 home sites, golf courses, open space and parks, schools, and some commercial areas. Maximum flow for the WRP at build out is 13.0 MGD. The WRP will utilize a sequencing batch reactor process that will be built in phases to accommodate development. The plant effluent will be reclaimed for irrigation of golf courses, parks, lakes or discharged into the Santa Cruz Wash about one mile south of the Gila River Indian Community.

The boundaries of the planning area are shown in Exhibit 2. Following is a list of the Sections in the 25 square mile sewage management service area:

Full Sections	*Partial Sections*	*Township*	*Range*
	13, 14, 15	4 South	2 East
13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 26, 35	18, 19, 25, 27, 29, 34, 36	4 South	3 East
19, 29, 30, 31, 32	18, 20	4 South	4 East
	1	5 South	3 East
4, 5,	6, 8, 9, 10, 15	5 South	4 East

2.0 BACKGROUND AND SUMMARY

Currently Palo Verde Utilities Company, L.L.C. (the Company) has a 300,000 gpd aerated lagoon plant servicing the Rancho El Dorado project. The lagoons are currently treating flows of approximately 200,000 gallon per day. The lagoons will be converted to emergency effluent storage. The Company has obtained an Aquifer Protection Permit (APP# 105228) for a new 2.25 MGD facility of which the first 1 MGD plant is under construction and is expected to be operational in October, 2003. This is the first phase of the proposed 13.0 MGD facility described in this 208 Amendment. The WRP site is laid out to accommodate the existing and all future WRP expansions in the northwest quarter of Section 13, T4S, R3E.(See Exhibit 3)

The original 208 Amendment anticipated growth west and south of the Rancho El Dorado. The Plan states," ....additional residential development will occur within a 3 mile radius to the west and south of the Rancho El Dorado development. To serve this future area development, the water utility may increase its delivery and storage capacity and the sewage utility may increase the size of the central treatment facilities to a total treatment capacity of 2.25MGD. This is based on 1.5 MGD for the Rancho El Dorado project and an allowance of .75 MGD for the additional expansion of the existing plant during Stage IV, making a total plant capacity of 2.25 MGD." See Exhibit 2.

The original 208 Amendment was needed to provide service for Sections 13,14 and the eastern portion of Section 15 up to John Wayne Highway in T4S, R3E. This area was included in the current Certificate of Convenience and Necessity(CC&N) for service to the Rancho El Dorado subdivisions. The Company has applied for an expansion of the CC&N from the Arizona Corporation Commission (ACC) for adjacent properties within the proposed 25 mile service area. See Exhibit 4.

Effluent is currently used to irrigate farm land in Section 13, T.4S., R3E. The new 1 MGD plant and future expansions will be producing A+ effluent which will be used to irrigate The Duke Golf Course and other developments nearby. (See Exhibit 5) The Company has applied for a AZPDES Permit which will be used when flows exceed reuse requirements.

3.0 SERVICE AREA

Currently, the 25 square mile planning area is mostly agricultural in nature with multiple ownerships. The Company wastewater management facility serves the Rancho El Dorado development and will be serving several proposed developments in Sections 15, 21, 22, and 23 of T4S, R3E. Please see Exhibit 4 extension of CC&N currently being considered by the Arizona Corporation Commission.

The 387 Improvement District wastewater treatment plant is located in the northwest quarter of Section 28, Township 4South, Range 3 East, about 5 miles from the Palo Verde facilities. The planing area for 387 Improvement District is located in Sections 25, 27, 28, 33, 34, and 36of Township 4 South, Range 3 East; Sections 21, 28, and 34 of Township 4 South, Range 4 East; and Sections 2, 3, 11 and 12 of Township 5 South, Range 3 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona. The plant is expected to begin operations in 2004. See Exhibit 2.

The water company serving Rancho El Dorado is the Santa Cruz Water Company, L.L.C. (SCWC). SCWC also has a request before the ACC to increase its CC&N to conform to the Company's CC&N area. See Exhibit 3. There are no other ACC certificated areas in the proposed planning area.

4.0 PROJECT POPULATION AND WASTEWATER FLOWS

The Company began sewer service to the Rancho El Dorado development in 1999 with a 0.3 MGD aerated lagoon wastewater treatment plant. The aerated lagoons plant is soon to be replaced by a new 1 MGD wastewater treatment plant expected to be in operation October 2003. New plant expansions will be added as the planning area develops and flows increase. Provisions have been made to expand to a 13.0 MGD if necessary. Current wastewater flows have averaged 160 GPD per dwelling unit.

Table1 shows the project service area flows and population for each Section of the planned area based on 210 GPD per dwelling unit which is based on 160 GPD from each home and 50 GPD from commercial and school flows.

Table 1
Palo Verde Utilities Company Service Area
Population and Wastewater Flow Projections - Per Section

Section	Dwelling Units	Population	Projected Average Daily Flow (GPD)
Township 4 South, Range 2 East			
15	1,400	3,500	294,000
14	1,120	2,800	235,200
13	1,400	3,500	294,000
Township 4 South, Range 3 East			
13	2,240	5,600	470,400
14	2,240	5,600	470,400
15	2,240	5,600	470,400
16	2,240	5,600	470,400
17	2,236	5,590	469,560
18	1,360	3,400	285,600
19	840	2,100	176,400
20	2,240	5,600	470,400
21	2,240	5,600	470,400
22	2,240	5,600	470,400
23	2,240	5,600	470,400
24	2,240	5,600	470,400
25	840	2,100	176,400
26	2,236	5,590	469,560
27	560	1,400	117,600
29	840	2,100	176,400
34	1,680	4,200	352,800

Table 1 - Continued
Palo Verde Utilities Company Service Area
Population and Wastewater Flow Projections - Per Section

Section	Dwelling Units	Population	Projected Average Daily Flow (GPD)
35	2,240	5,600	470,400
36	860	2,150	180,600
Township 4South, Range 4 East			
18	1,120	2,800	235,200
19	2,240	5,600	470,400
20	1,120	2,800	235,200
30	2,240	5,600	470,400
29	2,240	5,600	470,400
31	2,240	5,600	470,400
32	2,240	5,600	470,400
Township 5 South, Range 3 East			
1	280	700	58,800
Township 5 South, Range 4 East			
6	1,400	3,500	294,000
5	2,230	5,575	468,300
4	2,240	5,600	470,400
8	840	2,100	176,400
9	1,960	4,900	411,600
10	1,120	2,800	235,200
15	800	2,000	168,000
TOTAL	**62,082**	**155,205**	**13,037,220**

The wastewater flow projection for the service area is approximately 13.0 MGD.

5.0 PROPOSED WASTEWATER TREATMENT PLANT

The existing lagoon wastewater treatment plant site is located in the Northwest quarter of Section 13, T4S, R3E in the Rancho El Dorado development 1,000 feet south of the Gila River Indian Community, Arizona, and about 1 ½ miles east of SR-347, Pinal County. The existing aerated lagoons will be closed when the new 1 MGD plant becomes operational and will be utilized for effluent storage. Current sewage flows are approximately 200,000 GPD and the new plant will have a design capacity of 1 MGD, for the first phase with an ultimate facility capacity of 13.0 MGD. The location of the plant is shown in Exhibit 3.

Construction impacts for each new addition to the WWTP will be minimal. The site has been laid out to accommodate the expansions by use of common walls when possible. Yard piping and pump stations are sized to accommodate full build-out and to maintain all construction activities within the WWTP site. The site is master-planned to allow the construction of new phases with minimal interference with operations.

Operational impacts will be minimal. Chlorine usage will be eliminated with the activation of the UV disinfection system. Spent ultraviolet (UV) lamps will be disposed by returning to the manufacturer for proper disposal. Oils and grease collected from equipment maintenance will be stored in secure containers until they are picked up by an approved grease and oil recycler. The diesel fuel tank has a retention wall around the slab to prevent any spills flowing to the ground and contaminating the groundwater. Spent charcoal used for odor control will be collected by the supplier and re-generated.

The new plant will be enclosed and include odor control. The plant will have full noise, odor and aesthetic control. The ADEQ setbacks for the facility will be 350 feet (AAC R18-9-B201-I)

Influent sewage will be pumped into the headworks where screening, grit removal, and flow measurement will occur. Screenings and grit will be removed, dewatered, and disposed of at a landfill. Secondary treatment will include BOD_5 and TSS removal and nitrification/denitrification for nitrogen removal. The treatment plant is a sequencing batch reactor that provides biological treatment with nitrification, dentrification and clarification in one tank. The effluent will be decanted into a surge tank and then pumped to a tertiary filter (automatic backwash sand filter) followed by disinfection using UV lamps. Excess sludge will be wasted to an aerobic digester where it will be stabilized to a Class B sludge and de-watered using a belt press. Ultimate

sludge disposal will be to a landfill or permitted land application. See Exhibit 7 for a process flow diagram.

6.0 EFFLUENT MANAGEMENT

The treatment plant facilities will treat the sewage to a "Class A+" effluent quality for irrigation of golf courses, recreational lakes, parks and landscaping. An effluent distribution system is planned so projects can utilize effluent for recreational lakes and landscape irrigation. A water balance shows that the available agricultural land can handle flows to 1 MGD. Irrigation will be shifted from the agricultural land to landscaping, lake use, and golf course irrigation as these facilities develop. When the Section 24 (T4S, R3E) land is retired from agriculture, the excess flows, which will occur during portions of the winter months, will be discharged to the Santa Rosa Wash, see Exhibits 5, which runs north through the Rancho El Dorado Project. The Company has applied for an AZPDES Permit. The permit application is for 2.25 MGD, the flow rate of the existing 208 plan and will be increased when this plan is approved. Discharge will occur one mile south of the Gila River Indian Community boundary. The wash discharges into the Santa Cruz Wash which then meets with the Gila River, about 17 miles north of the discharge point. The effluent will be denitrified, tertiary treated and disinfected prior to release into the receiving wash and will exceed the water quality requirements for the Santa Cruz River.

7.0 REQUIRED PERMITS

ADEQ has been advised of this 208 Amendment Application by letter dated May 7, 2003. (See Attachment B)

Following is a summary of the permit requirements that are required for the wastewater management facility.

7.1 Aquifer Protection Permit (APP)

The State Aquifer Protection Permit (APP) Program was established by the Environmental Quality Act (EQA) and is primarily designed to regulate facilities that may discharge to an aquifer. An individual APP permit is required for all new wastewater treatment plant facilities and all such facilities must be constructed and operated to meet the greatest degree of discharge reduction achievable. The company has an Aquifer Protection Permit (APP# 105228)

which allows for the facility to expand and operate up to 2.25MGD. When the WWTP is expanded, the APP will be modified to correspond with other permits.

7.2 Effluent Reuse Permit

Type 2 Reclaimed Water General Permits are required for direct use of reclaimed water which includes irrigation of The Duke Golf Course, use in the community lakes, and irrigation of landscaping. Permit applications are in process for the proposed reuse areas.

7.3 Section 208 Plan Amendment

In accordance with Section 208 of the Clean Water Act, an Areawide Water Quality Management Plan was prepared for the Central Arizona Association of Governments (CAAG). The Water Quality Management Plan has continually been updated through several Plan Amendments and updates. This document will serve as the 208 Water Quality Plan Amendment for the Company. The Central Arizona Association of Government (CAAG) is a designated Areawide Water Quality Management Planning Agency for Pinal and Gila Counties.

7.4 AZPDES Permit

An AZPDES permit for discharge into the Santa Rosa Wash has been prepared and submitted to ADEQ for review and approval on May 5, 2003.

7.5 Sludge Management

Part 503 of the Clean Water Act and Chapter 9, Title 18, of the Arizona Administrative Code specifies the quality of sewage sludge that may be applied to land, distributed and marketed, placed in a sludge disposal facility, or incinerated in a sewage sludge incinerator. The sludge generated at the proposed wastewater treatment plant will be stabilized and dewatered and then disposed of at an operating sanitary landfill certified by the ADEQ to handle and dispose of sludge from wastewater treatment plants. Protection of the groundwater at the landfill location will be provided by the landfill facility.

The closest landfill accepting sludge for disposal is:

Butterfield Station Municipal Solid Waste Landfill
99th Avenue, one mile north of Highway 238
Mobile, Arizona

Operated by: Waste Management, Inc.
2425 South 40th Street
Phoenix, Arizona 85034 Phone: (602) 256-0630

Waste Management, Inc. has agreed to accept sludge from the Company's wastewater treatment plant at Butterfield Station Municipal Solid Waste Landfill. The life expectancy of the landfill is forty (40) to fifty (50) years.

An AZPDES Storm Water Pollution Prevention Permit will be required for the entire project including the treatment plant site work. The contractor for the facilities is responsible to obey all AZPDES Permit regulations relevant to construction sites to prevent surface water and groundwater contamination. All hazardous materials and potential pollutants shall be stored onsite in appropriate storage areas which are constructed to contain any spills or runoff of hazardous materials. Retention basins, silt traps, and other sediment barriers are to be provided at the site to filter sediment from storm water runoff leaving the site. The contractor shall keep the site clean and have covered dumpsters on site which are emptied regularly.

7.6 Local Floodplain and Drainage Regulations

The Santa Rosa Wash bisects the Rancho El Dorado project. The wastewater treatment plant is located approximately one mile east of the Santa Rosa Wash and is out of the 100-year floodplain.

7.7 Construction Permits (404/401 permits)

There are no non-point issues related to the wastewater treatment plant. If an issue does occur, the contractor will be required to obtain the necessary permits.

7.8 Air Quality Permit

An Air Quality Permit will be obtained from Pinal County.

8.0 CONSTRUCTION

The ultimate plant wastewater flow is approximately 13.0 MGD. All flows are from existing and new residential developments within the service area. Construction of the 1 MGD plant began in January 2003. Additional phases will be added to accommodate the future growth. Build out is expected to take 20 years, with completion projected for 2023. The contractor for the construction of the new 1 MGD wastewater treatment plant is Aquatec, Inc. Severn-Trent Services is under contract to operate and maintain the WWTP.

The new treatment units will be built in increments of 1, or 2 MGD units. As the flows increase, it may be cost effective to increase the unit capacity constructed. All infrastructure and discharge lines will be sized for ultimate flows. Some process units like odor control, solids de-watering, and generators will be sized to multiple phases. Construction will follow non-point source requirements to control stormwater runoff. Below is a table which shows a preliminary schedule of treatment plant expansions.

Table 2
Palo Verde Utility Company
Construction Phases

Phase	Year Completed	No. of Residential Units	Estimated Population per Dwelling	Treatment Capacity (MGD)	Capital Cost
I	2003	4,750	11,875	1.0	$5Million
II	2005	14,500	36,250	3.0	$10Million
III	2008	21,500	53,750	4.5	$7.5Million
IV	2010	28,500	71,250	6.0	$7.5Million
V	2013	35,500	88,750	7.5	$7.5Million
VI	2015	42,500	106,250	9.0	$7.5Million
VII	2018	49,500	123,750	10.5	$7.5Million
VIII	2020	56,500	141,250	12.0	$7.5Million
X	2023	62,082	**155,205**	**13.0**	$5Million
					Total: $65Million

9.0 ENVIRONMENTAL IMPACTS/BENEFITS

The wastewater treatment plant for the developments will provide benefits to the area:

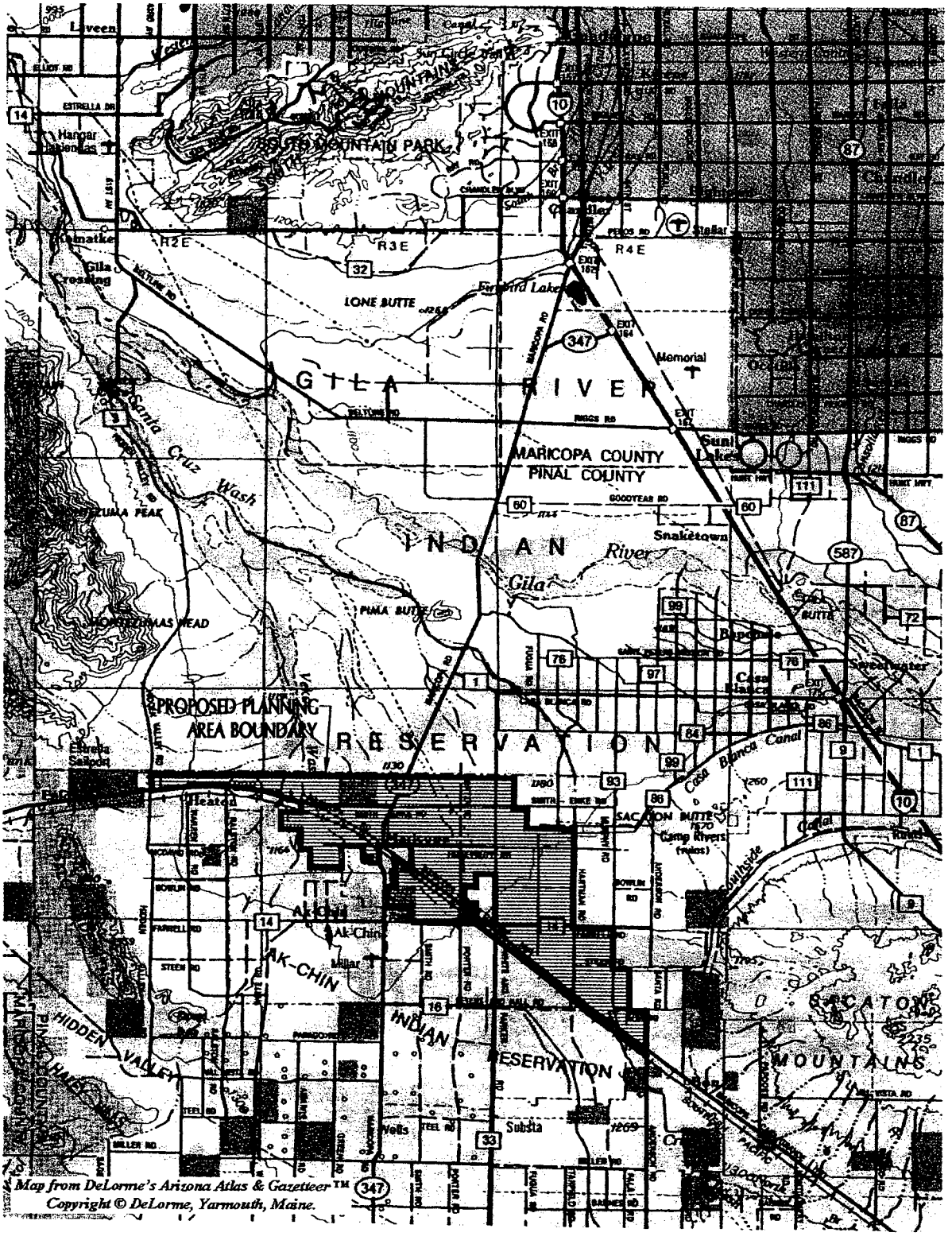
- Centralized wastewater treatment will be provided, reducing the potential for groundwater contamination from overuse of septic tanks with leach fields in the area.
- The treated effluent from the wastewater treatment plant will be used to irrigate the golf courses and other open area facilities.
- The expansion of the wastewater treatment plant will allow the area to accommodate growth in an environmentally safe manner.
- The development of new communities will fulfill a growing demand for affordable homes in high quality master planned communities, while retail uses within the community will provide an increased tax and employment base for Pinal County.
- The mechanical plants will meet aquifer water quality standards. Plant will be enclosed and have odor control.
- The golf course and landscaped areas will use best management practices to prevent pollution of the groundwater.

10.0 FINANCIAL INFORMATION

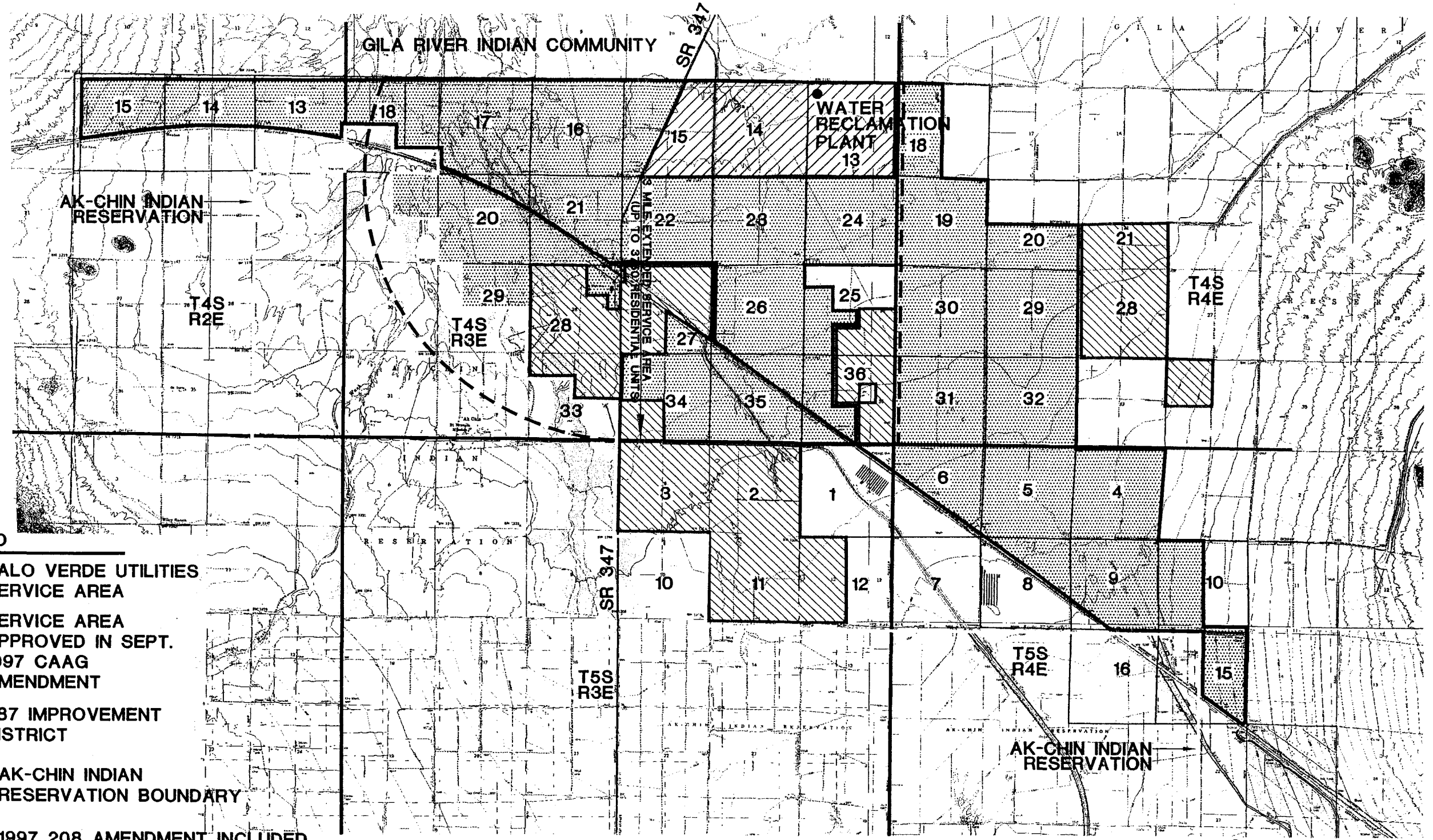
Palo Verde Utilities Company, L.L.C. is owned 1% by Phoenix Utility Management, L.L.C. and 99% by Phoenix Capital Partners, L.L.C. The Company currently has a Certificate of Convenience and Necessity for wastewater service for Section 13, 14, and 15, Township 4 South, Range 3 East, as shown in Exhibit 4. The Company is in the application process with the Arizona Corporation Commission to expand the Certificated Area.

The Company is responsible for the operation and maintenance of the sewage management system in their service area. The Company's customers will be paying user fees based upon fair value as determined by the Corporation Commission.

Capacity charges are assessed to the developers to fund the capital investments when expanding the WWTP. Effluent re-users will compensate the Company for treatment and delivery costs. The Company will fund the plant construction. Any portion of pipelines and interceptors constructed within a development by a developer will be conveyed to the Company under a main extension agreement.



GTA ENGINEERING, INC. CONSULTING ENGINEERS 1990 W CAMELBACK RD. STE. 401 PHOENIX, AZ (602)246-7759	**PALO VERDE UTILITIES** **LOCATION MAP** MAY 2003	EXHIBIT 1



LEGEND

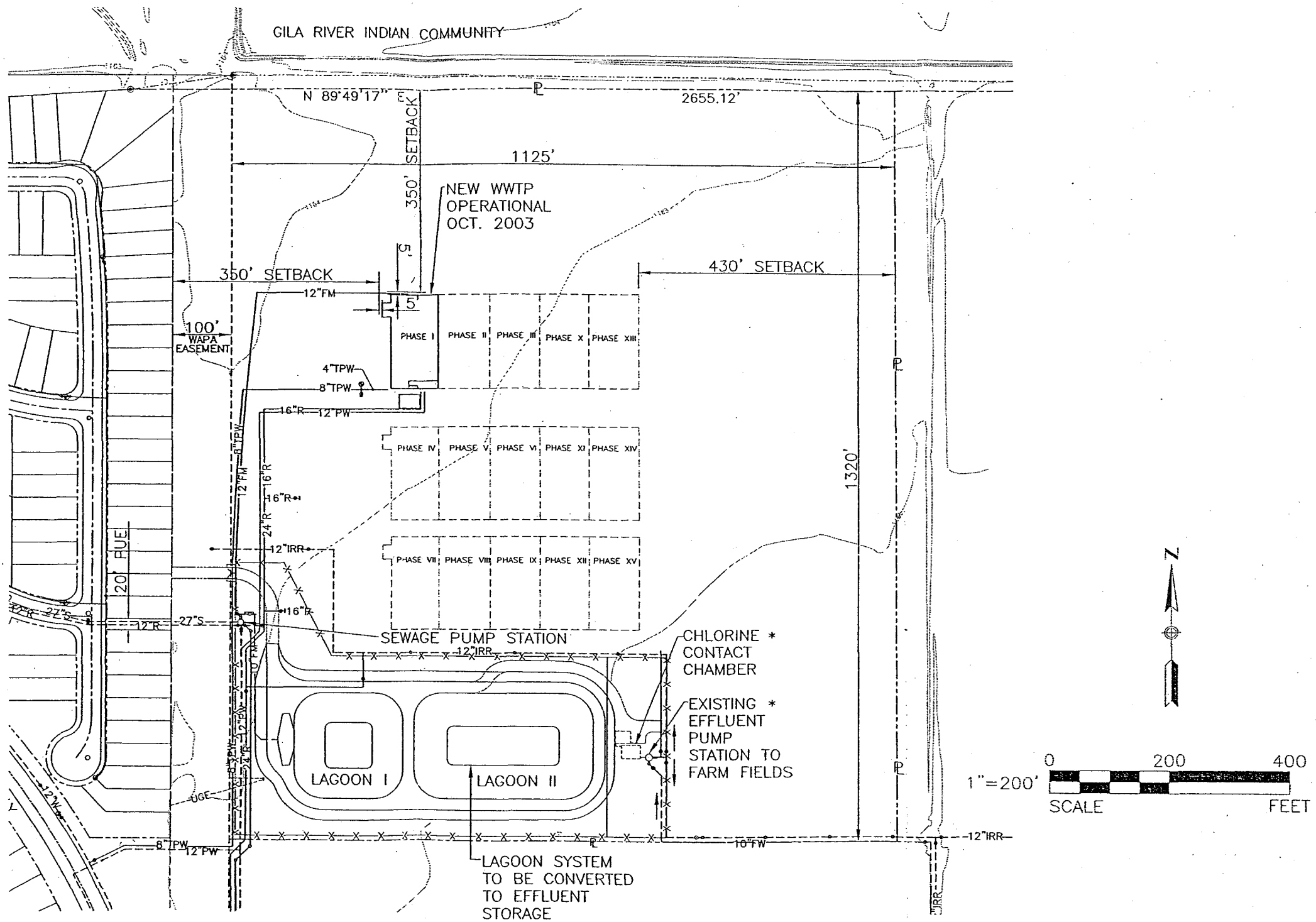
- PALO VERDE UTILITIES SERVICE AREA
- SERVICE AREA APPROVED IN SEPT. 1997 CAAG AMENDMENT
- 387 IMPROVEMENT DISTRICT
- AK-CHIN INDIAN RESERVATION BOUNDARY
- 1997 208 AMENDMENT INCLUDED SERVICE 3,750 UNITS WITHIN 3 MILES OF ORIGINAL SERVICE AREA

GTA ENGINEERING, INC.
CONSULTING ENGINEERS
1990 W CAMELBACK RD. STE. 401
PHOENIX, AZ (602)246-7759

PALO VERDE UTILITIES
SERVICE AREA MAP

JULY 2003

EXHIBIT 2



* TO BE DECOMMISSIONED

GTA ENGINEERING, INC.
CONSULTING ENGINEERS
1990 W CAMELBACK RD. STE. 401
PHOENIX, AZ (602)246-7759

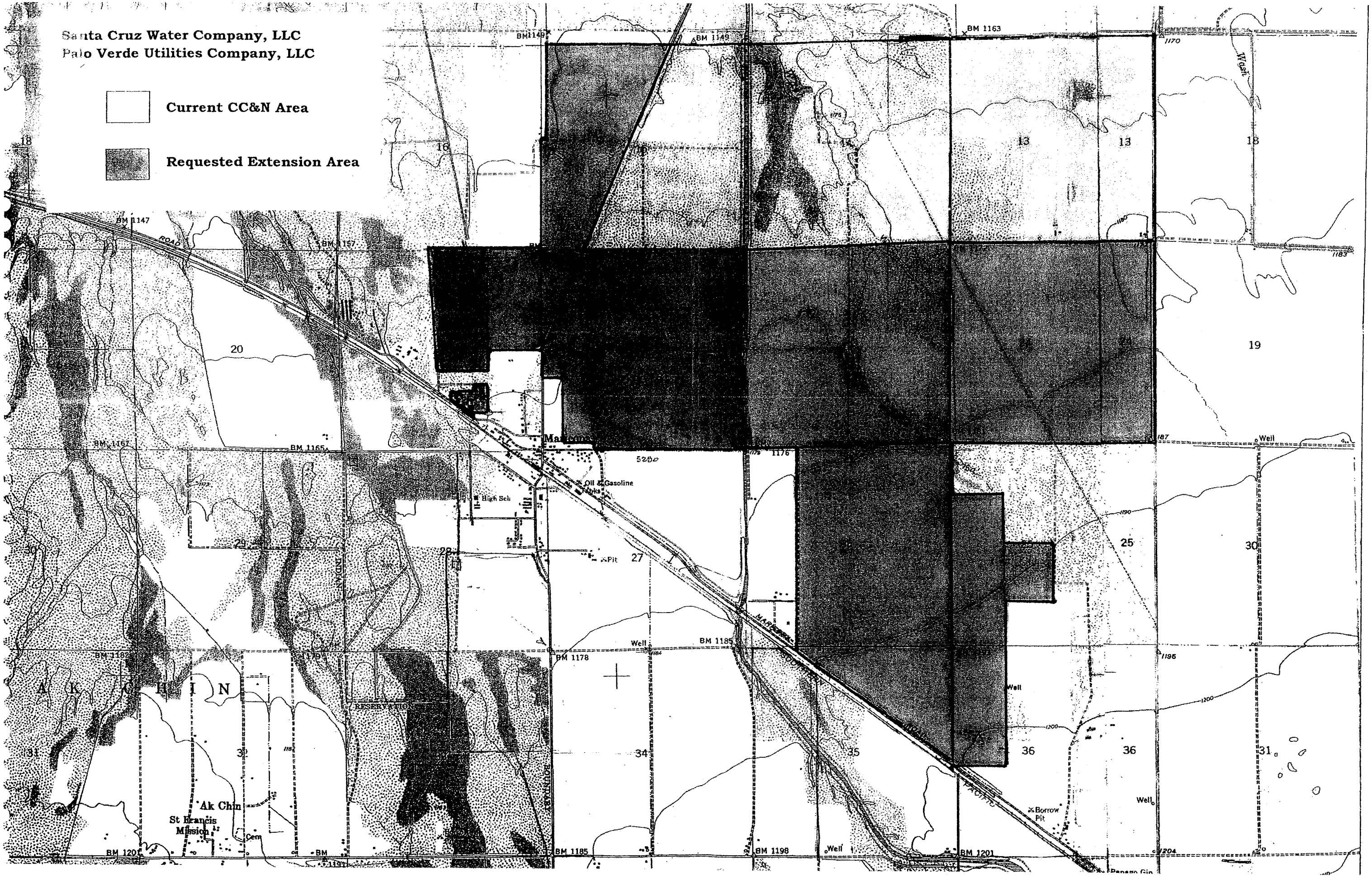
PALO VERDE UTILITIES COMPANY
WATER RECLAMATION PLANT
SITE PLAN
JULY 2003

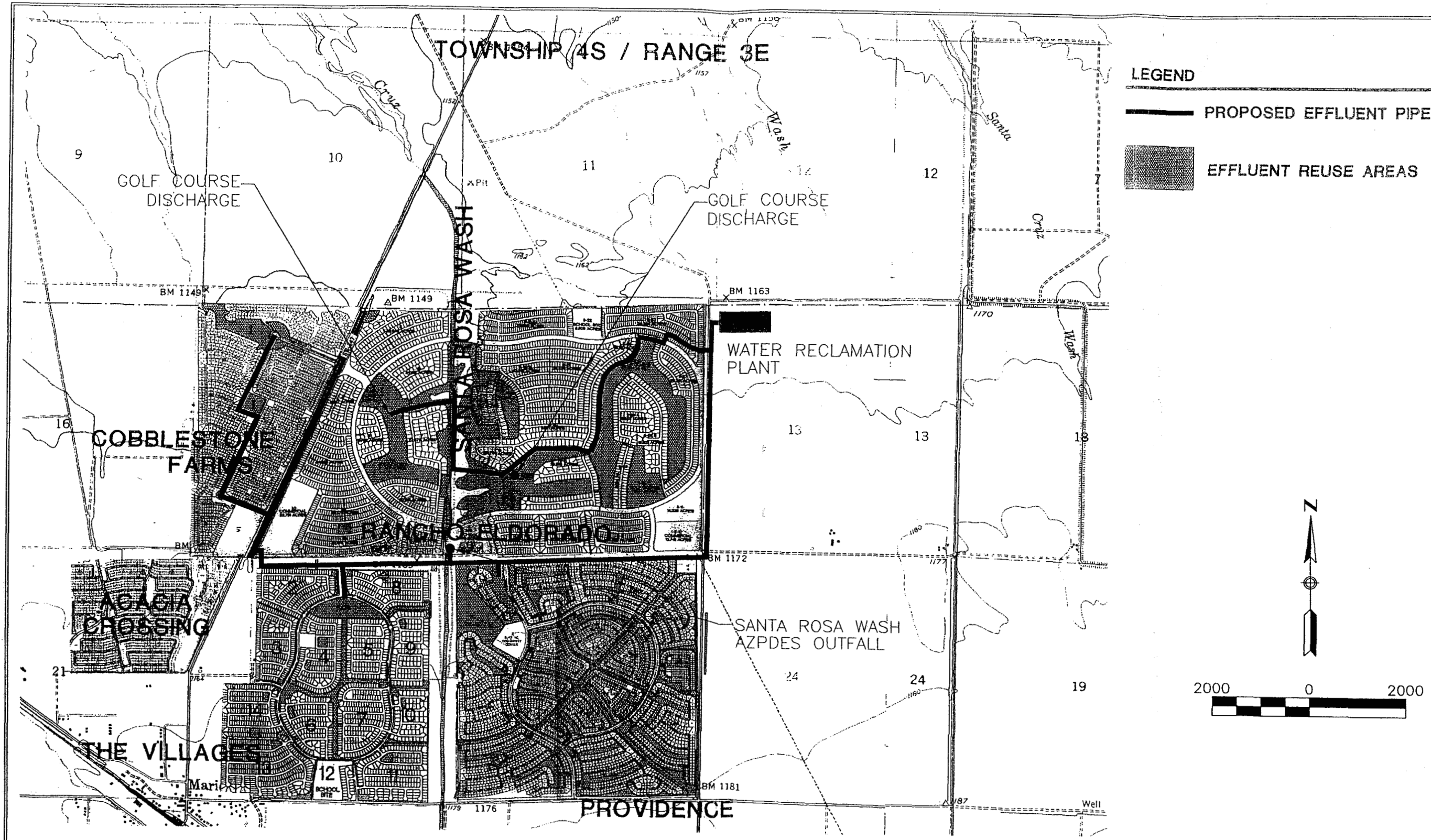
EXHIBIT 3

Santa Cruz Water Company, LLC
Palo Verde Utilities Company, LLC

Current CC&N Area

Requested Extension Area



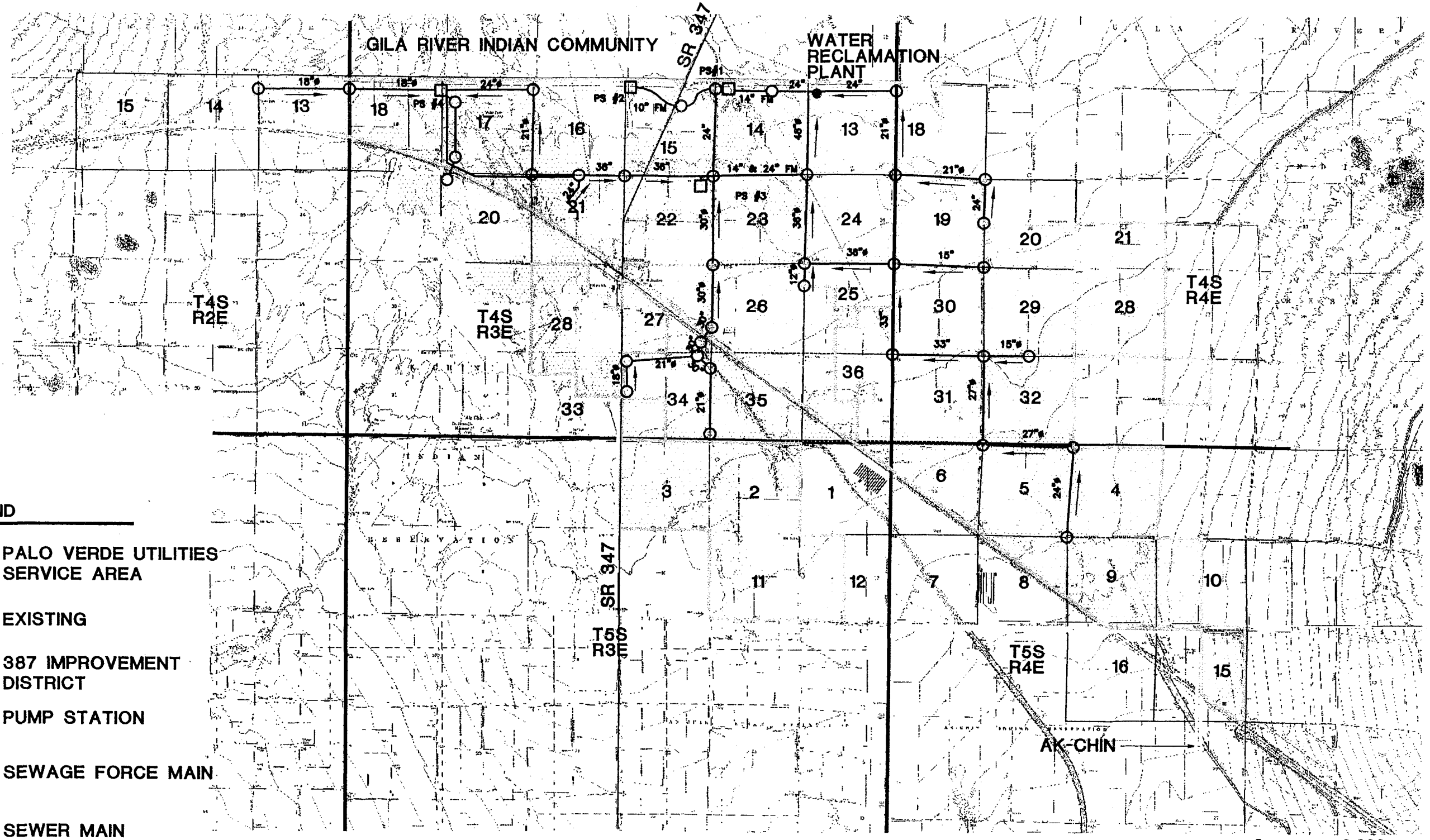


GTA ENGINEERING, INC.
CONSULTING ENGINEERS
1990 W CAMELBACK RD. STE. 401
PHOENIX, AZ (602)246-7759

PALO VERDE UTILITIES COMPANY
EFFLUENT MANAGEMENT PLAN

JULY 2003

EXHIBIT 5



LEGEND

- PALO VERDE UTILITIES SERVICE AREA
- EXISTING
- 387 IMPROVEMENT DISTRICT
- PUMP STATION
- SEWAGE FORCE MAIN
- SEWER MAIN

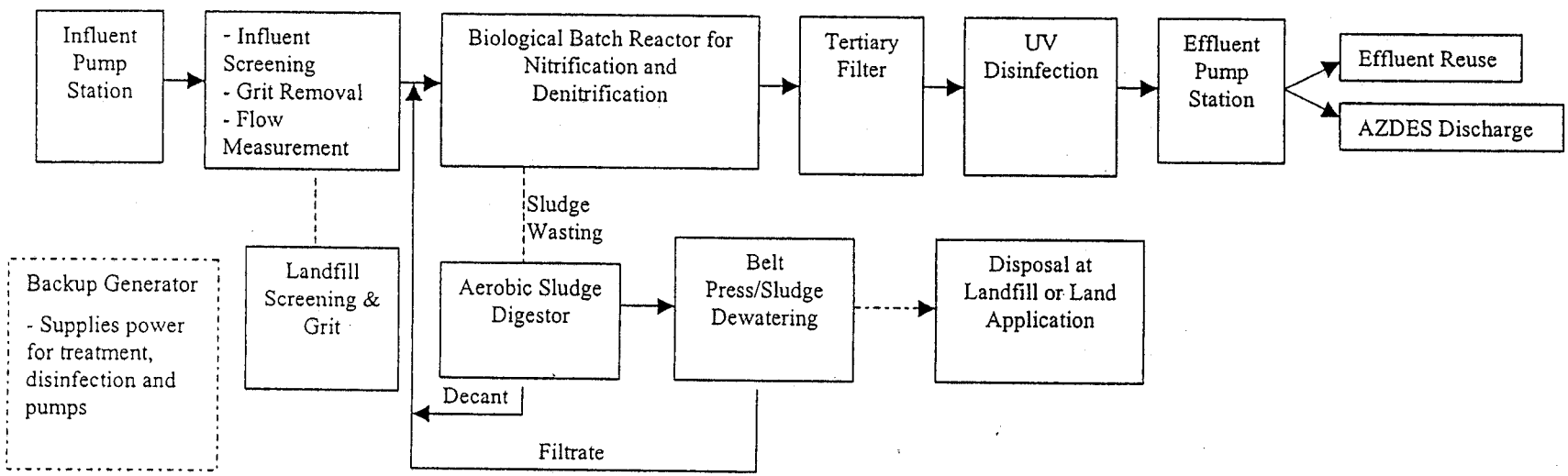
GTA ENGINEERING, INC.
CONSULTING ENGINEERS
1990 W CAMELBACK RD. STE. 401
PHOENIX, AZ (602)246-7759

PALO VERDE UTILITIES
TRUNK SEWER MAP

JULY 2003

EXHIBIT 6

PALO VERDE UTILITIES COMPANY, L.L.C.
PROCESS FLOW DIAGRAM



Narrative Description: The plant will be enclosed and include odor control. Influent sewage will be pumped into the headworks where screening, grit removal, and flow measurement will occur. Screening and grit will be dewatered and disposed of at a landfill. Secondary treatment will include BOD_5 and TSS removal and nitrification/denitrification for nitrogen removal. The process is a sequencing batch reactor that provides aerated bioligical treatment with nitrification anoxic denitrification and clarification in one tank. Sludge will be wasted to an aerobic digestor. Effluent will be decanted into a surge tank and then pumped to a tertiary filter (automatic backwash sand filter) followed by UV disinfection. Waste sludge will be stabilized to a Class B sludge in an aerobic digestor and dewatered using mechanical dewatering (belt press). Ultimate sludge disposal will be to a landfill or permitted land application.

GTA ENGINEERING, INC.
ALLJOBSCZ:PALOVERDE/NPDES/FLOWDIAGRAM

JULY 2003

Exhibit 7

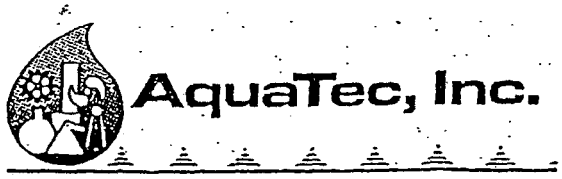
208 AMENDMENT CHECKLIST
Section 208 Clean Water Act
40 CFR Part 130.6

REQUIREMENT	PROVIDE BRIEF SUMMARY ON HOW REQUIREMENTS ARE ADDRESSED	ADDRESSED ON PAGE:
AUTHORITY Proposed Designated Management Agency (DMA) shall self-certify that it has the authorities required by Section 208(c)(2) of the Clean Water Act to implement the plan for its proposed planning and service areas. Self-certification shall be in the form of a legal opinion by the DMA or entity attorney.	N/A	-
20-YEAR NEEDS Clearly describe the existing wastewater (WWT) treatment facilities: - Describe existing WWT facilities.	Currently Palo Verde Utilities Company, L.L.C. (the Company) has a 300,000 gpd aerated lagoon plant servicing the Rancho El Dorado project. The lagoons are currently treating flows of approximately 200,000 gallon per day. The lagoons will be converted to emergency effluent storage.	Page 2, 3, 6
- Show WWT certified and service areas for private utilities and sanitary district boundaries if appropriate.		Exhibit 2 & 4
Clearly describe alternatives and the recommended WWT plan: - Provide POPTAC population estimates (or COG-approved estimates only where POPTAC not available) over 20-year period.	Population growth will be determined as developments are built and homes are bought. POPTAC figures are unavailable for undeveloped areas.	Page 3 Table 1 & 2
- Provide wastewater flow estimates over the 20-year planning period.	The wastewater flow projection for the entire service area is 13 mgd.	Page 1, 2 , 3, 10, 11 Table 1 & 2
- Illustrate the WWT planning and service areas.		Exhibit 4 and 6

Sequencing Batch Reactor

(Using SAM Aeration - Mixing Equipment)

Process Design Report



1235 Shappert Drive, Rockford, IL 61115

This AquaTec, Inc. Engineered System Report has been exclusively prepared for:

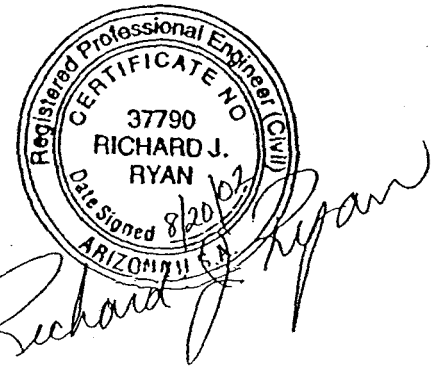
Project: Palo Verde Utilities Company Phase 1 1.0 MGD Treatment Plant

Date: 07/25/02

Report prepared by: Richard (Dick) Ryan, P.E., D.E.E.

Note: This report is submitted subject to the following conditions:

AquaTec, Inc. (AquaTec) provides the enclosed information and accompanying data and illustrations based upon our understanding of information conveyed to us by your verbal and/or written transmission of information. This data is relative to the general application of certain processes and equipment and controls. Variables can change, and their associated details may require the need to adjust process functions or require changes in the size and type of equipment used; and therefore, some design assumptions and mathematics used in models may need to be adjusted for final approval. It is our intent to present this data to be as accurate as possible for estimating purposes. However, unless an approved purchase order to AquaTec is overlaying such information as this, and unless such information is included as a condition to a specific purchase order, with all details of design confirmed and approved by AquaTec, then all information contained herein must be considered preliminary. Otherwise, AquaTec assumes no responsibility for the validity of neither this data nor its application. AquaTec assumes no responsibility for any liability resulting from any party using this data. This information, since it is the product of AquaTec's confidential and proprietary business resources is to be considered property of AquaTec and exclusive for use or distribution only as approved by written approval of AquaTec. It is not to be released for review by or to any third parties without AquaTec's written approval.



General Design Notes:

Pre-SBR treatment system

Mechanically cleaned bar screen with 1/4" opening will be provided.

Flow equalization

No Pre-SBR flow equalization basin(s) used in this design.
Post-SBR Flow equalization basin(s) used in this design.
A post flow equilization basin is used prior to UV disinfection.

Neutralization

Neutralization is recommended ahead of the SBR reactor if the pH can fall outside 6.5 - 8.5 for duration that can adversely effect the treatment process.

Raw wastewater inlet screening and grit removal

A minimum of coarse bar screening (maximum 1-inch openings) is recommended ahead of the SBR reactor. And, grit removal ahead of the SBR reactor, while not mandatory, is recommended. Equipment damage from these issues are not covered under AquaTec, Inc. warranty.

Daily flow parameters for SBR basin sizing

Unless otherwise included in the calculations shown in this report, the entire days flow is assumed to be generated over a 24-hour period.
A peak flow of 2.5 MGD has been included in this design.

Oxygen supply provided by Aeration

1.25 lbs./O_2/lb of BOD_5 applied is provided in the aeration system design for this SBR System.

Nitrogen utilization

Nitrogen utilization will be based up a uptake rate of 1:20 (N:BOD_5), unless otherwise noted. If credit for using applied TKN for nutrient source is used in the caluclations for oxygen requirements it will be noted. Where nitrification is required, it will be assumed that sufficient alkalinity exists or will be provided as needed.
The SBR has been sized with sufficient MCRT to allow denitrification.

Phosphorus

Some phosphorous may be removed in the SBR system by luxury uptake.

Control panel and process design logic

This SBR system is an "Engineered Process Design" and must incorporate the use of specific logic controls, some of which may require use of computers and/or PLC units. AquaTec, Inc. has used state of the art design logic and components for the controls used and they require specific signal and I/O compatibility. Chemical feed units, flow meters, level and sequencing dynamics are all unitized together to assure a high level of control and effluent quality. This control system is an integral part of the SBR system and must be furnished by AquaTec, Inc. for system integrity.

Equipment

Equipment chosen is based upon process requirements, including basin geometry wastewater type, depth, aeration and mixing requirements, flows, temperature considerations and a host of other parameters that each individual unit expresses as a need to fit or interact with the whole system. Any substitutions made that changes the proposed equipment can have considerable effect other equipment items or the engineered process itself. No substitutions should be considered without AquaTec, Inc. giving written approval after carefully evaluating the overall effect and its result.

Continued....

Basic SBR System Design Influent Parameters

Total design flow	1.00 mgd	3,785 m^3/day
BOD_5 applied	300 mg/l	
	2,502 lbs BOD_5/day	1,137 Kg BOD_5/day
Suspended solids	300 mg/l	
	2,502 lbs SS/day	1,137 Kg SS/day
Ammonia nitrogen (influent)	45 mg/l	
Nitrogen credit applied (to O_2)	5 mg/l	
Temp of SBR basin (deg C):		
Winter liquid Temp	15 °C	9.80 mg/l, O_2 saturation in clean water
Summer liquid Temp	27 °C	7.70 mg/l, O_2 saturation in clean water
SBR System jobsite elevation	1200 ft amsl	365.8 m amsl
Barometric Pressure @ Elevation	14.07 psia	727.6 mm Hg
Alpha value for aeration	0.85	
Beta value for wastewater	0.95	
Residual D.O. to maintain in SBR	2.00 mg/l	
SBR jobsite correction factor	0.582 (adjusts aerator clean water O_2 transfer rate to field conditions)	

Design effluent characteristics:	BOD_5	S.S.	NH_3
	10 mg/l	10 mg/l	<8.0 mg/l

This SBR design is capable of meeting these results when operated at above influent parameters with inclusion of the considerations in the General Design Notes on page 2 of this report, and with the exclusion of any undisclosed conditions that could adversely effect the process design. Tertiary sand filtration is recommended to meet these low limits after post equilization and before disinfection.

SBR Reactor Details (with process control sequences)

Number of SBR reactors used	2 basin(s) in SBR System	
Hydraulic retention time	29.07 hours (all SBR aeration basins)	
Number of cycles/day/basin	5 at Initial Program Selection	
Aeration hours per cycle	2.0	10.0 hours total aeration time/basin/day
Maximum liquid depth in SBR	22.00 ft	6.71 m
Decant liquid level drop	3.63 ft at Ave. Design Flow	1.11 m
Decant flow rate	2,941 gpm at Initial Program Flow	11.13 m^3m
Number of decanters per basin	1 (gravity, with automatic control valve, unless otherwise noted)	

Field programmable SBR process control sequencing parameters furnished with proposed system.

	(Minutes)	
Static Fill	per PRGM	Typically introduction of raw influent without mixing or aeration
Mixed Fill	per PRGM	Typically mixing only with introduction of raw influent
React Fill	per PRGM	Typically introduction of raw influent with aeration and mixing
React	per PRGM	Typically aeration and mixing without introduction of raw influent
Settle	per PRGM	Typically settling does not exceed 60-minutes
Decant	per PRGM	Typically decanting does not exceed 120-minutes
Sludge Draw	per PRGM	Typically waste sludge draw off does not exceed 30-minutes
Idle	per PRGM	Normal to multiple basin SBR's (time option varies, can be used elsewhere)

The minimum operating depth for each SBR at average flow conditions will be 12.9' liquid depth
The maximum operating depth for ead SBR at average flow conditions will be 16.6' liquid depth
The maximum operating depth for each SBR at peak flow conditions will be 22'0" liquid depth.

Continued....

SBR Reactor Aeration Basin Size and Type Details

2 SBR Reactor basin(s), sized as follows, used in this system design.

The SBR reactor basin(s) for this design will be square.

SBR reactor basin width is:	40.00 ft	12.19 m	
SBR reactor basin length is:	92.00 ft	28.04 m	
Liquid depth in SBR is:	22.00 ft	6.71 m	
Freeboard above liquid is:	2.00 ft	0.61 m	
The volume of each basin is:	605,550 gal	2292 m3	
Decant (design level drop) is:	3.63 ft	1.11 m	
Peak Flow Decant Level Drop is:	9.08 ft	2.77 m	
Design MLSS concentration is:	4000 mg/l @	0.80 VSS =	3200 mg/l mlvss
Design mean cell residence time:	26.91 days, MCRT		
Design Food/Microorganism ratio:	0.077 F/M		
Organic loading in aeration basin:	15.45 lb/ BOD_5/mft	0.25 Kg/BOD_5/m^3	
Sludge yield (waste) per day/basin:	12,000 gal/day	45.4 m^3/day @	1.0% solids

The above values are at average flow conditions of 1.0 MGD. The MLSS will decrease along with the F/M ratio at peak flow conditions. The organic loading will decrease at peak flow conditions as well. A minimum of 20 days MCRT (sludge age) is required to achieve good nitrification and denitrification.

Aeration Supply Information & Details for Each SBR Basin

Clean water aerator O_2 transfer	25% (at STD Temp. & Alt. for SBR design)	
Oxygen supplied per SBR reactor	2,331 lbs O_2/day	1,060 Kg O_2/day
	97.1 lbs O_2/hr	44.1 Kg O_2/hr
ACFM air supplied per SBR reactor	1,739 cfm	49.2 m^3m
Maximum SBR blower pressure	10.20 psig	0.703 Bar
SBR blower efficiency	80.00 percent	
Highest blower inlet Temp	115 °F	46 °C
Estimated blower discharge Temp	235 °F	113 °C
Blower BHP required per SBR reactor	95.6 Hp	71.3 kW
SAM Aerator - Mixer BHP required/SBR	49.7 Hp	37.1 kW
The SBR basin aeration - mixing power level is:		
SAM aerator - mixer equipment	82.6 Hp/mil/gals	16.3 Wm^3
SAM + blower (air) equipment	240.5 Hp/mil/gals	47.4 Wm^3
The air flow, cfm/1000 cu. ft. vol	21.5 cfm/mft^3	21.6 Lm/m^3
Total "cycle time" power (Hp/day)/SBR/day	71.6 Hp	53.4 kW

Note: Blower & SAM BHP values above are "on-line" power levels required during SBR react operation. Actual blower and SAM equipment sizes will be chosen by conventional sizes available that are closest to the size shown. Equipment power loading is set very close to required power values shown above by drive designs.

The total "cycle time" power (Hp/day)/SBR/day is the equivalent steady state power on line that each SBR basin's aeration and mixing equipment demands. It is the power consumed per day for aeration and mixing which is determined by the SBR process control program set by the PLC. This calculates to a power consumption of 1282.1 kW-Hours/Day for each SBR basin.

Two (2) 25 Hp SAM units will be installed in each SBR basin and can be operated at 10 to 25 Hp by VFD. At the average liquid depth of 14.7' at average flow conditions the blowers will draw only 7.0 psig and approximately 67.0 BHp. At peak flow conditions at 22' liquid depth, 10.2 psig the blowers draw 95.6 BHp. At average flow conditions the total SBR energy used is (67+49.7) X 2 X 0.416 = 97.1 BHp continuous.

Continued....

SBR - Aerobic Digester - Process Design Parameters

For Aerobic Digester jobsite conditions, the same conditions used for the SBR are applied.

The number of Aerobic Digester basins used is	1			
The sludge flow to each digester---	24,000 gal/day	90.9 m^3/day		
Each digester basin volume is-------	240,000 gal	908.5 m^3 =		10.0 days retention
The influent sludge concentration---	1.00% W.A.S. @	80% volatile SS		
The lbs O_2 applied per lb VSS-----	1.30 lb/lb	2.86 Kg/Kg		
The VSS applied per basin/day------	1,201 lbs/day	545.9 Kg/day		
The precent VSS reduction est----	20% VSS @	240.2 lbs/day	=	109.2 Kg/day
The gal digester solids wasted-----	10,560 gal/day @	2% solids	=	40.0 m^3/day
The gal supernatant discharged---	13,440 gal/day	50.9 m^3/day		

Aerobic Digester Aeration Basin Size and Type Details

The number of Aerobic Digester basins used is	1	
The digester basin(s) for this design will be rectangular.		
The digester basin width is:	18.00 ft	5.49 m
The digester basin length is:	82.00 ft	24.99 m
Liquid depth in the digester is:	22.00 ft	6.71 m
Freeboard above liquid is:	2.00 ft	0.61 m
The volume of each basin is:	240,000 gal	909 m3

Aeration Supply Information & Details for Each Digester Basin

Clean water aerator O_2 transfer---------- 26% (at STD Temp. & Alt. Digester design)

The lbs O_2 applied/Digester/day----------	1,561 lbs/O_2/day	710 Kg/O_2/day
The ACFM applied/Digester/day----------	442 cfm	12.5 m^3m
Maximum Digester blower pressure----------	10.16 psig	0.701 Bar
Digester blower efficiency----------	80%	
Highest blower inlet Temp----------	115 °F	46 °C
Estimated blower discharge Temp----------	235 °F	113 °C
Blower BHP required per Digester basin----------	24.2 Hp	18.08 kW
SAM Aerator - Mixer BHP required/Digester-------	17.7 Hp	13.19 kW
The digester aeration - mixing power level is:		
SAM aerator - mixer equipment----------	93.8 Hp/mil/gals	18.5 Wm^3
SAM + blower (air) equipment----------	194.7 Hp/mil/gals	38.4 Wm^3
The air flow, cfm/1000 cu. ft. vol----------	13.8 cfm/mft^3	13.78 Lm/m^3
Total Digester Hp power (Hp/day)/Digester-------	41.9 Hp	31.27 kW

Total calculated power consumption for each Digester / Day is 750.5 kW-Hours day.

Note: Blower & SAM BHP values above are "on-line" power levels required during Digester operation. Actual blower and SAM equipment sizes will be chosen by conventional sizes available that are closest to the size shown. Equipment power loading is set very close to required power values shown above by drive designs.

Three (3) 7.5 Hp SAM units will be installed in the aerobic sludge digester with one (1) 25 Hp blower delivering oxygen to the SAM units. Note that this design is better because the air input to the digester can be throttled and even turned off to denitrify and control filamentous microrganism and conserve energy requirements.

Continued....

Post-SBR Flow Equalization Basin Design Parameters

The Post-EQ basin minimum storage volume provided will be		2.92	SBR decant cycles @ ave design flow
		1.17	SBR decant cycles @ peak flow
For average design flow:			
Each SBR reactor decant flow is:	2,941 gpm	11.13	m^3m
Each SBR decant time cylce is:	34.00 minutes		
For peak flow:			
Each SBR reactor decant flow is:	3,906 gpm	14.79	m^3m
Each SBR decant time cylce is:	64.00 minutes		
The equalization basin(s) for this design will be rectangular.			
The equalization basin width is:	45.00 ft	13.72	m
The equalization basin length is:	74.00 ft	22.56	m
Max liquid depth in the EQ basin is:	11.92 ft	3.63	m
Freeboard above liquid is:	12.08 ft	3.68	m
The EQ basin working volume is:	291,765 gal	1,104	m3

This basin is sized larger and in common-wall with the SBR basins.
Note that the decanter is sized for the peak flow conditions at 3910 gpm each. For peak flow condition

SBR System waste sludge pumps, digester waste sludge pumps and supernatant transfer pumps:

Note: Unless otherwise stated, it is assumed the digester supernatant will be pumped to the SBR influent.

SBR waste sludge pumps:

The volume of waste sludge/SBR/day is----------	12,000 gal	45.4 m^3
The "cycle time" pump GPM flow rate is----------	240 gpm	0.91 m^3m
The total dynamic head for this flow rate is---------	30.0 ft	9.1 m
The BHP required for the flow and head is---------	3.64 Hp	2.71 kW
The size pump selected for this application is-----	5 Hp	3.73 kW
The number of pumps per SBR basin is----------	2	
The "cycle time" power used for sludge waste is---	54.25 kW-Hours/day/SBR basin	

Aerobic Digester waste sludge pumps:

The volume of waste sludge/digester/day is--------	10,560 gal	40.0 m^3
The "cycle time" pump GPM flow rate is----------	1,056 gpm	4.00 m^3m
The total dynamic head for this flow rate is---------	30.0 ft	9.1 m
The BHP required for the flow and head is---------	11.76 Hp	8.78 kW
The size pump selected for this application is-----	15 Hp	11.19 kW
The number of pumps per digester basin is----------	2	
The "cycle time" power used for sludge waste is---	35.11 kW-Hours/day/digester	

Aerobic Digester supernatant transfer pumps:

The volume of supernatant/digester/day is---------	13,440 gal	50.9 m^3
The "cycle time" pump GPM flow rate is----------	448 gpm	1.70 m^3m
The total dynamic head for this flow rate is---------	30.0 ft	9.1 m
The BHP required for the flow and head is---------	4.85 Hp	3.62 kW
The size pump selected for this application is------	7.5 Hp	5.60 kW
The number of pumps per digester basin is----------	2	
The "cycle time" power used for supernatant is-----	43.40 kW-Hours/day/digester	

Continued....

Date: 6/27/2002 **Prepared By:** Richard (Dick) Ryan, P.E., D.E.E.
Project: Palo Verde Utilities Company Phase 1 1.0 MGD Treatment Facility

Comments:

This design assumes that during average daily flow conditions the SBR tanks will run with a miminum liquid depth of 12.9' and a maximum liquid depth of 16.55' at average flow conditions of 1.0 MGD. When the flow exceeds the average by a peak factor of 2.5 times average then the liquid depth for each SBR will rise to the 22' liquid depth and the decant time will be automatically shifted to 64 minutes in lieu of 34 minutes and there will be no idle time in the cycle.

Design Parameters:

Flow, M^3/day	3786	1,000,156 gal/day
BOD_5, Mg/L	300	
N_O, TKN, Mg/L	45	
X_I, inert solids, Mg/L	60	(non-biodegradable inert influent solids)
Min. Temp, °C	15	
MLSS Mg/L	4000	X_T, when MLSS is represented at full tank volume
K_d, d^{-1}	0.06	
Y_{NH}, gr/gr	0.15	
K_O, Mg/L	0.5	DO inhibition coefficient, Mg/L
Nitrification SF	2	
SRT, d	30	
S, Eff BOD, Mg/L	10	
N_E, Eff NH_4, Mg/L	1	
Y, gTSS/gBOD_5 used	0.5	
F_N	0.1	

Select n, the number of Tanks = 2
Select N_C, number of Cycles/day = 5 (must be a whole number)
Select design tank depth, ft = 16.55

	Hours	Minutes
T_S (Settling time, hours) =	0.73333	44.00
T_W (Withdrawal time, hours) =	0.56666	34.00
T_I (Idle time, hours)* =	0.10000	6.00
T_{SF} (Static fill time, hours) =	0.00000	0.00
T_{MF} (Mix fill time, hours) =	1.40000	84.00
T_{RF} (React fill time, hours) =	1.00000	60.00
T_R (React time, hours) =	1.00000	60.00
T_A (Aeration time/cycle, hours) =	2.0000	120.00
T_F (Fill time, hours) =	2.4000	144.00
* Sludge wasted during idle time		288.00 288.00
T_C (Total Cycle Time, hours) =	4.8000	box values must be equal
	4.8	hrs max @ 5 cycles/day
SVI (Mg/L) =	120	Mg/L
f (Decant safety factor)	1.2	
T_{DN}, (Anoxic reaction time, hours) =	1.40000	includes only static fill & mix fill time cycles

Calc pad	Data	
Enter minutes	57.60	0.96000 hrs.
Enter hours	0.27	16.0020 min.
Enter value to adjust	2.6667	
Enter adjustment	2.4	
Add = 1; Subtract =2	2	0.2667 value

10.00 hours/day total aeration time
12.00 hours/day total fill time
-0.0006 variance (minutes)

1) Select SRT for design = 30 days

2) Determine net hetrotrophic yield

$Y_{NH} = Y / [1 + K_d (SRT)]$ = 0.5 / [1+ {(0.06) x (30)}] 0.18 g/g

3) Determine amount of nitrogen oxidized based upon influent flow (ignoring the small amount used for growth of nitrifiers)

N_{OX} = TKN - (Eff. NH_4-N) - {$F_N(Y_{NH})(S_O - S)$}

= (45 - 1.0) - 0.10) (0.18) (300 - 10)} 38.82 Mg/L

= 38.82 x 3786 m^3/d x 0.001 = 146.98 kg/d

4) Determine the volume of the aeration basin as follows

$$V = \frac{[Y_{NH}(S_O-S) + X_1 + Y_{NN}(N_{OX})]Q(SRT)}{X}$$

Where
X = Aeration tank mixed liquor concentration, Mg/L
S_O = Influent BOD_5, Mg/L
S = Effluent BOD_5, Mg/L
N_{OX} = Ammonia in influent flow oxidized, Mg/L
Y_{NH} = Net yield of heterotropic organisms at design SRT including endogenous decay, gTSS/gBOD_5 removed
Y_{NN} = Net yield of nitrifying bacteria, gTSS/gN oxidized
X_1 = Influent non-biodegradable inert solids, Mg/L

V = [((0.18) (300.00 - 10.00)+ 60.00 + (0.15) (38.82)) (3786) (30)]/ 4000

V = 3340 m^3 = 882,204 gallons total (all tanks)
441,102 gal/reactor
58,971 cu ft/reactor

Calculate the Tank Sizes (each tank) 2 reactors chosen for this design
Square Tanks 59.69 ft square, each
Round Tanks 67.36 ft dia, each

Detention Time = (3340 m^3 / 3786 m^3) 24 hrs/day = 21.17 hours

Select Tank Size (feet)	60.5 Square =	453,117 gal. each	3660 sq ft/ea =	60,577 cu ft/tank
	0 Round =	- gal. each		
Enter L/W ratio, ie 2 =2:1	2.3 Rectangular =	39.89 ft wide x	91.75 ft long =	453,117 gal./ tank

5) Calculate the fill volume

$V_F = Q/(N_C)_N$ = 3786 / (5) (2) = 378.60 m^3
= 100,016 gal/tank
13,371 cu ft/tank

Δ H for Selected Tank Size = 3.65 ft level drop at "Q" design
Low water level after decant = 16.55 - 3.65 = 12.90 ft SWD
V_D/V_T = 0.779
V_F/V_T = 0.221

6) Calculate the SBR minimum fill volume fraction

$[Y\{1+ K_d(T_A/T_C)SRT\} + (X_1/S_O)]SRT = X_T / \{(V_F/V_T)(S_O-S)(N_C)\}$

= { 0.5 {1+ 0.06 (2.00 / 4.8) 30 } + (60 / 300)] 30 =

4000 / {(V_F/V_T) (300 - 10) (5)}

32.25 = 4000 / (V_F/V_T) (1450)

V_F/V_T = 4000 / { (V_F/V_T) (1450) (32.25)}

V_F/V_T = 0.086 minimum fill volume fraction

7) Check the maximum V_F/V_T allowed

$(V_F/V_{TMAX}) = [1-f(X_1)(SVI/10^6)]$

$= [1 - 1.2 (4000) (120 /10^6)]$

$= 0.424$ maximum V_F/V_T allowed

8) Calculate the effective, SRT_E

$SRT_E = SRT (T_A/T_C)$

$= 30 (2.00 / 4.80)$

$= 12.50$ days

9) Calculate the heterotrophic yield based on effective, SRT_E

$Y_{NT} = Y/(1+K_d SRT_E) + (X_I/S_O)$

$= [0.5 / (1+(0.06)(12.50))]+(60 / 300)$

$= (0.286 + 0.200)$

$Y_{NT} = 0.486$

10) Determine the Nitrogen oxidized

$NO = N_O - Y_{NH} (S_O-S)(F_N) - N_e$

Where
N_O = Influent TKN, Mg/L
F_N = Nitrogen content of biomass, g/g
N_E = Effluent ammonia concentration, Mg/L

$NO = [45 - (0.18) (300 - 10) (0.1)] - 1$

$NO = 38.82$ Mg/L

11) Calculate the nitrifying bacteria mass

$X_N = Y_{NN} (NO) (V_F/V_T) (N_C) SRT$

Where X_N = Nitrifier biomass concentration, Mg/L

$X_N = (0.15) (38.82) (0.221) (5) (30)$

$X_N = 192.80$ Mg/L

% MLSS = 4.82%

12) Calculate the available nitrogen for nitrification during the aeration period

$NO_O = (NO + N_E) (V_F/V_T)$

$NO_O = (38.82 + 1.0) (0.221)$

$NO_O = 8.79$ Mg/L

13) Calculate the required time for nitrification

$$T_N = \frac{[\{(K_N)\, L_N\, (NO_O/N_E) + (NO_O - N_E)\}\, Y_{NN}]\, SF\, (24\ hr/d)}{(U_{N,\,MAX,\,DO})\, X_N}$$

Where

$U_{N,\,MAX,\,DO}$ = Maximum Specific growth rate corrected for DO, d^{-1} (@ 10^0C = 0.23)

$U_{N,\,MAX,\,DO}$ for design temp = $(0.50)10^{0.033(T-20)}$

= 0.342

N_E = Required effluent ammonia concentration, Mg/L

SF = Nitrification Safety Factor, 2.0

$K_N = 10^{0.051T-1.148}$ = 0.41 @ 15 deg C

$$T_N = \frac{[\{\ 0.41\ \ Ln(\ \ 8.79\ /\ \ 1.0\ \ )+(\ \ 8.79\ -\ \ 1\ \ )\}\ \ 0.15\ ]\ (\ \ 2.0\ \ )(\ \ 24\ \ )}{(\ \ 0.342\ \ )(\ \ 192.80\ \ )}$$

T_N = 62.56 / (0.342) (192.80)

T_N = 0.95 hours

ok

14) Calculate the pre-Anoxic Nitrogen removal

A) Determine SDNR and DNO possible during the Anoxic fill period of 1.40 hours

$F/M_A = (V_F/V_T)(S_O/X_T)(1/T_F)(24\ hrs/d)$

= (0.221) (0.075) (0.4) (24)

F/M_A = 0.166

B) $SDNR_{20} = 0.03\ (F/M_A) + 0.029$

= 0.03 (0.17) + 0.029

$SDNR_{20}$ = 0.034 g/g-d

C) Correct for temperature, the SDNR @ 15 deg C = ($SDNR_{20}$) (θ^{T-20}) 0.025

Where, for this equation, θ = 1.06

D) Calculate nitrate nitrogen reduced during anoxic period

$DNO_3 = (SDNR)\ (X_T)(T_{DN})(1/24)$

= (0.025) (4000) (1.40) (0.042)

DNO_3 = 5.92 Mg/L

15) Check for denitrification

$(V_F/V_T)\ NO_1 = (1-V_F/V_T)\ (NO_O - N_E) - DNO_3$

Note: if the right side of the equation is negative, excess denitrification capacity is available and NO_1 is equal to zero. NO_1 = nitrate nitrogen concentration remaining after pre-anoxic period in Mg/L

$(V_F/V_T)\ NO_1$ = (1 - 0.221) (8.79 - 1.0) - 5.92

= 0.15

Therefore NO_1 = 0.67 Mg/L

16) Determine the effluent nitrate nitrogen concentration

$NO_E = NO_O + NO_t - N_E$

= (8.79 + 0.67 - 1.0)

NO_E = 8.46 Mg/L

17) Determine nitrogen removal percent

% Removal = $[N_O - N_E - NO_E] 100/N_O$

= [(45) - (1.0) - (8.46)] (100 / 45)

= 78.98 % Removal

18) Calculate the denitrification rate for a post-anoxic period of 10 minutes after aeration

$DNR = F(K_d)(Y_{NH}/Y_{NT})(X_T)(1/24)$

Where

DNR = denitrification rate, Mg/L-hr

F = fraction of biological respiration rate using nitrate instead of oxygen g/g, 0.5

DNR = (0.5) (0.06) (0.18 / 0.49) (4000) (0.042)

= 1.84 Mg/L

Therefore, the additional nitrate removed is then

DNR (T_{DN}) = (1.84) (1.40)

= 2.57 Mg/L

19) Determine effluent nitrate nitrogen concentration including denitrification

$NO_{DE} = NO_E - [(DNR)(T_{DN})]$

= (8.46) (- 2.57)

= 5.89 Mg/L

% Removal= 84.70 %, including denitrification

20) Determine the total nitrogen concentration in the effluent

$TN = N_E + NO_{DE}$

TN = (1.0) + (5.89)

= 6.89 Mg/L

E.O.F.

Existing Influent Lift Station

Diameter (feet)	8
Area ($ft.^2$)	6.3
Maximum Liquid Depth (feet)	14.1
Minimum Liquid Depth (feet)	1.58
Working Volume (gallons)	588.1
Pump No. 1 Capacity (Flygt 3201 – 35 Hp)*	2,100 gpm @ 50 ft.
Pump No. 2 Capacity (Flygt 3201 – 35 Hp)*	2,100 gpm @ 50 ft.

* Existing pumps will be modified to meet the Peak Hour Demands of 2.5 MGD

Headworks[1]

Screen Capacity (GPM/MGD)	4,200/6.0

Effluent Filtration System

Filter Type	Gravity Traveling Carriage – 2
Filter Media Type	11mm sand – 12 in.
Number of Units	2
Number of Cells/Unit	40
Filtration Area per filter (SF)	360
Filtration Flow Rate @ Average Flow ($gpm/ft.^2$)	2.0
Filtration Flow Rate @ Peak Flow ($gpm/ft.^2$)	4.0
Backwash Flow Rate (gpm)	180
Backwash as % Throughput (%)	0.75%
Total Backwash Volume/Day (gallons)	7,500

UV Disinfection System

UV Type	Low Pressure – High Intensity
Number of Banks	3
Capacity/unit @ 100 mj/cm^2 (65%)	555
Number of Lamps/bank	40
Rating of Lamp (watts/lamp)	165
Total Kw installed	20
Average Kw During Operation	13.2
% of Total Capacity @ Maximum Monthly Day Flow	66.7

[1]This process unit is sized to handle the future average daily flow of 3.0 MGD and peak flow of 6.0 MGD

Effluent Clear Well

Length (ft.)	51 ft. 6 in.
Width (ft.)	11 ft. 0 in.
Maximum Liquid Depth (ft.)	22 ft.
Minimum Liquid Depth (ft.)	7 ft.
Total Volume (gallons)	93,223

Sludge Production[1]

Design Sludge Yield Factor	0.80
Pounds Dry Solids/Day from Secondary Treatment @ SYF = 0.80	6,004
Volume of WAS/day @ 10,000 MLSS (gallons)	72,000
Pounds of Dry Solids/Day After Digestion	4,803

Sludge Dewatering System[1]

Type	Belt Filter Press
Number of Units	1
Size of Unit	1.5m
Average loading Capacity (gpm)	90
Pounds of Dry Solids to press per day	4,803
Gallons of Sludge to press per day	28,797
Design % Solids in Feed	2.0
Design % Solids in Cake	20
Total Hours of Operation/Day	5.3
Total Volume of Sludge to Disposal (cy/day)	11.4

Polymer Requirements[1]

Design Polymer Requirements (lbs. Polymer/Ton Dry Solids)	15
Estimated Polymer Usage/Day	36
Gallons of Emulsion Polymer Required/ Day @ 25% Active	16.4
Gallon of Dilution Water/Day	3,290
Polymer Injection Requirement (gallons/hour)	3.1
Dilution Water Requirements (gallons/hour)	602

[1]This process unit is sized to handle the future average daily flow of 3.0 MGD and peak flow of 6.0 MGD

GTA ENGINEERING, INC.

Consulting Engineers

1990 W. Camelback Rd., Suite 401
Phoenix, Arizona 85015
TEL (602) 246-7759 FAX (602) 246-7645
e-mail: gta@gtaengineering.com

May 7, 2003

Asif Majeed
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, AZ 85007

Re: Palo Verde Utilities Company WWTP
APP No. P-103558

Dear Mr. Majeed:

Palo Verde Utilities Company is submitting a 208 Amendment to CAAG that includes an expansion to its current service area to include the area as shown on Figure 1, located in Township 4 South, Range 2, 3, and 4 East and Township 5 South, Range 4 East of the Gila and Salt River Base and Meridian, Pinal County.

The wastewater treatment plant will be expanded in phases to accommodate development in the service area. The existing APP (not yet signed) is for a flow rate of 3.0 MGD.

Palo Verde Utilities understands that expansion to their system will require the following permits:

1. Individual APP Modification
2. Reuse Permits for each effluent customer
3. AZPDES for any surface discharge

The 208 Amendment will be submitted to CAAG and ADEQ in June, 2003 for review. Design of the management system will be based upon sound engineering principles The entire project is expected to be completed in the year of 2011 with a wastewater treatment capacity of 9.0 mgd.

Z:\AlljobsZC\Palo Verde\208Amendment\letterRe-208plan.wpd

208 AMENDMENT CHECKLIST
Section 208 Clean Water Act
40 CFR Part 130.6

REQUIREMENT	PROVIDE BRIEF SUMMARY ON HOW REQUIREMENTS ARE ADDRESSED	ADDRESSED ON PAGE:
- Describe the type and capacity of the recommended WWT Plant.	Sequencing Batch Reactor WWTP with a 13 mgd capacity	Page 1, 2, 3, 6, 7 10 Exhibit 3, 7
- Identify water quality problems, consider alternative control measures, and recommend solution for implementation.	Type 2 Reclaimed Water General Permits are required and will be adhered to, for direct use to golf courses, community lakes, parks and landscape irrigation. The treatment plant will treat the sewage to a Class A+ effluent quality.	Page 7, 8
- If private WWT utilities with certificated areas are within the proposed regional service area; define who (municipal or private utility) serves what area and when. Identify whose sewer lines can be approved in what areas and when?	N/A	-
- Describe method of effluent disposal and reuse sites (if appropriate).	"Class A+" effluent quality for reuse for irrigation of golf courses, recreational lakes, parks and landscaping.	Page 7, 8, 9, 11
- If Sanitary Districts are within a proposed planning or service area, describe who serves the Sanitary Districts and when.	Located approximately three (3) miles from the existing WWTP will be the treatment plant of the 387 Improvement District. The planing area boundary for 387 Improvement District is located in Sections 25, 27, 28, 33, 34, and 36 of Township 4 South, Range 3 East; Sections 21, 28, and 34 of Township 4 South, Rang 5 East; and Sections 2, 3, 11 and 12 of Township 5 South, Range 3 East of Pinal County, Arizona. Operation expected to begin 2004.	Page 3 Exhibit 2

208 AMENDMENT CHECKLIST
Section 208 Clean Water Act
40 CFR Part 130.6

REQUIREMENT	PROVIDE BRIEF SUMMARY ON HOW REQUIREMENTS ARE ADDRESSED	ADDRESSED ON PAGE:
- Describe ownership of land proposed for plant sites and reuse areas.	The undeveloped land is owned by numerous individuals. Once the land is bought and developed, Home Owner Associations will be established and will be responsible for following regulations of reclaimed water usage.	Page 11, 12
- Address time frames in the development of the treatment works.	The wastewater flow projection when all phases are built out is 13 mgd in approximately 20 years, in the year 2023.	Page 1, 6, 10 Table 2
- Address financial constraints in the development of the treatment works.	None	Page 12
- Describe how discharges will comply with EPA municipal and industrial stormwater discharge regulations (Section 405, CWA).	A AZPDES permit for discharge into the Santa Rosa Wash has been submitted to ADEQ. The sludge generated at the proposed wastewater treatment plant will be stabilized and dewatered and then disposed of at an operating sanitary landfill certified by the ADEQ to handle and dispose of sludge from wastewater treatment plants. Protection of the groundwater at the landfill location will be provided by the landfill facility.	Page 8, 9, 10
- Describe how open areas & recreational opportunities will result from improved water quality and how those will be used.	The treated effluent from the wastewater treatment plant will be used to irrigate the golf courses, lakes and other open area facilities and to recharge the aquifer using rapid infiltration basins. Operation of the golf courses using best management practices to prevent pollution of the groundwater.	Page 7, 11

208 AMENDMENT CHECKLIST Section 208 Clean Water Act 40 CFR Part 130.6		
REQUIREMENT	**PROVIDE BRIEF SUMMARY ON HOW REQUIREMENTS ARE ADDRESSED**	**ADDRESSED ON PAGE:**
- Describe potential use of lands associated with treatment works and increased access to water-based recreation, if applicable.	N/A	-
REGULATIONS - Describe types of permits needed, including NPDES, APP and reuse.	Needed are AZPDES (NPDES), APP, Reuse, Air Quality, Construction Permits	Page 7, 8, 9, 10
- Describe restrictions on NPDES permits, if needed, for discharge and sludge disposal.	The AZPDES (NPDES) program also regulates sewage sludge under Section 405 of the Clean Water Act (CWA). Part 503 of the Clean Water Act controls the quality of sewage sludge that may be applied to land, distributed and marketed, placed in a sludge disposal facility, or incinerated in a sewage sludge incinerator. Sluge will be hauled to: Butterfield Station Municipal Solid Waste Landfill, 99th Avenue, one mile north of Highway 238, Mobile, Arizona. Waste management verbally agreed to accept the sludge.	Page 8, 9
- Provide documentation of communication with ADEQ Permitting Section 30 to 60 days prior to public hearing regarding the need for specific permits.	See Attachment B	Page 7 Attachment B
- Describe pretreatment requirements and method of adherence to requirements (Section 208 (b)(2)(D), CWA).	Accomplished by Best Available Demonstration Control Technology (BADCT). Modifications to existing APP will be submitted.	Page 7, 8

208 AMENDMENT CHECKLIST
Section 208 Clean Water Act
40 CFR Part 130.6

REQUIREMENT	PROVIDE BRIEF SUMMARY ON HOW REQUIREMENTS ARE ADDRESSED	ADDRESSED ON PAGE:
- Identify, if appropriate, specific pollutants that will be produced from excavations and procedures that will protect ground and surface water quality (Section 208(b)(2)(K) and Section 304, CWA).	The contractor for the facilities is responsible to obey all AZPDES Permit regulations relevant to construction sites to prevent surface water and groundwater contamination. All hazardous materials and potential pollutants shall be stored onsite in appropriate storage areas. Retention basins, silt traps, and other sediment barriers are to be provided at the site to filter sediment from storm water runoff leaving the site. The Contractor shall keep the site clean and have covered dumpsters on site which are emptied regularly.	Page 6, 7, 8, 9, 11
- Describe alternatives and recommendation in the disposition of sludge generated. (Section 405 CWA).	Sludge will be stabilized and dewatered and then disposed of to a landfill certified by ADEQ. The landfill: Butterfield Station Municipal Solid Waste Landfill, 99th Avenue, one mile north of Highway 238, Mobile, Arizona has been notified and verbally agreed to accept the sludge.	Page 8, 9
- Define any nonpoint issues related to the proposed facility and outline procedures to control them.	No nonpoint issues. If an issue does occur, it will be required that the contractor obtain the necessary permits.	Page 10
- Describe process to handle all mining runoff, orphan sites and underground pollutants, if applicable.	N/A	-
- If mining related, define where collection of pollutants has occurred, and what procedures are going to be initiated to contain contaminated areas.	N/A	-

208 AMENDMENT CHECKLIST
Section 208 Clean Water Act
40 CFR Part 130.6

REQUIREMENT	PROVIDE BRIEF SUMMARY ON HOW REQUIREMENTS ARE ADDRESSED	ADDRESSED ON PAGE:
- If mining related, define what specialized procedures will be initiated for orphan sites, if applicable.	N/A	-
CONSTRUCTION Define construction priorities and time schedules for initiation and completion.	Construction of 1 MGD plant began 2/2003 and is expected to be in opertions in October 2003. As land develops, flows will increase. See Table 2 for phases of construction to Build-out in 2023	Page 2, 3, 6, 10 Table 2
Identify agencies who will construct, operate and maintain the facilities and otherwise carry out the plan.	The current facility is under contract with Severn-Trent Services to operate and maintain WWTP. Westcon is the Contractor and the Supplier is AquaTec.	Page 10
Identify construction activity-related sources of pollution and set forth procedures and methods to control, to the extent feasible, such sources.	Construction will follow non-pont source requirements to control erosion. There are no non-point issues related to this project that are expected. Construction impacts for each new addition to the WWTP will be minimal. The site has been laid out to accommodate the expansions by use of common walls when possible. Yard piping and pump stations are sized to accommodate full build-out and to maintain all construction activities within the WWTP site. The site is master-planned to allow the construction of new phases with minimal interference with operations.	Page 6,10

208 AMENDMENT CHECKLIST
Section 208 Clean Water Act
40 CFR Part 130.6

REQUIREMENT	PROVIDE BRIEF SUMMARY ON HOW REQUIREMENTS ARE ADDRESSED	ADDRESSED ON PAGE:
FINANCING AND OTHER MEASURES NECESSARY TO CARRY OUT THE PLAN - If plan proposes to take over certificated private utility, describe how, when and financing will be managed.	N/A	-
- Describe any significant measure necessary to carry out the plan, e.g., institutional, financial, economic, etc.	Palo Verde will have a CC&N for Wastewater. Palo Verde will be financially responsible for the construction of the plant.	Page11, 12
- Describe proposed method(s) of community financing.	The developers will be responsible for pipelines and interceptors. Palo Verde will have a CC&N. User fees will be paid by customers as regulated by the CC&N.	Page 11, 12
- Provide financial information to assure DMA has financial capability to operate and maintain wastewater system over its useful life.	N/A	-
- Provide a time line outlining period of time necessary for carrying out plan implementation.	Construction will be scheduled as properties are bought and developed. The wastewater treatment plant will be built in accordance with land development. Construction of new 1.0 mgd plant began 2/03 and is expected to be completed 10/03. Built out is expected in approximately 20 years, 2023.	Page 10 Table 2
- Provide financial information indicating the method and measures necessary to achieve project financing. (Section 201 CWA or Section 604 may apply.)	Palo Verde Utilities is requiring connection fees from the developer and home owners will be paying the user fee based upon fair value as determined by the Corporation Commission.	Page 11, 12

208 AMENDMENT CHECKLIST
Section 208 Clean Water Act
40 CFR Part 130.6

REQUIREMENT	PROVIDE BRIEF SUMMARY ON HOW REQUIREMENTS ARE ADDRESSED	ADDRESSED ON PAGE:
IMPLEMENTABILITY Describe impacts and implementability of Plan: - Describe impacts on existing wastewater (WW) facilities, e.g., Sanitary district, infrastructure/facilities and certificated areas.	The Palo Verde Utilities Company existing wastewater treatment facility serves the Rancho El Dorado development. 387 Improvement District WWTP is located 3 miles from Rancho El Dorado. There will be no impact to the 387 Improvement District WWTP. There are no other Arizona Corporation Commission certificated areas in the area.	Page 2, 3
- Describe how and when existing package plants will be connected to a regional system.	N/A	-
- Describe the impact on communities and businesses affected by the plan.	It will allow the area to accommodate more growth in an environmentally safe manner and the development of new communities will fulfill a growing demand for affordably priced homes , while retail uses within the community will provide an increased tax and employment base for Pinal County.	Page 11
- If a municipal wastewater (WWT) system is proposed, describe how WWT service will be provided until the municipal system is completed: i.e., will package plants and septic systems be allowed and under what circumstances. (Interim services).	N/A	-
PUBLIC PARTICIPATION - Submit copy of mailing list used to notify the public of the public hearing on the 208 amendment. (40 CFR, Chapter 1, Part 25.5)	CAAG	-
- List location where documents are available for review at least 30 days before public hearing.	CAAG	-

208 AMENDMENT CHECKLIST Section 208 Clean Water Act 40 CFR Part 130.6		
REQUIREMENT	**PROVIDE BRIEF SUMMARY ON HOW REQUIREMENTS ARE ADDRESSED**	**ADDRESSED ON PAGE:**
- Submit copy of the public notice of the public hearing as well as an official affidavit of publication from the area newspaper. Clearly show the announcement appeared in the newspaper at least 45 days before the hearing.	CAAG	-
- Submit affidavit of publication for official newspaper publication.	CAAG	-
- Submit responsiveness summary for public hearing.	CAAG	-

ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.adeq.state.az.us

Janet Napolitano
Governor

Stephen A. Owens
Director

January 20, 2004

Ms. Alexis Strauss, Director
EPA Region IX, Water Division
75 Hawthorne Street (WTR-1)
San Francisco, CA 94105

Dear Ms. Strauss:

Pursuant to Section 208 of the Clean Water Act and 40 CFR 130.6(e), I certify that the 208 Plan Amendment for the Palo Verde Utilities Company, L.L.C. is consistent with both the State of Arizona's and the Central Arizona Association of Governments' Water Quality Management Plans.

As the Governor's designee for the State's Water Quality Management Program, I hereby transmit this amendment to EPA for review.

Sincerely,

Stephen A. Owens
Director

Enclosure

cc: Cheryl McGovern, Water Division, EPA Region IX, (WTR-4)
Edwina Vogan, Watershed Management Unit, ADEQ

PINAL COUNTY
BOARD OF SUPERVISORS

November 4, 2003

Ms. Maxine Leather
Executive Director
Central Arizona Association of Governments
271 Main Street
Superior, Arizona 85273

Dear Ms. Leather,

Pinal County has reviewed the plans for the Palo Verde Utilities Company. We concur with their efforts and recommend CAAG proceed with the public 208 Amendment process.

Sincerely,

Stanley D. Griffis, Ph.D.
Pinal County Manager

SDG/rp

Palo Verde Utilities Company, L.L.C.
CAAG 208 Amendment
Service Area Legal Description

October 3, 2003

KENNEDY/JENKS CONSULTANTS
3101 N. Central Ave., Suite 1470
Phoenix, AZ 85012
Tel. 602-274-0886
Fax. 602-274-0764

formerly

GTA ENGINEERING, INC.

LEGAL DESCRIPTION OF SERVICE AREA FOR PALO VERDE UTILITIES COMPANY, L.L.C. APPROVED IN 1997 CAAG 208 AMENDMENT

All of Section 13 and 14 Township 4 South, Range 3 East, SRB&M and that portion of Section 15, Township 4 South, Range 3 East, SRB&M lying East of the West right-of-way line of Maricopa Road (Arizona State Route 347) in Pinal County, Arizona.

In addition to the above: LEGAL DESCRIPTION OF SERVICE AREA FOR PALO VERDE UTILITIES COMPANY, L.L.C. IN THE 2003 CAAG 208 AMENDMENT:

That portion of Sections 13, 14, and 15, Township 4 South, Range 2 East, SRB&M lying North of the South Right-of-Way line of the Mobile Road (Arizona State Route 238) in Pinal County, Arizona.

That portion of Section 15, Township 4 South, Range 3 East, SRB&M lying West of the West Right-of-Way line of Maricopa Road (Arizona State Route 347) in Pinal County, Arizona.

All of Sections 16, 22, 23, and 24 of Township 4 South, Range 3 East, SRB&M in Pinal County, Arizona.

All of Section 17, Township 4 South, Range 3 East, SRB&M except for that portion lying South of the South Right-of-Way line of the Mobile Road (Arizona State Route 238) in Pinal County, Arizona.

All of that portion of Section 18, Township 4 South, Range 3 East, SRB&M lying North of the Ak-Chin Indian Reservation in Pinal County, Arizona.

That portion of Section 20, Township 4 South, Range 3 East, SRB&M lying North of the South Right-of-Way line of the Mobile Road (Arizona State Route 238) in Pinal County, Arizona.

That portion of Section 21, Township 4 South, Range 3 East, SRB&M lying North of the South Right-of-Way line of the Mobile Road (Arizona State Route 238) in Pinal County, Arizona.

That portion of Section 25, Township 4 South, Range 3 East, SRB&M in Pinal County, Arizona, described as follows:

> The Southwest Quarter of the Northwest Quarter of said Section 25, and together with the North One-Half of the Southwest Quarter, and together with the Southwest Quarter of the Southwest Quarter of said Section 25.

All of Section 26, Township 4 South, Range 3 East, SRB&M, in Pinal County, Arizona, EXCEPT for the West Half of the West Half of said Section 26.

Palo Verde Utilities Company, L.L.C. October 3, 2003
Service Area Legal Description

That Portion of the Northwest Quarter of Section 34 in Township 4 South, Range 3 East, SRB&M, in Pinal County, Arizona, being more particularly described as follows:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 34; THENCE NORTH 89° 24' 54" EAST, ALONG THE NORTH LINE OF SAID SECTION 34 A DISTANCE OF 2,751.05 FEET, MORE OR LESS, TO THE NORTH QUARTER CORNER OF SAID SECTION 34; THENCE SOUTH 00° 12' 02" WEST, ALONG THE NORTH SOUTH MID-SECTION LINE OF SAID SECTION 34 A DISTANCE OF 2,664.95 FEET TO THE CENTER OF SAID SECTION 34; THENCE NORTH 89° 51' 49" WEST, ALONG THE EAST WEST MID-SECTION LINE OF SAID SECTION 34 A DISTANCE OF 2,591.70 FEET, MORE OR LESS, TO THE WEST LINE OF SAID SECTION 34; THENCE NORTH 00° 40' 29" WEST ALONG THE WEST LINE OF SAID NORTHWEST QUARTER 2,663.95 FEET, MORE OR LESS, TO THE POINT OF BEGINNING.

THE BASIS OF BEARING IS THE MONUMENT LINE OF MARICOPA ROAD (ARIZONA STATE ROUTE 347), ALSO BEING THE WEST LINE OF THE NORTHWEST CORNER OF SECTION 34, TOWNSHIP 4 SOUTH, RANGE 3 EAST, USING A BEARING OF NORTH 00° 06' 23" WEST.

CONTAINS 159.00 ACRES MORE OR LESS.

All of that portion of Section 35, Township 4 South, Range 3 East, SRB&M in Pinal County, Arizona, lying Southerly of the South Right-of-Way line of the Union Pacific Railroad in Pinal County, Arizona, EXCEPT any portion lying within the following described property:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 35;

THENCE NORTH 89 DEGREES 19 MINUTES 10 SECONDS WEST, A DISTANCE OF 1971.27 FEET TO THE TRUE POINT OF BEGINNING;

THENCE CONTINUING NORTH 89 DEGREES 19 MINUTES 10 SECONDS WEST, A DISTANCE OF 765.30 FEET;

THENCE NORTH 01 DEGREE 19 MINUTES 10 SECONDS EAST, A DISTANCE OF 1377.37 FEET;

THENCE SOUTH 27 DEGREES 53 MINUTES 16 SECONDS EAST, A DISTANCE OF 1568.23 FEET TO THE TRUE POINT OF BEGINNING; AND

EXCEPT ALL OIL, GAS AND MINERAL RIGHTS AS RESERVED IN INSTRUMENT RECORDED IN DOCKET 15, PAGE 70;

AND EXCEPT ANY PORTION LYING WITHIN THE FOLLOWING DESCRIBED PROPERTY:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 35;

THENCE NORTH 01 DEGREE 12 MINUTES 36 SECONDS EAST, A DISTANCE OF 77.50 FEET TO THE TRUE POINT OF BEGINNING;

THENCE SOUTH 89 DEGREES 44 MINUTES 11 SECONDS WEST, A DISTANCE OF 660.00 FEET;

THENCE NORTH 01 DEGREE 12 MINUTES 38 SECONDS EAST, A DISTANCE OF 1320 FEET;

THENCE NORTH 89 DEGREES 44 MINUTES 11 SECONDS EAST, A DISTANCE OF 660.00 FEET;

THENCE SOUTH 01 DEGREE 12 MINUTES 36 SECONDS WEST, A DISTANCE OF 1320 FEET TO THE TRUE POINT OF BEGINNING; AND

EXCEPT ONE-HALF OF ALL OIL, GAS AND OTHER MINERALS AS RESERVED IN INSTRUMENT RECORDED IN BOOK 85 OF DEEDS, PAGE 228.

That portion of Section 35, Township 4 South, Range 3 East, SRB&M lying North of the South Right-of-Way line of the Maricopa-Casa Grande Highway in Pinal County, Arizona.

That portion of Section 36, Township 4 South, Range 3 East, SRB&M, in Pinal County, Arizona described as follows:

The West half of the Northwest Quarter of said Section 36, and
That portion of the Southwest Quarter of said Section 36 lying North of the South Right-of-Way line of the Maricopa-Casa Grande Highway EXCEPT any portion thereof lying within the Ak-Chin Indian Reservation.

All of Sections 19, 29, 30, 31, and 32 of Township 4 South, Range 4 East, SRB&M in Pinal County, Arizona.

The West One-Half of Section 18, Township 4 South, Range 4 East, SRB&M in Pinal County, Arizona.

Palo Verde Utilities Company, L.L.C. October 3, 2003
Service Area Legal Description

The South One-Half of Section 20 of Township 4 South, Range 4 East, SRB&M in Pinal County, Arizona.

All of Section 4 of Township 5 South, Range 4 East, SRB&M in Pinal County, Arizona.

That portion of Section 6, Township 5 South, Range 4 East, SRB&M lying North of the South Right of Way Line of the Maricopa-Casa Grande Highway in Pinal County, Arizona.

That portion of Section 8, Township 5 South, Range 4 East, SRB&M lying North of the South Right of Way Line of the Maricopa-Casa Grande Highway in Pinal County, Arizona.

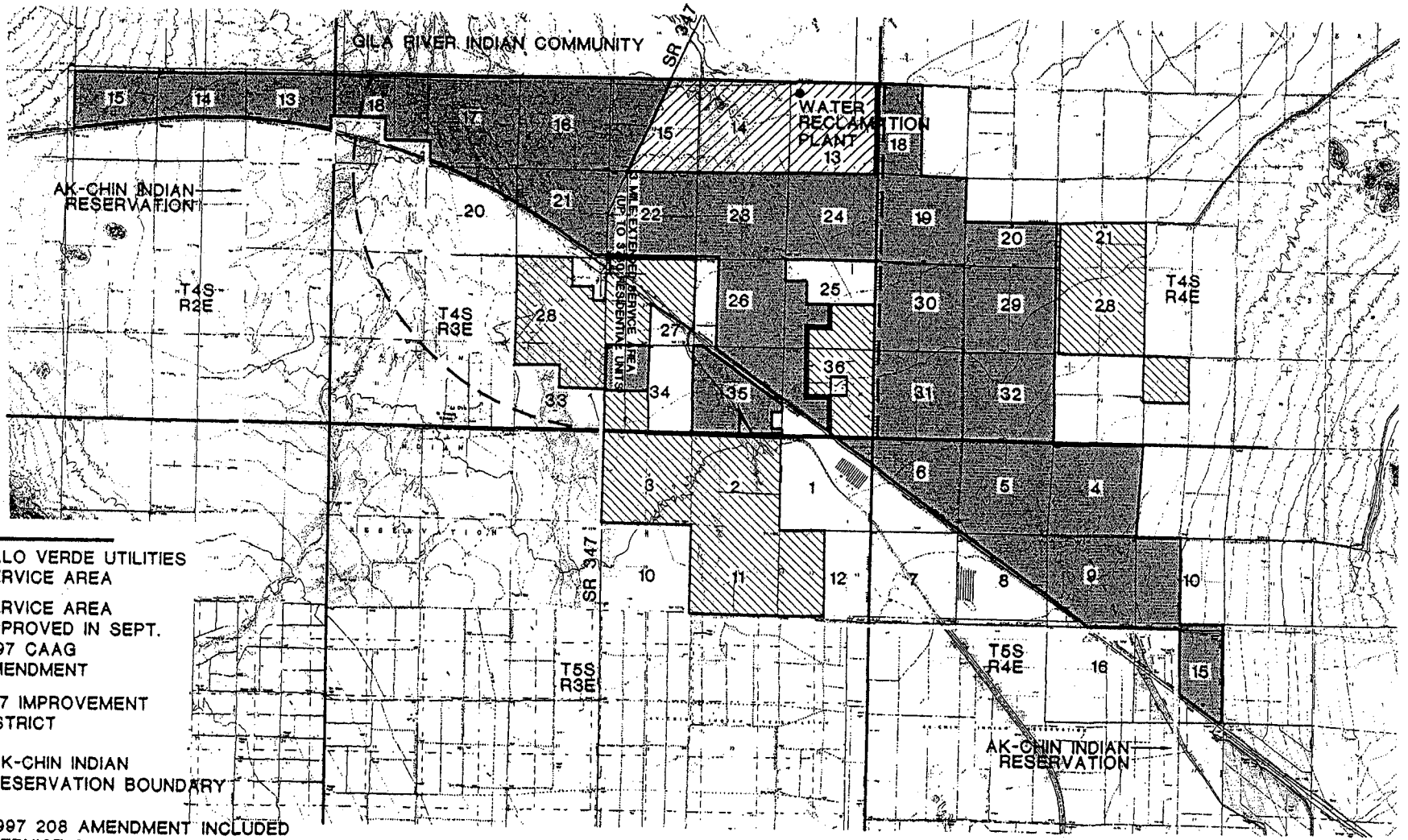
That portion of Section 9, Township 5 South, Range 4 East, SRB&M lying North of the South Right of Way Line of the Maricopa-Casa Grande Highway in Pinal County, Arizona.

The West One-Half of Section 10 together with the South 33 feet of the East One-Half of said Section 10, Township 5 South, Range 4 East, SRB&M in Pinal County, Arizona.

The East One-Half Section 15, Township 5 South, Range 4 East, SRB&M in Pinal County, Arizona lying North of the South Right of Way Line of the Maricopa-Casa Grande Highway in Pinal County, Arizona.

All of Section 5, Township 5 South, Range 4 East, SRB&M except for that portion lying South of the South Right of Way Line of the Maricopa-Casa Grande Highway in Pinal County, Arizona.

That portion of the Northeast Quarter of Section 1, Township 5 South, Range 3 East, SRB&M lying North of the South Right of Way Line of the Maricopa-Casa Grande Highway in Pinal County, Arizona.



GTA ENGINEERING, INC.
CONSULTING ENGINEERS
1990 W CAMELBACK RD. STE. 401
PHOENIX, AZ (602)246-7759

PALO VERDE UTILITIES COMPANY, L.L.C.

CAAG SERVICE AREA MAP

OCTOBER 2003

FIGUR
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