Kyrene Expansion Pr

NEW APPLICATION

0000000845

# Application for a Certificate of Environmental Compatibility

# SRP Kyrene Expansion Project

Prepared for
State of Arizona Power Plant and
Transmission Line Siting Committee

Submitted by
Salt River Project

Date: _____

Case No: _____

DOCKET NO. L-00000B-00-0104

# APPLICATION FOR A
# CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

# KYRENE EXPANSION PROJECT

**SALT RIVER PROJECT**

**June 2000**

# TABLE OF CONTENTS


Introduction ..... 1
Figure 1 - Location Map ..... 2

Application for a Certificate of Environmental Compatibility ..... 4
Figure 2 - Combined Cycle Plant Facility Layout ..... 6
Figure 3 - Project Site - Aerial Photograph ..... 7
Figure 4 - Typical Combined Cycle Plant Configuration ..... 8

Exhibit A – Location and Land Use Maps ..... A-1
Figure A-1 - Project Location ..... A-2
Figure A-2 - Jurisdiction ..... A-3
Figure A-3 - Existing Land Use ..... A-4
Figure A-4 - Planned Land Use ..... A-5

Exhibit B – Environmental Reports ..... B-1
Planning Process Overview
Exhibit B-1 - Land Use ..... B-1-1
Exhibit B-2 - Water and Wastewater ..... B-2-1
Exhibit B-3 - Air Quality ..... B-3-1

Exhibit C – Areas of Biological Wealth ..... C-1

Exhibit D – Biological Resources ..... D-1

Exhibit E – Scenic Areas, Historic Sites and Structures, and Archaeological Sites ..... E-1
Figure E-1 - Local Area ..... E-3
Figure E-2 - Archaeological Project Areas ..... E-9
Figure E-3 - Archaeological, Historical, Cultural Map ..... E-10

Exhibit F – Recreational Purposes and Aspects ..... F-1
Figure F-1 - Regional Area – Transportation, Open Space, and Recreation ..... F-3

Exhibit G – Concepts of Typical Facilities ..... G-1
Figure G-1 - Preliminary Mitigation and Enhancement Zones ..... G-2
Figure G-2 - Area A - Mitigation and Enhancement Concepts ..... G-3
Figure G-3 - Area B - Mitigation and Enhancement Concepts ..... G-4
Figure G-4a - Area C - Mitigation and Enhancement Concepts ..... G-6
Figure G-4b - Area C - Mitigation and Enhancement Concepts ..... G-7
Figure G-5 - Area D - Mitigation and Enhancement Concepts ..... G-8
Figure G-6 - Area E - Mitigation and Enhancement Concepts ..... G-9
Figure G-7 - Community Integration Concept ..... G-10

Table of Contents (continued)

Exhibit H – Existing Plans ..... H-1

Exhibit I – Anticipated Noise/Interference with Communication Signals ..... I-1

Exhibit J – Special Factors ..... J-1
- Exhibit J-1 – Newsletters, Billing Inserts, Comment Forms
- Exhibit J-2 – Newspaper Ads, News Releases
- Exhibit J-3 – Neighborhood Meeting Flyer and Sign-up Form
- Exhibit J-4 – City of Tempe – SRP Information Letters to Officials
- Exhibit J-5 - Agreement

# INTRODUCTION

# INTRODUCTION

Salt River Project Agricultural Improvement and Power District (SRP or the Applicant) is applying for a Certificate of Environmental Compatibility (CEC) to expand its Kyrene Generating Station in Tempe, Arizona. SRP proposes to add 250 megawatts (MW) of new capacity in the form of a one-on-one combined-cycle natural gas facility. Construction is scheduled to begin approximately January 2001, with an expected in-service date of May 1, 2002. Figure 1 is a map of the proposed plant location.

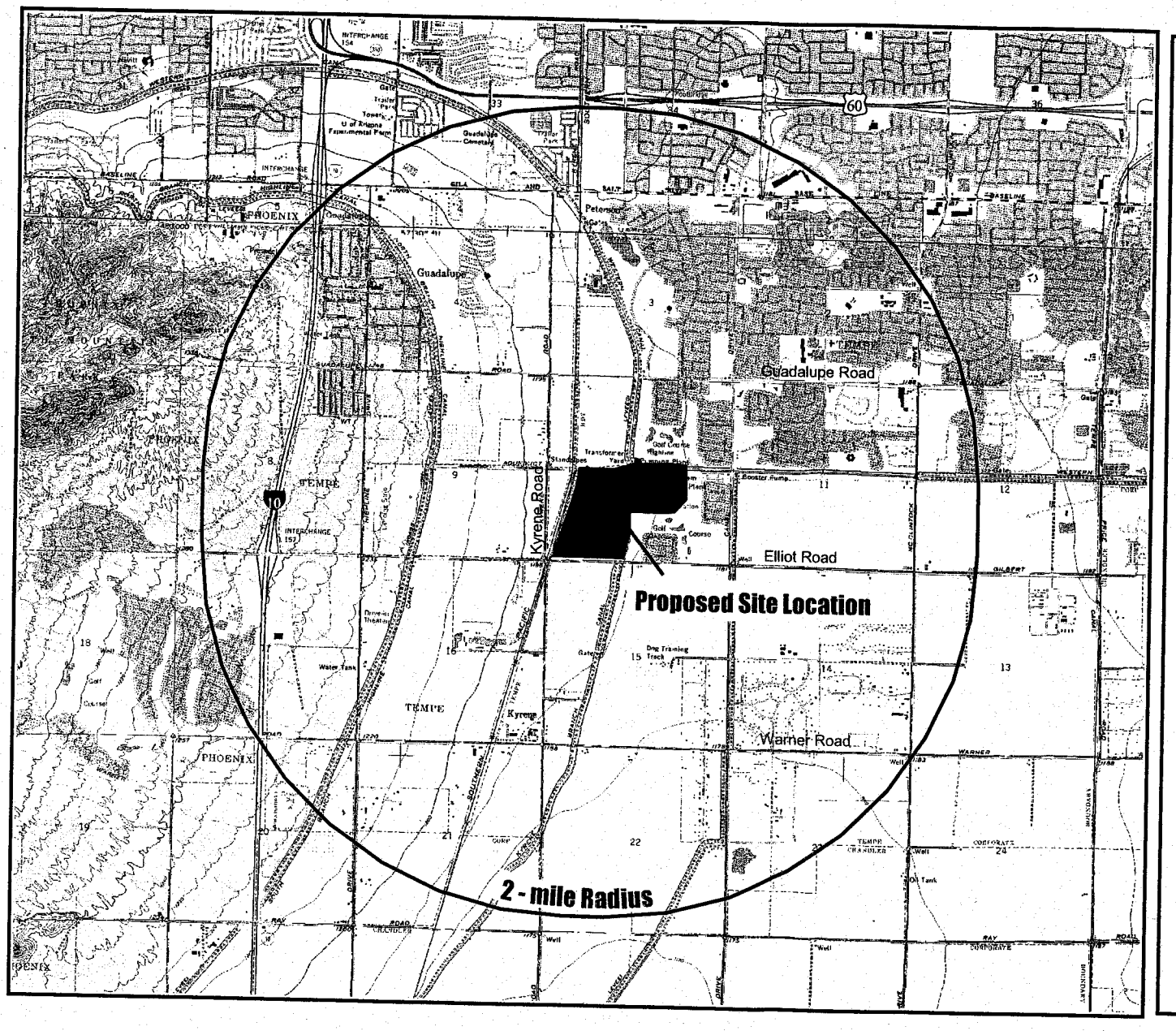
The new facilities at Kyrene are needed to meet the needs of the record-setting growth in the Phoenix metropolitan area and particularly in the East Valley. Over the past five years the number of SRP electric customers has increased by more than 16 percent. Last fiscal year alone SRP welcomed more than 27,000 new customers to its service territory–a record annual growth. SRP's customer growth is expected to continue at a similar pace over the coming years. This is particularly true in the Southeast Valley where a majority of the population growth is occurring. SRP anticipates that during the next 10 years SRP's greatest growth will occur in Tempe, Gilbert, Mesa, Chandler, and Ahwatukee/Phoenix.

The new facilities are also needed to maintain and improve the reliability of the electric system. Proper system planning dictates a mix of local and remote generation. Local generation is necessary to maintain voltage levels and to provide resources in the event of an outage of a system component. Yet, no new local generation has been built in the East Valley since the mid-1970s. The Kyrene expansion will partially address this element of system operations.

The new facilities will also address transmission system import constraints. Because of the growth, the existing transmission system is near or at its full capacity. This means either that additional power must be produced locally or that new transmission lines must be built into the load centers from areas outside Phoenix. The Kyrene expansion will not require any new off-site transmission. The result will be to avoid the need for some new transmission and to delay the need for other transmission.

As a prelude to this application, SRP conducted an extensive public notification and involvement process. The process included the formation of a Community Working Group (CWG), which included representatives of the community, City of Tempe, and local business interests. Through the public involvement process, and in cooperation with the City of Tempe, SRP engaged in a "mediation" process with representatives of local neighborhoods to determine the size and various mitigation and enhancement measures relative to the Kyrene expansion. This application reflects the agreements reached with the community during the mediation process. Most significantly, through the community mediation process SRP has agreed to downsize the planned expansion from 825 MW to 250 MW. Cooperation with the community and Tempe regarding additional mitigation and enhancement measures is ongoing.

FIGURE 1
LOCATION MAP




# LOCATION MAP

## Figure 1

Sources:
U. S. Geological Survey
1:24,000 Scale
Digital Line Databases
Tempe, AZ. 1952 Revised 1982
Guadalupe, AZ. 1952 Revised 1982

1000 0 2000 4000 8000
Scale in Feet

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Kyrene Expansion Project

N:/projects/srp/kyrene/spr/location.spr/site-layout

The proposed new facilities will include one combined-cycle unit and supportive equipment for the turbines. The new facilities will have a nominal summer output of 250 MW. The unit will be designed to operate in base load mode or cyclic duty mode (to follow power requirements). The facilities will be located on the site of the existing Kyrene Generating Station, which is property owned by SRP, located within the City of Tempe. The location of the new facilities is shown on Figure 1 and is approximately 600 feet from the nearest residential property.

The water supply for the cooling water for the new facilities will come from the Western Canal or the City of Tempe Reclamation Plant. During canal dry-up periods, or when water is not available from the City of Tempe, water can be supplied by existing SRP groundwater wells.

Additional benefits of the proposed facilities include the following:

- Visual impacts will be minimal because of design, siting, mitigation, and enhancement plans.
- Land use impacts are expected to be minimal because of siting adjacent to the existing plant, which is located in an industrial area.
- Noise impacts from the expansion project are expected to be minimal and will meet all applicable noise ordinances.
- Air quality will not deteriorate as a result of the operation of the new facilities. Air quality may improve as a result of offsets obtained in the area.
- No special status species or unique habitats occur within the project site.

SRP believes that the proposed expansion project is environmentally compatible based on the information contained in this document. In accordance with the factors considered by the Siting Committee, as defined in ARS § 40-360.06, plans to construct the new facilities should be found suitable for issuance of a CEC.

# APPLICATION

# APPLICATION

1. *Name and address of the applicant*

   Salt River Project Agricultural Improvement and Power District (SRP)
   1521 North Project Drive
   Tempe, Arizona 85281-1298

2. *Name, address, and telephone number of a representative of the application who has access to technical knowledge and background information concerning this application, and who will be available to answer questions or furnish additional information.*

   Mr. Randall G. Dietrich
   Project Manager
   c/o SRP
   P.O. Box 52025, PAB 356
   Phoenix, AZ 85072-2025
   (602) 236- 5213

3. *State each date on which applicant has filed a ten-year plan in compliance with ARS §40-360.02, and designate each such filing in which the facilities for which this application is made were described. If they have not been described in a ten-year plan, state the reasons therefore.*

   Recent legislation has eliminated the need to file a ten-year plan for the contemplated construction of generation facilities.

4. *Description of the proposed facilities:*

   SRP proposes to expand its existing Kyrene generating facility. SRP requests a CEC authority to expand the generating facility to the extent described below.

   *4.1 With respect to an electric generating plant:*

   *4.1.1 Type of Generating Facilities:*

   The Kyrene Expansion Project (KEP) will include one combined-cycle unit and supportive equipment. The KEP will have a summer nominal output of 250 MWs, base loaded. The KEP will be designed to operate in base load mode or cyclic duty mode (to follow power requirements). The KEP will have three basic components:

A. one combustion turbine generator (CT)
B. one multiple pressure heat recovery steam generator (HRSG)
C. one steam turbine generator (STG)

The KEP will be located within the City of Tempe, and completely on the 160 acres owned by SRP. The KEP will be adjacent to the existing Kyrene Generating Station. The location of the KEP is shown in Figure 1. The KEP will be operated by SRP. The KEP site is approximately 600 feet from the nearest residential property.

The site plan, with supporting infrastructure, shown in Figure 2, includes vehicular access, water supply system, natural gas supply lines, and transmission lines. The natural gas line will be connected to the El Paso Natural Gas (EPNG) Pipeline 2214. The new switchyard will connect to an existing 230 kilovolt (kV) line along the south boundary of the new site. The new switchyard will be operated by SRP. Figure 3 shows the proposed plant facilities overlaid on an aerial photograph.

The unit will be a natural gas-fired, advanced technology CT in a combined cycle arrangement. The technical details of the generating facility components are described in Section 4.1.2 below. There will be no back-up fuel (distillate oil) source.

The CT uses state-of-the-art technology to effectively burn clean natural gas with reduced nitrogen oxide ($NO_x$) and carbon monoxide (CO) emissions relative to other generation options. Emissions control technology used will comply with air quality regulations (see Exhibit B-3 for more information).

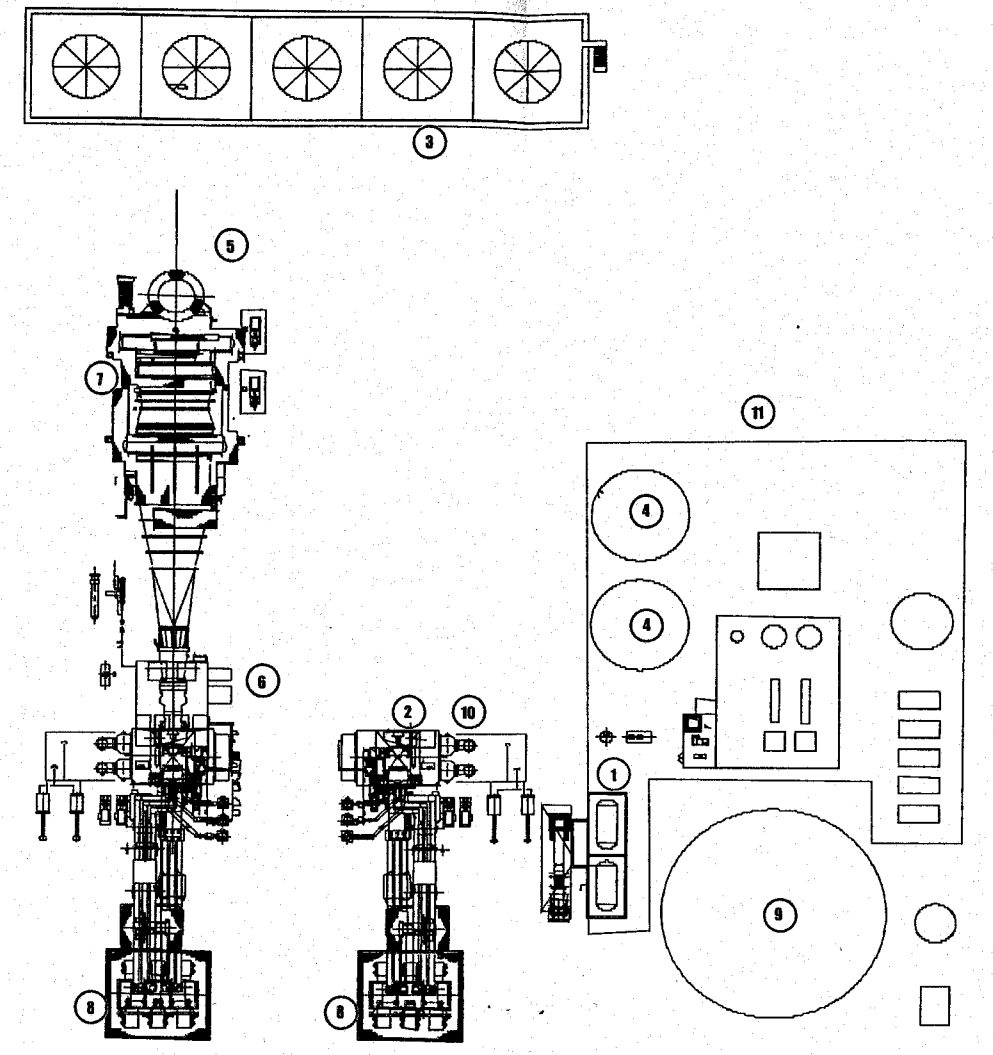
In a combined-cycle configuration, a CT serves two functions. It produces electric power through a directly connected electric generator and supplies hot exhaust gases to a dedicated HRSG. The heat in the CT exhaust gas transfers energy to produce steam as it passes through the HRSG. The steam generated in the HRSG is sent to a condensing steam turbine and generator that produces additional electricity. The steam turbine exhaust steam is water cooled via a condenser served by a wet mechanical draft cooling tower. Figure 4 illustrates a typical combined cycle plant configuration.

For the CT, ambient air is drawn into the gas turbine compressor section through the silencing, air filtration and evaporative or fogging cooling system where it is compressed to approximately 14 atmospheres. The compressed air is then mixed and burned with the gas in combustors to produce the hot gases that expand

Figure 2
Combined Cycle Plant Facility Layout

# COMBINED CYCLE PLANT
# FACILITY LAYOUT

## Figure 2




| ITEM | DESCRIPTION |
|---|---|
| 1 | WATER TREATMENT CHEMICAL TANKS |
| 2 | CONDENSER |
| 3 | COOLING TOWER |
| 4 | DEMINERALIZATION WATER TANK |
| 5 | EXHAUST STACK |
| 6 | GAS TURBINE GENERATOR |
| 7 | HEAT RECOVERY STEAM GENERATOR |
| 8 | MAIN STEP-UP TRANSFORMER |
| 9 | PROCESS WATER/FIRE WATER STORAGE TANK |
| 10 | STEAM TURBINE GENERATOR |
| 11 | WATER TREATMENT AREA |

0 50 100 150 200

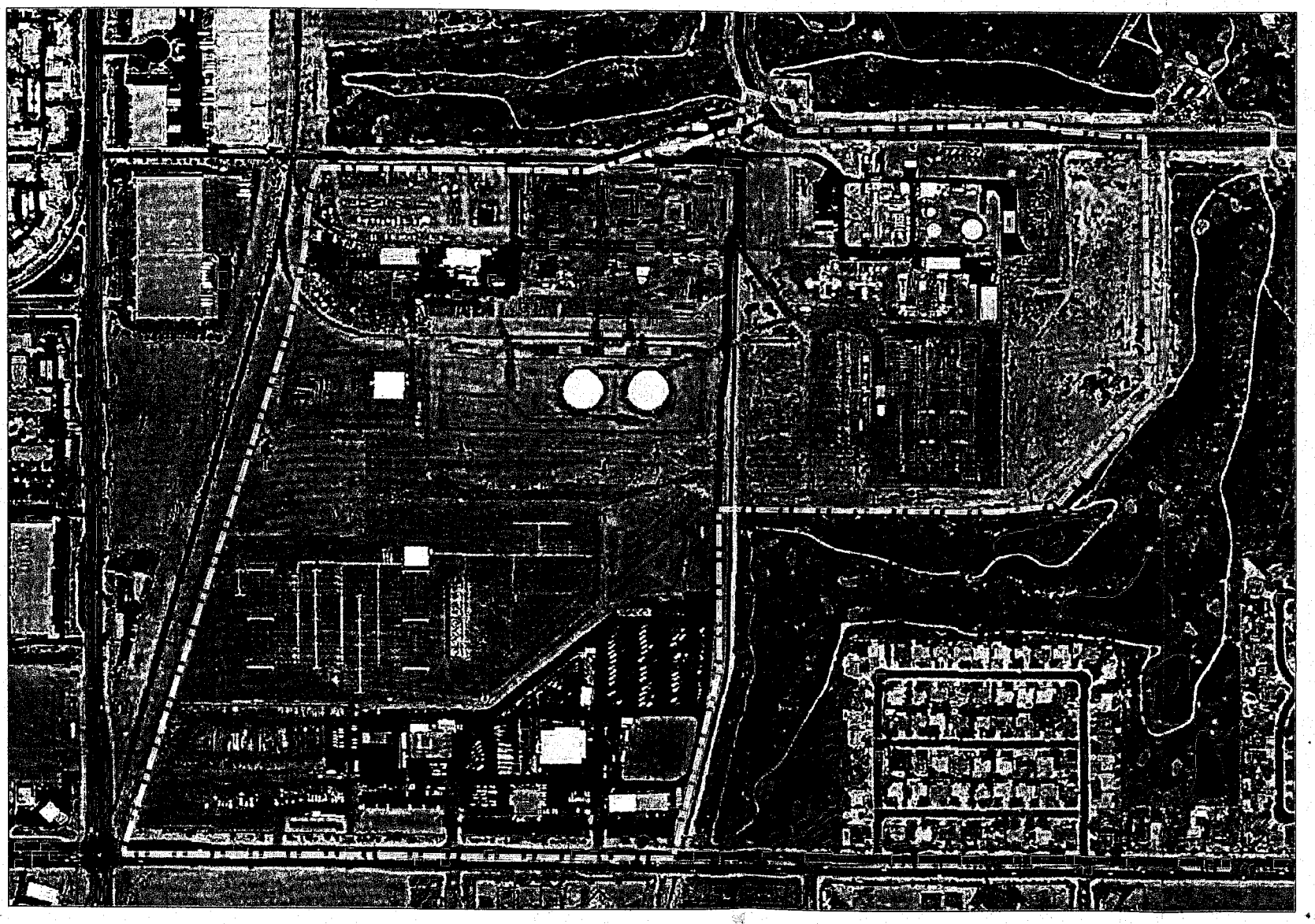
SCALE IN FEET

Kyrene Expansion Project

JUNE 12, 2000

m:/projects/srp/kyrene/plots/cycle.pdf

Figure 3
Project Site – Aerial Photograph



# PROJECT SITE

## Figure 3

**Legend**

Project Site

Preliminary Project Location

0 100 200 400 600

Scale In Feet

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Kyrene Expansion Project

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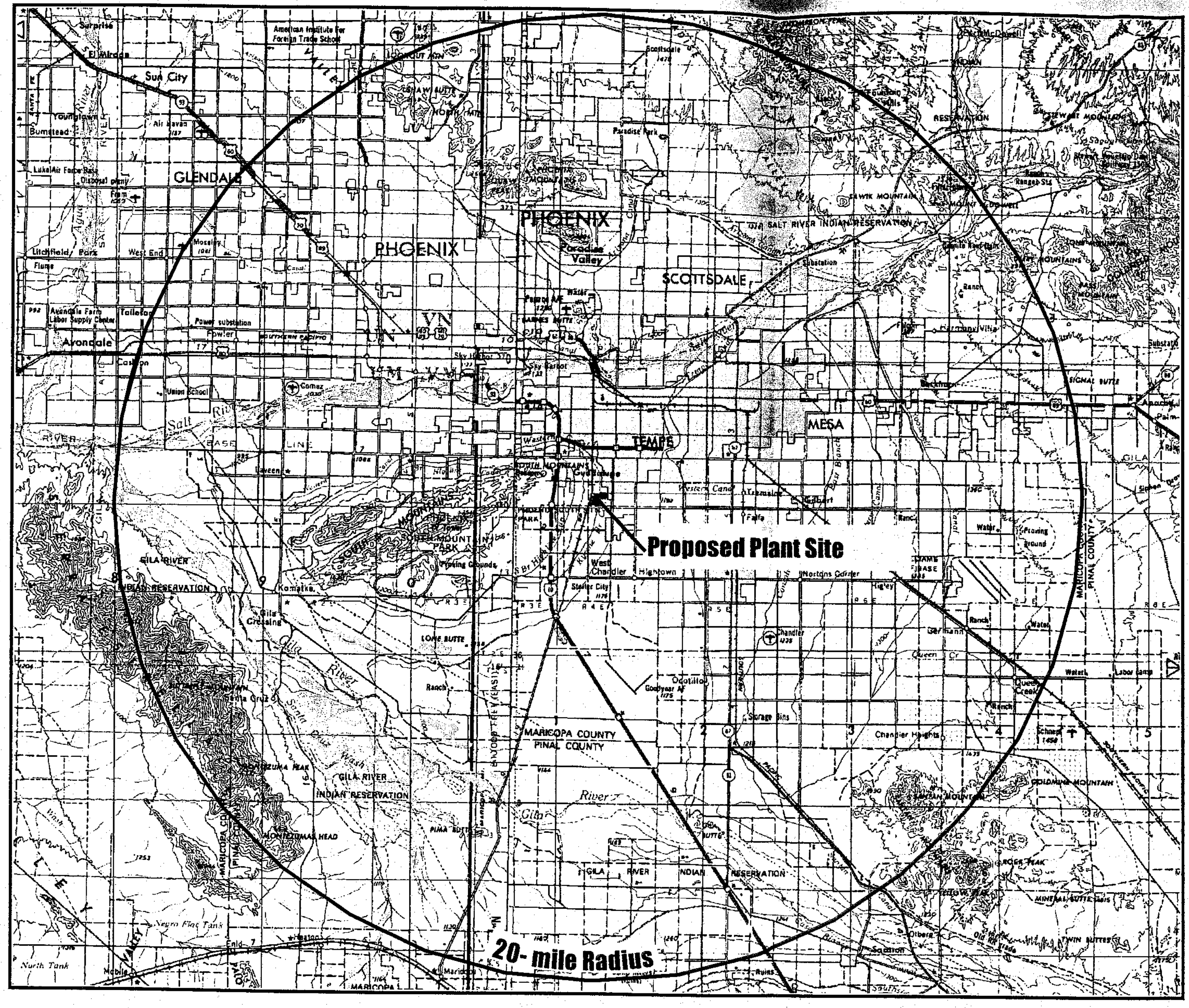


## PROJECT LOCATION

## Figure A-1

**Sources:**
U. S. Geological Survey
1:250,000 Scale
Digital Line Database
Phoenix, AZ. 1954 Revised 1969
Mesa, AZ. 1954 Revised 1969

1.5 0 3 6 9
Scale in Miles

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Kyrene Expansion Project

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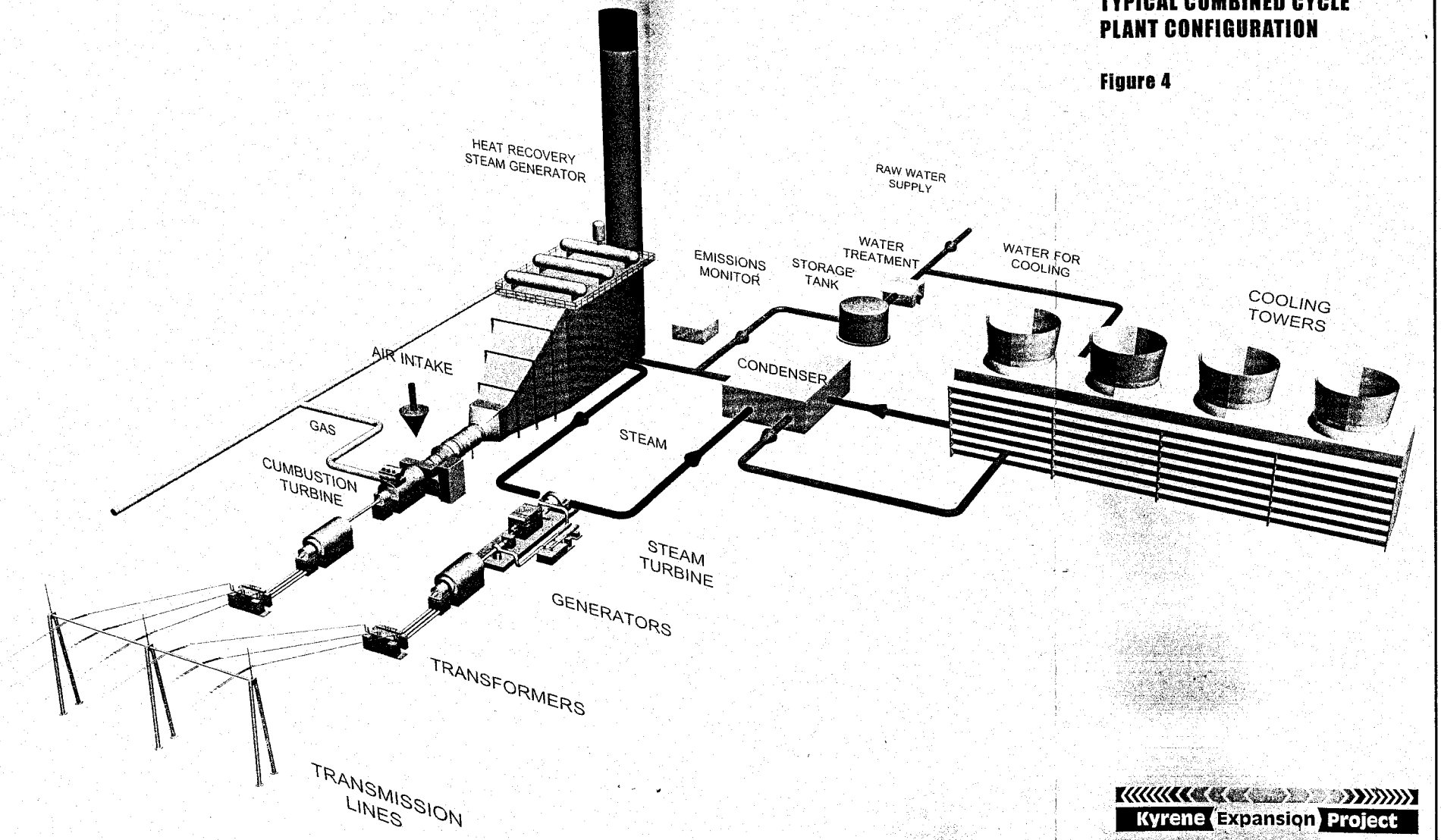
Figure 4
Typical Combined Cycle Plant Configuration

# TYPICAL COMBINED CYCLE PLANT CONFIGURATION

**Figure 4**




Kyrene Expansion Project

JUNE 12, 2000

m:/projects/srp/kyrene/plots/config2.pdf

through the turbine sections. When a CT and steam turbine are used in a combined cycle, the overall cycle efficiency is improved because most of the excess energy of the gas turbine exhaust is recovered in the HRSG. The HRSG is a horizontal gas flow, natural circulation type. The HRSG is a two or three-pressure non-reheat or three pressure reheat, design. The steam generated in the HRSG is piped into the steam turbine. The steam drives the steam turbine and discharges to the condenser. The steam turbine produces electrical power through its directly connected generator. A portion of the steam from the HRSG can also be sent to the CT to augment the mass of the combustion air and increase the power output.

The CT will only use natural gas. Fuel gas will be delivered to the project site via an existing EPNG pipeline at adequate pressure. Plant exhaust gas emissions are controlled by dry low $NO_x$ combustors, the use of selective catalytic reduction (SCR) systems for additional $NO_x$ control, and CO reduction will be performed by the use of CO catalytic converter systems. The steam will be condensed in a wet surface condenser. The condenser is a water-cooled, horizontal surface design, close coupled to the axial exhaust from the steam turbine. The condensed steam (condensate) is recirculated through the cycle by the condensate and boiler feedwater systems. A mechanical draft wet cooling tower will provide the cooling water source.

Supplemental duct firing is part of the plant design to increase the CT exhaust gas temperature by burning natural gas in the HRSG duct. A burner grid (natural gas only) located in the duct between the CT exhaust manifold and the HRSG housing accomplishes duct firing. The higher temperature gas produces more high-pressure steam, thereby increasing the power output of the plant. A typical application of supplemental duct firing is during high ambient temperature conditions when additional heat is needed to maintain adequate steam flow from the HRSG to the steam turbine.

The use of catalysts in the exhaust gas steam is required to reduce $NO_x$ and CO emissions from the plant. The catalytic oxidation will also reduce Volatile Organic Carbons (VOCs). SCR reduces the emissions of $NO_x$ to the environment utilizing aqueous ammonia in the presence of a catalyst. The level of $NO_x$ reduction is anticipated to be as high as 80 to 90 percent. The addition of SCR involves the insertion of reactors and associated structures and transitions into the HRSG, and the addition of aqueous ammonia injection equipment and storage. The HRSG substantially removes the remaining heat in the gas and exhausts the residual through the stack. The stack contains a continuous emission monitor (CEM) to ensure air emission standards are not exceeded.

*4.1.2 Number and size of proposed units:*

The KEP includes the following major components and systems as listed and described below:

A. Site improvements, foundations, buildings, and structures
B. One natural gas fired CT with dry low $NO_x$ combustors, an air inlet silencer, an evaporative or fogging air cooler, and one direct-coupled generator
C. One HRSG with supplemental natural gas duct firing and catalyst oxidation systems to control $NO_x$, CO, and VOC emissions
D. One 150-foot HRSG exhaust stack
E. One condensing steam turbine and generator, and one water-cooled condenser
F. One mechanical draft cooling tower
G. Raw and waste water treatment facilities
H. Natural gas handling and treatment facilities
I. Switchyard (connecting to existing 230kV transmission lines) and electrical plant

Description of each major component and system above:

**A. Site improvements, foundations, buildings, and structures:**
Access to the site will be on an existing road from Kyrene Road, approximately 0.5 mile north of Elliot Road, on the east side. This intersection will be modified, if required, by the City of Tempe. All site roads will be paved or conditioned to comply with emissions standards.

If required, the area will be graded and drained to route site runoff to a retention basis. The retention basin discharge will comply with state and federal standards. Final landscaping will be coordinated with the City of Tempe.

All on-site bulk storage of water and chemicals will meet containment (berm or wall) requirements. Various chemicals are used for conditioning of raw and wastewater, condensate and feedwater, circulating water, and emissions controls.

**B. One natural gas fired CT with dry low $NO_x$ combustors, air inlet silencer, an evaporative or fogging air cooler, and one direct-coupled generator:**
The CT will burn natural gas. The mixed gas and air are compressed and ignited, which expands through the CT, turning the CT, which turns the direct-coupled generator. The air inlet silencer will provide noise abatement. The evaporative or fogging air cooler provides additional cycle efficiency gains as the power generation increases as the inlet air temperature is lowered. CT performance is dependent on ambient conditions (temperature, humidity,

and barometric pressure), fuel source, and draft system losses (ductwork, emission controls, and stack height).

To further increase the cycle efficiency, especially during peak power demand periods, steam from the HRSG will augment the mass flow through the CT, which increases the power output.

The generator will produce approximately 175 MWs (gross).

Auxiliary systems will be installed to support the CT and generator. These systems include lubrication, air filtration, fire protection, noise attenuation, gas delivery, instrumentation/control, compressed air, and lighting.

**C. One HRSG with supplemental natural gas duct firing and catalyst oxidation systems to control $NO_x$, CO, and VOC emissions.**

The HRSG consists of ductwork, steam drums, piping, condensate preheater, three steam pressure zones (low, intermediate, and high), catalytic oxidation equipment (for $NO_x$, CO, and VOC), and an exhaust stack. The condensate is heated by the CT exhaust gas, then passes through a series of heat exchange piping arrangements, which results in steam at a temperature and pressure needed for efficient use in the steam turbine. The steam is piped to the steam turbine, which is direct-coupled to a generator, generating additional electricity.

To optimize the performance of the catalytic oxidation equipment, which is temperature dependent, the catalytic unit will be specifically placed within the HRSG.

The duct burner grid will be upstream of the catalytic oxidation equipment to ensure stack emission requirements are maintained.

The HRSG is located outdoors, on an independent foundation, and separated to ensure maintenance access is adequate.

**D. One 150-foot HRSG exhaust stack.**

The stack will be immediately adjacent to the HRSG, and will be 150 feet in height. A CEM will be placed in the stack to monitor unit emissions. External platforms may be required to access the CEM for testing and maintenance.

**E. One condensing steam turbine and generator.**

Steam is piped from the HRSG to the steam turbine, which turns the turbine and direct-coupled generator. The generator will produce approximately 90 MWs (gross). Steam turbine exhaust will be directed to a condenser, which is cooled by circulating water from the cooling tower.

The steam turbine and generator package includes supportive systems for lubrication, shaft sealing, and operational control. Cooling media for the generator cooling and lubrication systems will be from the circulating water system.

The combined electrical output of the CT and the steam turbine will be 250 MW (net).

**F. One mechanical draft cooling tower.**

The cooling tower will provide cooling water to the condenser (for cooling of the steam exhausted by the steam turbine) and various smaller heat exchangers (lubricating oil, generator hydrogen, compressed air, etc.). The cooling tower will incorporate drift minimization equipment to reduce water losses and avoid fogging conditions.

**G. Raw and waste water treatment facilities.**

Raw water will be provided by various sources, in compliance with the State of Arizona water laws and the City of Tempe requirements. Raw water will be from the Western Canal or the City of Tempe Reclamation Plant. During canal dry up (approximately 4 to 6 weeks per year), when supply and discharge is not allowed from or into the Western Canal, wells owned and operated by SRP will provide raw water.

Raw water is treated (conditioned and softened) for use in the cooling tower. The cooling tower evaporation process is the primary consumption of site water. This water is also processed by a reverse osmosis system, which provides pure water for steam cycle operation and the closed bearing (lubricating oil) cooling water system.

Wastewater sources are from the cooling tower blowdown, raw water treatment (conditioning and/or softening) system, demineralizer regeneration effluent, HRSG blowdown, roof and floor drains, and rainfall runoff. Treated wastewater may be discharged to the circulating water system, to minimize raw water makeup. Cooling tower blowdown will be three cycles of concentration. All remaining wastewater will be monitored and discharged into the Western Canal or the Gila Drain in compliance to federal, state, and city discharge requirements.

Potable water and sewage disposal will be tied to the City of Tempe systems.

The fire water source will be either from the City of Tempe or a separate fire protection system will be installed to meet all fire protection standards. If a separate fire water protection system is required, treated raw water will be used.

The site drainage plan may include grading and paving to direct rainwater and spills to a retention basin. The retained water will be monitored, and discharged if water discharge requirements are met.

**H. Natural gas handling and treatment facilities.**

The natural gas handling and treatment facilities will transfer low sulfur, pipeline quality gas from the EPNG system to the plant site. Except for gas pressure reduction, metering, filtration, heating, connection to the CT and HRSG duct burners, all gas distribution lines to and within the plant will be underground. Filtration and heating are required to ensure proper CT dry low $NO_x$ combustor operation.

**I. Switchyard (connecting to existing 230kV transmission lines) and Electrical Plant.**

A new switchyard will be adjacent to the new site and will be connected to an existing 230kV line. New transmission poles or lines will be required within the new switchyard and within the existing SRP property. The switchyard, beginning on the high side of the new main step up transformers, will be built, owned, and operated by SRP, to SRP design, construction, and operating standards. SRP's standard switchyard is an open air, breaker-and-a-half bus design, with high voltage circuit breakers, disconnect and grounding switches, potential transformers, surge arrestors, relay protection, substation steel structures, and separately fenced.

The balance of the electrical plant system will be 4.16kV. All plant electrical systems will be fed from the 4.16kV system, and stepped down to feed various motor control centers, back-up (125 VDC) systems, and other loads. Start-up power will be backfed from existing SRP circuits to the in-plant 4.16kV system (no black start capabilities; no diesel generator back-up or start-up system).

Critical circuits, such as control power, field instruments, CEM, etc., have automatic alternative power sources from separately supplied motor control centers. The alternative power sources include an uninterruptible power source (UPS) and batteries.

*4.1.3 The source and type of fuel to be utilized, including a proximate analysis of fossil fuels:*

The KEP will use low sulfur, pipeline quality, natural gas provided by EPNG. A new gas pipeline to the new site will be connected near Elliot and Kyrene roads, in Tempe.

A typical monthly analysis of the natural gas that will be used is shown below. The values are provided by EPNG Meter 30031 - Guadalupe, August 14, 1999:

| | Normalized Percent | |
|---|---|---|
| | Jan. 1, 1999 | June 1, 1999 |
| Carbon Dioxide | 0.510 | 1.620 |
| Nitrogen | 1.780 | 0.170 |
| Methane | 94.390 | 97.120 |
| Ethane | 2.820 | 1.020 |
| Propane | 0.330 | 0.060 |
| Iso. Butane | 0.040 | 0.000 |
| Normal Butane | 0.060 | 0.010 |
| Iso. Pentane | 0.020 | 0.000 |
| Normal Pentane | 0.020 | 0.000 |
| Hexanes + | 0.030 | 0.000 |
| BTU | 1,022 | 1,005 |
| Specific Gravity | 0.587 | 0.577 |

*4.1.4 Amount of fuel to be utilized daily, monthly, and yearly:*

Assuming the KEP is base loaded, with steam augmentation and HRSG duct burners in service for the entire year and at the Higher Heating Value (HHV) of the natural gas provided by EPNG, the KEP could consume approximately 49,000 MMBtu of gas per day; 1,470,000 MMBtu of gas per month; and 17,885,000 MMBtu of gas per year. At a 60 percent capacity factor, the annual usage would be 10,731,000 MMBtu. The fuel use will vary with system load requirements, CT operation, actual hours of duct burner use, steam augmentation, and number of start-up/shut-down events. The KEP annual capacity factor is expected to be approximately 60 percent, with a range of 45 percent to 85 percent.

*4.1.5 Type of cooling to be utilized and the source of any water to be utilized:*

**A. Type of cooling.**
A cooling tower will be used to cool circulating water. This water will also provide cooling to various smaller heat exchangers (lubricating, hydrogen, compressed air, etc.). The CT inlet air system will be cooled via evaporation filter media or a fogging system.

**B. Source of any water to be utilized.**
The circulating water system makeup will be from the raw water treatment system, which receives water from the Western Canal, the City of Tempe Reclamation Plant, or SRP owned wells (during canal dry up conditions).

*4.1.6 Proposed height of stacks and number of stacks, if any:*

The KEP will have one stack, 150 feet high.

*4.1.7 Date for scheduled start-up and firm operation of each unit and date construction must commence in order to meet schedules:*

The KEP construction, start up, and firm operation dates are:

| | |
|---|---|
| Start of construction: | January 2001 |
| Start up: | February 2002 |
| Firm operation: | May 1, 2002 |

**A. Project Construction:**

An engineer, procure, construct (EPC) contract may be awarded to build the KEP. The EPC award is anticipated to occur approximately November 2000, with mobilization to the site on approximately January 2001. Shortly after November 2000 the EPC contractor may place long lead-time orders. In support of the January 2001 mobilization date, site archaeology, and related site preparation work began January 3, 2000.

During the construction period, the construction work force will peak at approximately 150 construction employees. The peak is anticipated to occur from May to October 2001.

During construction, existing SRP land will be used for construction parking, over-the-road truck and railroad deliveries to the laydown area, and temporary construction and work site management trailers. Site access will be off Kyrene Road, approximately 0.5 mile north of Elliot Road, on the east side. Construction water will be drawn from the Western Canal for approximately 4 months, then the normal KEP water source system will be in place. Construction power will be fed from the existing Kyrene Generating Station or from the nearby existing Kyrene 69kV yard.

**B. Project Operation:**

The KEP is designed for base load and cyclic (load following) duty. During load following operation the unit is expected to be operated on a dispatchable basis with load swings occurring as frequently as minute to minute in order to match generation with instantaneous changes in load. It is anticipated the plant will operate at full load throughout the summer months. The level of generation will be determined primarily by the level of SRP retail customer load, daily/hourly wholesale energy prices, and transmission availability into the Phoenix metropolitan area.

The combined cycle unit should be operated annually for a total of approximately 200 starts. The plant annual capacity factor should be approximately 60 percent. The plant will employ between 10 to 15 new people. Maintenance and overhaul functions may be performed by SRP personnel or out-sourced.

Anticipated operational modes are:

1. Annual Average Operation: Base load at average ambient conditions, 16 hours.
2. Part Load: 50 percent CT load at average ambient conditions, 24-hour basis.
3. Summer Operation: Base load at 97.5 percent maximum ambient/fired + steam injection (augmentation).
4. Winter Operation: Base load at 2.5 percent minimum ambient conditions.
5. Normal Operation: The CT is operating without steam injection, the HRSG is unfired, and the steam turbine is in operation.
6. Peak Operation: The CT is operating with steam injection, the HRSG is fired, and the steam turbine is in operation.
7. Standby Operation: The CT is operating without steam injection, the HRSG is unfired, and the steam turbine is in operation, at minimum load.
8. Start-up: It is anticipated the unit minimum load will be achieved within 30 minutes after the start command is initiated.
9. CT Trip: In the event of a CT trip, steam from the HRSG will be vented or dumped into the condenser.
10. CT Out Of Service: If the CT is out of service, the unit will be off line.
11. Steam Turbine Trip: In the event of a steam turbine trip, steam from the HRSG will be vented, or dumped to the condenser and the unit will be removed from service (off line).
12. CT Part Load Operation: The unit will be designed so that the CT may be operated from 50 percent to 100 percent load. The HRSG may not be fired if the CT is operating at part load.

*4.1.8 To the extent available, the estimated costs of the proposed facilities and site, stated separately:*

The estimated cost of the proposed KEP facility (including natural gas pipeline) is between $150 to $160 million. The KEP site estimated cost is approximately $25 million (including water, land, and electrical interconnect).

*4.1.9 Legal description of the proposed site:*

The KEP will be located in the SW 1/4 of Section 10, Township 1 South, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The KEP is located in the City of Tempe, Arizona, approximately 2 miles east of Interstate 10 (I-10) and ½ mile north of Elliot Road.

*4.2 Description of the proposed transmission lines:*

No additional transmission is proposed as a part of the KEP.

5. *Jurisdictions:*

*5.1 Areas of jurisdiction (as defined in ARS § 40-360) affected by this site:*

The existing plant and expansion area are located within the City of Tempe and Maricopa County. SRP owns the property and intends to expand within the existing property boundary.

*5.2 Designation of proposed sites or routes, if any, which are contrary to the zoning ordinances or master plans of affected areas of jurisdiction:*

The proposed plant location is zoned as general industrial.

6. *Description of the environmental studies the applicant has performed.*

SRP has retained various consultants to conduct studies and assist with the permit application process in several areas. Exhibits B through I contain the results of these studies.

An evaluation of the existing plant site included land use, air quality, water resources, visual resources, biological resources, cultural resources, and noise effects. Potential environmental effects of implementation of the project also were assessed.

A combination of collecting existing environmental data including literature, maps, and other agency data and contacts with appropriate agencies and organizations were conducted. In addition, resource specialists conducted field studies of the plant site and vicinity.

Analysis of the potential environmental effects included the comparison of environmental conditions with the proposed project and existing environment. SRP will implement mitigation measures, where appropriate, to minimize or eliminate impacts. Such measures will include the net reduction of emissions as required by EPA with the construction of the new plant. In addition, noise abatement measures will be implemented to meet City of Tempe ordinance.

Study results indicate that there will be no significant direct, indirect, or cumulative impacts on land use, cultural resources, biological resources, including any species of special concern, air quality, ground or surface water quality, earth resources, socioeconomics, or noise at the project site.

In addition to the various studies conducted, SRP and the Environmental Planning Group, Inc. (EPG) have implemented a comprehensive public involvement program. The purpose of this program is to engage the surrounding areas, City of Tempe, and other interested parties in the planning process. Their input allows SRP to identify the potential issues and concerns and address them while developing certain aspects of the project. Key elements of the program are the formation of a CWG, public open houses, meetings with homeowners and

homeowners associations, mailings to all surrounding addresses within 2½ miles, and media releases. The CWG includes representatives from local subdivisions, school administrators, City of Tempe, Town of Guadalupe, and local businesses. SRP has worked with some of these individuals in a similar capacity on a previous transmission line siting process (RS 16).

An agreement between SRP and the City of Tempe to implement mitigation and enhancements beyond the impacted area of the plant site is in progress. Through the planning process, SRP learned of various other issues and concerns in the surrounding area and is addressing these items as part of the power plant project.

In summary, the Applicant affirms, upon a comprehensive environmental analysis, that the project and its site are environmentally compatible, and respectfully requests the Siting Committee to approve a CEC for the project at the existing Kyrene power plant site.

**SALT RIVER PROJECT**

By: Randall G. Dietrich

Randall G. Dietrich
Manager of Resource Development

Authorized Representative
On Behalf of Salt River Project

Original and 25 copies of the foregoing hand delivered and filed with the Director of Utilities, Arizona Corporation Commission.

this 14 day of June, 2000.

# EXHIBIT A
# LOCATION AND LAND USE MAPS

# EXHIBIT A
# LOCATION AND LAND USE MAPS

As stated in Arizona Corporation Commission Rules of Practice R-14-3-219:

*"Where commercially available, a topographic map, 1:250,000 scale, showing the proposed plant site and the adjacent area within twenty (20) miles thereof. If application is made for alternative plant sites, all sites may be shown on the same map, if practicable, designated by applicant's order of preference."*

*"Where commercially available, a topographic map, 1:62,500 scale, of each proposed plant site, showing the area within two (2) miles thereof. The general land use plan within this area shall be shown on the map, which shall also show the areas of jurisdiction affected and any boundaries between such areas of jurisdiction. If the general land use plan is uniform throughout the area depicted, it may be described in the legend in lieu of an overlay."*

The following maps are included as exhibits:

- Figure A-1 – Project Location
- Figure A-2 – Jurisdiction
- Figure A-3 – Existing Land Use
- Figure A-4 – Planned Land Use

Figure A-1 – Project Location

Figure A-2 – Jurisdiction

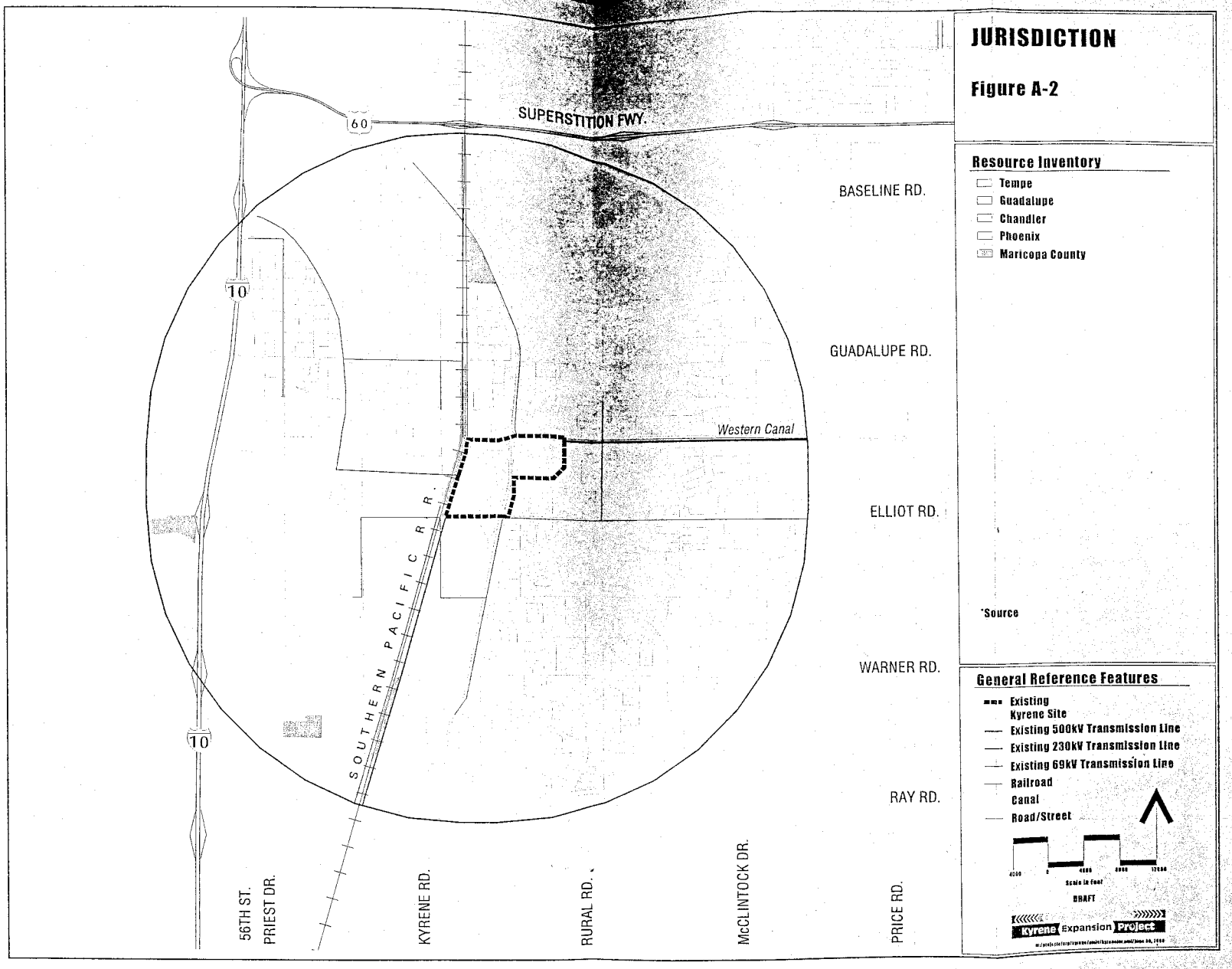
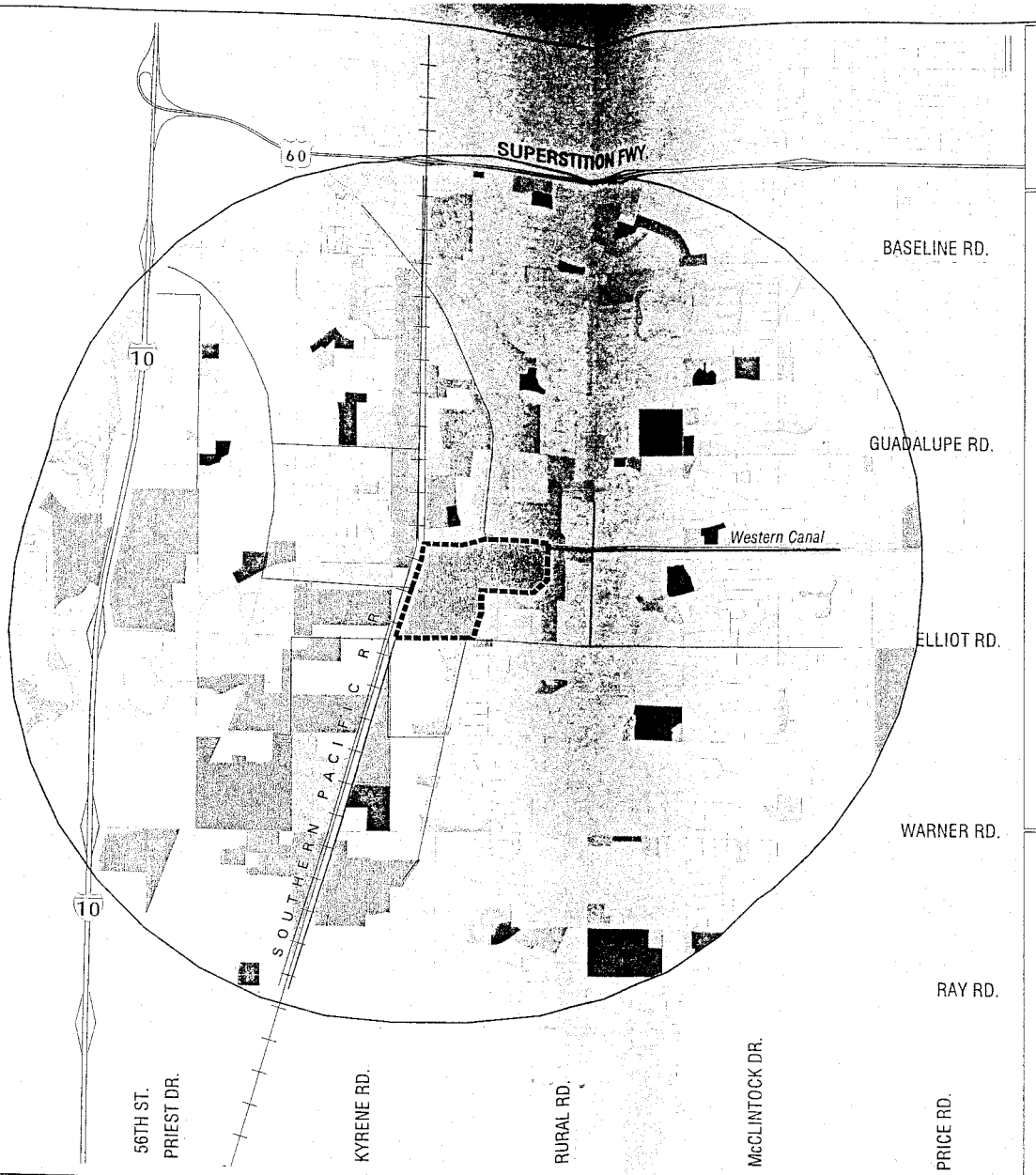

JURISDICTION
Figure A-2
Resource Inventory
Tempe
Guadalupe
Chandler
Phoenix
Maricopa County
*Source
General Reference Features
Existing Kyrene Site
Existing 500kV Transmission Line
Existing 230kV Transmission Line
Existing 69kV Transmission Line
Railroad
Canal
Road/Street
Scale in Feet
DRAFT
Kyrene Expansion Project
SUPERSTITION FWY.
60
10
10
BASELINE RD.
GUADALUPE RD.
ELLIOT RD.
WARNER RD.
RAY RD.
Western Canal
SOUTHERN PACIFIC R.R.
56TH ST.
PRIEST DR.
KYRENE RD.
RURAL RD.
McCLINTOCK DR.
PRICE RD.

Figure A-3 – Existing Land Use




# EXISTING LAND USE

## Figure A-3

### Resource Inventory

- Residential (< or = 8 du per acre)
- Residential (> 8 du per acre)
- Retail/Service
- Office/Business Park/Warehouse
- Mixed Use
- Light Industrial
- General Industrial
- Utilities/Communication Facilities
- Recreation (golf courses, parks, open space, flood control, etc.)
- Public/Quasi-Public Facilities
- Schools/Educational Facilities
- Vacant/Undeveloped
- Transportation
- Agriculture
- Lake/Water

*Source
Imagery Provided by Salt River Project
March/April 1999

### General Reference Features

- Existing Kyrene Site
- Existing 500kV Transmission Line
- Existing 230kV Transmission Line
- Existing 69kV Transmission Line
- Railroad
- Canal
- Road/Street

4000 0 4000 8000 12000
Scale in Feet

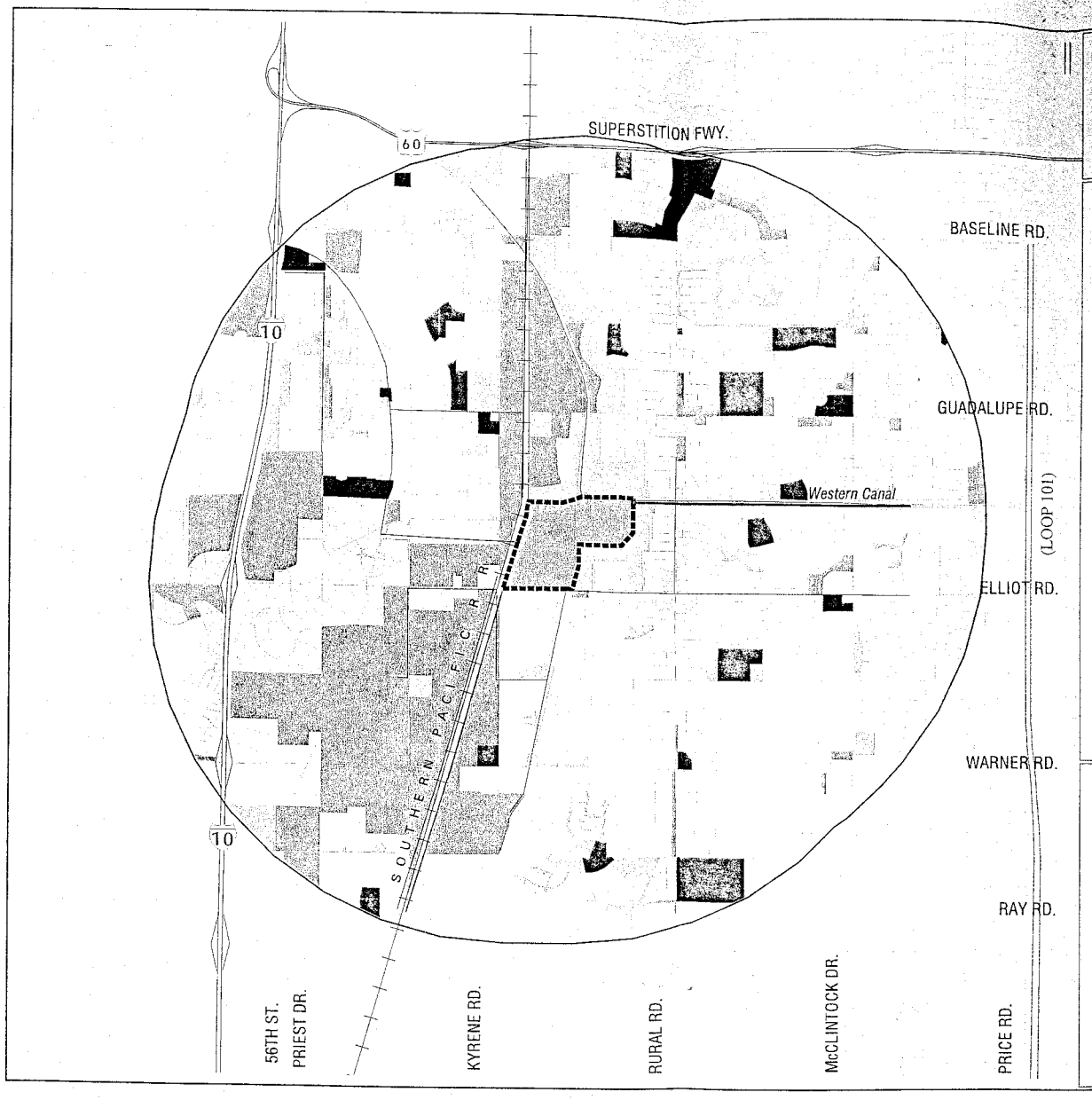
DRAFT

Kyrene Expansion Project

Figure A-4 – Planned Land Use

# PLANNED LAND USE

## Figure A-4




### Resource Inventory

- Residential (< or = 8 du per acre)
- Residential (> 8 du per acre)
- Retail
- Office/Service
- Mixed Use
- Light Industrial
- General Industrial
- Recreation (golf courses, parks, open space, flood control, etc.)
- Public/Quasi-Public Facilities
- Schools/Educational Facilities
- Transportation
- Lake/Water

*Source
Tempe, Arizona General Plan 2020

### General Reference Features

- Existing Kyrene Site
- Existing 500kV Transmission Line
- Existing 230kV Transmission Line
- Existing 69kV Transmission Line
- Railroad
- Canal
- Road/Street
- Future Freeway

4000 0 4000 8000 12000
Scale in Feet

DRAFT

Kyrene Expansion Project

# EXHIBIT B
# ENVIRONMENTAL REPORTS

# EXHIBIT B
# ENVIRONMENTAL REPORTS

As stated in Arizona Corporation Commission Rules of Practice R-14-3-219:

*"Attach any environmental studies which applicant has made or obtained in connection with the proposed site(s) or route(s). If an environmental report has been prepared for any federal agency or if a federal agency has prepared an environmental statement pursuant to Section 102 of the National Environmental Policy Act, a copy shall be included as part of this exhibit."*

Exhibit B contains the following reports:

- Exhibit B-1 – Land Use
- Exhibit B-2 – Water and Wastewater
- Exhibit B-3 – Air Quality

## PLANNING PROCESS OVERVIEW

A comprehensive planning process has been implemented for the proposed project including environmental studies and a public involvement program. Figure B-1 on the following page illustrates this process and the integration of environmental, public, and technical aspects in the development of this project. Environmental Planning Group, Inc. (EPG) worked with SRP to facilitate the planning process.

The process began in the fall of 1999 and is ongoing with efforts now focused on the mitigation and enhancement measures. A CWG was formed and public open houses were held among other activities associated with the public involvement program. Details on the public involvement process are provided in Exhibit J – Special Factors.

The overall intent of the planning process was to integrate the community and City of Tempe plans with the proposed project. Attention was given not only to potential impacts directly associated with the project, but also to issues separate from the project that were raised as concerns related to the surrounding area. SRP's intent in addressing these concerns is to have the proposed project be the catalyst for providing enhancements to the community. Figure B-2 illustrates the impact assessment and mitigation planning.

Issues raised during the process, both related and unrelated to the proposed project, were carried forward in a detailed analysis. Where appropriate, they were addressed in the development of various mitigation and enhancement measures, some of which are illustrated in Exhibit G.

The CWG continues to be involved in this process offering suggestions and ideas for mitigation and enhancement plans.

Figure B-1
Planning Process
11 x 17 color

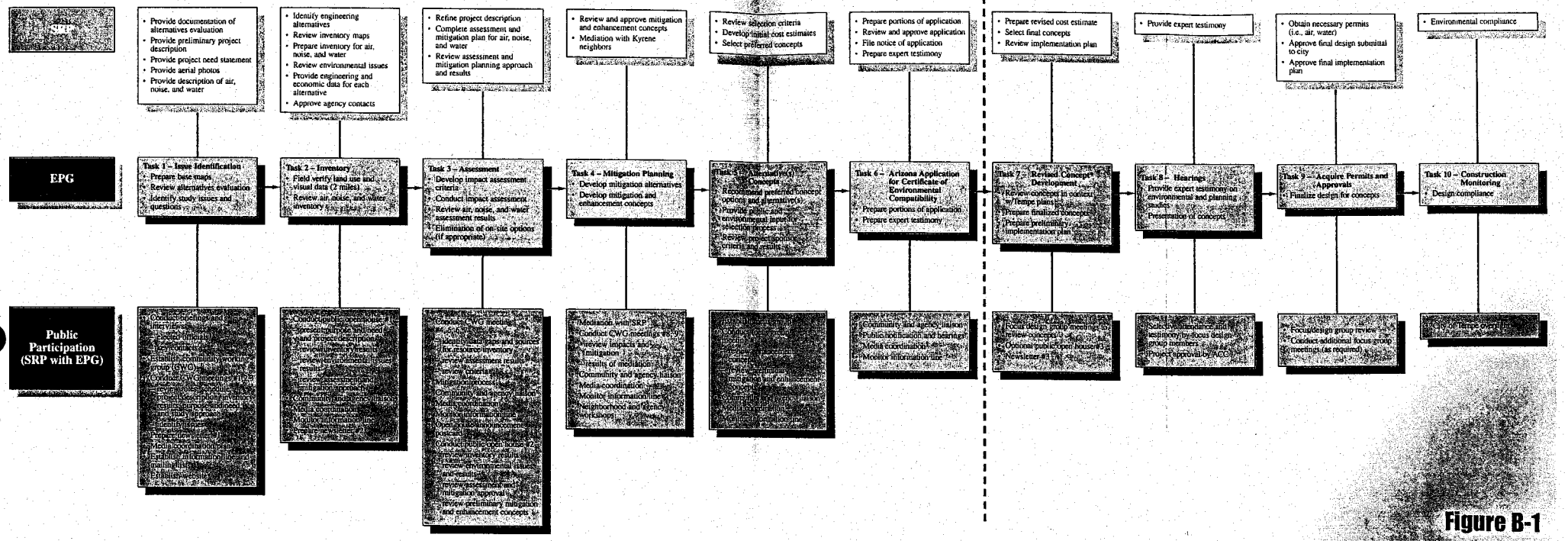



**Figure B-1**

**Planning Process**

**Kyrene Expansion Project**

June 13, 2000

Versions are subject to change as appropriate.

Figure B-2
Impact Assessment and Mitigation Planning
11 x 17 Color

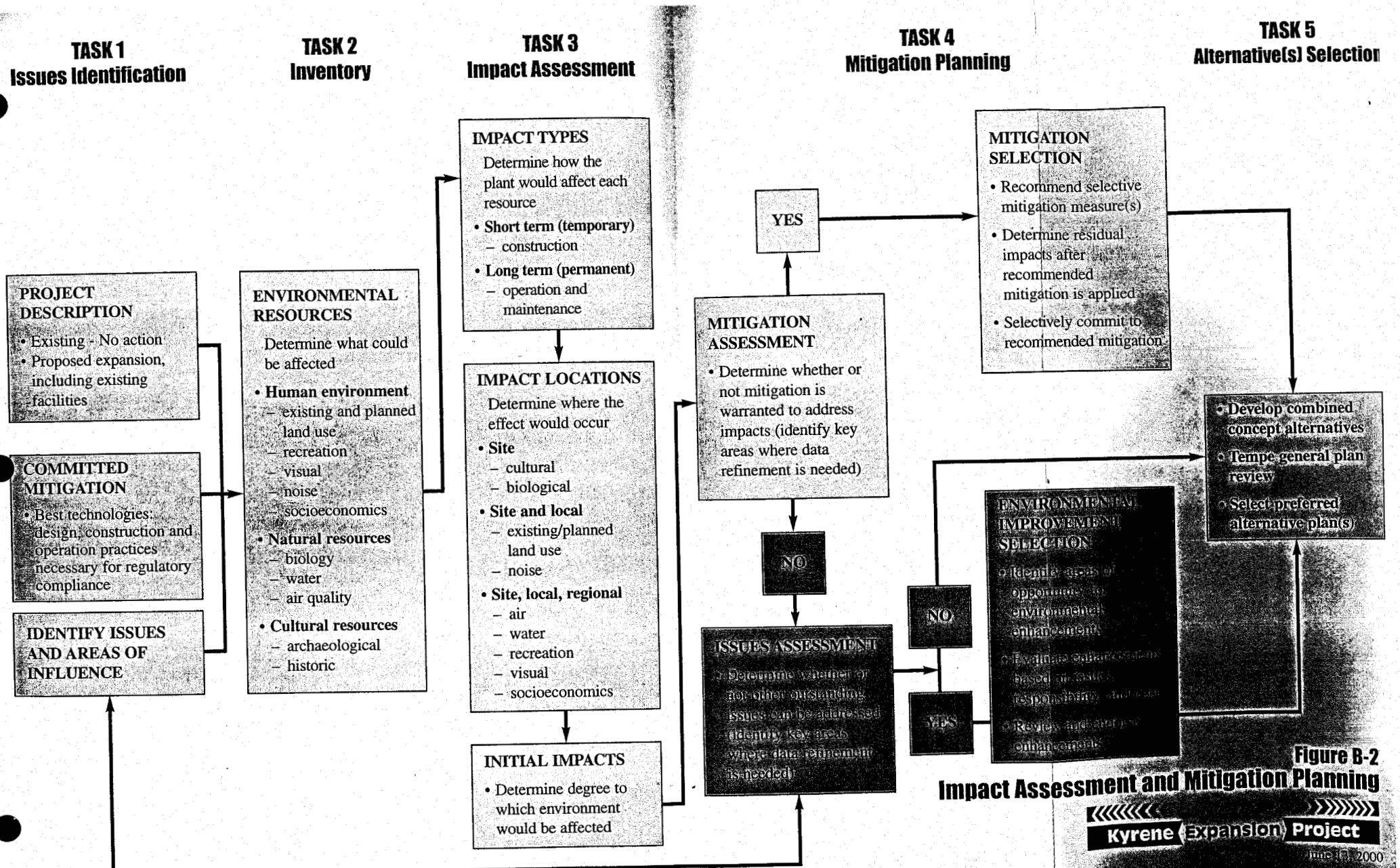



Figure B-2
Impact Assessment and Mitigation Planning
Kyrene Expansion Project
June 13, 2000

# EXHIBIT B-1
# LAND USE

# EXHIBIT B-1
# LAND USE

## INTRODUCTION

The land use study characterizes existing and future land uses, identifies potential impacts associated with planned facilities, and presents mitigation measures and enhancements for the proposed expansion project. Following is a description of:

- study methods
- land jurisdiction
- existing land use
- future land use
- impact assessment
- mitigation measures
- enhancements

### Study Methods

Land use information was collected within a 2-mile radius of the proposed expansion project site. Inventoried data were gathered through aerial photograph interpretation, field verification, review of existing maps and plans. Information was mapped at a scale of 1:24,000. Following public comment regarding issues potentially associated with the proposed expansion project, impacts to existing and future land use were evaluated for the site, local, and regional area. The site area is defined as the area within the existing Kyrene Generating Station property. The local area includes those locations immediately adjacent to the site where land use(s) could be directly affected by the proposed expansion project. The regional area extends beyond the local area to address outlying land use(s) within a 2-mile zone as required for the CEC application. For the planned land use study, the Tempe General Plan 2020 was used to characterize future land use.

### Land Jurisdiction

The majority of the study area (including the site, local, and regional areas) is located in the City of Tempe, with limited lands in the City of Phoenix and Town of Guadalupe to the west, and City of Chandler to the south. Small portions of Maricopa County lands are also found within the study area. Figure A-2 illustrates jurisdictions in the study area.

### Existing Land Use

The proposed expansion project is located in a developed area including residential, retail/service, and office/warehouse land uses to the west, the Ken McDonald Golf Course

immediately to the north and east, and residential areas to the south. Following is a characterization of the site, local, and regional areas.

**Site**

The expansion project site is situated on land (pole guard area) owned by SRP within the existing Kyrene Generating Station property. This land has been used by SRP for reclamation functions and as the heavy transformer area. Existing facilities on the property include the Kyrene generating plant, cooling towers, transmission switchyards, various storage and staging areas, and service center. The proposed expansion project will occur within the 160 acres of the existing site. The Kyrene site is bordered by the Union Pacific Railroad corridor on the west, the Ken McDonald Golf Course on the north and east, and Elliot Road on the south. Primary access to the site is from Kyrene Road and from Elliot Road. The proposed plant location is currently zoned for general industrial land uses including utilities and communication facilities.

**Local**

The local area includes the land immediately adjacent to the proposed expansion project site and is composed of a mixture of land uses including the Ken McDonald Golf Course. This 18-hole course is located directly to the north and east side of the proposed expansion project providing a buffer between the existing and planned facilities and adjacent residential areas. The Tempe YMCA, a public/quasi-public facility, is located on the east side of the Ken McDonald Golf Course along the Western Canal and west of Rural Road and the Tempe Center for Habilitation, a school/educational facility, is located north across the Ken McDonald Golf Course (see Figure A-3). The Western Canal flows from the east along the northern border of the property until it reaches the northeast corner of the proposed project area, then turns north and flows through the golf course. Lateral 7-2.6 continues through and along a portion of the eastern edge of the proposed KEP site and continues south across Elliot Road.

Residential areas in the vicinity were characterized according to density level (see Figure A-3). These density levels were determined by following the Tempe General Plan 2020 in order to remain consistent with planned land use. Residential areas were divided into two categories: areas with less than or equal to eight dwelling units per acre (lower density), and areas with greater than eight dwelling units per acre (higher density). Residential areas with densities less than eight dwelling units per acre and vacant/undeveloped land are located to the south of the existing plant site, across Elliot Road and also aligned along the outside of the golf course as described above. Two high-density developments, while not immediately adjacent to the KEP site, are located north of the Ken McDonald Golf Course (La Estancia Apartments) and west of Kyrene Road (Elliot Crossings Apartments).

The Union Pacific Railroad and a partially vacant area designed for future industrial/office/ retail/business park/warehouse/land use border the site on the west.

**Regional**

The existing regional transportation system includes major highways and railroads. The Union Pacific Railroad corridor extends north and south from the existing plant boundary. I-10 also runs north/south approximately 1½ miles west of the proposed expansion site. The Superstition Freeway or Highway 60 is located approximately 2 miles north of the expansion site.

General industrial land use areas are associated primarily with processing or heavy manufacturing. These uses follow the railroad corridor and are located southwest of the proposed expansion site adjacent to the Union Pacific Railroad corridor. Light industrial land uses including manufacturing are also located adjacent to the railroad corridor approximately 1 mile to the north of the proposed expansion project site.

Areas including office/business park/warehouse land uses are concentrated in the western portion of the study area. They primarily occupy the large area along the railroad corridor and west to I-10 and include retail/service and/or office uses with interspersed residential areas. The only other mixed-use area is found in the Town of Guadalupe.

Recreation use areas include parks, open space, flood control facilities, and recreation trails. Kiwanis Community Park, located approximately ½ mile north of the project site, adjoins the north end of the Ken McDonald Golf Course. Smaller parks and open space are found throughout the study area in residential areas and adjacent to education facilities.

Residential use in the regional area is primarily located east of the Union Pacific Railroad corridor and also northwest of the KEP site. These areas are characterized primarily by lower density dwellings (less than 8 dwelling units per acre); however, there are scattered areas of condominiums and apartment complexes dispersed within the study area. Retail/service uses also occur throughout the regional area often on major street corners. The largest concentration of this land use type is located west of the proposed site between the railroad corridor and I-10 off of Elliot Road.

Public/quasi-public facilities have been identified at various locations and include churches, government buildings, and schools that are scattered throughout the regional area. The closest public school to the proposed expansion project site, Wood Elementary School, is approximately ¾ mile to the northwest.

**Planned Land Use**

Information depicting future land use was compiled from the Tempe General Plan 2020, the Phoenix General Plan, Town of Guadalupe Master Plan, City of Chandler Land Use Element, and Maricopa County Comprehensive Plan. The Tempe General Plan 2020 shows no major changes to existing developed land in the study area. Since relatively few undeveloped areas exist in the study area, significant changes to land use are not expected to occur. The areas

currently undeveloped are concentrated in the corridor east of I-10 and west of the railroad. The City of Tempe General Plan has designated these areas for industrial and retail use. A few smaller parcels of undeveloped land occur in residential areas and are planned for residential development (see Figure A-4).

The Tempe General Plan divides the city into three distinct growth areas to reflect its north to south growth pattern. The proposed expansion project area falls within the South Tempe area, which is characterized by land use categories including industrial, retail office, residential, schools, and recreation areas. The existing Kyrene Generating Station itself is located in an area that has been designated for continued industrial use. According to the Tempe General Plan 2020, the industrial land use category accommodates industrial as well as office business park/warehouse and limited commercial activity directly related to the primary industrial use. The General Plan shows an industrial trend following the railroad corridor from Baseline Road continuing south near Ray Road. In the southern half of the study area between I-10 and the railroad corridor, mixed industrial, retail, and office/service areas are the primary types of planned land use.

The Tempe General Plan 2020 also contains a Bicycle Master Plan including existing and proposed bicycle trail connections in the City of Tempe. The objectives of this bicycle plan include making bicycling safer in Tempe, encouraging the use of the bicycle as a part of the transportation system, and improving the bikeway system by providing facilities for all types of bicyclists. Two bicycle trails in the Master Plan are located in the immediate vicinity of the proposed expansion project site. The first is a proposed trail following the railroad corridor along the western border of the plant site. The second is a trail that would be aligned along the Western Canal and Kyrene Canal that crosses the existing plant site adjacent to the golf course. As a part of this project, SRP has proposed enhancements to provide a trail linkage in this area described further in the Enhancements to Existing Facilities section on the next page and in Exhibit F.

## Impact Assessment

Impacts to existing and planned land use include displacement of or restrictions to an existing land use or site incompatibility with future plans. Impacts were studied and evaluated for either short- or long-term impacts. Short-term impacts are those that would occur during construction of the proposed expansion project while long-term impacts are those that would remain after the construction of the project was complete, and for the life of the project.

The proposed expansion project is located on the property of an existing, operational power generating facility owned by SRP. Activities associated with the construction, operation, and maintenance of proposed facilities would all be located on the current site and would be compatible with existing facilities on site. Therefore, no long-term impacts were identified for existing or planned land uses as a result of the project. The proposed expansion site is within an existing industrial land use area and is part of a regional industrial area as designated in the Tempe General Plan 2020; therefore, the proposed expansion would not conflict with the General Plan.

During the construction of the project there is expected to be a short-term increase in traffic on Elliot Road; however, this traffic would be routed to an area on the northern side of the plant off of Kyrene Road (see mitigation measures below).

## Mitigation Measures

To relieve short-term impacts based on construction, a phasing and scheduling plan will be developed and implemented for the project. In order to mitigate the short-term increase in traffic off Elliot Road due to construction, mitigation is proposed which would relocate all construction traffic from Elliot Road to the access road off Kyrene Road on the north side of the project site (office/business park/warehouse/planned future industrial area). In addition, increases in rail traffic (potentially 25 railcar deliveries in total during the construction period) would be scheduled appropriately to minimize disturbance.

## Enhancements to Existing Facilities

As a part of the planning process, interested community members and other members of the public were asked to share concerns or issues they might have regarding both the planned and existing facilities on site (see Exhibit B, Planning Process Overview). These concerns and issues were evaluated and preliminary enhancement measures have been developed to address concerns. In addition, elements of the Tempe General Plan 2020 also were reviewed in order to integrate the proposed expansion project with the City of Tempe's vision regarding current conditions and future plans. Proposed enhancements, while not necessary to address impacts associated with new facilities, are additional measures SRP would implement on the existing property to further integrate the plant site with the community and address long-range plans for the area.

Community issues associated with land use centered primarily on air, visual, and noise effects (Exhibits B-3, E, and I). However, additional issues included current access to the existing plant on Elliot Road. The residents of Alisanos, a development on the south side of Elliot Road directly across from the site, voiced concern about the current Kyrene Service Center entrance directly across from their subdivision entry. In order to address this concern, SRP is evaluating the modification or permanent relocation of the Elliot Road entrance to the west in this area (see Figures G-2 and G-3). This modification/relocation could divert service center traffic away from the vicinity of the residential entrance and to the area across from planned commercial uses west of Alisanos.

Other enhancement measures are being considered to integrate the site with local and regional recreation amenities in accordance with the Bicycle Facilities Master Plan. The Plan shows links connecting the northern and southern site boundaries along Lateral 7-2.6, which currently crosses the plant site. SRP is evaluating enhancement measures, which will link Elliot Road to the banks of the Western Canal by following the eastern side of the site boundary. These measures are described further in Exhibit F, Recreational Purposes and Aspects.

## REFERENCES

Chandler, City of. September 1998. City of Chandler Land Use Element (an element of the master plan).

Guadalupe, Town of. November 1992. Guadalupe Master Plan 1992-2010.

Maricopa County. October 1997. Comprehensive Plan.

Phoenix, City of. May 1997. City of Phoenix General Plan.

Tempe, City of. December 1997. City of Tempe General Plan 2020.

# EXHIBIT B-2
# WATER AND WASTEWATER

The KEP will require from 1,500 to 1,700 gallons per minute (gpm) of raw water during normal operations. On an annual basis, water consumption through the evaporation from the cooling tower will be approximately 1,600 acre feet. Approximately 480 gpm, or 800 acre feet annually, will be discharged from the cooling tower water system. This discharge is referred to as blowdown.

## WATER SUPPLY OPTIONS

There are a variety of water supplies that can be made available to meet the water needs at KEP. SRP was the nation's first multi-use reclamation project and has been delivering water to its shareholders since 1903. Its water service area covers approximately 248,000 acres in the central Phoenix Metropolitan Area. The water transmission and distribution system consists of 131 miles of canals, 1,250 miles of laterals, 250 groundwater wells, and 6 surface water reservoirs with a total water storage capacity exceeding 2.3 million acre feet. In an average year, approximately 1.0 million acre feet of water is delivered to meet agricultural, municipal, residential, and industrial water demands within the SRP's water service area. At the present time, nearly 80 percent of the lands within SRP are urbanized. In 1990, the CAP/SRP Interconnect Facility (CSIF) was completed, enabling the distribution of Central Arizona Project (CAP) water through SRP canals and laterals.

One of these canals, the Western Canal, is located just north of the boundary of the KEP site and has been selected as the primary diversion location for the delivery of raw water to KEP. Even though the Western Canal is immediately accessible, SRP will obtain the right to any water diverted for use. There are four potential sources of water:

1. surface water from the Salt and Verde rivers
2. excess Colorado River water
3. reclaimed water from the Tempe Reclamation Plant
4. groundwater

As a municipal water provider, Tempe has surface water from the Salt and Verde rivers available for use on SRP shareholder land. Rather than deliver this surface water to Tempe's Water Treatment Plants, SRP could provide this water directly to the KEP site from the Western Canal. SRP will be working with the City of Tempe to explore this option.

CAP water can now be delivered through SRP canals. There are four primary ways by which SRP can obtain CAP water for use at KEP:

1. lease of unused CAP allocation water for direct use
2. direct use of excess CAP water
3. direct recharge of excess CAP water

4. development of recharge credits by using CAP water in lieu of groundwater pumping

All four of these options would utilize CAP water that currently goes unused by the State of Arizona. Because so much of Arizona's allocation of CAP water has gone unused, the state developed recharge programs in the 1980s and early 1990s to help encourage the use of CAP water. Direct recharge projects have been developed to store CAP water in underground aquifers for future use. The Granite Reef Underground Storage Project (GRUSP), managed by SRP, is one example of direct recharge. Over 200,000 acre feet of CAP water has been stored in GRUSP since 1994. A Groundwater Savings Program provides for the direct use of CAP water in lieu of pumping groundwater, effectively preserving groundwater resources for later use. SRP developed its Groundwater Savings Facility (GSF) in 1996, allowing SRP shareholders to use CAP water for agricultural use, thus "saving" groundwater which otherwise would have been pumped. The groundwater saved is "banked" in a long-term storage account to be withdrawn at a later date to meet municipal water demands within the participating cities. Tempe could participate in SRP's GSF program. All of SRP's 250 wells are already permitted to recover "banked" water.

The Kyrene Water Reclamation Facility is located ½ mile north of the KEP site. This facility is operated by Tempe and generates approximately 3,360 acre feet of reclaimed water annually. The majority of this water is discharged to the Salt River. SRP will be working with Tempe to acquire this supply as cooling water at KEP.

Finally, direct groundwater could be used from existing wells located on or near the KEP site. This option is being considered only for back-up water supplies. Future pumping for KEP will not exceed the historic pump capacity for agricultural purposes, thus no additional hydrologic impacts are anticipated.

## WATER DELIVERIES AND USE

Once the right to water is obtained, raw water will be delivered via SRP's Western Canal to the KEP site. The Western Canal provides the water source to Lateral 7-2.6. This lateral will be modified by installing a pump vault. The vault will contain pumps, motors, control system, pipes, valves, etc. to pump raw water to the KEP. During periods of canal dry up (approximately 4 to 6 weeks per year), when supply and discharge is not allowed from or into the Western Canal and Lateral 7-2.6, the wells will provide raw water directly to the plant. These wells will also be used as emergency back up water sources.

Raw water is treated (filtered, conditioned, or softened) for use in the cooling tower and firewater protection (if required). The cooling tower evaporation process is the primary consumption of site water. This water is also processed by a reverse osmosis system, which provides pure water for steam cycle operation and the closed bearing (lubricating oil) cooling water system.

Potable water and sewage disposal will be tied to the City of Tempe systems.

The fire water source will be from the City of Tempe or a separate fire protection system will be installed to meet all fire protection standards. If a separate fire water protection system is required, treated raw water will be used.

**Wastewater Disposal Alternatives**

Wastewater sources are from the cooling tower blowdown, raw water treatment (conditioning and softening) system, demineralizer regeneration effluent, HRSG blowdown, roof and floor drains, and rainfall runoff. Wastewater may be discharged to the circulating water system, to minimize raw water makeup. Cooling tower blowdown will be three cycles of concentration. Wastewater will be monitored and discharged into the Western Canal, or to the Gila Drain. During canal maintenance conditions (e.g., dry up, emergencies), the discharge will be directed to the Gila Drain. This drain collects agricultural tail water, and storm water from SRP shareholder lands. The drain flows south through the Gila River Indian Community and eventually to the Gila River. The Gila River Indian Community utilizes these flows to irrigate a golf course and leased agricultural land. The discharge water will comply with all federal and state discharge requirements.

# EXHIBIT B-3
# AIR QUALITY

# AIR QUALITY IMPACT ANALYSIS
# KYRENE EXPANSION PROJECT
# 250 MW NATURAL GAS-FIRED COMBINED CYCLE FACILITY
# TEMPE, ARIZONA

**FOR**
**SALT RIVER PROJECT**

D&M Job No. 01009-093-007
June 13, 2000

# AIR QUALITY IMPACT ANALYSIS
# KYRENE EXPANSION PROJECT
# 250 MW NATURAL GAS-FIRED COMBINED CYCLE FACILITY
# TEMPE, ARIZONA

***Submitted by***

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**Contact: Mr. Steven Frey**

# TABLE OF CONTENTS


**1 INTRODUCTION ..... 1**

**2 DESCRIPTION OF THE PROPOSED POWER PLANT ..... 3**

2.1 CONFIGURATION OF THE PROPOSED POWER PLANT AT THE EXISTING KYRENE GENERATING STATION ..... 3

*2.1.1 Proposed Natural Gas Fired Stationary Combustion Turbine ..... 4*

*2.1.2 Natural Gas Fired Auxiliary Boiler ..... 4*

*2.1.3 Diesel Fired Emergency Fire Water Pump and Generator ..... 5*

*2.1.4 Cooling Tower ..... 5*

*2.1.5 Steam Generator ..... 5*

*2.1.6 Existing Kyrene Station ..... 5*

2.2 PROPOSED AIR POLLUTION CONTROL EQUIPMENT ..... 5

2.3 EMISSION ESTIMATES ..... 6

**3 SITE AREA CHARACTERISTICS ..... 11**

3.1 WIND FLOW PATTERN ..... 11

3.2 RURAL/URBAN LAND USE DESCRIPTION ..... 11

3.3 TOPOGRAPHY ..... 11

3.4 AIR QUALITY STATUS ..... 12

**4 FEDERAL/STATE REGULATORY REQUIREMENTS ..... 13**

4.1 FEDERAL REQUIREMENTS ..... 13

*4.1.1 Nonattainment Area New Source Review (NANSR) ..... 13*

*4.1.2 PSD Review ..... 14*

*4.1.3 New Source Performance Standards (NSPS) ..... 15*

4.1.3.1 **Combustion Turbine** ..... 16

4.1.3.2 **Supplemental Duct Burner** ..... 17

4.1.3.3 **Auxiliary Natural Gas Fired Boiler** ..... 17

*4.1.4 Application of Stack Height Regulations ..... 18*

*4.1.5 Hazardous Air Pollutant Regulations ..... 19*

*4.1.6 Continuous Emissions Monitoring ..... 19*

*4.1.7 Compliance Assurance Monitoring ..... 20*

*4.1.8 Acid Rain Provisions ..... 20*

*4.1.9 Title V Operating Permits ..... 21*

4.2 STATE/LOCAL REQUIREMENTS ..... 21

*4.2.1 Permit Requirements for New Major Sources and Major Modifications to Existing Major Sources 21*

*4.2.2 Rule 245 "Continuous Source Emission Monitoring" ..... 22*

*4.2.3 Rule 270 "Performance Tests" ..... 22*

*4.2.4 Rule 300 "Visible Emissions" ..... 22*

*4.2.5 Rule 310 "Fugitive Dust Sources" ..... 22*

*4.2.6 Rule 311 "Particulate Matter from Process Industries" ..... 23*

*4.2.7 Rule 371 "Acid Rain" ..... 23*

4.3 SPECIAL REQUIREMENTS ..... 23

*4.3.1 Rule 32 "Odors and Gaseous Emissions" ..... 23*

*4.3.2 Arizona Ambient Air Quality Guidelines (AAAQGs) ..... 24*

**5 NONATTAINMENT AREA PROVISIONS ..... 26**

5.1 LOWEST ACHIEVABLE EMISSION RATE (LAER) DEMONSTRATION ..... 26

5.2 $NO_X$ EMISSIONS ..... 28
*5.2.1 Proposed Power Plant – Control of $NO_x$ Emissions* ..... *32*
*5.2.2 LAER Determination For NOx Emissions* ..... *32*
5.3 CO EMISSIONS ..... 33
*5.3.1 Proposed Power Plant - Control of CO Emissions* ..... *33*
*5.3.2 LAER Determination for CO Emissions* ..... *34*
5.4 VOC EMISSIONS ..... 34
*5.4.1 Proposed Power Plant - Control of VOC Emissions* ..... *35*
*5.4.2 LAER Determination for VOC Emissions* ..... *35*
5.5 $PM_{10}$ EMISSIONS ..... 36
*5.5.1 Proposed Power Plant - Control of $PM_{10}$ Emissions* ..... *36*
*5.5.2 LAER Determination for $PM_{10}$ Emissions* ..... *36*
5.6 POLLUTANT EMISSION OFFSETS ..... 37
*5.6.1 Emission Offsets – $NO_x$ Emissions* ..... *39*
*5.6.2 Emission Offsets – VOC Emissions* ..... *39*
*5.6.3 Emission Offsets – CO Emissions* ..... *40*
*5.6.4 Emission Offsets – $PM_{10}$ Emissions* ..... *40*
5.7 NET AIR QUALITY BENEFIT DEMONSTRATION FOR NONATTAINMENT AREA POLLUTANTS ($NO_2$, VOC, $PM_{10}$ AND CO) ..... 41
5.8 ALTERNATIVE SITE ANALYSIS ..... 43

**6 ATTAINMENT AREA PROVISIONS ..... 48**

6.1 CONTROL TECHNOLOGY REVIEW- BEST AVAILABLE CONTROL TECHNOLOGY DEMONSTRATION ..... 49
*6.1.1 BACT Definition and Applicability* ..... *49*
*6.1.2 BACT – $NO_x$ Emissions* ..... *49*
6.2 AIR QUALITY IMPACT ASSESSMENT ..... 50
*6.2.1 Description of Air Quality Dispersion Model* ..... *50*
*6.2.2 Databases for Air Quality Assessment* ..... *52*
6.2.2.1 Emission Inventory Data ..... 52
6.2.2.2 Meteorological Data ..... 53
6.2.2.3 Receptor Grid ..... 53
6.2.2.4 Background Concentrations ..... 54
6.3 HAZARDOUS AIR POLLUTANT IMPACT ASSESSMENT ..... 59
6.4 $NO_2$ PSD AMBIENT AIR QUALITY MONITORING REQUIREMENT ..... 60
6.5 ADDITIONAL AIR QUALITY IMPACT ANALYSES ..... 60
*6.5.1 Construction and Growth Impacts* ..... *60*
*6.5.2 Impact on Soil and Vegetation* ..... *61*
*6.5.3 Impact on Visibility (Regional Haze Analysis)* ..... *61*
6.5.3.1 Results of the Analyses ..... 63

**7 SUMMARY ..... 65**

**8 REFERENCES ..... 69**

# LIST OF TABLES


2-1 TOTAL FACILITY POTENTIAL EMISSION ESTIMATES

2-1(a) TOTAL FACILITY POTENTIAL EMISSION ESTIMATES (INCLUDING STARTUP EMISSIONS)

2-2 SUMMARY OF EMISSIONS (VARIOUS OPERATING CONDITIONS – 1 COMBINED CYCLE SYSTEM)

2-2(a) SUMMARY OF EMISSIONS (VARIOUS OPERATING CONDITIONS – 1 COMBINED CYCLE SYSTEM WITH STARTUP EMISSIONS)

2-3 SUMMARY OF STARTUP EMISSION ESTIMATES

2-4 AUXILIARY BOILER POTENTIAL EMISSION ESTIMATES

2-5 EMERGENCY GENERATOR POTENTIAL EMISSION ESTIMATES

2-6 EMERGENCY FIRE WATER PUMP POTENTIAL EMISSION ESTIMATES

2-7 COOLING TOWER POTENTIAL EMISSION ESTIMATES

2-8(a) HAZARDOUS AIR POLLUTANT EMISSION ESTIMATES FOR ONE COMBINED CYCLE SYSTEM

2-8(b) HAZARDOUS AIR POLLUTANT EMISSION ESTIMATES FOR ONE DUCT BURNER

2-9 HAZARDOUS AIR POLLUTANT EMISSION ESTIMATES FOR THE AUXILIARY BOILER

2-10 HAZARDOUS AIR POLLUTANT EMISSION ESTIMATES FOR THE EMERGENCY GENERATOR AND EMERGENCY FIRE WATER PUMP

2-11 HAZARDOUS AIR POLLUTANT EMISSION ESTIMATES – FACILITY TOTALS

3-1 IDENTIFICATION AND CLASSIFICATION OF LAND USE TYPES

4-1 NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS), PSD INCREMENTS, SIGNIFICANT EMISSION RATES, SIGNIFICANT IMPACT INCREMENTS, AND MONITORING DE MINIMIS CONCENTRATIONS

5-1 RLBC DATABASE INFORMATION – COMBINED CYCLE TURBINES $NO_X$ EMISSIONS

5-2 RLBC DATABASE INFORMATION – COMBINED CYCLE TURBINES CO EMISSIONS

5-3 RLBC DATABASE INFORMATION – COMBINED CYCLE TURBINES VOC EMISSIONS

5-4 RLBC DATABASE INFORMATION – COMBINED CYCLE TURBINES $PM_{10}$ EMISSIONS

6-1 AIR QUALITY IMPACT ASSESSMENT EMISSION INVENTORY

6-2 HAZARDOUS AIR POLLUTANT EMISSION ESTIMATES – MODELING ANALYSIS

6-3 SUMMARY OF PREDICTED CONCENTRATIONS FROM THE VARIOUS OPERATING CONDITIONS

6-4 SUMMARY OF MAXIMUM PREDICTED $NO_2$ CONCENTRATIONS FROM THE PROPOSED POWER PLANT

6-5 SUMMARY OF MAXIMUM PREDICTED CO CONCENTRATIONS FROM THE PROPOSED POWER PLANT

6-6 SUMMARY OF MAXIMUM PREDICTED $PM_{10}$ CONCENTRATIONS FROM THE PROPOSED POWER PLANT

6-7 SUMMARY OF MAXIMUM PREDICTED $SO_2$ CONCENTRATIONS FROM THE PROPOSED POWER PLANT

6-8 SUMMARY OF MAXIMUM PREDICTED SULFURIC ACID CONCENTRATIONS FROM THE PROPOSED POWER PLANT

6-9 SUMMARY OF MAXIMUM PREDICTED AIR TOXIC CONCENTRATIONS FROM THE PROPOSED POWER PLANT

6-10 SUMMARY OF MAXIMUM PREDICTED $NO_2$ CONCENTRATIONS FROM THE PROPOSED POWER PLANT FOR COMPARISON WITH THE MONITORING DE MINIMIS CONCENTRATION

6-11 SUMMARY OF MAXIMUM PREDICTED $NO_2$ , $PM_{10}$, CO AND $SO_2$ CONCENTRATIONS AT NEARBY INDIAN RESERVATIONS FROM THE PROPOSED POWER PLANT

6-12 IMPACTS AT THE SUPERSTITION CLASS I AREA

# LIST OF FIGURES


1-1 LOCATION OF THE PROPOSED POWER PLANT

2-1 LOCATION OF THE PROPOSED PROJECT WITHIN THE KYRENE SITE

2-2 LAYOUT OF THE PROPOSED POWER PLANT

2-3 PROCESS FLOW DIAGRAM

3-1 PHOENIX, ARIZONA ANNUAL WIND ROSE (1994)

3-2 PHOENIX, ARIZONA ANNUAL WIND ROSE (1995)

3-3 PHOENIX, ARIZONA ANNUAL WIND ROSE (1996)

3-4 PHOENIX, ARIZONA ANNUAL WIND ROSE (1997)

3-5 PHOENIX, ARIZONA ANNUAL WIND ROSE (1998)

3-6 PHOENIX, ARIZONA COMBINED ANNUAL WIND ROSE (1994-1998)

3-7 GENERAL TOPOGRAPHY SURROUNDING THE SITE LOCATION OF THE PROPOSED POWER PLANT

6-1 LOCATION OF EMISSION SOURCES IN RELATION TO BUILDING STRUCTURES

6-2 RECEPTOR GRID FOR AIR QUALITY IMPACT ANALYSES

6-3 RECEPTOR GRID – INDIAN RESERVATIONS

6-4 LOCATION OF EMISSION SOURCES IN RELATION TO PROPERTY BOUNDARY

6-5 CALPUFF RECEPTOR GRID

# 1 INTRODUCTION

Salt River Project (herein referred to as SRP) is proposing to construct and operate a new power plant located at the existing Kyrene Generating Station located in Tempe (Maricopa County), Arizona (Refer to Figure 1-1). This proposed power plant is considered a major modification to an existing stationary source. The proposed plant will have the capacity to generate approximately 250 megawatts (MW) of electrical power. To achieve this output, the plant will be equipped with one (1) combined cycle electric generating system and miscellaneous support equipment (i.e., emergency generator, emergency fire water pump, auxiliary boiler and mechanical draft cooling tower). A more detailed discussion of the proposed power plant and associated equipment is provided in Section 2.0.

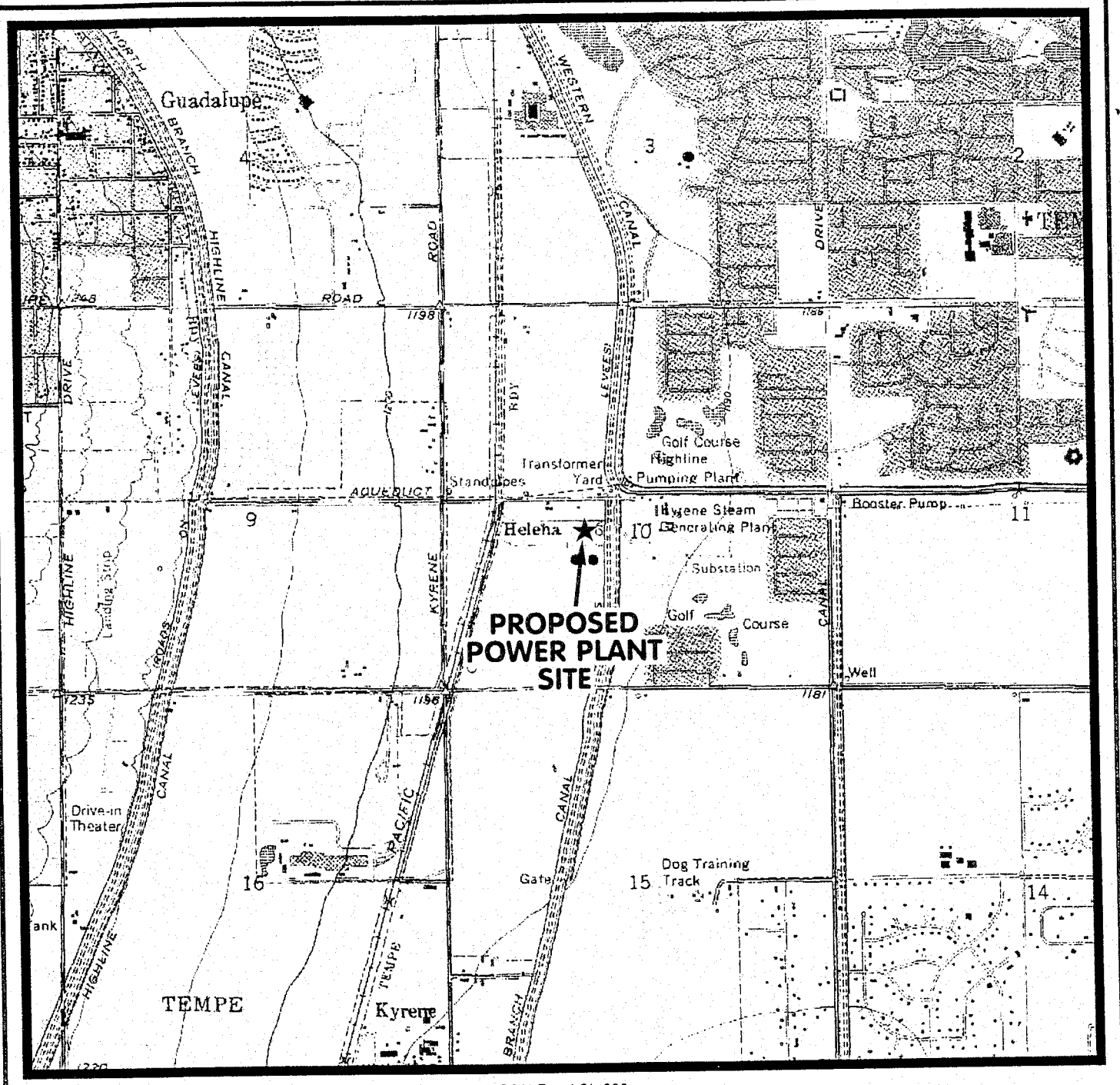
The proposed power plant will have the potential to emit the following types of air pollutants:

- Oxides of Nitrogen ($NO_x$) ≈ 96.9 tons/year;
- Carbon Monoxide (CO) ≈ 145.6 tons/year;
- Particulate Matter less than 10 microns in aerodynamic diameter ($PM_{10}$) ≈ 83.3 tons/year;
- Sulfur Dioxide ($SO_2$) ≈ 5.4 tons/year;
- Volatile Organic Compounds (VOCs) ≈ 36.5 tons/year; and
- Hazardous Air Pollutants (HAPs) <25 tons/year (aggregate), and <10 tons/year (individual)

Since the proposed power plant will have the potential to emit air pollutants in quantities (tons/year) that would surpass regulatory threshold levels, a permit must be obtained from the appropriate regulatory agency prior to initiation of any onsite construction at the new plant. The level of potential air pollutant emissions, along with the air quality status of the site area will dictate the level of permitting required. Areas classified as nonattainment (not meeting USEPA air quality standards) require more rigorous and complex requirements, while attainment areas require less rigorous requirements.

Maricopa County, as of the date of this application, is classified as a serious nonattainment area for the air pollutants $PM_{10}$, CO and ozone ($O_3$). Since industrial facilities do not emit $O_3$, USEPA regulates emissions of VOCs, which are considered potential precursors to the formation of $O_3$. In addition, based on past studies performed for $O_3$, USEPA has concluded that emissions of $NO_x$, may also chemically react in the atmosphere to form $O_3$. Subsequently, in $O_3$ nonattainment areas, emissions of $NO_x$ may also be treated the same as emissions of VOCs. Thus, depending on the potential level $NO_x$ emissions, a source may also be subject to the more stringent nonattainment permitting requirements. This county is also designated as attainment for the air pollutants nitrogen dioxide ($NO_2$) and sulfur dioxide ($SO_2$).

Based on the above air pollutant emission estimates, the proposed power plant is subject to the following federal and state regulations for construction of new and modified major stationary sources:




SCALE: 1:24 000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

NORTH

MAP REFERENCE:

PORTION OF U.S.G.S. QUADRANGLE MAP
7 ½ MINUTE SERIES (TOPOGRAPHIC)
GUADALUPE, ARIZONA 1952;
PHOTOREVISED 1982

QUADRANGLE LOCATION

SALT RIVER PROJECT
KYRENE GENERATING STATION

FIGURE 1-1
LOCATION OF THE PROPOSED POWER PLANT

| | |
|---|---|
| DATE: MAY 31, 2000 | |
| JOB NO.: 01009-093-007 | |
| DRAWN BY: MAR | CHK'D BY: SAF |
| SCALE: AS SHOWN | |

URS

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1701 GOLF ROAD, SUITE 1000
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- Nonattainment Area New Source Review (NANSR) for emissions of $NO_x$, CO, $PM_{10}$, and VOCs. Since emissions of $NO_x$ may also participate in the potential formation of ozone, the regulatory agency has concluded that these emissions should be subject to the same regulatory requirements imposed upon VOC sources in an ozone nonattainment area. Thus, for purposes of this air permit application, emissions of $NO_x$ from the proposed power plant are subject to the requirements outlined for major stationary sources in nonattainment and attainment areas (i.e., PSD review); and
- Prevention of Significant Deterioration (PSD) regulations for emissions of $NO_x$. Emissions of $SO_2$ have been estimated to be less than the significant emission rate (40 tons/year) which triggers applicability of the PSD regulations.

This report constitutes a detailed analysis of the air quality impacts associated with the construction and operations of the proposed 250 MW power plant expansion at SRP's existing Kyrene Generating Station. The natural gas combined cycle power plant will comply with all applicable Arizona, Maricopa County and federal air pollution control regulations, including the Prevention of Significant Deterioration (PSD) regulations, Nonattainment Area New Source Review (NANSR) requirements, New Source Performance Standards (NSPS) and Federal Acid Rain Provisions.

As part of the licensing process, the applicant is required to receive an Air Quality Control Permit from the Maricopa County Environmental Services Department (MCESD). MCESD has been delegated authority by USEPA for Prevention of Significant Deterioration, Nonattainment Area New Source Review (NANSR), and Title V Operational Permits requirements, as well as the primary authority for air permit approvals for new and modified sources.

# 2 DESCRIPTION OF THE PROPOSED POWER PLANT

## 2.1 CONFIGURATION OF THE PROPOSED POWER PLANT AT THE EXISTING KYRENE GENERATING STATION

The proposed power plant will be located at the existing SRP Kyrene Generating Station, which is located in Tempe, (Maricopa County) Arizona (refer to Figure 1-1). The proposed power plant will occupy approximately 15 acres of land within the Kyrene site. As shown in Figure 2-1, the proposed plant will be located on the western side of the Kyrene site, just east of the existing plant operations.

The proposed power plant, as laid out in Figure 2-2, will involve construction of the following building structures and support functions:

*Building Structures:*

- Continuous Emission Monitoring Building;
- Electrical Building; and
- Firewater Pump House

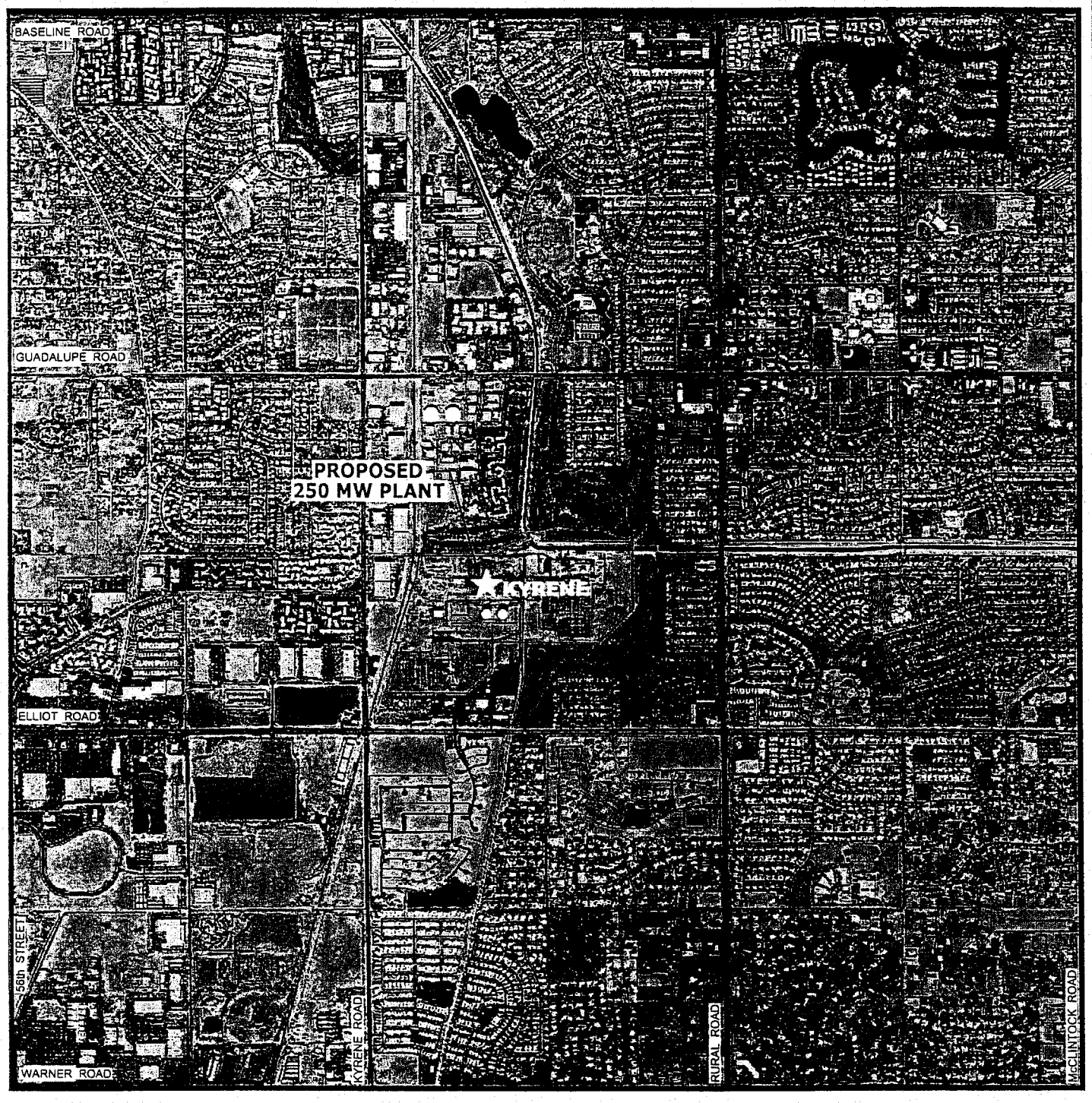
*Support Functions:*

- Acid/Caustic Regeneration Skid;
- Instrument Air Skid;
- Lube Oil Storage Skid;
- Water Treatment Area; and
- Cooling Water Support System (i.e., Chemical Feed Area, Demineralized Water Tank/Trailer, Neutralization Tank, Raw Water Tank).

The above-identified building structure and support functions will have the potential to generate negligible quantities of air pollutants.

To generate, as well as to support the generation of electrical power, the proposed plant will be equipped with the following equipment. Refer to Figure 2-3 for a process flow diagram of the electrical power generation process.

- One Natural Gas Fired Combined Cycle System [Stationary Combustion Turbine, Stationary Steam Turbine and Heat Recovery Steam Generator (HRSG)];
- One Natural Gas Fired Auxiliary Boiler;
- One Diesel Fired Emergency Fire Water Pump;
- One Diesel Fired Emergency Generator; and
- One Mechanical Draft Cooling Tower (part of the water cooling system).




NORTH

SCALE:

0 1/2 1 MILE

1000 0 1000 2000 3000 FEET

0 1/2 1 KILOMETER

SALT RIVER PROJECT
KYRENE GENERATING STATION

**FIGURE 2-1**
**LOCATION OF THE PROPOSED PROJECT WITHIN THE KYRENE SITE**

| | |
|---|---|
| DATE: JUNE 2, 2000 | |
| JOB NO.: 01009-093-007 | |
| DRAWN BY: MAR | CHK'D BY: JJD |
| SCALE: AS SHOWN | |

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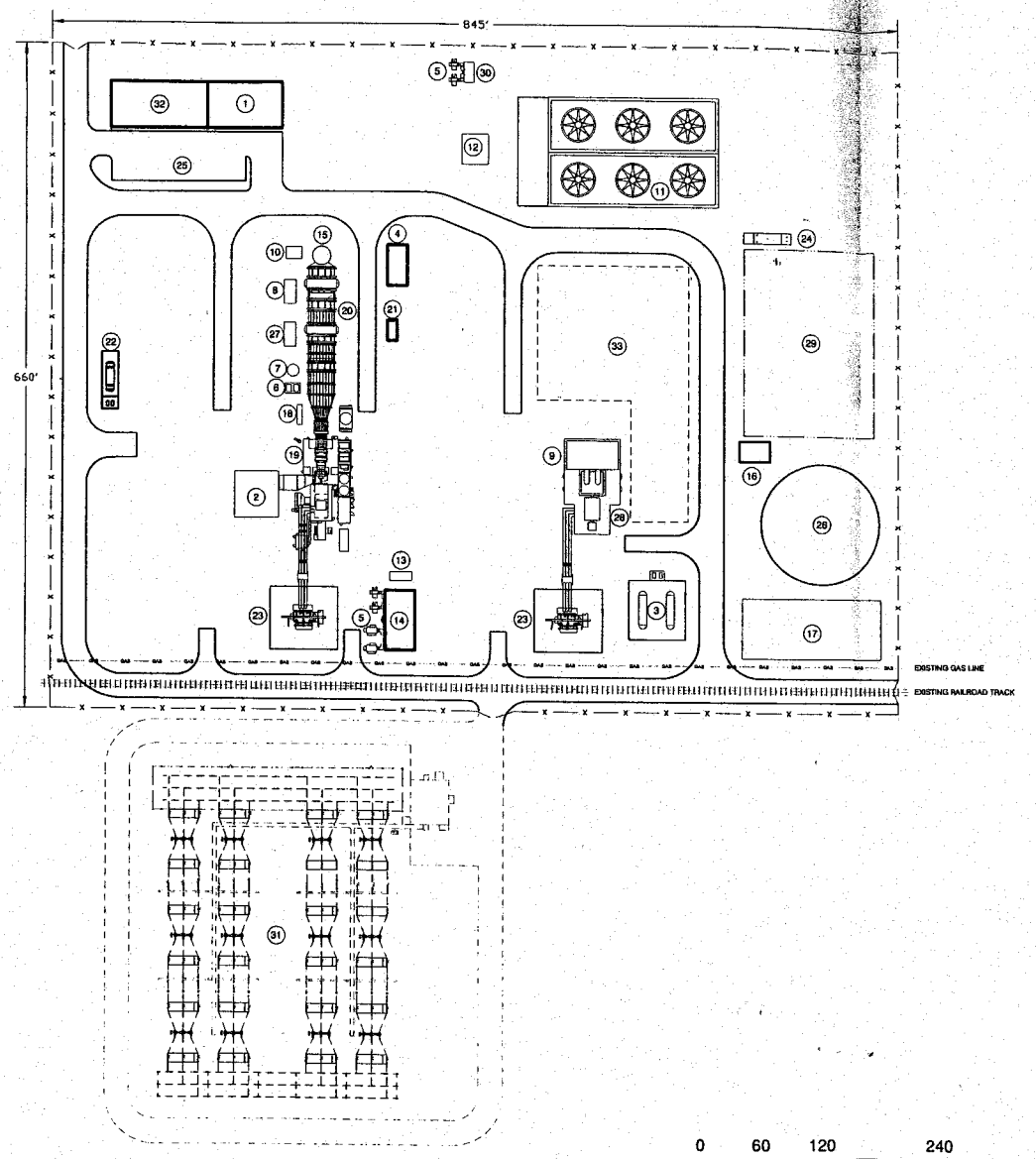


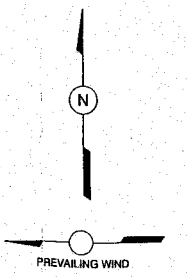


| ITEM | DESCRIPTION |
|---|---|
| 1 | ADMINISTRATION / CONTROL BUILDING |
| 2 | AIR INLET FILTER |
| 3 | AMMONIA VESSEL |
| 4 | AUXILIARY BOILER |
| 5 | AUXILIARY TRANSFORMERS |
| 6 | BLOWDOWN PUMPS |
| 7 | BLOWDOWN TANK |
| 8 | BOILER FEEDWATER PUMP |
| 9 | CONDENSER |
| 10 | CONTINUOUS EMISSION MONITORING BUILDING |
| 11 | COOLING TOWER |
| 12 | COOLING TOWER CHEMICAL FEED AREA |
| 13 | DIESEL GENERATOR |
| 14 | ELECTRICAL BUILDING |
| 15 | EXHAUST STACK |
| 16 | FIREWATER PUMP HOUSE |
| 17 | FUEL GAS AREA |
| 18 | FUEL GAS HEATER |
| 19 | GAS TURBINE GENERATOR |
| 20 | HEAT RECOVERY STEAM GENERATOR |
| 21 | INSTRUMENT AIR SKID |
| 22 | LUBE OIL STORAGE SKID |
| 23 | MAIN GENERATOR TRANSFORMER |
| 24 | OIL / WATER SEPARATOR |
| 25 | PARKING AREA |
| 26 | PROCESS WATER TANK |
| 27 | SELECTIVE CATALYTIC REDUCTION |
| 28 | STEAM TURBINE GENERATOR |
| 29 | STORMWATER RETENTION POND |
| 30 | SWITCHGEAR BUILDING |
| 31 | SWITCHYARD AREA - BY OTHERS |
| 32 | WAREHOUSE / MAINTENANCE BUILDING |
| 33 | WATER TREATMENT AREA |

**SALT RIVER PROJECT**
KYRENE GENERATING STATION

**FIGURE 2-2**
**LAYOUT OF THE PROPOSED POWER PLANT**

DATE: MAY 31, 2000
JOB NO.: 01009-093-007
DRAWN BY: MAR
CHK'D BY: SAF
SCALE: 1"=120'

URS
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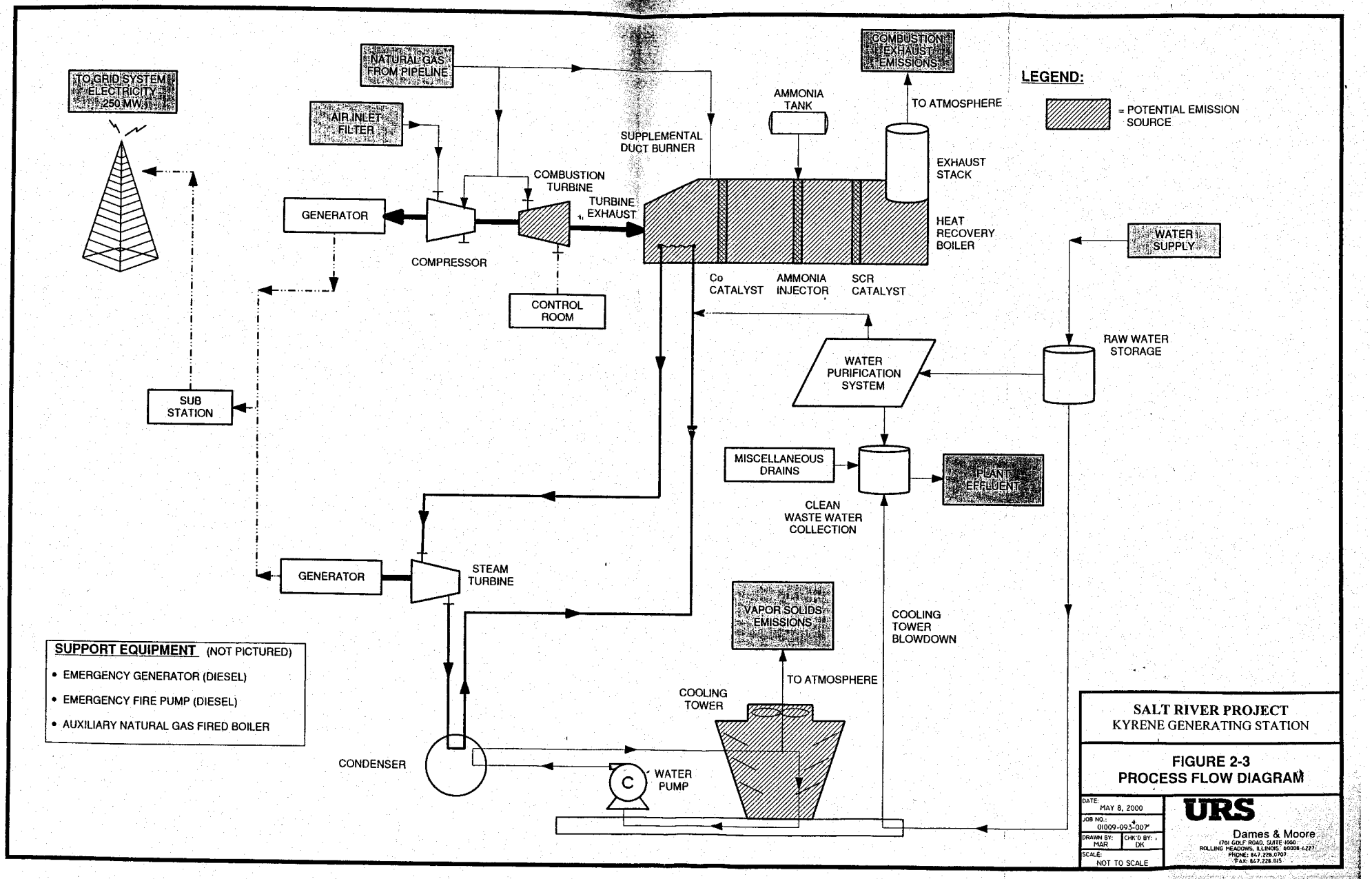
TO GRID SYSTEM ELECTRICITY 250 MW
NATURAL GAS FROM PIPELINE
AIR INLET FILTER
COMBUSTION EXHAUST EMISSIONS
LEGEND:
= POTENTIAL EMISSION SOURCE
AMMONIA TANK
TO ATMOSPHERE
SUPPLEMENTAL DUCT BURNER
EXHAUST STACK
COMBUSTION TURBINE
TURBINE EXHAUST
GENERATOR
HEAT RECOVERY BOILER
WATER SUPPLY
COMPRESSOR
Co CATALYST
AMMONIA INJECTOR
SCR CATALYST
CONTROL ROOM
RAW WATER STORAGE
WATER PURIFICATION SYSTEM
SUB STATION
MISCELLANEOUS DRAINS
PLANT EFFLUENT
CLEAN WASTE WATER COLLECTION
GENERATOR
STEAM TURBINE
VAPOR SOLIDS EMISSIONS
COOLING TOWER BLOWDOWN
SUPPORT EQUIPMENT (NOT PICTURED)
• EMERGENCY GENERATOR (DIESEL)
• EMERGENCY FIRE PUMP (DIESEL)
• AUXILIARY NATURAL GAS FIRED BOILER
TO ATMOSPHERE
COOLING TOWER
CONDENSER
WATER PUMP
SALT RIVER PROJECT
KYRENE GENERATING STATION
FIGURE 2-3
PROCESS FLOW DIAGRAM
DATE: MAY 8, 2000
JOB NO.: 01009-093-007
DRAWN BY: MAR
CHK'D BY: DK
SCALE: NOT TO SCALE
URS
Dames & Moore
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ROLLING MEADOWS, ILLINOIS 60008-4227
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Provided below is a brief description of each piece of equipment, along with a discussion on the equipment's potential to emit air pollutants.

### 2.1.1 Proposed Natural Gas Fired Stationary Combustion Turbine

The proposed power plant project will involve the installation of one combined cycle combustion system. This system will consist of a natural gas fired combustion turbine and a heat recovery steam generator equipped with a natural gas fired duct burner (referred to as a supplemental duct burner). Specifications associated with this equipment are noted below.

- Turbine Type: General Electric
- Supplemental Duct Burner: 150 MMBtu/hr
- Combustion Turbine Electrical Output (one system): Gross Power 175 MWs (excludes the steam turbine)
- Combustion Turbine Heat Input (one system): 1,713 MMBtu/hour (LHV), 1,900 MMBtu (HHV)
- Fuel: Pipeline natural gas

Since this combined cycle system will be combusting natural gas, considered to be the cleanest fossil fuel, air pollutants in the form of combustion by-products will be generated. To control these air pollutants, the system will incorporate the following air pollution control devices.

| Control Device | Air Pollutant | Proposed Control Efficiency | Maximum Controlled Emission Concentration (ppmvd) |
|---|---|---|---|
| Selective Catalytic Reduction | $NO_x$ | 90 | 2.5 @ 15% $O_2$ (1-hour average) |
| Oxidation Catalyst | CO | 90 | 3.9 @ 15% $O_2$ (1-hour average) |
| Oxidation Catalyst | VOC | 20 | 2.7 @ 15% $O_2$(1-hour average) |

Estimated air pollutant emission rates for the controlled combined cycle system are provided in Section 2.3. Each system will be equipped with a 150-foot exhaust stack.

### 2.1.2 Natural Gas Fired Auxiliary Boiler

To support the combined cycle system, the proposed project will also include a natural gas fired auxiliary boiler. The purpose of the auxiliary boiler is to heat the combined cycle systems to shorten the startup duration. This boiler is anticipated to operate primarily when the combined cycle system is idle or in startup mode. This boiler will have a designed heat input rate of 99 MMBtu/hour and will be equipped with a single exhaust stack (135 feet above grade).

Since the boiler will combust natural gas, it will have the potential to emit air pollutants. Estimated air pollutant emission rates for this boiler are presented in Section 2.3.

### 2.1.3 Diesel Fired Emergency Fire Water Pump and Generator

To further support the proposed power plant, a 310 horsepower diesel fired emergency fire water pump and 335 horsepower emergency diesel fired generator will be installed. This equipment will be used only during emergency situations to operate the station's fire pumps or to generate site electrical power. This equipment will be operated (typically a few hours) on a monthly basis to maintain the integrity and operational readiness of the equipment.

Minimal amounts of air pollutants will be generated during the burning of diesel fuel in this equipment. Each device will be equipped with its own exhaust stack. Refer to Section 2.3 for estimated air pollutant emission rates associated with this emergency equipment

### 2.1.4 Cooling Tower

As shown in Figures 2-2 and 2-3, a cooling tower will be used to cool water associated with the combined cycle's steam generating system. Due to the nature of this type of equipment, total dissolved solids contained in the cooling water may be emitted in the form of particulates. Refer to Section 2.3 for a discussion on air pollutant emission estimates. The proposed cooling tower will have a water circulation rate of between 60,000 gallons per minute (gpm) and 115,000 gpm and a total dissolved solid content of 3,000 mg/l and liquid drift of 0.0005% which will be achieved through the use of state-of-the-art mist eliminators. Refer to Section 2.3 for a discussion on air pollutants emission estimates. For purposes of the air quality impact analysis, the cooling tower was assumed to have a water circulation rate of 115,000 gpm.

### 2.1.5 Steam Generator

To generate additional electrical power at the proposed plant, a steam turbine will be installed. This turbine will receive steam for the HRSGs and will have the capability of generating approximately 90 MW (gross) of additional electrical power. Since this turbine will use steam, no air pollutants will be generated from this device.

### 2.1.6 Existing Kyrene Station

The proposed power plant will be located within property owned by SRP near the existing Kyrene Generating Station. Construction and operation of the proposed power plant is not anticipated to affect operation of the existing power plant. This substation is in compliance with all county, state, and federal air regulations.

## *2.2 PROPOSED AIR POLLUTION CONTROL EQUIPMENT*

In order to minimize the potential air pollutant emissions associated with the proposed power plant, air pollution control devices are being proposed for installation on the combined cycle system. In addition, to minimize airborne particulates from the mechanical draft cooling tower, state-of-the-art mist eliminators will be installed. Due to the nature of the support equipment, no air pollution control devices are being proposed for those pieces of equipment. However, these devices (emergency generator, emergency fire water pump and auxiliary boiler) will be designed to combust

natural gas (auxiliary boiler) and small quantities of diesel fuel (emergency equipment). In addition, the support equipment will be operated sporadically throughout the year. A detailed discussion on the selection of the appropriate control devices is provided in Sections 4 and 5.

To control $NO_x$ emissions from the combined cycle system, a selective catalytic reduction system (SCR) will be installed in the HRSG, downstream of the supplemental duct burner. In addition, the combustion turbine will be equipped with a dry low $NO_x$ combustor. The dry low $NO_x$ combustor is designed to maintain the mixture of fuel and air near the lean flammability limit of the mixture. By doing this, emissions of $NO_x$ can be reduced. Further reduction of the $NO_x$ emissions will be achieved from the SCR device. This device selectively reduces $NO_x$ by injecting water diluted ammonia into the exhaust gas stream upstream of a catalyst. $NO_x$, ammonia, and oxygen react on the surface of the catalyst to form molecular nitrogen and water. Further discussion of these $NO_x$ control devices are provided in Section 4 and 5. The combined devices (dry low $NO_x$ combustor and SCR) will be at least 90% efficient at reducing $NO_x$ emissions. The combination of these control devices is considered a reliable technique for achieving the lowest achievable NOx emission rate from the combined cycle system.

To control CO emissions from the combined cycle system, an oxidation catalyst is being proposed for installation downstream of the supplemental duct burner. The oxidation catalyst is used to oxidize CO at lower temperatures. The addition of a catalyst to the basic thermal oxidation process accelerates the rate of oxidation by absorbing oxygen and CO in the exhaust gas on to the catalyst surface. The collected constituents react with the catalyst to form $CO_2$ and $H_2O$. Further discussion of the oxidization catalyst is provided in Section 4 and 5. This catalyst is anticipated to reduce CO emission by 90%. This catalyst will also be capable of reducing VOC emissions by approximately 20%. The oxidation catalyst is also considered the best technique for achieving the lowest CO emission rates from a combined cycle combustion system.

The installation of a dry low NOx combustor, SCR, and oxidation catalyst are considered state-of-the-art control technologies for combined cycle electric generating system. These control technologies will be discussed in detail in Section 4.0.

## *2.3 EMISSION ESTIMATES*

Because the proposed power plant's combined cycle electric generating equipment and support equipment will be designed to combust natural gas and diesel fuel, this equipment will have the potential to generate air contaminant emissions. The primary air contaminants will be oxides of nitrogen ($NO_x$), carbon monoxide (CO), sulfur dioxide ($SO_2$), particulate matter (PM) and volatile organic compounds (VOC). For purposes of this application, emissions of particulate matter with an aerodynamic diameter of 10 microns or less ($PM_{10}$) have been assumed to be identical to emissions of PM. Table 2-1 provides a summary of potential emissions of primary air contaminants associated with the proposed SRP power plant project. A second table (2-1a) provides a summary of potential emissions including startup emissions. A discussion on how startup emissions were quantified is provided later in this section.

**Ta[illegible]2-1**
**Salt River Project**
**Proposed Power Plant**
**Existing Kyrene Generating Station**
**Total Facility Potential Emission Estimates**

| Emission Unit Description | VOC Tons/Year | PM/PM10 Tons/Year | NOx Tons/Year | CO Tons/Year | $SO_2$ Tons/Year |
|---|---|---|---|---|---|
| One Combined Cycle Systems | 25.5 | 72.8 | 71.1 | 66.7 | 4.9 |
| Auxiliary Boiler | 0.25 | 0.59 | 4.34 | 4.0 | 0.17 |
| Emergency Generator | 0.02 | 0.01 | 0.19 | 0.04 | 0.003 |
| Emergency Fire Pump | 0.015 | 0.013 | 0.18 | 0.039 | 0.002 |
| Mechanical Draft Cooling Tower | - | 3.8 | - | - | - |
| **Total** | **25.7** | **77.2** | **75.9** | **70.8** | **5.0** |
| Major Source Threshold / Significant Levels (PSD) | - | - | 100 / 40 | - | 100 / 40 |
| Major Source Threshold (NANSR)/ Significant Levels | 50/25 | 70/15 | 50/25 | 50/50 | - |
| ***PSD/NANSR Review Required**** | ***y*** | ***y*** | ***y*** | ***y*** | ***n*** |

* Note: Y=yes, N=no

**Table 2-1a**
**Salt River Project**
**Proposed Power Plant**
**Existing Kyrene Generating Station**
**Total Facility Potential Emission Estimates (Including Startup Emissions)**

| Emission Unit Description | VOC Tons/Year | PM/PM10 Tons/Year | NOx Tons/Year | CO Tons/Year | $SO_2$ Tons/Year |
|---|---|---|---|---|---|
| One Combined Cycle System | 36.2 | 78.8 | 92.1 | 141.6 | 5.3 |
| Auxiliary Boiler | 0.25 | 0.59 | 4.34 | 4.0 | 0.17 |
| Emergency Generator | 0.02 | 0.01 | 0.19 | 0.04 | 0.003 |
| Emergency Fire Pump | 0.015 | 0.013 | 0.18 | 0.039 | 0.002 |
| Mechanical Draft Cooling Tower | - | 3.8 | - | - | - |
| **Total** | **36.5** | **83.3** | **96.9** | **145.6** | **5.4** |
| Major Source Threshold / Significant Levels (PSD) | - | - | 100 / 40 | - | 100 / 40 |
| Major Source Threshold (NANSR)/ Significant Levels | 50/25 | 70/15 | 50/25 | 50/50 | - |
| ***PSD/NANSR Review Required**** | ***y*** | ***y*** | ***y*** | ***y*** | ***n*** |

* Note: Y=yes, N=no

Emission of hazardous air pollutants (HAPs), as regulated under Section 112(b) of the Clean Air Act, may also be generated during the combustion of natural gas or diesel fuel. However, these emission rates are anticipated to be insignificant.

As discussed in Section 2.2, the proposed power plant will involve the installation and operation of the following equipment:

- One (1) natural gas fired combustion turbine and supplemental fired duct burner (combined cycle system);
- One (1) natural gas fired auxiliary boiler;
- One (1) diesel fuel fired emergency fire water pump;
- One (1) diesel fuel fired emergency generator; and
- One (1) mechanical draft cooling tower.

To estimate air contaminant emission rates from this equipment, vendor data, "AP-42" emission factors, and/or regulatory derived emission factors were used in conjunction with the equipment design rating, hours of operation, and control device removal efficiency.

Table 2-2 contains a summary of the estimated emissions for the combined cycle system under various operating scenarios. A second Table 2-2a provides a summary of estimated emissions for one combined cycle system including startup emissions. These emission estimates are based on technical input from the turbine manufacturer. It is important to note that the emission rates provided in these tables incorporate a control efficiency of 90% for emission of NOx, 90% for CO emissions and 20% for emissions of VOC. The removal efficiencies are associated with the installation of a selective catalytic reduction system and oxidation catalyst on the combined cycle system.

For purposes of estimating annual Potential to Emit (PTE) emission rates (tons/year), Case 4 was selected as representing worst case conditions. The following worst-case load condition and annual temperature was selected:

- Base load with duct firing and an ambient temperature of 76 °F for 8,760 hours per year (refer to Table 2-2). This condition was selected because it best represents a maximum output that could be achieved for an entire year. The emission rates provided in Table 2-2 reflect the highest rates provided by the equipment vendor.

The proposed power plant is anticipated to generate most of its electrical power during warm days during the summer, when air-conditioning loads lead to peak power demands. The mass emissions during warm ambient conditions are lower than those anticipated for cold conditions. This is because of the greater mass flow through the turbine when the inlet combustion air is coldest. Refer to Table 2-2 for emission rates that may occur at various load conditions and ambient temperatures.

Table 2-2
Salt R[illegible] Project
Propose[illegible]er Plant
Existing Kyrene Generating Station
Summary of Emissions (Various Operating Conditions - 1 Combined Cycle System)
Potential to Emit (8,760 hrs/yr)

| | Operating Conditions | Gross Power MW (1 Combined Cycle System) | Heat Input MMBtu/Hr - LHV (1 Combined Cycle System) | Hours of Operation | Duct Burner (yes or no) | NOx | | CO | | $SO_2$ | | VOC | | $PM/PM_{10}$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | lbs/hr | tons/year* | lbs/hr | tons/year* | lbs/hr** | tons/year* | lbs/hr | tons/year* | lbs/hr | tons/year* |
| Case 1 | Winter Baseload | 185 | 1,697 | 8,760 | no | 16.3 | 71.394 | 9.9 | 43.362 | 1.1 | 4.82 | 2.7 | 11.826 | 13.4 | 58.69 |
| Case 2 | Annual Average, Baseload | 172 | 1,598 | 8,760 | no | 15.4 | 67.452 | 9.4 | 41.172 | 1 | 4.38 | 2.6 | 11.388 | 12.6 | 55.19 |
| Case 3 | Summer Peak, Baseload | 160 | 1,514 | 8,760 | no | 14.6 | 63.948 | 8.9 | 38.982 | 1 | 4.38 | 2.5 | 10.95 | 11.9 | 52.12 |
| Case 4 | Annual Average, Supplementary Fired/Power Aug | 190 | 1,713 | 8,760 | yes | 17.6 | 77.088 | 16.5 | 72.27 | 1.2 | 5.26 | 6.3 | 27.594 | 18 | 78.84 |
| Case 5 | Summer Peak, Supplementary Fired/Power Aug | 178 | 1,622 | 8,760 | yes | 16.7 | 73.146 | 15.9 | 69.642 | 1.1 | 4.82 | 6.3 | 27.594 | 13.3 | 58.25 |
| Case 6 | Winter Partload | 129 | 1,271 | 8,760 | no | 12.3 | 53.874 | 7.5 | 32.85 | 0.8 | 3.50 | 4 | 17.52 | 10.7 | 46.87 |
| Case 7 | Annual Average, Partload | 115 | 1,173 | 8,760 | no | 11.3 | 49.494 | 6.9 | 30.222 | 0.7 | 3.07 | 3.7 | 16.206 | 10.1 | 44.24 |
| Case 8 | Summer Peak, Partload | 101 | 1,082 | 8,760 | no | 10.4 | 45.552 | 6.3 | 27.594 | 0.7 | 3.07 | 3.4 | 14.892 | 9.4 | 41.17 |

* Calculation method: lbs/hr (vendor specifications) x 8,760 hrs/yr x 1/2000 = tons/yr
Emission estimates are controlled rates

Rate selected to represent tons/year for regulatory applicability.
Rate selected to represent worst case short term emissions (lbs/hr).

Table 2-2A
Salt P[illegible] Project
Proposed Power Plant - E[illegible] Kyrene Generating Station
Summary of Emissions (Various Operating Conditions - 1 Combined Cycle System with Startup Emissions)
Potential to Emit (8,760 hrs/yr)

| | | | NOx | | CO | | $SO_2$ | | VOC | | $PM/PM_{10}$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Operating Conditions | Hours of Operation | lbs/hr | tons/year* | lbs/hr | tons/year* | lbs/hr** | tons/year* | lbs/hr | tons/year* | lbs/hr | tons/year* |
| Case 1 | Winter Baseload | 8,760 | 16.3 | 71.4 | 9.9 | 43.4 | 1.1 | 4.8 | 2.7 | 11.8 | 13.4 | 58.7 |
| Case 2 | Annual Average, Baseload | 8,760 | 15.4 | 67.5 | 9.4 | 41.2 | 1 | 4.4 | 2.6 | 11.4 | 12.6 | 55.2 |
| Case 3 | Summer Peak, Baseload | 8,760 | 14.6 | 63.9 | 8.9 | 39.0 | 1 | 4.38 | 2.5 | 11.0 | 11.9 | 52.1 |
| Case 4 | Annual Average, Supplementary Fired/Power Aug | 8,535 | 17.8 | 75.1 | 16.5 | 70.4 | 1.2 | 5.1 | 6.3 | 26.9 | 18 | 76.8 |
| Case 4 | Startup | 225 | 171.5 | 17.0 | 760.2 | 71.2 | 1.2 | 0.14 | 93.3 | 9.325 | 18.0 | 2.03 |
| Case 4 | Total | 8,760 | 189.1 | 92.1 | 776.7 | 141.6 | 2.4 | 5.26 | 99.6 | 36.2 | 36.0 | 78.8 |
| Case 5 | Summer Peak, Supplementary Fired/Power Aug | 8,760 | 16.7 | 73.1 | 15.9 | 69.6 | 1.1 | 4.8 | 6.3 | 27.6 | 13.3 | 58.3 |
| Case 6 | Winter Partload | 8,760 | 12.3 | 53.9 | 7.5 | 32.9 | 0.8 | 3.5 | 4 | 17.5 | 10.7 | 46.9 |
| Case 7 | Annual Average, Partload | 8,760 | 11.3 | 49.5 | 6.9 | 30.2 | 0.7 | 3.1 | 3.7 | 16.2 | 10.1 | 44.2 |
| Case 8 | Summer Peak, Partload | 8,760 | 10.4 | 45.6 | 6.3 | 27.6 | 0.7 | 3.1 | 3.4 | 14.9 | 9.4 | 41.2 |

* Calculation method (All Cases except 4): lbs/hr (vendor specifications) x 8,760 hrs/yr x 1/2000 = tons/yr
All emission estimates for the combined cycle systems (excluding startup conditions) are controlled rates.
Startup emissions will be identical for all cases. Emission estimates for Case 4 have been included since they reflect worst case emissions estimates.
Startup emissions based on a worst case condition (50 Cold, 50 Warm + 50 Hot startups). Each cold, warm and hot startup has a duration 2 hours, 1.5 hours and 1.0 hours, respectively.

Rate selected to represent tons/year for regulatory applicability.
Rate selected to represent worst case short term emissions (lbs/hr).

It is also important to note that each combined cycle system will be equipped with a supplemental natural gas fired duct burner. This burner will be operated during certain conditions to provide additional steam to the steam turbine. This will result in additional electrical power output from the power plant during peak conditions. As shown in Table 2-2, the duct burner operation has been reflected in Case 4.

Based on the demand for electrical power, the proposed combined cycle system may not operate continuously throughout the year. Subsequently, it has been determined that the combined cycle system could be started under one of the three following operation scenarios. These are discussed below:

Cold Start — This type of start is associated with a combined cycle system that has been inactive for an extended period of time (typically greater than 8 hours). During this start-up condition, it takes the system approximately 2-hour to reach its normal operating mode.

Hot Start — This type of start is associated with a combined cycle system that has been inactive overnight (typically less than 8 hours). During this startup condition, it takes the system approximately 1 hour to reach its normal operating mode.

Warm Start — This type of start is associated with a combined cycle system that has been kept warm with the auxiliary boiler. During this startup condition it takes the system approximately 1.5 hours to reach its normal operating mode.

SRP has evaluated the potential use of the combined cycle system and has concluded that the following startup conditions or scenarios could occur at the proposed plant.

| Scenario | No. of Cold Starts | No. of Warm Starts | No. of Hot Starts |
|---|---|---|---|
| Operating Scenario #1 | 50 | 50 | 50 |
| Operating Scenario #2 | 0 | 50 | 150 |
| Operating Scenario #3 | 0 | 83 | 100 |
| Operating Scenario #4 | 30 | 20 | 135 |

Based on the above scenarios, it was determined that startup conditions could occur between 150 and 200 times per year.

To determine emissions of $NO_x$, CO and VOC emissions that may occur during the various startup conditions, SRP evaluated historical data. Based on this historical data, SRP was able to quantify what level of $NO_x$, CO and VOC emissions that may occur during cold, warm and hot startup scenarios. Table 2-3 provides emission estimates for each of the four operating scenarios for various startup conditions during a given year. As shown in Table 2-3, the maximum lbs of $NO_x$ emissions from a combined cycle system would be from scenario #1 (50 cold, warm and hot startups,

respectively). For emissions of CO and VOC, the maximum operating scenario that would generate the greatest emission rates would be scenario #2 (50 warm startups and 150 hot startups).

To account for these startup emissions, in the power plant's potential emissions, the emissions estimates for the combined cycle systems under normal conditions were adjusted (maximum hours of operation of 8,760 were reduced accordingly to account for the startup conditions). The combined emissions rates are provided in Table 2-2a.

To estimate air pollutant emission rates from the support equipment, "AP-42" emission factors and/or vendor data were used in conjunction with the equipment design rating and hours of operation. Since the emergency equipment is designed to operate during emergency conditions or for a short period of time during each month, potential emission estimates were based on a specific number of operating hours. These operating hours are provided below:

- Emergency Generator — 37.5 Hours per year and 1 hour for each day of operation;
- Emergency Fire Water Pump — 37.5 Hours per year and 1 hour for each day of operation; and
- Auxiliary Boiler – 1,200 Hours per year and 24 hours for each day of operation.

Refer to Tables 2-4, 2-5, 2-6, and 2-7 for emission rates associated with the auxiliary boiler, emergency generator, emergency fire water pump, and cooling tower, respectively. The cooling tower is designed to operate in combination with the combined cycle systems. No restriction on hours was incorporated into the emissions estimates for the cooling tower. In addition, it is possible that an aboveground storage tank will be installed to store diesel fuel. This tank will generate negligible VOC emissions due to breathing and working losses.

Tables 2-1 and 2-1a provide a summary of potential air pollutants on a ton per year from the proposed power plant. This table also provides the emission rate (ton/year) threshold that triggers applicability of NANSR and PSD. The requirements associated with triggering these regulatory programs, along with the proposed power plants status of compliance with federal, state, and county regulations, are outlined in Sections 4 and 5.

In addition to the generation of the air pollutants discussed above, the proposed power plant may generate insignificant levels of hazardous air pollutants. To determine the types of hazardous air pollutants that could be emitted, a data base developed by USEPA and some state agencies (i.e., California Air Resource Board – CARB) was reviewed for the availability of emissions factors for these types of pollutants.

Using the emission factors deemed appropriate, hazardous air pollutant emission rates were estimated for the combined cycle systems and support equipment. Table 2-8 summarizes the hazardous air pollutant emission rates estimated for the combined cycle system, while Tables 2-9 and 2-10 provide estimates for the support equipment. As shown in Table 2-11 potential hazardous air pollutant emission rates for the proposed power plant are below the major source threshold

Table 2-3
Salt River Project
Proposed Power Plant - Existing Kyrene Generating Station
Summary of Startup Emission Estimates

**Proposed Power Plant - Summary of Emissions Per Turbine Unit Start**

| | Cold Start | | | Warm Start | | | Hot Start |
|---|---|---|---|---|---|---|---|
| Parameter | 1st Hour (lb/hr) | 2nd Hour (lb/hr) | **Cold Start (lb)** | 1st Hour (lb/hr) | 2nd Hour (lb/hr) | **Total per Warm Start (lb)** | **Total per Hot Start (lb)** |
| NOx | 146.1 | 162 | **308.1** | 55.6 | 171.5 | **227.1** | **146.1** |
| CO | 760.2 | 9.9 | **770.1** | 704.9 | 10.5 | **715.4** | **710.5** |
| VOC | 93.3 | 2.6 | **95.9** | 91.5 | 2.8 | **94.3** | **92.9** |
| PM/PM10 | 18.0 | 18.0 | **36.0** | 9.0 | 18.0 | **27.0** | **18.0** |
| SO2 | 1.2 | 1.2 | **2.4** | 0.6 | 1.2 | **1.8** | **1.2** |
| Startup Duration | | | **2.0 hrs** | | | **1.5 hrs** | **1.0 hrs** |

NOx, CO and VOC emissions are based on turbine vendor startup emissions data.
PM/PM10 and SO2 emission rates are based on turbine vendor performance Case 4 - Annual Average.
Hot Start = turbine is shutdown overnight (approximately 8 hrs of shutdown)
Warm Start = turbine is shut down over the weekend (approx. 8-48 hrs of shutdown)
or indefinite turbine shutdown if auxiliary boiler is in operation
Cold Start = turbine is shut down for longer than 48 hrs (without auxiliary boiler to keep it warm)

**Summary of Proposed Annual Startup Emission Scenarios - Turbine Unit Starts**

| | Units | Startup Case #1 | Startup Case #2 | Startup Case #3 | Startup Case #4 | Expected Startup Case |
|---|---|---|---|---|---|---|
| Total Turbine Starts | starts/yr | 150 | 200 | 183 | 185 | 153 |
| Cold | starts/yr | 50 | 0 | 0 | 30 | 26 |
| Warm | starts/yr | 50 | 50 | 83 | 20 | 14 |
| Hot | starts/yr | 50 | 150 | 100 | 135 | 113 |
| Total Startup Hours | Hrs | 225 | 225 | 225 | 225 | 185 |
| NOx Total | tons/yr | **17.0** | 16.6 | 16.8 | 16.8 | 13.8 |
| Cold | tons/yr | 7.7 | 0.0 | 0.0 | 4.6 | 4.0 |
| Warm | tons/yr | 5.7 | 5.7 | 9.5 | 2.3 | 1.6 |
| Hot | tons/yr | 3.7 | 11.0 | 7.3 | 9.9 | 8.3 |
| CO Total | tons/yr | 54.9 | **71.2** | 65.3 | 66.7 | 55.0 |
| Cold | tons/yr | 19.3 | 0.0 | 0.0 | 11.6 | 9.9 |
| Warm | tons/yr | 17.9 | 17.9 | 29.8 | 7.2 | 4.9 |
| Hot | tons/yr | 17.8 | 53.3 | 35.5 | 48.0 | 40.3 |
| VOC Total | tons/yr | 7.1 | **9.3** | 8.6 | 8.7 | 7.1 |
| Cold | tons/yr | 2.4 | 0.0 | 0.0 | 1.4 | 1.2 |
| Warm | tons/yr | 2.4 | 2.4 | 3.9 | 0.9 | 0.6 |
| Hot | tons/yr | 2.3 | 7.0 | 4.6 | 6.3 | 5.3 |
| PM/PM10 Total | tons/yr | 2.0 | 2.0 | 2.0 | 2.0 | 1.7 |
| Cold | tons/yr | 0.9 | 0.0 | 0.0 | 0.5 | 0.5 |
| Warm | tons/yr | 0.7 | 0.7 | 1.1 | 0.3 | 0.2 |
| Hot | tons/yr | 0.5 | 1.4 | 0.9 | 1.2 | 1.0 |
| SO2 Total | tons/yr | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Cold | tons/yr | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Warm | tons/yr | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Hot | tons/yr | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 |

Maximum "worst case" annual startup emissions for each pollutant are highlighted.

Ta 2-4
Salt River Project
Proposed Power Plant - Existing Kyrene Generating Station
Auxiliary Boiler Potential Emission Estimates

| Air Pollutant | Emission Factor (lb/MMBtu) | Heat Input (MMBtu/hour) | Annual Hours Of Operation | Annual Emissions (lbs/year) | Annual Emissions (TPY) |
|---|---|---|---|---|---|
| $NO_X$ | 0.073 | 99 | 1200 | 8672.4 | 4.34 |
| CO | 0.067 | 99 | 1200 | 7959.6 | 3.98 |
| VOC | 0.0042 | 99 | 1200 | 499.0 | 0.25 |
| $PM_{10}$ | 0.010 | 99 | 1200 | 1188.0 | 0.59 |
| SO2 | 0.0028 | 99 | 1200 | 332.6 | 0.17 |

Maximum Design Heat Input Rate
(MMBtu/hr) = 99

Notes:
Annual Emissions are based on 1200 hours of operation and vendor supplied emissions data.
lb/MMBtu = pounds per million Btu of natural gas
MMBtu/hour = million Btu of natural gtas per hour
SO2 emission factor based on 1 grain of sulfur per 100 standard cubic feet of natural gas.

Example Calculation:

Emission Factor(lbs/MMBtu) x Heat Input (MMBtu/Hour) x 1200 hours/year x 1 ton/2000 lbs= Annual emissions (lbs/year)

Table 2-5
Salt River Project
Proposed Power Plant - Existing Kyrene Generating Station
Emergency Generator Potential Emission Estimates

| Air Pollutant | Emission Factor (lb/hp-hr) | Hourly Emissions (lb/hour) | Hours Of Operation | Annual Emissions (TPY) |
|---|---|---|---|---|
| $NO_x$ * | 0.031 | 10.39 | 37.5 | 0.19 |
| CO * | 0.00668 | 2.24 | 37.5 | 0.04 |
| TOC (VOC) * | 0.00251 | 0.84 | 37.5 | 0.02 |
| PM * | 0.0022 | 0.74 | 37.5 | 0.01 |
| $SO_2$ | - | 0.14 | 37.5 | 0.003 |

Maximum Design Rate in Horsepower = 335

Notes:
Annual Emissions are based on 37.5 hours of operation.
* AP-42 emission factor (Table 3.3-1, 10/96).
Generator fires diesel fuel with a sulfur content of 0.05 percent.
It is assumed that TOC = VOC.

Sample Calculation:

NOx (tons/year) = 0.031 lb/hp-hr * 335 hp * 37.5 hrs/year * 1 ton/2000 lbs = 0.19 tons/year

$SO_2$ Sample Calculation and Basis for Estimate:

$SO_2$ (tons/year) = 20 gal/hr * 7.05 lbs/gal * 0.05/100 (sulfur fraction) * 2 lb $SO_2$/lb S * 37.5 hrs/year * 1 ton/2000 lbs = 0.003 tons/year

Generator fuel usage (gal/hr): 20
Diesel fuel density (lbs/gal): 7.05

Table 2-6
Salt River Project
Proposed Power Plant - Existing Kyrene Generating Station
Emergency Fire Water Pump Potential Emission Estimates

| Air Pollutant | Emission Factor (lb/hp-hr) | Hourly Emissions (lb/hour) | Hours Of Operation | Annual Emissions (TPY) |
|---|---|---|---|---|
| $NO_x$ * | 0.031 | 9.61 | 37.5 | 0.180 |
| CO * | 0.00668 | 2.07 | 37.5 | 0.039 |
| TOC (VOC) * | 0.00251 | 0.78 | 37.5 | 0.015 |
| PM * | 0.0022 | 0.68 | 37.5 | 0.013 |
| $SO_2$ | - | 0.13 | 37.5 | 0.002 |

Maximum Design Rate in Horsepower = 310

Notes:
Annual Emissions are based on 37.5 hours of operation.
* AP-42 emission factor (Table 3.3-1, 10/96).
Fire pump fires diesel fuel with a sulfur content of 0.05 percent.
It is assumed that TOC = VOC.

Sample Calculation:

NOx (tons/year) = 0.031 lb/hp-hr * 310 hp * 37.5 hrs/year * 1 ton/2000 lbs = 0.18 tons/year

SO2 Sample Calculation and Basis for Estimate:

SO2 (tons/year)=18 gal/hr * 7.05 lbs/gal * 0.05/100 (sulfur fraction) * 2 lb SO2/lb S * 37.5 hrs/year * 1 ton/2000 lbs=0.002 tons/year

Pump fuel usage (gal/hr): 18
Diesel fuel density (lbs/gal): 7.05

Ta 2-7
Salt River Project
Proposed Power Plant - Existing Kyrene Generating Station
Cooling Tower - Potential Emission Estimates

| Air Pollutant | Circ Water Flow (gpm) | Drift (gpm) | TDS (lbs/gallon) | PM emissions (lbs/minute) | Hourly Emissions (lb/hour) | Annual Emissions (TPY) |
|---|---|---|---|---|---|---|
| PM | 115,000 | 0.575 | 0.025 | 0.0140 | 0.86 | 3.8 |

Annual emissions are based on 8760 hours of operation.
Guarantee of 0.0005% liquid drift of the circulation. (115,000 gpm X 0.0005% = 0.575 gallon per minute drift)
TDS equals 3000 mg/liter. This equates to 3000 mg/liter X 3.785/1 liters/gallon X g/1000 mg X lb/454 g or 0.025 pounds per gallon.

Ta[illegible]8(a)
Salt [illegible] Project
Proposed Power Plant - E[illegible], Kyrene Generating Station
Hazardous Air Pollutant Emission Estimates for One Combined Cycle System

| POLLUTANT | HAP (Yes/No) | EMISSION FACTOR (lbs/MMBtu) | EMISSION FACTOR SOURCE | EMISSION FACTOR (lbs/MMBtu) | EMISSION FACTOR SOURCE | EMISSION FACTOR SELECTED (lbs/MMBtu) | ESTIMATED UNCONTROLLED EMISSIONS (tons/year) | ESTIMATED CONTROLLED EMISSIONS (tons/year) |
|---|---|---|---|---|---|---|---|---|
| 1,3-Butadiene | Yes | 4.3E-07 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 1.245E-07 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 4.300E-07 | 0.003 | 0.003 |
| 2-Chloronaphthalene | Yes | 2.667E-10 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 2.667E-10 | 0.000002 | 0.000002 |
| 2-Methylnaphthalene | Yes | 5.186E-09 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 5.186E-09 | 0.00004 | 0.000031 |
| Acenaphthene | Yes | 1.863E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 1.863E-08 | 0.0001 | 0.0001 |
| Acenaphthylene | Yes | 1.441E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 1.441E-08 | 0.0001 | 0.0001 |
| Acetaldehyde | Yes | 4.0E-05 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 6.725E-05 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 6.725E-05 | 0.505 | 0.404 |
| Acrolein | Yes | 6.4E-06 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 2.324E-05 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 2.324E-05 | 0.174 | 0.139 |
| Anthracene | Yes | 3.314E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 3.314E-08 | 0.0002 | 0.0002 |
| Benzene | Yes | 1.2E-05 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 1.333E-05 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 1.333E-05 | 0.100 | 0.080 |
| Benzo(a)anthracene | Yes | 2.216E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 2.216E-08 | 0.0002 | 0.0001 |
| Benzo(a)pyrene | Yes | 1.363E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 1.363E-08 | 0.00010 | 0.00008 |
| Benzo(b)fluoranthene | Yes | 1.108E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 1.108E-08 | 0.00008 | 0.00007 |
| Benzo(e)pyrene | Yes | 5.333E-10 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 5.333E-10 | 0.000004 | 0.000003 |
| Benzo(g,h,i)perylene | Yes | 1.343E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 1.343E-08 | 0.00010 | 0.00008 |
| Benzo(k)fluoranthene | Yes | 1.078E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 1.078E-08 | 0.00008 | 0.00006 |
| Chrysene | Yes | 2.471E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 2.471E-08 | 0.00019 | 0.00015 |
| Dibenz(a,h)anthracene | Yes | 2.304E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 2.304E-08 | 0.00017 | 0.00014 |
| Ethylbenzene | Yes | 3.2E-05 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 1.755E-05 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 3.200E-05 | 0.240 | 0.192 |
| Fluoranthene | Yes | 4.235E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 4.235E-08 | 0.00032 | 0.00025 |
| Fluorene | Yes | 5.686E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 5.686E-08 | 0.00043 | 0.00034 |
| Formaldehyde | Yes | 7.1E-04 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 1.078E-04 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 7.100E-04 | 5.327 | 4.262 |
| Hexane | Yes | 2.539E-04 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 2.539E-04 | 1.905 | 1.524 |
| Indeno(1,2,3-cd)pyrene | Yes | 2.304E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 2.304E-08 | 0.00017 | 0.00014 |
| Naphthalene | Yes | 1.3E-06 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 1.627E-06 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 1.627E-06 | 0.012 | 0.010 |
| Perylene | Yes | 6.863E-10 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 6.863E-10 | 0.000005 | 0.000004 |
| Phenanthrene | Yes | 3.069E-07 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 3.069E-07 | 0.002 | 0.002 |
| Polycyclic Aromatic Hydrocarbon | Yes | 2.2E-06 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | | | 2.200E-06 | 0.017 | 0.013 |
| Propylene | No | 7.559E-04 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 7.559E-04 | - | - |
| Propylene Oxide | Yes | 2.9E-05 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 4.686E-05 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 4.686E-05 | 0.352 | 0.281 |
| Pyrene | Yes | 2.716E-08 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | | | 2.716E-08 | 0.00020 | 0.00016 |
| Toluene | Yes | 1.3E-04 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 6.961E-05 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 1.300E-04 | 0.975 | 0.780 |
| Xylene | Yes | 6.4E-05 | AP-42 Stat. Gas Turb. (4/00), Table 3.1-3 | 2.559E-05 | CATEF- Nat Gas Turbines w/SCR, Mean Em Fctr | 6.400E-05 | 0.480 | 0.384 |

Controlled emissions are 20 percent VOC control from the oxidation catalyst.
Heat Input of one CT (MMBtu/hr) = 1713

T' '(b)
Salt ' 'roject
**Proposed Power Plant - Existing Kyrene Generating Station**
**Hazardous Air Pollutant Emission Estimates for One Duct Burner**

| POLLUTANT | HAP (Yes/No) | EMISSION FACTOR (lbs/MMBtu) | EMISSION FACTOR SOURCE | EMISSION FACTOR (lbs/MMBtu) | EMISSION FACTOR SOURCE | EMISSION FACTOR SELECTED (lbs/MMBtu) | ESTIMATED UNCONTROLLED EMISSIONS (tons/year) | CONTROLLED EMISSIONS (tons/year) |
|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | Yes | 2.353E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.353E-08 | 1.463E-05 | 1.170E-05 |
| 3-Methylchloranthrene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | 1.097E-06 | 8.777E-07 |
| 7,12-Dimethylbenz(a)anthracene | Yes | 1.569E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.569E-08 | 9.752E-06 | 7.802E-06 |
| Acenaphthene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | 1.097E-06 | 8.777E-07 |
| Acenaphthylene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | 1.097E-06 | 8.777E-07 |
| Acetaldehyde | Yes | 8.696E-06 | CATEF- Nat Gas Boiler w/no controls, Mean Em Fctr | | | 8.696E-06 | 5.406E-03 | 4.325E-03 |
| Anthracene | Yes | 2.353E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.353E-09 | 1.463E-06 | 1.170E-06 |
| Arsenic | Yes | 1.961E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.961E-07 | 1.219E-04 | 9.752E-05 |
| Barium | No | 4.314E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 4.314E-06 | - | - |
| Benz(a)anthracene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | 1.097E-06 | 8.777E-07 |
| Benz(a)pyrene | Yes | 1.176E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.176E-09 | 7.314E-07 | 5.851E-07 |
| Benzaldehyde | No | 1.608E-05 | CATEF- Nat Gas Boiler w/no controls, Mean Em Fctr | | | 1.608E-05 | - | - |
| Benzene | Yes | 2.059E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | 4.225E-06 | CATEF- Nat Gas Boiler w/no controls, Mean Em Fctr | 4.225E-06 | 2.627E-03 | 2.102E-03 |
| Benzo(b)fluoranthene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | 1.097E-06 | 8.777E-07 |
| Benzo(g,h,i)perylene | Yes | 1.176E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.176E-09 | 7.314E-07 | 5.851E-07 |
| Benzo(k)fluoranthene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | 1.097E-06 | 8.777E-07 |
| Beryllium | Yes | 1.176E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.176E-08 | 7.314E-06 | 7.314E-06 |
| Butane | No | 2.059E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.059E-03 | - | - |
| Cadmium | Yes | 1.078E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.078E-06 | 6.705E-04 | 6.705E-04 |
| Chromium | Yes | 1.373E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.373E-06 | 8.533E-04 | 8.533E-04 |
| Chrysene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | 1.097E-06 | 8.777E-07 |
| Cobalt | Yes | 8.235E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 8.235E-08 | 5.120E-05 | 5.120E-05 |
| Copper | No | 8.333E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 8.333E-07 | - | - |
| Dibenzo(a,h)anthracene | Yes | 1.176E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.176E-09 | 7.314E-07 | 5.851E-07 |
| Dichlorobenzene | Yes | 1.176E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.176E-06 | 7.314E-04 | 5.851E-04 |
| Ethane | No | 3.039E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 3.039E-03 | - | - |
| Fluoranthene | Yes | 2.941E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.941E-09 | 1.829E-06 | 1.463E-06 |
| Fluorene | Yes | 2.745E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.745E-09 | 1.707E-06 | 1.365E-06 |
| Formaldehyde | Yes | 7.353E-05 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | 2.167E-04 | CATEF- Nat Gas Boiler w/no controls, Mean Em Fctr | 2.167E-04 | 1.347E-01 | 1.078E-01 |
| Hexane | Yes | 1.765E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-03 | 1.097E+00 | 8.777E-01 |
| Indeno(1,2,3-cd)pyrene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | 1.097E-06 | 8.777E-07 |
| Manganese | Yes | 3.725E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 3.725E-07 | 2.316E-04 | 2.316E-04 |
| Mercury | Yes | 2.549E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.549E-07 | 1.585E-04 | 1.585E-04 |
| Molybdenum | No | 1.078E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.078E-06 | - | - |
| Naphthalene | Yes | 5.980E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 5.980E-07 | 3.718E-04 | 2.974E-04 |
| Nickel | Yes | 2.059E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.059E-06 | 1.280E-03 | 1.280E-03 |
| Pentane | No | 2.549E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.549E-03 | - | - |
| Phenanathrene | Yes | 1.667E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.667E-08 | 1.036E-05 | 8.289E-06 |
| Propane | No | 1.569E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.569E-03 | - | - |
| Pyrene | Yes | 4.902E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 4.902E-09 | 3.048E-06 | 2.438E-06 |
| Selenium | Yes | 2.353E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.353E-08 | 1.463E-05 | 1.463E-05 |
| Toluene | Yes | 3.333E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 3.333E-06 | 2.072E-03 | 1.658E-03 |
| Vanadium | No | 2.255E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.255E-06 | - | - |
| Zinc | No | 2.843E-05 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.843E-05 | - | - |
| | | | | | | | 1.2 | 1.0 |

Controlled emissions are 20 percent VOC control from the oxidation catalyst.
Emission estimates based on 8,760 hours of operation/year/duct burner.
Heat Input of one Duct Burner (MMBtu/hour) = 141.94

**Table 2-9**
**Salt River Project**
**Proposed Power Plant- Existing Kyrene Generating Station**
**Hazardous Air Pollutant Emission Estimates for the Auxiliary Boiler**

| POLLUTANT | HAP (Yes/No) | EMISSION FACTOR (lbs/MMBtu) | EMISSION FACTOR SOURCE | EMISSION FACTOR (lbs/MMBtu) | EMISSION FACTOR SOURCE | EMISSION FACTOR SELECTED (lbs/MMBtu) | ESTIMATED UNCONTROLLED EMISSIONS (tons/year) |
|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | Yes | 2.353E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.353E-08 | **1.398E-06** |
| 3-Methylchloranthrene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | **1.048E-07** |
| 7,12-Dimethylbenz(a)anthracene | Yes | 1.569E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.569E-08 | **9.318E-07** |
| Acenaphthene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | **1.048E-07** |
| Acenaphthylene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | **1.048E-07** |
| Acetaldehyde | Yes | 1.441E-05 | CATEF- Nat Gas Boiler w/no controls, Max Em Fctr | | | 1.441E-05 | **8.561E-04** |
| Anthracene | Yes | 2.353E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.353E-09 | **1.398E-07** |
| Arsenic | Yes | 1.961E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.961E-07 | **1.165E-05** |
| Barium | No | 4.314E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 4.314E-06 | - |
| Benz(a)anthracene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | **1.048E-07** |
| Benz(a)pyrene | Yes | 1.176E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.176E-09 | **6.988E-08** |
| Benzaldehyde | No | 2.667E-05 | CATEF- Nat Gas Boiler w/no controls, Max Em Fctr | | | 2.667E-05 | - |
| Benzene | Yes | 2.059E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | 8.529E-06 | CATEF- Nat Gas Boiler w/no controls, Max Em F | 8.529E-06 | **5.066E-04** |
| Benzo(b)fluoranthene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | **1.048E-07** |
| Benzo(g,h,i)perylene | Yes | 1.176E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.176E-09 | **6.988E-08** |
| Benzo(k)fluoranthene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | **1.048E-07** |
| Beryllium | Yes | 1.176E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.176E-08 | **6.988E-07** |
| Butane | No | 2.059E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.059E-03 | - |
| Cadmium | Yes | 1.078E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.078E-06 | **6.406E-05** |
| Chromium | Yes | 1.373E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.373E-06 | **8.153E-05** |
| Chrysene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | **1.048E-07** |
| Cobalt | Yes | 8.235E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 8.235E-08 | **4.892E-06** |
| Copper | No | 8.333E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 8.333E-07 | - |
| Dibenzo(a,h)anthracene | Yes | 1.176E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.176E-09 | **6.988E-08** |
| Dichlorobenzene | Yes | 1.176E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.176E-06 | **6.988E-05** |
| Ethane | No | 3.039E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 3.039E-03 | - |
| Fluoranthene | Yes | 2.941E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.941E-09 | **1.747E-07** |
| Fluorene | Yes | 2.745E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.745E-09 | **1.631E-07** |
| Formaldehyde | Yes | 7.353E-05 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | 2.167E-04 | CATEF- Nat Gas Boiler w/no controls, Max Em F | 2.167E-04 | **1.287E-02** |
| Hexane | Yes | 1.765E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-03 | **1.048E-01** |
| Indeno(1,2,3-cd)pyrene | Yes | 1.765E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.765E-09 | **1.048E-07** |
| Manganese | Yes | 3.725E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 3.725E-07 | **2.213E-05** |
| Mercury | Yes | 2.549E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.549E-07 | **1.514E-05** |
| Molybdenum | No | 1.078E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 1.078E-06 | - |
| Naphthalene | Yes | 5.980E-07 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 5.980E-07 | **3.552E-05** |
| Nickel | Yes | 2.059E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.059E-06 | **1.223E-04** |
| Pentane | No | 2.549E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 2.549E-03 | - |
| Phenanathrene | Yes | 1.667E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.667E-08 | **9.900E-07** |
| Propane | No | 1.569E-03 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 1.569E-03 | - |
| Pyrene | Yes | 4.902E-09 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 4.902E-09 | **2.912E-07** |
| Selenium | Yes | 2.353E-08 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.353E-08 | **1.398E-06** |
| Toluene | Yes | 3.333E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-3 | | | 3.333E-06 | **1.980E-04** |
| Vanadium | No | 2.255E-06 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.255E-06 | - |
| Zinc | No | 2.843E-05 | AP-42 Nat. Gas Comb. (7/98), Table 1.4-4 | | | 2.843E-05 | - |
| | | | | | | | **0.12** |

Emission estimates based on 1,200 hours of operation/year.
Heat Input of Auxiliary Boiler (MMBtu/hour) = **99**

developed by USEPA. The threshold levels developed by USEPA for defining a source as a major stationary source of hazardous air pollutants is 10 tons per year of an individual pollutant and 25 tons per year as an aggregate. USEPA has identified 188 chemicals that are considered hazardous air pollutants. These pollutants are listed under Section 112(b) of the Clean Air Act.

T 10
Salt k Project
Proposed Power Plant- Existing Kyrene Generating Station
Hazardous Air Pollutant Emission Estimates for the Emergency Generator and Emergency Fire Pump

| POLLUTANT | HAP (Yes/No) | EMISSION FACTOR (lbs/MMBtu) | EMISSION FACTOR SOURCE | ESTIMATED UNCONTROLLED EMISSIONS FROM THE EMERGENCY GENERATOR (tons/year) | ESTIMATED UNCONTROLLED EMISSIONS FROM THE EMERGENCY FIRE WATER PUMP (tons/year) | TOTAL UNCONTROLLED EMISSIONS (tons/year) |
|---|---|---|---|---|---|---|
| 1,3-Butadiene | Yes | 3.910E-05 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 6.3E-07 | 5.8E-07 | **1.2E-06** |
| Acenaphthene | Yes | 1.420E-06 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 2.3E-08 | 2.1E-08 | **4.4E-08** |
| Acenaphthylene | Yes | 5.060E-06 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 8.1E-08 | 7.5E-08 | **1.6E-07** |
| Acetaldehyde | Yes | 7.670E-04 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 1.2E-05 | 1.1E-05 | **2.4E-05** |
| Acrolein | Yes | 9.250E-05 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 1.5E-06 | 1.4E-06 | **2.8E-06** |
| Anthracene | Yes | 1.870E-06 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 3.0E-08 | 2.8E-08 | **5.8E-08** |
| Benzene | Yes | 9.330E-04 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 1.5E-05 | 1.4E-05 | **2.9E-05** |
| Benzo(a)anthracene | Yes | 1.680E-06 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 2.7E-08 | 2.5E-08 | **5.2E-08** |
| Benzo(a)pyrene | Yes | 1.880E-07 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 3.0E-09 | 2.8E-09 | **5.8E-09** |
| Benzo(b)fluoranthene | Yes | 9.910E-08 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 1.6E-09 | 1.5E-09 | **3.1E-09** |
| Benzo(g,h,I)perylene | | 4.890E-07 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | - | - | - |
| Benzo(k)fluoranthene | Yes | 1.550E-07 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 2.5E-09 | 2.3E-09 | **4.8E-09** |
| Chrysene | Yes | 3.530E-07 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 5.6E-09 | 5.2E-09 | **1.1E-08** |
| Dibenz(a,h)anthracene | Yes | 5.830E-07 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 9.3E-09 | 8.6E-09 | **1.8E-08** |
| Fluoranthene | Yes | 7.610E-06 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 1.2E-07 | 1.1E-07 | **2.3E-07** |
| Fluorene | Yes | 2.920E-05 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 4.7E-07 | 4.3E-07 | **9.0E-07** |
| Formaldehyde | Yes | 1.180E-03 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 1.9E-05 | 1.7E-05 | **3.6E-05** |
| Indeno(1,2,3-cd)pyrene | Yes | 3.750E-07 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 6.0E-09 | 5.5E-09 | **1.2E-08** |
| Naphthalene | Yes | 8.480E-05 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 1.4E-06 | 1.3E-06 | **2.6E-06** |
| Phenanthrene | Yes | 2.940E-05 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 4.7E-07 | 4.3E-07 | **9.1E-07** |
| Propylene | No | 2.580E-03 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | - | - | - |
| Pyrene | Yes | 4.780E-06 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 7.6E-08 | 7.1E-08 | **1.5E-07** |
| Toluene | Yes | 4.090E-04 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 6.5E-06 | 6.1E-06 | **1.3E-05** |
| Total PAH | | 4.329E-03 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | - | - | - |
| Xylenes | Yes | 2.850E-04 | AP-42 Gasoline & Diesel Ind. Engines (10/96), Table 3.3-2 | 4.6E-06 | 4.2E-06 | **8.8E-06** |
| | | | | | | **1.2E-04** |

Emission estimates based on 37.5 hours of operation/year for testing and emergency purposes for each piece of equipment.

Emergency Generator:
250 kW (250,000 Watts)
1 HP = 745.7 Watts
1 HP = 2,545 Btu/hr
Heat Input (MMBtu/hr)= **0.85**

Emergency Fire Water Pump:
310 HP
1 HP = 2,545 Btu/hr
Heat Input (MMBtu/hr)= **0.79**

**Table 2-11**
**Salt River Project**
**Proposed Power Plant - Existing Kyrene Generating Station**
**Hazardous Air Pollutant Emission Estimates - Facility Totals**

| POLLUTANT | COMBINED CYCLE SYSTEM* (TONS/YEAR) | DUCT BURNER* (TONS/YEAR) | AUXILIARY BOILER (TONS/YEAR) | EMERGENCY EQUIPMENT (TONS/YEAR) | TOTAL (TONS/YEAR) |
|---|---|---|---|---|---|
| 1,3-Butadiene | 2.58E-03 | - | - | 1.20E-06 | 2.58E-03 |
| 2-Chloronaphthalene | 1.60E-06 | - | - | - | 1.60E-06 |
| 2-Methylnaphthalene | 3.11E-05 | 1.17E-05 | 1.40E-06 | - | 4.42E-05 |
| 3-Methylchloranthene | - | 8.78E-07 | 1.05E-07 | - | 9.83E-07 |
| 7,12-Dimethylbenz(a)anthr | - | 7.80E-06 | 9.32E-07 | - | 8.73E-06 |
| Acenaphthene | 1.12E-04 | 8.78E-07 | 1.05E-07 | 4.37E-08 | 1.13E-04 |
| Acenaphthylene | 8.65E-05 | 8.78E-07 | 1.05E-07 | 1.56E-07 | 8.76E-05 |
| Acetaldehyde | 4.04E-01 | 4.33E-03 | 8.56E-04 | 2.36E-05 | 4.09E-01 |
| Acrolein | 1.39E-01 | - | - | 2.85E-06 | 1.39E-01 |
| Anthracene | 1.99E-04 | 1.17E-06 | 1.40E-07 | 5.76E-08 | 2.00E-04 |
| Arsenic | - | 9.75E-05 | 1.16E-05 | - | 1.09E-04 |
| Benzene | 8.00E-02 | 2.10E-03 | 5.07E-04 | 2.87E-05 | 8.27E-02 |
| Benzo(a)anthracene | 1.33E-04 | 8.78E-07 | 1.05E-07 | 5.17E-08 | 1.34E-04 |
| Benzo(a)pyrene | 8.18E-05 | 5.85E-07 | 6.99E-08 | 5.79E-09 | 8.25E-05 |
| Benzo(b)fluoranthene | 6.65E-05 | 8.78E-07 | 1.05E-07 | 3.05E-09 | 6.75E-05 |
| Benzo(e)pyrene | 3.20E-06 | - | - | - | 3.20E-06 |
| Benzo(g,h,i)perylene | 8.06E-05 | 5.85E-07 | 6.99E-08 | | 8.13E-05 |
| Benzo(k)fluoranthene | 6.47E-05 | 8.78E-07 | 1.05E-07 | 4.77E-09 | 6.57E-05 |
| Beryllium | - | 7.31E-06 | 6.99E-07 | - | 8.01E-06 |
| Cadmium | - | 6.70E-04 | 6.41E-05 | - | 7.35E-04 |
| Chromium VI | - | 8.53E-04 | 8.15E-05 | - | 9.35E-04 |
| Chrysene | 1.48E-04 | 8.78E-07 | 1.05E-07 | 1.09E-08 | 1.49E-04 |
| Cobalt | - | 5.12E-05 | 4.89E-06 | - | 5.61E-05 |
| Dibenz(a,h)anthracene | 1.38E-04 | 5.85E-07 | 6.99E-08 | - | 1.39E-04 |
| Dichlorobenzene | - | 5.85E-04 | 6.99E-05 | - | 6.55E-04 |
| Ethylbenzene | 1.92E-01 | - | - | - | 1.92E-01 |
| Fluoranthene | 2.54E-04 | 1.46E-06 | 1.75E-07 | 2.34E-07 | 2.56E-04 |
| Fluorene | 3.41E-04 | 1.37E-06 | 1.63E-07 | 8.99E-07 | 3.44E-04 |
| Formaldehyde | 4.26E+00 | 1.08E-01 | 1.29E-02 | 3.63E-05 | 4.38E+00 |
| Hexane | 1.52E+00 | 8.78E-01 | 1.05E-01 | - | 2.51E+00 |
| Indeno(1,2,3-cd)pyrene | 1.38E-04 | 8.78E-07 | 1.05E-07 | 1.15E-08 | 1.39E-04 |
| Lead | - | - | - | - | 0.00E+00 |
| Manganese | - | 2.32E-04 | 2.21E-05 | - | 2.54E-04 |
| Mercury | - | 1.58E-04 | 1.51E-05 | - | 1.74E-04 |
| Naphthalene | 9.77E-03 | 2.97E-04 | 3.55E-05 | 2.61E-06 | 1.01E-02 |
| Nickel | - | 1.28E-03 | 1.22E-04 | - | 1.40E-03 |
| N-nitrosodimethylamine | - | - | - | - | 0.00E+00 |
| N-nitrosomorpholine | - | - | - | - | 0.00E+00 |
| Perylene | 4.12E-06 | - | - | - | 4.12E-06 |
| Phenanthrene | 1.84E-03 | 8.29E-06 | 9.90E-07 | 9.05E-07 | 1.85E-03 |
| Polycyclic Aromatic Hydrocarbon | 1.32E-02 | - | - | - | 1.32E-02 |
| Propylene | - | - | - | - | 0.00E+00 |
| Propylene Oxide | 2.81E-01 | - | - | - | 2.81E-01 |
| Pyrene | 1.63E-04 | 2.44E-06 | 2.91E-07 | 1.47E-07 | 1.66E-04 |
| Selenium | - | 1.46E-05 | 1.40E-06 | - | 1.60E-05 |
| Toluene | 7.80E-01 | 1.66E-03 | 1.98E-04 | 1.26E-05 | 7.82E-01 |
| Trimethylamine | - | - | -- | - | 0.00E+00 |
| Xylene | 3.84E-01 | - | - | 8.78E-06 | 3.84E-01 |

**Grand Total** **9.19**

= Controlled Emission Estimate

# 3 SITE AREA CHARACTERISTICS

Site area characteristics that are related to defining the potential impact on ambient air quality from the proposed power plant, include wind flow, rural/urban land use classification, topography, and current ambient air quality status.

## *3.1 WIND FLOW PATTERN*

Measurements of surface wind flow from the Phoenix National Weather Service (NWS) station were considered as representative of the local meteorology for the proposed power plant at the existing Kyrene Generating Station site. Annual wind roses for each year from 1994 through 1998 are presented in Figures 3-1 through 3-5, respectively. Figure 3-6 presents the cumulative annual wind rose based on the 5-year period. From this figure it can be seen that the prevailing wind direction is from the east and west, occurring approximately 15 percent of the time.

## *3.2 RURAL/URBAN LAND USE DESCRIPTION*

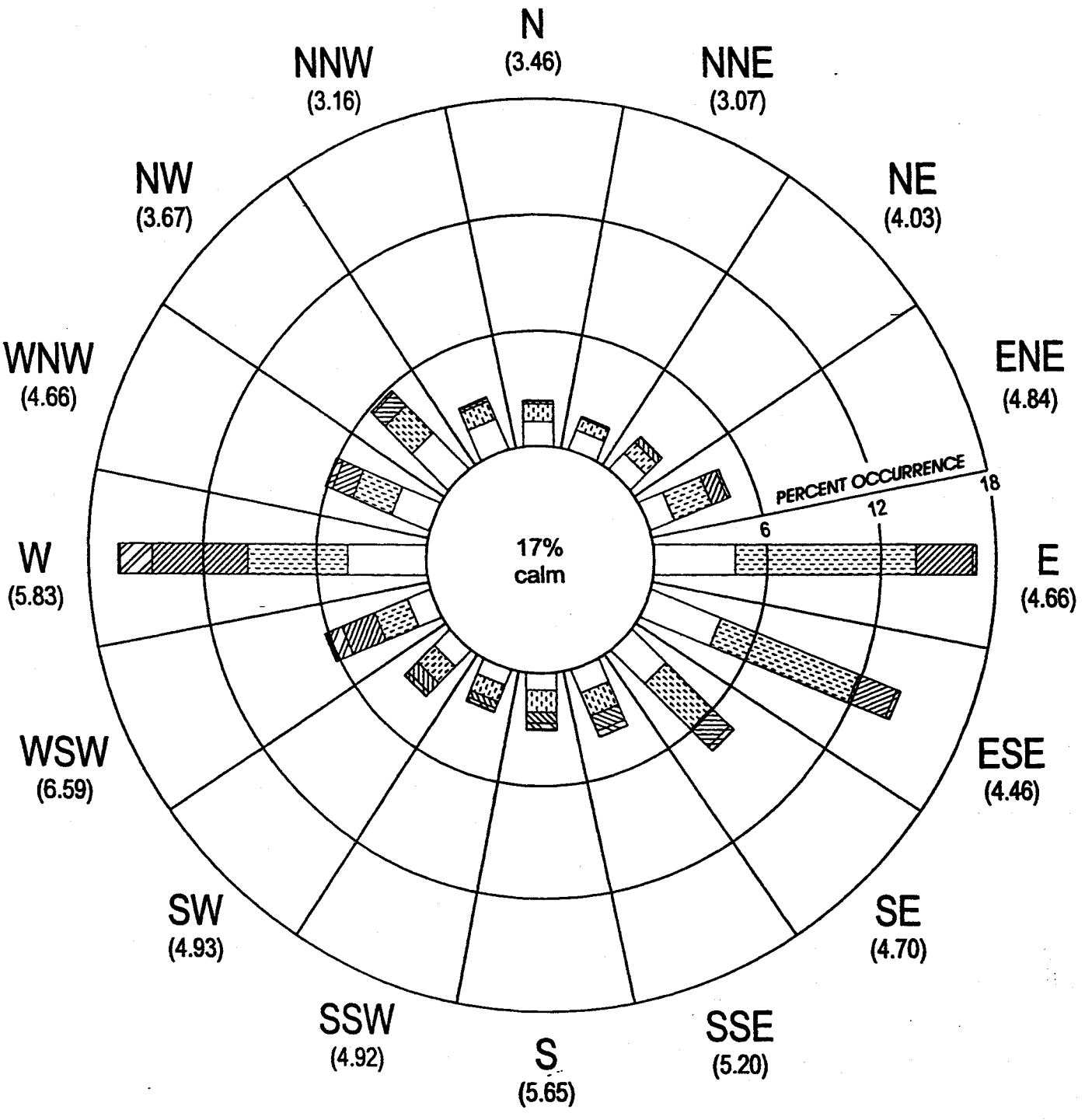
An analysis technique was developed by Irwin (1979) to classify a site area as either rural or urban for purposes of using rural or urban dispersion coefficients. The classification can be based on either average heat flux, land use, or population density within a 3-kilometer radius from the proposed power plant site. Of these, the USEPA has specified that land use is the most definitive criterion (USEPA, 1986). The rural/urban classification based on land use is as follows:

> Using the meteorological land use typing scheme (Table 3-1) established by Auer (1978), an urban classification of the site area requires more than 50 percent of the following land use types: heavy industrial (I1), light-moderate industrial (I2), commercial (C1), single-family compact residential (R2), and multi-family compact residential (R3). Otherwise, the site area is considered rural.

Using the land use typing scheme, urban land use types may comprise greater than 50 percent of the total area. Primarily, the area surrounding the Kyrene site is common residential (R1), metropolitan natural (A1), compact residential (R2), and commercial (C1). For purposes of this application, it has been assumed that the area surrounding the plant sites meets the land use criteria for urban areas. Thus, the proposed power plant site and surrounding area will be classified as urban, requiring the use of urban dispersion coefficients in the air quality impact analyses. Refer to Section 5.0 for a discussion of these analyses.

## *3.3 TOPOGRAPHY*

The topography surrounding the Kyrene site can be described as generally flat with complex terrain several kilometers away in all directions (refer to figure 3-7). Because terrain has the potential to influence plume transport and dispersion, terrain elevations were considered in the air quality impact assessment (refer to Section 5.0).




NUMBERS INDICATE SECTOR MEAN WIND SPEED
SECTORS ARE DIRECTIONS FROM WHICH THE WIND IS BLOWING

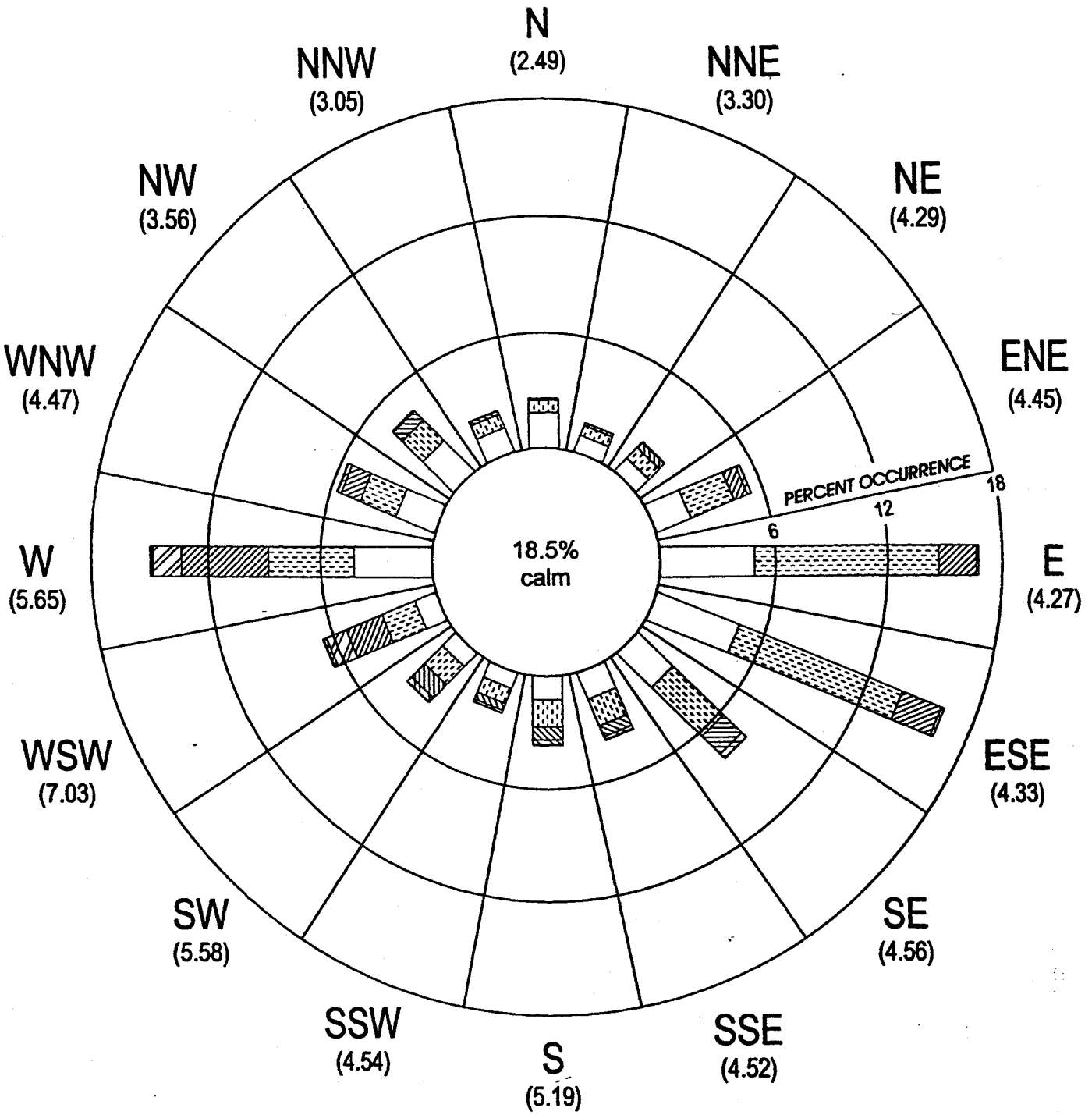
FIGURE 3-1

WIND SPEED RANGE (KNOTS)

- 0.0 - 3.0
- 4.0 - 6.0
- 7.0 - 10.0
- 11.0 - 16.0
- 17.0 - 21.0
- > 21.0

WIND FREQUENCY DISTRIBUTION
ANNUAL WIND ROSE
FOR 1994

HOURLY SURFACE WIND OBSERVATIONS
SKY HARBOR INTERNATIONAL AIRPORT
PHOENIX, ARIZONA




NUMBERS INDICATE SECTOR MEAN WIND SPEED
SECTORS ARE DIRECTIONS FROM WHICH THE WIND IS BLOWING

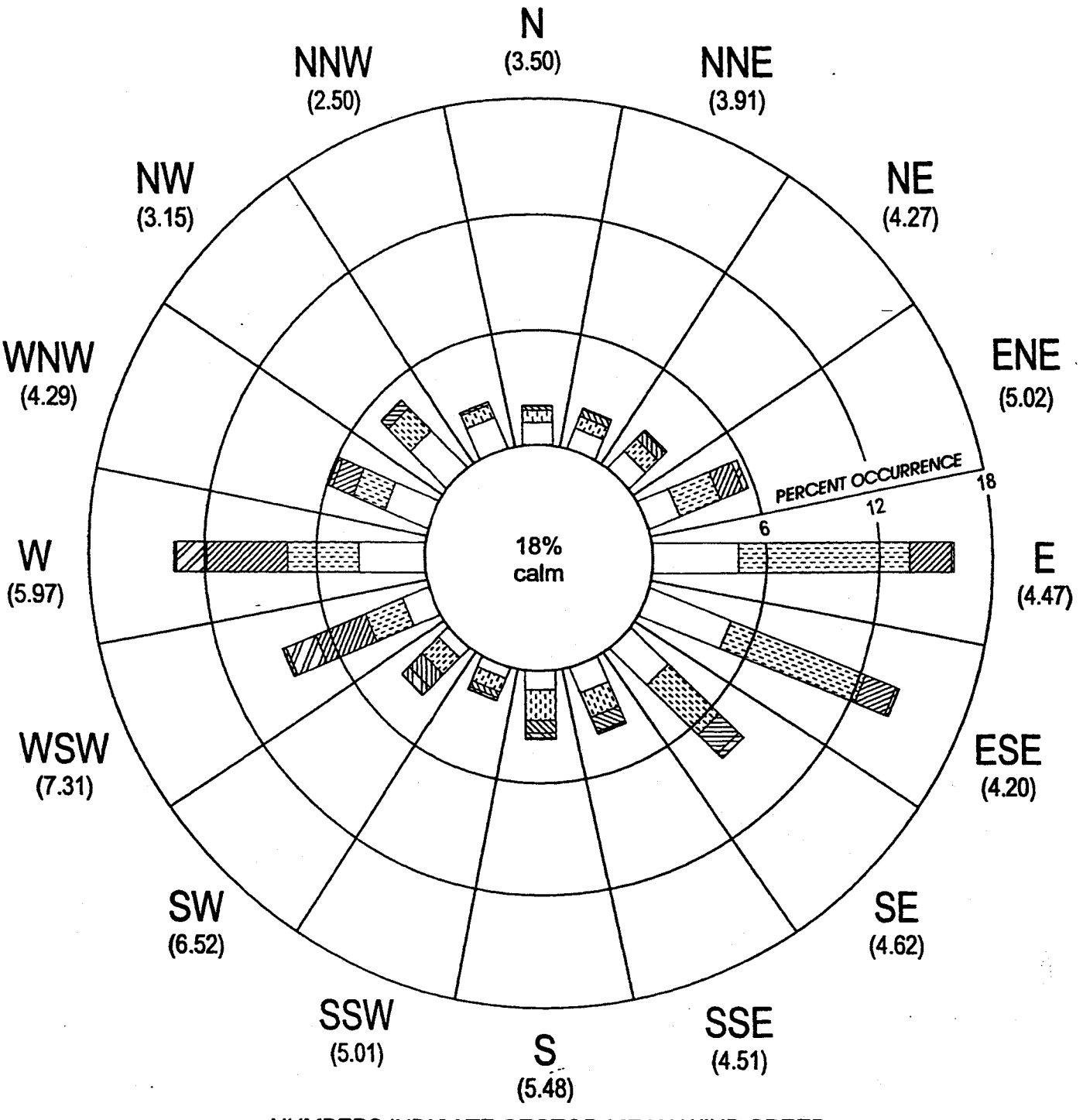
WIND SPEED RANGE (KNOTS)

- 0.0 - 3.0
- 4.0 - 6.0
- 7.0 - 10.0
- 11.0 - 16.0
- 17.0 - 21.0
- > 21.0

FIGURE 3-2

WIND FREQUENCY DISTRIBUTION
ANNUAL WIND ROSE
FOR 1995

HOURLY SURFACE WIND OBSERVATIONS
SKY HARBOR INTERNATIONAL AIRPORT
PHOENIX, ARIZONA




NUMBERS INDICATE SECTOR MEAN WIND SPEED
SECTORS ARE DIRECTIONS FROM WHICH THE WIND IS BLOWING

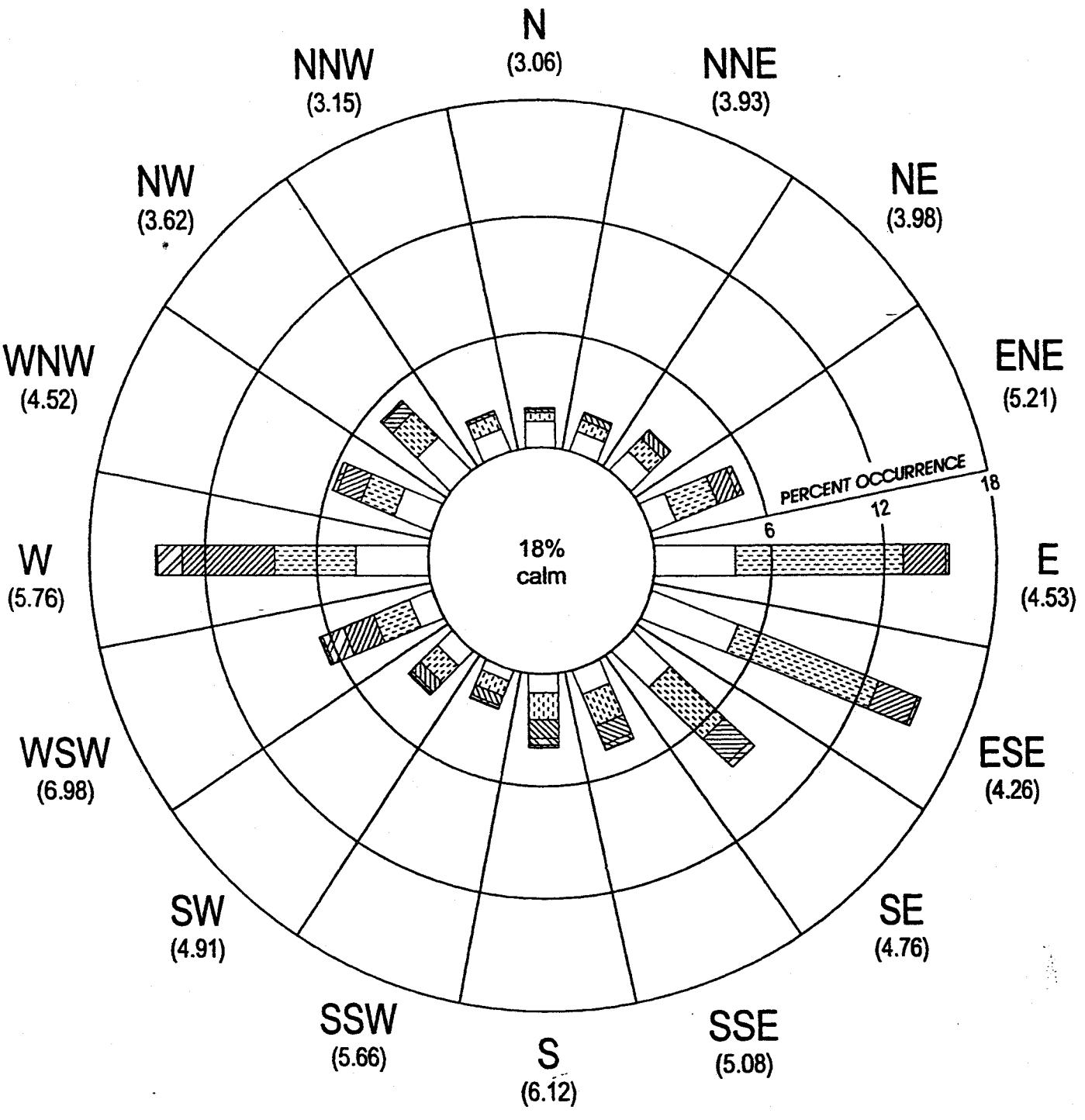
FIGURE 3-3

WIND SPEED RANGE (KNOTS)

- 0.0 - 3.0
- 4.0 - 6.0
- 7.0 - 10.0
- 11.0 - 16.0
- 17.0 - 21.0
- > 21.0

WIND FREQUENCY DISTRIBUTION
ANNUAL WIND ROSE
FOR 1996

HOURLY SURFACE WIND OBSERVATIONS
SKY HARBOR INTERNATIONAL AIRPORT
PHOENIX, ARIZONA




NUMBERS INDICATE SECTOR MEAN WIND SPEED
SECTORS ARE DIRECTIONS FROM WHICH THE WIND IS BLOWING

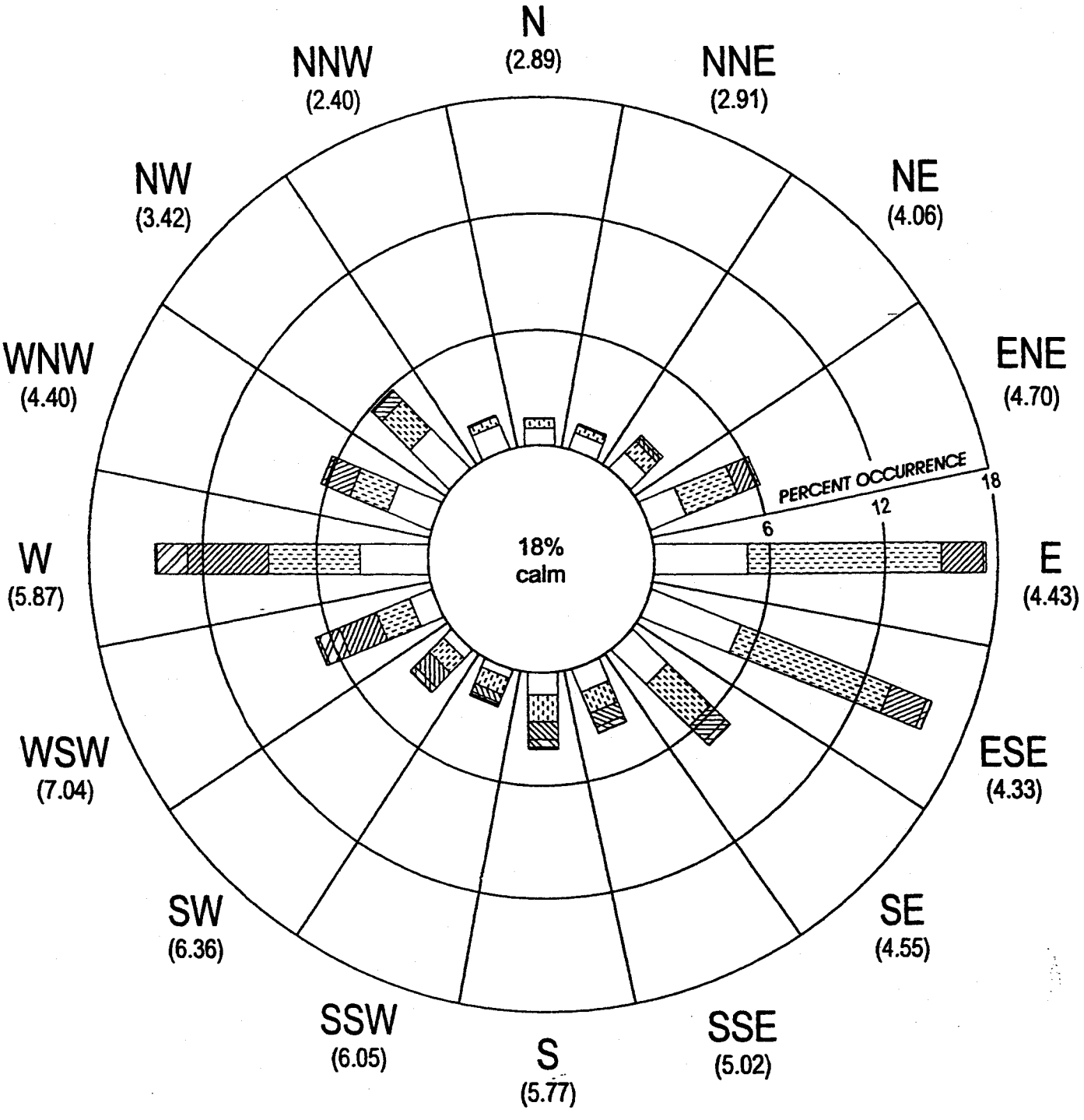
FIGURE 3-4

WIND SPEED RANGE (KNOTS)

- 0.0 - 3.0
- 4.0 - 6.0
- 7.0 - 10.0
- 11.0 - 16.0
- 17.0 - 21.0
- > 21.0

WIND FREQUENCY DISTRIBUTION
ANNUAL WIND ROSE
FOR 1997

HOURLY SURFACE WIND OBSERVATIONS
SKY HARBOR INTERNATIONAL AIRPORT
PHOENIX, ARIZONA




NUMBERS INDICATE SECTOR MEAN WIND SPEED
SECTORS ARE DIRECTIONS FROM WHICH THE WIND IS BLOWING

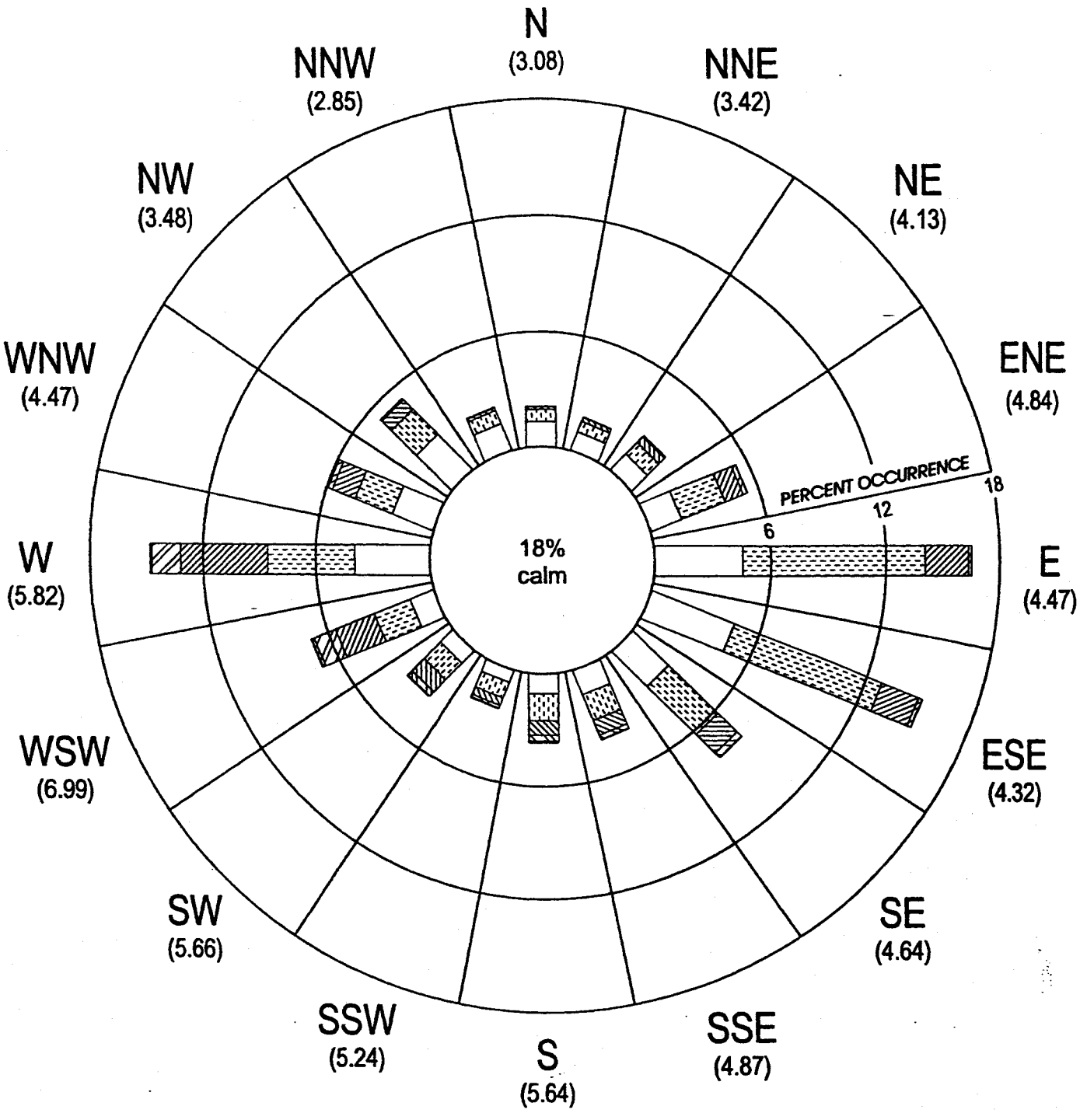
FIGURE 3-5

WIND SPEED RANGE (KNOTS)

- 0.0 - 3.0
- 4.0 - 6.0
- 7.0 - 10.0
- 11.0 - 16.0
- 17.0 - 21.0
- > 21.0

WIND FREQUENCY DISTRIBUTION
ANNUAL WIND ROSE
FOR 1998

HOURLY SURFACE WIND OBSERVATIONS
SKY HARBOR INTERNATIONAL AIRPORT
PHOENIX, ARIZONA




NUMBERS INDICATE SECTOR MEAN WIND SPEED
SECTORS ARE DIRECTIONS FROM WHICH THE WIND IS BLOWING

WIND SPEED RANGE (KNOTS)

- 0.0 - 3.0
- 4.0 - 6.0
- 7.0 - 10.0
- 11.0 - 16.0
- 17.0 - 21.0
- > 21.0

FIGURE 3-6

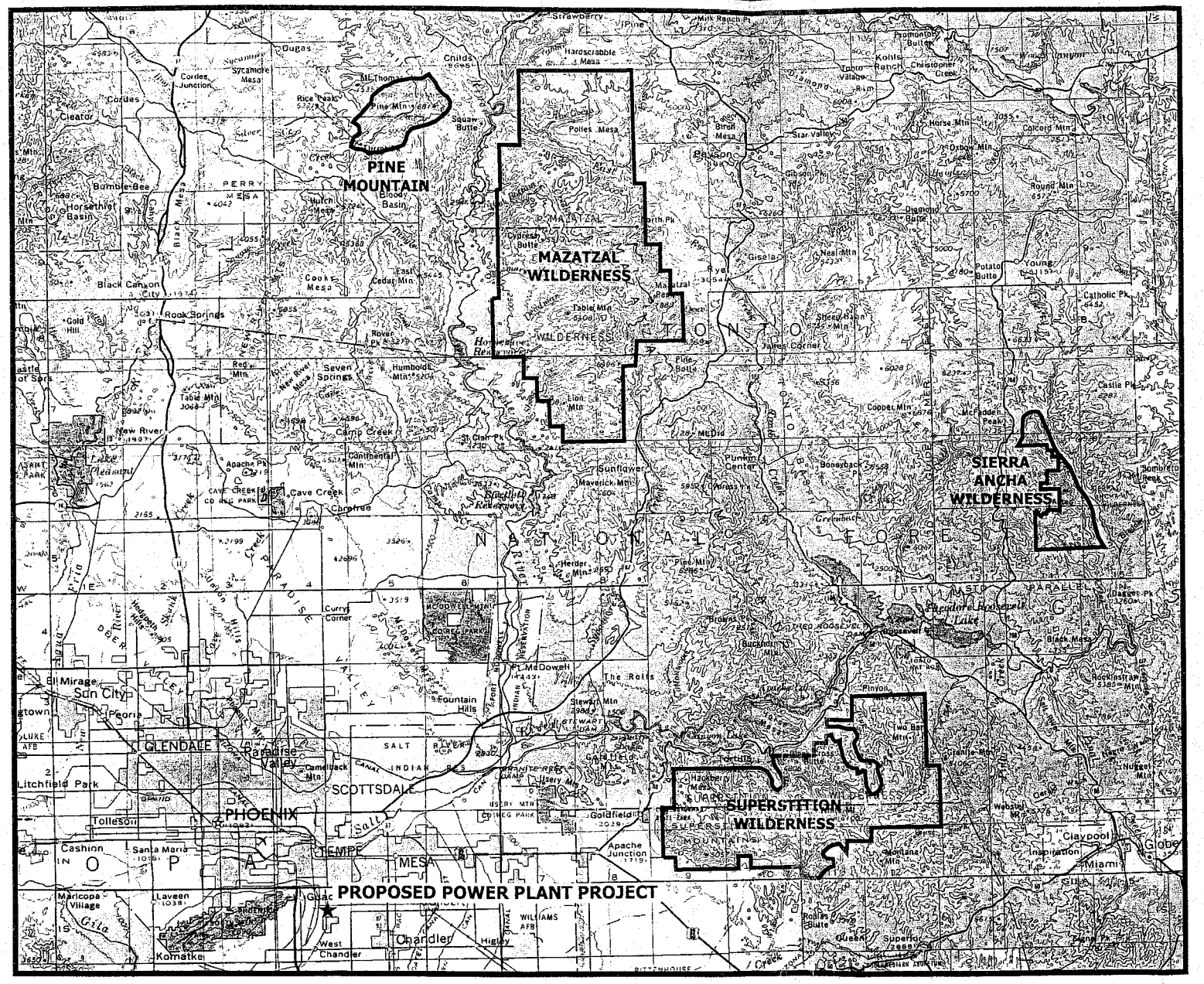
WIND FREQUENCY DISTRIBUTION
COMPOSITE ANNUAL WIND ROSE
FOR 1994 - 1998

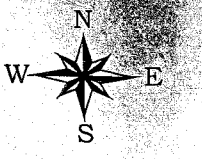
HOURLY SURFACE WIND OBSERVATIONS
SKY HARBOR INTERNATIONAL AIRPORT
PHOENIX, ARIZONA

TABLE 3-1

## IDENTIFICATION AND CLASSIFICATION OF LAND USE TYPES

| TYPE | USE AND STRUCTURES | VEGETATION |
|---|---|---|
| I1 | **Heavy Industrial**<br>Major chemical, steel and fabrication industries; generally 3-5 story buildings, flat roofs | Grass and tree growth extremely rare; <5% vegetation |
| I2 | **Light-Moderate Industrial**<br>Railyards, truck depots, warehouses, industrial parks, minor fabrications; generally 1-3 story buildings, flat roofs | Very limited grass, trees almost totally absent; <5% vegetation |
| C1 | **Commercial**<br>Office and apartment buildings, hotels; >10 story heights, flat roofs | Limited grass and trees; <15% vegetation |
| R1 | **Common Residential**<br>Single-family dwellings with normal easements; generally one story, pitched roof structures; frequent driveways | Abundant grass lawns and lightly to moderately wooded; >70% vegetation |
| R2 | **Compact Residential**<br>Single, some multiple, family dwellings with close spacing; generally <2 story, pitched roof structures; garages (via alley), no driveways | Limited lawn sizes and shade trees; <30% vegetation |
| R3 | **Compact Residential**<br>Old multi-family dwellings with close (<2 m) lateral separation; generally 2 story, flat roof structures; garages (via alley) and ash pits, no driveways | Limited lawn sizes, old established shade trees; <35% vegetation |
| R4 | **Estate Residential**<br>Expensive family dwellings on multi-acre tracts | Abundant grass lawns and lightly wooded; >80% vegetation |
| A1 | **Metropolitan Natural**<br>Major municipal, state, or federal parks, golf courses, cemeteries, campuses; occasional single-story structures | Nearly total grass and lightly wooded; >95% vegetation |
| A2 | **Agricultural Rural** | Local crops (e.g., corn, soybeans); 95% vegetation |
| A3 | **Undeveloped**<br>Uncultivated, wasteland | Mostly wild grasses and weeds, lightly wooded; >90% vegetation |
| A4 | **Undeveloped Rural** | Heavily wooded; 95% vegetation |
| A5 | **Water Surface**<br>Rivers, lakes | |




SCALE 1:500,000

0 5 10 Mile

0 10 20 Kilometers

MAP REFERENCE:
U.S. DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY:
STATE OF ARIZONA
COMPILED 1972, REVISED 1981

**SALT RIVER PROJECT**
**KYRENE GENERATING STATION**

**FIGURE 3-7**
**GENERAL TOPOGRAPHY SURROUNDING THE SITE LOCATION OF THE PROPOSED POWER PLANT**

URS
Dames & Moore

### *3.4 AIR QUALITY STATUS*

The Kyrene site is located in Maricopa County, Arizona which is currently designated as attaining the National Ambient Air Quality Standards (NAAQS) for $NO_2$, $SO_2$ and lead (Pb). The county is also designated as a serious nonattainment area for the air pollutants CO, $PM_{10}$, and $O_3$. This status indicates that historical measured air quality in Maricopa County has shown exceedance of the corresponding National Ambient Air Quality Standards (NAAQS) developed by the USEPA. It does not necessarily reflect the air quality currently being measured in this county. Air Quality within Maricopa County has been improving over the past three years. In fact, air quality monitoring stations within the vicinity of the Kyrene station did not show any exceedances of the NAAQS during calendar year 1999.

# 4 FEDERAL/STATE REGULATORY REQUIREMENTS

This section discusses the pertinent federal and state/county air pollution control regulations that may be applicable to the proposed power plant. These types of regulations typically include:

- Requirements to obtain a construction permit prior to commencing construction;
- Control technology evaluations;
- Air quality impact assessments;
- Emission limitations;
- Monitoring and testing requirements; and
- Recordkeeping and reporting requirements.

The following sections are intended to highlight federal, state, and county regulations that may be applicable to the proposed power plant. Also included in these sections is a discussion on how the proposed plant will comply with these applicable regulations.

## *4.1 FEDERAL REQUIREMENTS*

USEPA has developed regulations that are contained in the Code of Federal Regulations (CFR) that are designed to control air pollution. These regulations included permitting requirements for new or modified major stationary sources located in nonattainment and attainment areas. The requirements for major sources located in nonattainment areas is called Nonattainment Area New Source Review (NANSR) and is codified in Appendix S of 40 CFR Part 51. For attainment areas, the regulation that applies to major sources is called "Prevention of Significant Deterioration" and is contained in Section 52.21 of the CFR.

The permitting requirements associated with each program are discussed in the following subsections.

### 4.1.1 Nonattainment Area New Source Review (NANSR)

A new source will be subject to nonattainment area new source review requirements only if it will emit, or will have the potential to emit, in major amounts, any criteria pollutant for which the area has been designated nonattainment. For a source to be classified as having the potential to emit major amounts of air pollutants (typically referred to as a major stationary source) it must meet the criteria outlined below:

- A stationary source which emits or has the potential to emit 100 tons per year of the air pollutant for which the area is classified as nonattainment; or
- Lesser amount as established by USEPA for specific geographical areas.

The major source threshold for Maricopa County has been lowered to below 100 tons per year for each nonattainment area air pollutant. These lower thresholds are a result of Maricopa County being designated as a serious nonattainment area for $O_3$, CO and $PM_{10}$. An applicability threshold of 50 tons/year has been established for VOC emissions ($O_3$ nonattainment) and CO emissions, while a 70 tons per year threshold has been established for emissions of $PM_{10}$.

The proposed power plant will have the potential to emit VOCs (a precursor to the formation of $O_3$), CO and $PM_{10}$ that are above the 50 and 70 tons per year thresholds, respectively. As a consequence, the proposed power plant will be subject to NANSR for these pollutants. Recent changes to NANSR requirements have resulted in emissions of $NO_x$ also being regulated as a precursor to the formation of $O_3$. Subsequently, the requirements associated with NANSR for $O_3$ now also apply to emissions of $NO_x$. The exclusion to these requirements are areas that receive a waiver, referred to as 182(f). Maricopa County has received this waiver; however the county regulatory agency does not recognize this waiver. As a result, emissions of $NO_x$ from the proposed power plant are subject to both NANSR and PSD review. (Refer to discussion in Section 4.1.2).

The preconstruction review requirements for major stationary source or major modification located in areas designated nonattainment pursuant to Section 107 of the Act differ from the Prevention of Significant Deterioration (PSD) requirements. First, the emission control requirement for nonattainment areas, Lowest Achievable Emission Rate (LAER) , is defined differently than the Best Available Control Technology (BACT) emissions control requirements. Second, the source must obtain emissions reduction (offsets) of the nonattainment pollutant from other sources which impact the same area as the proposed source. Third, the applicant must certify that all other sources owned by the applicant in the state are complying with all applicable requirements of the CAA, including all applicable requirements in the State Implementation Plan (SIP). Fourth, such sources impacting visibility in mandatory Class I Federal areas must be reviewed by the appropriate Federal Land Manager (FLM).

Further discussion of the NANSR requirements, are discussed in Section 4.0. This section also addresses the proposed plant's compliance status with each of the NANSR requirements.

### 4.1.2 PSD Review

The PSD regulations, amended by the U.S. Environmental Protection Agency (USEPA) on August 7, 1980 (45 FR 52675), specify that any major new stationary source or major expansion project to an existing major source within an air quality attainment area must undergo PSD review. For new sources, the regulations (Maricopa County Rule 240, Section 308) apply to:

1. Any source type in any of 28 designated industrial source categories having potential emissions of 100 tons per year or more; or

2. Any other source having potential emissions of 250 tons per year or more of any pollutant regulated under the Clean Air Act.

"Potential emissions" are defined as the emissions of any pollutant at maximum design capacity (or less than maximum design capacity if specified as a permit condition), including the control efficiency of air pollution control equipment. For modifications of existing sources, the regulations apply if the existing source is major (as defined above) for any criteria pollutant and the modification project results in increased emissions of any criteria pollutant exceeding the significant emission limits presented in Table 4-1.

PSD review generally consists of:

1. A case-by-case Best Available Control Technology (BACT) demonstration, taking into account energy, environmental, and economic impacts as well as technical feasibility;

2. An ambient air quality impact analysis to determine whether the allowable emissions from the proposed expansion project, in conjunction with all other applicable emission increases or reductions, would cause or contribute to a violation of the applicable PSD increments and National Ambient Air Quality Standards (NAAQS) (refer to Table 4-1);

3. An ambient air quality monitoring program for up to one year;

4. An assessment of the direct and indirect effects of the proposed expansion project on general growth, soil, vegetation, and visibility; and

5. Public comment, including an opportunity for a public hearing.

An applicant may be exempt from the ambient air quality monitoring requirement if there are existing air quality monitoring data representative of the site, or if the impact from the proposed expansion project is less than the monitoring de minimis concentrations listed in Table 4-1.

Maricopa County is designated attainment for $NO_2$ and $SO_2$. Based on the estimated $NO_x$ and $SO_2$ emission rates associated with the proposed power plant, only emissions of $NO_x$ will exceed the applicability threshold. As stated previously, the proposed power plant project is classified as a modification to an existing major stationary source. A detailed discussion of the proposed plant's compliance status, with each PSD review requirement is provided in Section 5.0

### 4.1.3 New Source Performance Standards (NSPS)

New Source Performance Standards (NSPS) have been developed by USEPA for specific source categories. These standards are codified in the CFR under Part 60 (40 CFR 60) based on the equipment to be installed. As part of the proposed power plant, it appears that several of these standards may apply. Those that may apply are noted below:

- Subpart GG - "Standards of Performance for Stationary Gas Turbines";

# NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS), PSD INCREMENTS, SIGNIFICANT EMISSION RATES, SIGNIFICANT IMPACT INCREMENTS, AND MONITORING DE MINIMIS CONCENTRATIONS

| POLLUTANT | AVERAGING PERIOD | NAAQS (µg/m³) | | PSD INCREMENTS (µg/m³) | | | SIGNIFICANT EMISSION RATES (tons/year) | SIGNIFICANT IMPACT INCREMENTS (µg/m³) | MONITORING DE MINIMIS CONCENTRATIONS (µg/m³) |
|---|---|---|---|---|---|---|---|---|---|
| | | PRIMARY | SECONDARY | CLASS I | CLASS II | CLASS III | | | |
| Total Suspended Particulate Matter (TSP) | Annual | -- | -- | 5[a] | 19[a] | 37[a] | 25 | 1 | -- |
| | 24-Hour | -- | -- | 10[a,b] | 37[a,b] | 75[a,b] | | 5 | 10 |
| Particulate Matter Less than 10 µm ($PM_{10}$) | Annual | 50 | [c] | 4 | 17 | 34 | 15 | 1 | -- |
| | 24-Hour | 150[b] | [c] | 8[b] | 30[b] | 60[b] | | 5 | 10 |
| Sulfur Dioxide | Annual | 80 | -- | 2 | 20 | 40 | 40 | 1 | -- |
| | 24-Hour | 365[b] | -- | 5[b] | 91[b] | 182[b] | | 5 | 13 |
| | 3-Hour | -- | 1300[b] | 25[b] | 512[b] | 700[b] | | 25 | -- |
| Nitrogen Dioxide | Annual | 100 | [c] | 2.5 | 25 | 50 | 40 | 1 | 14 |
| Ozone | 1-Hour | 235[d] | [c] | -- | -- | -- | 40[e] | -- | [f] |
| Carbon Monoxide | 8-Hour | 10,000[b] | [c] | -- | -- | -- | 100 | 500 | 575 |
| | 1-Hour | 40,000[b] | [c] | -- | -- | -- | | 2000 | -- |
| Lead | Calendar Quarter | 1.5 | [c] | -- | -- | -- | 0.6 | -- | 0.1 |
| Total Reduced Sulfur (TRS) Reduced Sulfur Compounds | 1-Hour | -- | -- | -- | -- | -- | 10 | -- | 10 |
| Asbestos | -- | -- | -- | -- | -- | -- | 0.007 | -- | -- |
| Mercury | 24-Hour | -- | -- | -- | -- | -- | 0.1 | -- | 0.25 |
| Beryllium | 24-Hour | -- | -- | -- | -- | -- | 0.0004 | -- | 0.001 |
| Fluorides | 24-Hour | -- | -- | -- | -- | -- | 3 | -- | 0.25 |
| Vinyl Chloride | 24-Hour | -- | -- | -- | -- | -- | 1 | -- | 15 |
| Sulfuric Acid Mist | -- | -- | -- | -- | -- | -- | 7 | -- | -- |
| Hydrogen Sulfide | 1-Hour | -- | -- | -- | -- | -- | 10 | -- | 0.2 |

[a] TSP increment was replaced by $PM_{10}$ increment effective June 3, 1994.
[b] Concentration not to be exceeded more than once per year.
[c] Same as primary NAAQS.
[d] Expected number of days in which one or more hourly ozone concentrations exceed this value must be greater than 1.
[e] Emissions of volatile organic compounds.
[f] Increase in volatile organic compounds of more than 100 tons/year.

* Note: table does not reflect lower significant emission rate thresholds established under the non-attainment area provisions (i.e., 25 tons/year for VOC/NOx)

[R:\AIRGRO~1\GENERAL\NAAQST1.TBL]

- Subpart Db - "Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units"; and
- Subpart Dc- "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units."

#### 4.1.3.1 **Combustion Turbine**

The proposed combustion turbine will be subject to the New Source Performance Standard (NSPS) emission limitations for stationary gas turbines (Subpart GG of 40 CFR Part 60). This NSPS is applicable to all stationary gas turbines with heat input at peak load equal to or greater than 10.7 gigajoules per hour (Gj/hour) or approximately 10 MMBtu/hour. Subpart GG regulates both $NO_x$ and $SO_2$ emissions.

The $SO_2$ requirement covers both the allowable sulfur in fuel (<0.8 percent by weight) and emission concentrations of $SO_2$ (<150 ppmv at 15% $O_2$ on a dry basis). The use of only pipeline quality natural gas (< 0.25 gr of sulfur per 100 Standard Cubic Feet (SCF) on average) in the gas turbine will easily meet the fuel requirement. The $SO_2$ in the exhaust gas from this fuel will be less than 1 ppmv at 15% $O_2$. Therefore, the $SO_2$ requirements of Subpart GG will be easily met.

The NSPS for NOx is expressed in terms of the following equation:

$$STD = (0.0075 * 14.4 / Y) + F$$

where:

STD= Allowable $NO_x$ emissions (percent by volume dry @ 15% $O_2$)
Y= Manufacturer's rated heat rate at rated load (kJ/w-hr) using the Lower Heating Value (LHV)
F= $NO_x$ emission allowance for fuel bound nitrogen (typically 0 for natural gas)

The heat rate for the proposed combustion turbine is approximately 9,000 Btu/kW-hour (LHV) at average ambient conditions of 77 degrees Fahrenheit and a base load condition.

$$Y = (9{,}000 \text{ Btu/kW-hr}) * (1054.2 \text{ J/Btu}) * (\text{kw}/1000 \text{ w}) * (\text{kJ}/1000 \text{ J})$$
$$= 9.5 \text{ kJ/w-hr}$$

Therefore, the emission limitation based on Subpart GG will be:

$$STD=75 * (14.4/9.5) = 114 \text{ ppm @ } 15\% \ O_2$$

The combustion turbine to be utilized as part of the proposed expansion project will emit no more than 2.5 ppm @ 15% $O_2$. Therefore, this turbine will easily meet the Subpart GG nitrogen oxides emission limit of 114 ppm.

#### 4.1.3.2 Supplemental Duct Burner

The supplemental duct burner associated with the combined cycle's HRSG will be subject to the NSPS Subpart Db. This subpart applies to steam generating units that commence construction after June 19, 1984 and that have heat input capacity from fuels combusted greater than 100 MMBtu/year.

This subpart contains emission limitations for $SO_2$, PM and $NO_x$. It appears that the requirements for $SO_2$ and PM emissions are not applicable to units that combust natural gas.

The $NO_x$ limitation requires duct burners in a combined cycle system burning natural gas to meet 0.2 lb/MMBtu. The proposed burner will achieve approximately 0.1 lb/MMBtu. Additional requirements stipulated in this subpart that may apply to the proposed HRSG are as follows:

- Initial performance test using the nitrogen oxides and oxygen measurement procedures in 40 CFR Part 60, Appendix A, Method 20 (40 CFR 60.46b(f));
- Duct burners are not required to install or operate continuous monitoring systems to measure $NO_x$ emissions (40 CFR 60.48b(h));
- Submit notification of the date of initial startup (40 CFR 60.49b(a));
- Submit to the administrator the performance test data from the initial performance test(40 CFR 60.49b(b));
- Record and maintain records on the amount of fuel combusted each day (40 CFR 60.49b(d));
- Submission of excess emission reports – quarterly (40 CFR 60.49b(h)).

#### 4.1.3.3 Auxiliary Natural Gas Fired Boiler

Subpart Dc applies to each steam generator unit for which construction, modification or reconstruction in commenced after June 9, 1989 and that has a maximum design heat input capacity of 100 MMBtu/hour or less, but greater than or equal to 10 MMBtu/hour. The proposed auxiliary boiler will have a maximum design heat input rating of 99 MMBtu/hour. Thus, the proposed boiler appears to meet the applicability requirements for this subpart.

Emission standards contained within this subpart are for $SO_2$ and PM. Because the proposed boiler will be designed to only combust natural gas, this boiler should meet the emission standards of this subpart. The proposed boiler may also be subject to the following reporting and recordkeeping requirements:

- Maintain records on the amount of fuel combusted each day [40 CFR Part 60.48c(g)]; and
- Maintain these records for a period of two years following the date of each record [40 CFR Part 60.48c(i)].

### 4.1.4 Application of Stack Height Regulations

The stack height regulations promulgated by USEPA on July 8, 1985 (50 FR 27892) established a stack height limitation to assure that stack height increases and other plume dispersion techniques would not be used in lieu of constant emission controls. These regulations apply to facilities that commenced construction after December 31, 1970, and to dispersion techniques implemented after that date. The regulations specify that Good Engineering Practice (GEP) stack height is the maximum creditable stack height that a source may use in establishing its applicable State Implementation Plan (SIP) emission limitation. For stacks uninfluenced by terrain features, the determination of a GEP stack height for a source is based on the following empirical equation:

$$H_g = H + 1.5l_b$$

where:

$H_g$ =GEP stack height;
H =Height of the controlling structure on which the source is located, or nearby structure; and
$l_b$ =Lesser dimension (height or width) of the controlling structure on which the source is located, or nearby structure.

Both the height and width of the structure are determined from the frontal area of the structure projected onto a plane perpendicular to the direction of the wind. The area in which a nearby structure can have a significant influence on a source is limited to five times the lesser dimension (height or width) of that structure, or within 0.5 mile (0.8 km) of the source, whichever is less. The methods for determining GEP stack height for various building configurations have been described in USEPA's technical support document (USEPA, 1985).

Since the heights of exhaust stacks at the proposed power plant site are less than respective GEP stack heights, a dispersion model to account for aerodynamic plume downwash was necessary in performing the air quality impact analyses. Further, since some terrain elevations in the vicinity of the proposed plant site may exceed stack top, a dispersion model which accounts for complex terrain was incorporated.

The proposed building/equipment structures to be associated with the proposed power plant are listed below. The ratio of the stack height to building height is a critical element for determining the likelihood of aerodynamic downwash forming in the vicinity of the individual exhaust stacks.

| ***STRUCTURE*** | ***HEIGHT (Feet Above Grade)*** |
|---|---|
| Combustion Turbine Enclosure | 30 |
| Inlet Air Filter | 40 |
| Inlet Air Duct | 27 |
| HRSG | 90 |

### 4.1.5 Hazardous Air Pollutant Regulations

USEPA has developed National Emission Standards for Hazardous Air Pollutants (NESHAPS) for numerous source categories. However, the proposed power plant will not involve categories proposed or promulgated as of the date of this application.

On December 15, 1996, the USEPA promulgated the final regulations implementing Section 112(g). This section addresses new and reconstructed major sources of hazardous air pollutants (HAPs). A primary requirement of this section is that those sources apply Maximum Achievable Control Technology (MACT) for control of HAPs. Section 112(g) is intended to address those sources for which USEPA has not established a source specific MACT standard until a sources specific MACT standard is developed. In this sense it is said that Section 112(g) in the "case-by-case" MACT standard.

The proposed project will have the potential to emit regulated HAPs in quantities less than 10 tons/year as an individual and 25 tons/year as an aggregate. Thus, the proposed power plant should not trigger the requirements of 112(g).

### 4.1.6 Continuous Emissions Monitoring

Affected utility units are required by 40 CFR Part 75 to continuously monitor emissions of $SO_2$ and $NO_x$. In addition, EPA is requiring affected units to monitor emissions of carbon dioxide ($CO_2$) or oxygen ($O_2$), flow and opacity. Generally, this would require the installation of a continuous emission monitoring system (CEMS). The following is a summary of monitoring requirements and options:

- Gas-fired units are exempt from opacity monitoring.
- For $SO_2$, units burning natural gas may determine mass emissions by: (1) measuring heat input with a gas flowmeter and using a default emission rate; or (2) sampling and analyzing gas daily for sulfur and using the volume of gas combusted; or (3) using CEMS. SRP will select the appropriate option.
- Gas-fired base-loaded units must use $NO_x$ CEMS. Gas-fired peaking units may estimate $NO_x$ emissions by using site-specific emission correlations and periodic stack testing to verify continued representativeness of the correlations, or use $NO_x$ CEMS. As a combined cycle unit, SRP proposes to determine emissions by using site-specific emission correlations and periodic stack testing.

- For $CO_2$ or $O_2$, all units can use either a mass balance estimation or a $CO_2$ or $O_2$ CEMS in order to estimate $CO_2$ emissions. SRP proposes to use a mass balance estimation.

### 4.1.7 Compliance Assurance Monitoring

Compliance Assurance Monitoring (CAM) (40 CFR Part 64) may be required for the proposed power plant since the system will be equipped with an oxidation catalyst and selective catalytic reduction system. The monitoring requirements imposed by the Acid Rain regulations and New Source Performance Standards should satisfy the requirements of CAM.

### 4.1.8 Acid Rain Provisions

All utility generating units of greater than 25 MW are required to obtain a Phase II acid rain permit. These permits are generally incorporated into a facility's Title V Operating permit and are issued by the state (in this case, Maricopa County). In order to comply with the requirements of 40 CFR Part 72, the following course of action will be taken.

1. SRP will send a letter to USEPA identifying a Designated Representative, as per 40 CFR 72.20. The Project will also need to obtain an ORIS code from DOE/USEPA.

2. The Project will submit a Phase II acid rain application as soon as possible in order to allow Maricopa County to issue the permit prior to start of operation.

Part 73 of the acid rain provisions establishes requirements related to sulfur dioxide allowance system. This includes:

- The allocation of sulfur dioxide emissions allowances;
- The tracking, holding and transfer of allowances;
- The deduction of allowances for purposes of compliance; and
- Miscellaneous other requirements.

SRP is aware of the requirements to secure SO2 allowances on an annual basis and will comply with the appropriate requirements.

Affected units are also required by 40 CFR Part75 to continuously monitor emissions of SO2 and NOx. In addition, USEPA is requiring affected units to monitor emissions of carbon dioxide and opacity. Generally, this would require the installation of a continuous emission monitoring system (CEMS). However, several exemptions exist in the regulations that apply to natural gas fired units.

- Gas-fired units are exempt from opacity monitoring (40 CFR 75.14(c));
- Gas-fired units can monitor SO2 according to the protocol of Appendix D in lieu of an SO2 CEM and flow monitor (40 CFR 75.11(d)(2)). Note: If the fuel is pipeline quality natural gas, an emission factor of 0.0023 lbs/MMBtu is used in combination with hourly metered gas usage.

- Gas-fired units can monitor CO2 according to the protocol of Appendix G in lieu of a CO2 CEM and flow monitor (Section 2.3 of Appendix G of 40 CFR 75). This protocol involves use of an emission factor in combination with calculated hourly heat input.
- Gas-fired units are not exempt from the NOx CEM requirements.

SRP is aware of these requirements and will be developing the appropriate procedures to comply with the requirements of 40 CFR Part 73 and 75.

#### 4.1.9 Title V Operating Permits

Title V operating permits, as mandated by the 1990 amendments of the Clean Air Act, serve as an "umbrella permit" that incorporates all applicable CAA requirements for each regulated source.

A source is required to file a Title V operating permit application if it is classified as a major stationary source. A major stationary source is defined as any source having the potential to emit greater than 100 tons/year of any criteria air pollutant. Lower thresholds have been established for nonattainment areas. In addition, any source that has the potential to emit greater than 10 tons per year of a HAP or 25 tons per year as an aggregate, would also be classified as a major source under the Title V program.

The proposed power plant will have potential emissions that exceed the applicability threshold levels for the Title V program. SRP will be submitting a Title V application to the MCDES, along with the permit application to construct the proposed plant.

### *4.2 STATE/LOCAL REQUIREMENTS*

Both the state of Arizona and the Maricopa County Environmental Services Department (MCESD) have air pollution control regulations. (Arizona Administrative Code and Maricopa County Air Pollution Control Regulations, respectively). These regulations contain requirements for permitting new and modified major sources, as well as emission limitations and standards.

The following subsections are intended to present regulations that contain emissions limitations and standards, and monitoring, recordkeeping or reporting requirements. Those regulations that contain general or administrative requirements have not been presented.

For purposes of this application, since Maricopa County is responsible for issuance of construction permits, the regulations herein discussed will focus on the Maricopa County air pollutant regulations.

#### 4.2.1 Permit Requirements for New Major Sources and Major Modifications to Existing Major Sources

The Arizona Administrative Code (Article 4) and Maricopa County regulation (Regulation II, Rule 240) both contain specific requirements that must be addressed as part of a construction application

for a major stationary source. These requirements are specifically defined for nonattainment and attainment areas.

The requirements stipulated in these regulations for major stationary sources in nonattainment and attainment areas are essentially identical to those described in Sections 3.1.1 and 3.1.2.

#### 4.2.2 Rule 245 "Continuous Source Emission Monitoring"

This rule contains requirements to conduct continuous source emission monitoring for fossil fuel-fired generators. This rule shall not apply to any source that is subject to an NSPS. Since the HRSGs and auxiliary boiler will be subject to NSPS Subparts Db and Dc, respectively, this rule should not apply to the proposed power plant.

#### 4.2.3 Rule 270 "Performance Tests"

Rule 270 provides requirements for conducting performance tests. Section 401 requires the owner or operator to conduct performance tests within 60 days of achieving the capability to operate at its maximum production rate, but no later than 180 days after initial startup.

SRP is aware of this requirement and will conduct the appropriate performance tests within the timeframes established by MCESD personnel.

#### 4.2.4 Rule 300 "Visible Emissions"

This rule is intended to limit the emissions of air contaminants into the ambient air by establishing standards for visible emissions and opacity. Section 301 states that "No persons shall discharge into the ambient air for any single source of emissions, any air contaminant other than uncombined water, in excess of 20% opacity." Specific exceptions to this limitation apply to startups, shutdowns, and emergencies.

SRP is proposing to conduct Method 9 testing on a periodic basis. A specific protocol will be developed by SRP.

#### 4.2.5 Rule 310 "Fugitive Dust Sources"

Sources that generate fugitive dust, such as bulk material handling, equipment, earthmoving operations, haul trucks, etc., are regulated by this rule. The rule establishes an opacity limitation and the requirement to prepare a fugitive dust control plan.

The proposed power plant should not include operations or activities (excluding initial construction activities) that are capable of generating fugitive dust.

4.2.6 Rule 311 "Particulate Matter from Process Industries"

The purpose of this rule is to limit the discharge of particulate matter into the atmosphere by establishing emission rates based on process weight. It appears that Section 304 "Limitations – Fuel Burning Equipment" may apply to the proposed expansion project. This section contains a specific PM limitation based on the heat input rating of the equipment.

The equation is as follows:

$$\text{PM Limitation} = 1.02Q^{0.769}$$

where:

Q = the heat output in million Btu/hour

The combined cycle system and auxiliary boiler will be combusting natural gas. Combustion of this fuel will result in PM emission well below the limitation.

4.2.7 Rule 371 "Acid Rain"

Refer to Section 4.1.8 for a discussion of the applicable requirements established under the acid rain program.

## *4.3 SPECIAL REQUIREMENTS*

In addition to the county, state, and federal air pollution requirements, the following requirements must also be met for the proposed SRP power plant.

4.3.1 Rule 32 "Odors and Gaseous Emissions"

This rule states that no person shall emit into the ambient air any sulfur oxide or sulfuric acid in such manner and amounts as to result in ground level concentrations at any place beyond the premises on which the source is located exceeding those limits shown below.

| Concentration of Sulfur Dioxide ($\mu g/m^3$) | Averaging Time |
|---|---|
| 850 | 1 hour |
| 250 | 24 hours |
| 120 | 72 hours |

| Concentration of Sulfuric Acid and Sulfur Trioxide Expressed as Sulfuric Acid ($\mu g\ SO_4/m^3$) | Averaging Time |
|---|---|
| 15 | 24 hours |

Since the proposed equipment at the SRP power plant will combust natural gas, potential sulfur oxide emissions will easily comply with the established concentration levels. Refer to Section 5.0 for the results of the SO2 air quality impact assessment.

### 4.3.2 Arizona Ambient Air Quality Guidelines (AAAQGs)

The Arizona Department of Health Services (ADHS) began developing health-based guidelines for contaminants in air during 1987. The ADHS has developed a list of chemicals with corresponding Arizona Ambient Air Quality Guidelines (AAAQGs). These guidelines are residential screening values that are designed to protect human health, including children. The AAAQGs are not intended to be used as standards. Rather, they are intended to provide health-based guidelines that may be useful in making environmental risk decisions.

The ADHS has established guidelines for three specific averaging periods: annual, 24-hour, and 1-hour. Each of the guidelines developed was based on health related studies performed by USEPA or OSHA.

The proposed power plant will have the potential to emit the following constituents that have guideline concentrations established by the ADHS.

| Chemical Name | 1-Hour AAAQG ($\mu g/m^3$) | 24-Hour AAAQG ($\mu g/m^3$) | Annual AAAQG ($\mu g/m^3$) |
|---|---|---|---|
| 1,3-Butadiene | 5.0E+00 | 1.3E+00 | 3.6E+00 |
| 2-Methylnaphthalene | — | — | — |
| 3-Methylchloranthrene | — | — | — |
| Acrolein | 6.3E+00 | 2.0E+00 | — |
| Arsenic | 6.0E-02 | 1.6E-02 | 2.3E-04 |
| Benzene | 1.7E+02 | 4.4E+01 | 1.2E-01 |
| Benzo(a)anthracene | 6.0E+00 | 1.6E+00 | 4.8E-03 |
| Benzo(a)pyrene | 6.7E-01 | 1.8E-01 | 4.8E-04 |
| Beryllium | 6.0E-02 | 1.6E-02 | 4.2E-04 |
| Cadmium | 7.7E-01 | 2.0E-01 | 5.6E-04 |
| Chromium VI | 1.7E-02 | 4.4E-03 | 1.2E-05 |
| Dibenzo(a,h)anthracene | 6.7E-01 | 1.8E-01 | 4.8E-04 |
| 1,2-Dichlorobenzene | 9.0E+03 | 2.4E+03 | — |
| 1,4-Dichlorobenzene | 2.0E+02 | 5.3E+01 | 1.5E-01 |
| Ethylbenzene | 4.5E+03 | 3.5E+03 | — |
| Formaldehyde | 2.5E+01 | 1.6E+01 | 7.6E-02 |
| Hexane | 5.4E+03 | 1.4E+03 | — |
| Lead | NAAQS | NAAQS | — |
| Manganese | 2.5E+01 | 7.9E+00 | — |
| Mercury | 1.5E+00 | 4.0E-01 | — |

| Chemical Name | 1-Hour AAAQG ($\mu g/m^3$) | 24-Hour AAAQG ($\mu g/m^3$) | Annual AAAQG ($\mu g/m^3$) |
|---|---|---|---|
| Naphthalene | 6.3E+02 | 4.0E+02 | — |
| Nickel | 4.5E-01 | 1.2E-01 | 2.1E-03 |
| N-nitrosodimethylamine | 9.9E-02 | 2.6E-02 | 7.1E-05 |
| Propylene Oxide | 3.7E+02 | 9.8E+01 | 2.7E-01 |
| Selenium | 6.0E+00 | 1.6E+00 | — |
| Toluene | 4.4E+03 | 3.0E+03 | — |
| Xylene | 5.4E+03 | 3.5E+03 | — |

As shown in Section 6, potential emissions of the above listed chemicals will not result in ambient concentration levels above the acceptable 1-hour, 24-hour, and annual AAAQGs.

# 5 NONATTAINMENT AREA PROVISIONS

Any person proposing to construct a new major stationary source in a nonattainment area where that source has the potential to emit significant levels of that pollutant for which the area is designated nonattainment must perform specialized analyses as part of an air permit application to construct.

These specialized analyses include the following:

- A demonstration that the proposed emission sources will meet the Lowest Achievable Emission Rate;
- Reduction in actual emissions (emission offsets) for each nonattainment area pollutant associated with the proposed source. This reduction in actual emissions should be at least 1.2 to 1 for VOC and $NO_x$ emissions, and as necessary to show a net air quality benefit for emissions of CO and $PM_{10}$;
- Conduct a net air quality benefit demonstration for each nonattainment area pollutant associated with the proposed source. USEPA Region IX has stated that due to the regional nature of emissions of VOCs and $NO_x$, a net air quality benefit will be achieved as long as the emission offset requirement is met. Thus, a net air quality demonstration is not required for emissions of VOC and NOx; and
- Demonstrate that the benefits of constructing the new source significantly outweigh the social and environmental costs imposed as a result of its location, construction, or modification.

The following section provides a discussion on how the proposed power plant will comply with each specialized analysis identified above.

## *5.1 LOWEST ACHIEVABLE EMISSION RATE (LAER) DEMONSTRATION*

LAER (Lowest Achievable Emission Rate) is defined as the most stringent emissions limitation contained in the State Implementation Plan (SIP) of any state for any such category of stationary source or the most stringent emissions limitation which is achieved in practice by such category of stationary source. LAER shall be demonstrated for a major new source or expansion project for all pollutants for which the area has been designated as nonattainment and for which that source is major.

The proposed power plant will be classified as a major source for the following nonattainment area air pollutants:

- NOx;
- CO;
- VOC; and
- $PM_{10}$.

Subsequently, a LAER demonstration must be performed for each piece of equipment associated with the proposed power plant that will have the potential to emit one or more of the air pollutants listed above. The primary or significant equipment associated with the proposed power plant will be one (1) combined cycle combustion systems and one (1) auxiliary boiler. For purposes of this air permit application, the LAER demonstration was limited to this equipment. The proposed power plant will also incorporate support equipment. Since this equipment (i.e., emergency generator, emergency fire water pump and mechanical draft cooling tower) is used to meet a specialized need and air pollutant emissions from this equipment can be considered insignificant, a detailed LAER demonstration for this equipment was not performed.

LAER for these pieces of equipment are defined as follows:

- **Emergency Fire Water Pump** (310 hp) — This fire pump will be limited to the use of diesel fuel and 37.5 hours of operation/year. The following air pollutant emission rates have been estimated for this fire pump:

  $NO_x$ = 0.180 tons/year
  CO = 0.039 tons/year
  $PM_{10}$ = 0.013 tons/year
  VOC = 0.015 tons/year

- **Emergency Generator** (335 hp) — The generator will be limited to 37.5 hours of operation/year and will only use diesel fuel. The following air pollutant emission rates have been estimated for this generator:

  $NO_x$ = 0.19 tons/year
  CO = 0.04 tons/year
  $PM_{10}$ = 0.01 tons/year
  VOC = 0.02 tons/year

- **Cooling Tower** — The cooling tower will be designed to handle 115,000 gallons of cooling water /minute with a liquid drift of 0.0005% and a dissolved solids content of 3,000 milligrams per liter (mg/l). This cooling tower will be equipped with a state of the art mist collection system that will minimize liquid drift to 0.0005%. The inclusion of this collection system will limit potential $PM_{10}$ emissions to less than four (4) tons per year.

To perform the LAER demonstration for the combined cycle systems and auxiliary boiler, the following steps were followed:

1. Individual state regulations were reviewed to define emissions limitations that are promulgated for combined cycle systems and natural gas-fired boilers;

2. The USEPA BACT/LAER Clearinghouse and web pages developed for specific regulatory agencies were reviewed to identify recent permits issued for combined cycle combustion systems and auxiliary natural gas-fired boilers;

3. The information obtained under Steps 1 and 2 were evaluated to define the Lowest Achievable Emission Rate for combined cycle systems and auxiliary boilers;

4. Combustion techniques and/or control devices capable of achieving the lowest possible emission rates were defined for the combined cycle system and auxiliary boiler; and

5. A combination of combustion techniques and/or control devices was selected by SRP for the combined cycle system and auxiliary boiler in order to meet LAER.

For ease of review, the LAER demonstration has been broken down by air pollutant in the following subsections. Each subsection describes the following:

- How that air pollutant is formed;
- Types of techniques available to control or minimize the formation of that air pollutant;
- Air pollution control methods being proposed for the combined cycle system and auxiliary boiler at the SRP power plant; and
- What is considered LAER and how the proposed power plant's combined cycle system and auxiliary boiler will achieve these emission rates.

## *5.2 $NO_X$ EMISSIONS*

The proposed power plant will be equipped with one natural gas fired combined cycle system. The system will be capable of generating approximately 250 MW (net) of electrical output. This system will consist of a natural gas fired combustion turbine, a supplemental natural gas fired duct burner associated with the HRSG, and a steam turbine. The proposed auxiliary boiler will be used to provide steam during startup conditions and has a rated design heat input capacity of 99 MMBtu/hour. Because the proposed combined cycle system and auxiliary boiler will be combusting natural gas, both will have the potential to generate $NO_x$ emissions. $NO_x$ collectively refers to the combustion products nitric oxide (NO) and nitrogen dioxide ($NO_2$). $NO_x$ emissions from natural gas combustion originate in three primary ways: from fuel-bound nitrogen, as prompt $NO_x$, and as thermal $NO_x$. $NO_x$ from fuel-bound nitrogen is important in some liquid and solid fuels, but is minimal in gaseous fuels. Fuel $NO_x$ is formed from the nitrogen bound in the fuel of combustion. $NO_x$ is created when the fuel molecule is oxidized, releasing the reactive nitrogen. Prompt $NO_x$ is a component of thermal $NO_x$ formed at the combustion flame front (promptly) from early reactions of fuel-derived nitrogen intermediaries and hydrocarbon radicals during combustion. Prompt $NO_x$ is recognized to be a minor component of total $NO_x$ and is independent of combustion temperature. The most abundant means of $NO_x$ production, especially for internal combustion, is thermal-induced $NO_x$. Thermal $NO_x$ is created by high temperatures in the presence of free oxygen. The proportion of thermally induced NOx is even greater when combusting gaseous fuels.

Atmospheric conditions that affect $NO_x$ emissions are humidity, temperature, and pressure. Atmospheric water vapor has a quenching effect; the energy required to heat the airborne water has a tendency to lower combustor temperatures. At low humidity, $NO_x$ emissions increase with increasing temperature. At high humidity, the effect of temperature is varied; $NO_x$ emissions decrease with increasing ambient temperature above 50 °F, and increase with increasing temperature within the range below 50 °F. Increased atmospheric pressure results in higher pressure and temperature levels within the combustor, so $NO_x$ emissions increase.

There is a direct relationship between the power output level of a gas turbine, the firing temperature, and the combustor flame temperature. Gas turbines each have a base-rated power output level with corresponding $NO_x$ emissions. At power outputs below base-rated power, flame temperatures are lower and thus $NO_x$ emissions are lower. However at peak-power outputs, $NO_x$ emissions are greater due to increased flame temperatures.

To reduce $NO_x$ emissions from the combustion turbine and natural gas-fired duct burner, a combination of modifying the natural-gas combustor and add-on control devices are employed. The types of $NO_x$ combustor modifications include:

- Diluent Injection- the injection of a small amount of water or steam via a nozzle into the immediate vicinity of the combustor burner flame. This type of combustion modification can control $NO_x$ formation by approximately 50%;
- Dry Low-$NO_x$ Combustor- this type of combustor minimizes the combustion temperature by providing a lean pre-mixed air/fuel mixture, where air and fuel are mixed before entering the combustor. A dry-low combustor can control $NO_x$ formation by approximately 95%; and
- Catalytic Combustion- In catalytic combustion, a catalyst is used to promote oxidation of the inlet gas stream at lower temperatures than are required in standard thermal combustion. The catalyst bed is used to oxidize a lean air/fuel mixture within the combustor instead of burning it with a flame, as in a conventional combustor. The catalyst limits the temperature in the combustor and helps to stave off the production of thermal $NO_x$. Catalytic combustion can achieve $NO_x$ emissions of about 3 ppmvd $NO_x$ at 15 percent oxygen (approximately 98 percent control), as claimed by manufacturers.

The proposed combined cycle system will be equipped with an HRSG to extract more energy from the hot exhaust gases leaving the gas turbine and create steam for use in a steam turbine to generate electricity. Feed water pumps send water through heat exchangers in the HRSG. The heat exchangers are generally large tubes made of conductive metals. Hot gases exchange heat energy with the water in the tubes before exiting through the stack. Duct burners can be used to increase the steam capacity of the HRSG. The duct burners are installed at the front of the HRSG to supply additional heat to the flue gas exiting the gas turbine. Because the duct burners are fuel-fired, they will produce NOx emissions in addition to those from combustion in the gas turbine. The proposed systems will be equipped with supplemental natural gas-fired duct burner.

To reduce $NO_x$ formation from this duct burner, a low $NO_x$ burner is typically employed. Low $NO_x$ burners reduce $NO_x$ by completing the combustion process in stages. Staged combustion can achieve lower $NO_x$ emissions by dividing the combustion process into a number of stages where the air to fuel ratio is varied to reduce $NO_x$ formation. This staging partially delays the combustion process and results in a cooler flame that suppresses thermal $NO_x$ formation. After the initial combustion zone where the fuel is ignited, a pyrolytic zone is formed where the fuel is chemically broken down by heat from the flame. In the next stage, a fuel-rich (oxygen-lean) zone is formed which limits the formation of $NO_x$. The last stage consists of a burnout zone where completion of combustion occurs.

The configuration of combined-cycle power plants is such that the gas turbine and duct burner exhausts through a common stack. Therefore, $NO_x$ emissions from the combined cycle system can be further reduced with add-on controls. The types of add-on controls, or commonly called flue gas controls, that can be used on combined cycle systems are described below.

Selective Catalytic Reduction

Selective catalytic reduction (SCR) systems selectively reduce $NO_x$ by injecting ammonia ($NH_3$) into the exhaust gas stream upstream of a catalyst. $NO_x$, ammonia, and oxygen react on the surface of the catalyst to from molecular nitrogen ($N_2$) and water. The primary chemical reactions are shown below:

$$4NO + 4NH_3 + O_2 \rightarrow 4N_2 + 6H_2O$$
$$2NO_2 + 4NH_3 + O_2 \rightarrow 3N_2 + 6H_2O$$

The catalyst, comprised of parallel plates or honeycomb structures, is installed in the form of rectangular modules, downstream of the gas turbine in simple-cycle configurations, and into the HRSG portion of the gas turbine downstream of the superheater in combined-cycle and cogeneration configurations.

In honeycomb-type catalysts, the size of the catalyst openings (i.e., pitch) is important. Smaller pitch equates to larger surface area, and thus greater $NO_x$ removal efficiency due to maximizing of the surface area on which the reactions take place. At the other extreme, if catalyst openings are too small, potential for clogging from contaminants becomes an issue. The residence time of the exhaust gases in the presence of the catalyst must be sufficient for the reactions to take plane. The longer the exposure time of the exhaust with the catalyst, the greater the $NO_x$ removal is. Residence time is defined as the volume of the catalyst (e.g., $ft^3$) divided by the exhaust flow rate ($ft^3$/min). Space velocity is the inverse of residence time. Efficient $NO_x$ removal is usually indicated by a space velocity of approximately 30,000 per hour.

The turbine exhaust gas must contain a minimum amount of oxygen and be within a particular temperature range in order for the selective catalytic reduction system to operate properly. The temperature range is dictated by the catalyst, which is typically made from noble metals, base metal oxides, or zeolite-based material. The typical temperature range for base-metal catalyst is 600 to

800°F. Keeping the exhaust gas temperature within this range is important. If the temperature drops below 600°F, the reaction efficiency becomes too low and increased amounts of $NO_x$ and ammonia will be released out the stack. If the reaction temperature gets too high, the catalyst may begin to decompose. Turbine exhaust gas is generally in excess of 1000°F. HRSGs cool the exhaust gases before they reach the catalyst by extracting energy from the hot turbine exhaust gases and creating steam for use in other industrial processes or to turn a steam turbine. Selective catalytic reduction can typically achieve $NO_x$ emission reductions in the range of about 80-95 percent.

Selective catalytic reduction uses ammonia as a reducing agent in controlling $NO_x$ emissions from gas turbines. The portion of the unreacted ammonia passing through the catalyst and emitted from the stack is called ammonia slip.

SCONOx

The SCONOx system, developed by Goal Line Environmental Technologies, uses a catalyst to remove $NO_x$ emissions by oxidizing NO to $NO_2$. The $NO_x$ is absorbed onto the catalytic surface using a potassium carbonate ($K_2CO_3$) absorber coating. The potassium carbonate coating reacts with $NO_2$ to form potassium nitrites and nitrates that are deposited onto the catalyst surface. SCONOx does not use ammonia; therefore there are no ammonia emissions from this catalyst system. The reactions are shown below:

$$NO = 1/2\ O_2 \rightarrow NO_2$$
$$2NO_2 + K_2CO_3 \rightarrow CO_2 + KNO_2 + KNO_3$$

The optimal temperature window for operation of the SCONOx catalyst is from 280 to 700 °F. Operating data from Federal Cogeneration in Los Angeles County, California indicates SCONOx can achieve an emission level of 2.0 ppmvd $NO_x$ at 15 percent oxygen (approximately 98.6 percent control).

When all of the potassium carbonate absorber coating has been converted to nitrogen compounds, $NO_x$ can no longer be absorbed and the catalyst must be regenerated. Regeneration can be accomplished by passing a dilute hydrocarbon reducing gas across the surface of the catalyst in the absence of oxygen. Hydrogen in the gas reacts with the nitrites and nitrates to form water and molecular nitrogen. Carbon dioxide in the gas reacts with the potassium nitrite and nitrates to form potassium carbonate, which is the absorbing surface coating on the catalyst.

$$KNO_2 + KNO_3 + 4H_2 + CO_2 \rightarrow K_2CO_3 + 4H_2O_{(g)} + N_2$$

The regeneration gas is produced by reacting natural gas with oxygen from ambient air. A gas generator uses a two-stage process to produce hydrogen and carbon dioxide. In the first stage, natural gas and air are reacted across a partial oxidation catalyst to form carbon monoxide and hydrogen. Steam is added to the mixture and then passes across a low temperature shift catalyst,

forming carbon dioxide, and more hydrogen. The mixture is diluted to less than 4 percent hydrogen using steam.

The SCONOx catalyst is designed to be installed downstream of the gas turbine after the HRSG; whereas the selective catalytic reduction catalyst is installed within the HRSG in combined-cycle and cogeneration power plant configurations.

It is important to note that the SCONOx system has been used effectively on smaller turbines (<100 MW). However, this system has not yet been shown to be effective on large units (>100 MW).

### 5.2.1 Proposed Power Plant – Control of $NO_x$ Emissions

SRP has conducted a comprehensive evaluation on the type of combustion equipment required to meet the electrical objectives of the proposed power plant. Based on this evaluation, a specific combustion system and auxiliary boiler have been selected. The following control techniques for reducing $NO_x$ emissions have been selected for the proposed combined cycle system and auxiliary boiler.

- Combined Cycle System – Dry low $NO_x$ combustor for the turbines, low $NO_x$ burner for the HRSG supplemental fired duct burners and selective catalytic reduction; and
- Auxiliary Boiler – Low $NO_x$ burner

The installation of SCR has been selected based on its proven reliability and actual use in the power generation industry. SRP is reluctant to install the SCONOx system based on its limited use in this industry and lack of proven reliability. The SCONOx system has been limited to units with substantially less electrical output (MWs).

### 5.2.2 LAER Determination For NOx Emissions

As stated previously, several steps were followed to determine the Lowest Achievable Emission Rate (LAER). Table 5-1 presents a list of similar types of projects permitted across the United States. As shown in this table, LAER for $NO_x$ emissions from existing combined cycle systems can be defined as follows:

- 2.0 parts per million volume density as 15% $O_2$ (3-hour average); and
- 2.5 parts per million volume density at 15% $O_2$ (1-hour average).

The combination of dry low $NO_x$ combustor, low $NO_x$ burner, and SCR for the proposed combined cycle system will achieve the $NO_x$ rates identified above. Thus, these rates are considered LAER for the proposed combined cycle system.

Table 5-1
Salt [illegible] Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FINA | PORT ARTHUR | PENDING | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 39.00 | Mwe | NOX | 15.0000 | | DRY LOW NOx CONTROL, FUEL GAS FIRED | | |
| | FINA | PORT ARTHUR | PENDING | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 39.00 | Mwe | NOX | 9.0000 | | SCR CATALYST CONTROL, FUEL GAS FIRED | | |
| | UNION CARBIDE CORPORATION | SEADRIFT | PENDING | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 39.00 | MW | NOX | 9.0000 | | DRY LOW NOx CONTROL | | |
| | LUBBOCK POWER AND LIGHT | LUBBOCK | 1/8/99 | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 44.00 | MW | NOX | 42.0000 | | SCR CATALYST CONTROL | | |
| | PANDA ONETA POWER L.P. | ONETA | 9/29/99 | COMBINED CYCLE GAS TURBINES WITH SUPPLEMENTAL DUCT BURNERS | | 1000.00 | MW | NOX | 9.0000 | PPMVD | DRY LOW NOx CONTROL | | BACT |
| AL-0128 | ALABAMA POWER COMPANY - THEODORE COGENERATION | THEODORE | 6/23/99 | TURBINE, WITH DUCT BURNER | 15.004 | 170.00 | MW | NO2 | 0.0130 | LB/MMBTU | DLN COMBUSTOR IN CT, LNB IN DUCT BURNER, SCR | 68.200 | BACT-PSD |
| CT-0139 | PDC EL PASO MILFORD LLC | MILFORD | 6/17/99 | TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS | 15.004 | 1.97 | MMCF/H | NOX | 2.0000 | PPMV @ 15% O2 GAS | SCR WITH AMMONIA INJECTION | 0.000 | LAER |
| CT-0140 | PDC EL PASO MILFORD LLC | MILFORD | 6/17/99 | TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS | 15.004 | 1.97 | MMCF/H | NOX | 2.0000 | PPMV @ 15% O2 GAS | SCR WITH AMMONIA INJECTION | 0.000 | LAER |
| CA-0855 | CROCKETT COGENERATION C&H SUGAR | CROCKETT | 4/19/99 | TRUBINE, GAS, GENERAL ELECTRIC MODEL PG7221(FA) | 15.004 | 240.00 | MW | NOX | 5.0000 | PPMVD @ 15% O2 | DRY LOW-NOX COMBUSTERS AND A MITSUBISHI HEAVY INDUSTRIES AMERICAN SELECTIVE CATALYTIC REDUCTION CATALYST. | 0.000 | BACT-OTHER |
| CA-0863 | SUNLAW COGEN. (FEDERAL COLD STORAGE COGENERATION) | VERNON | 4/19/99 | TURBINE, NATURAL GAS FIRED, COMBINED CYCLE AND COG | 15.004 | 28.00 | MW | NOX | 186817 | LB/YR | WATER INJECTION AND SCONOX (MOD 2) CATALYST SYSTEM IS INSTALLED AFTER THE HRSG. | 92.000 | BACT-OTHER |
| CO-0037 | COLORADO SPRINGS UTILITIES | FOUNTAIN | 4/19/99 | TURBINE, COMBINE, NATURAL GAS FIRED | 15.004 | 30.00 | MW EACH | NOX | 15.0000 | PPMVD ABOVE 70% LOAD | POLLUTION PREVENTION BUILT INTO EQUIPMENT. | 0.000 | BACT-PSD |
| MA-0021 | MILLENNIUM POWER PARTNER, LP | CHARLTON | 4/19/99 | TURBINE, COMBUSTION, WESTINGHOUSE MODEL 501G | 15.007 | 2534.00 | MMBTU/H | NOX | 0.0130 | LB/MMBTU | DRY LOW-NOX COMBUSTION TECHNOLOGY IN CONJUNCTION WITH SCR ADD-ON NOX CONTROLS. | 0.000 | BACT-PSD |
| MA-0022 | BERKSHIRE POWER DEVELOPMENT, INC. | AGAWAM | 4/19/99 | TURBINE, COMBUSTION, ABB GT24 | 15.007 | 1792.00 | MMBTU/H | NOX | 20.3000 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0022 | BERKSHIRE POWER DEVELOPMENT, INC. | AGAWAM | 4/19/99 | ENGINES, CHILLER, NATURAL GAS-FIRED, TWO | 15.004 | 23.40 | MMBTU/H | NOX | 0.7000 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0023 | DIGHTON POWER ASSOCIATE, LP | DIGHTON | 4/19/99 | TURBINE, COMBUSTION, ABB GT11N2 | 15.004 | 1327.00 | MMBTU/H | NOX | 17.1200 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| ME-0016 | GORHAM ENERGY LIMITED PARTNERSHIP | GORHAM | 4/19/99 | TURBINE, COMBINED CYCLE | 15.007 | 900.00 | MW TOTAL | NOX | 2.5000 | PPM @ 15% O2 (NAT G) | SELECTIVE CATALYTIC REDUCTION. EMISSION IS FROM EACH 300 MW SYSTEM. | 0.000 | LAER |
| ME-0018 | WESTBROOK POWER LLC | WESTBROOK | 4/19/99 | TURBINE, COMBINED CYCLE, TWO | 15.004 | 528.00 | MW TOTAL | NOX | 2.5000 | PPM @15% O2 | SELECTIVE CATALYTIC REDUCTION AND DRY LOW NOX BUR-NERS. | 0.000 | LAER |
| ME-0019 | CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY | BUCKSPORT | 4/19/99 | TURBINE, COMBINED CYCLE, NATURAL GAS | 15.004 | 175.00 | MW | NOX | 9.0000 | PPMVD @15% O2 GAS | DRY LOW NOX BURNER 1 OPTION IS CONSIDERED FOR OIL AND IS SELECTED. | 0.000 | BACT-OTHER |

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Salt [illegible] Project

Proposed Power Plant - Existing Kyrene Generating Station

RLBC Database Information - Combined Cycle Turbines

NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ME-0020 | CASCO RAY ENERGY CO | VEAZIE | 4/19/99 | TURBINE, COMBINED CYCLE, NATURAL GAS, TWO | 15.004 | 170.00 | MW EACH | NOX | 3.5000 | PPM @15% O2 | SELECTIVE CATALYTIC REDUCTION | 0.000 | BACT-PSD |
| MI-0244 | WYANDOTTE ENERGY | WYANDOTTE | 4/19/99 | TURBINE, COMBINED CYCLE, POWER PLANT | 15.004 | 500.00 | MW | NOX | 4.5000 | PPM | SCR | 70.000 | BACT |
| MN-0035 | LSP - COTTAGE GROVE, L.P. | COTTAGE GROVE | 4/19/99 | GENERATOR, COMBUSTION TURBINE & DUCT BURNER | 15.007 | 1988.00 | MMBTU/H (CTG) | NOX | 4.5000 | PPMDV @15%O2 (NG) | SELECTIVE CATALYTIC REDUCTION (SCR) WITH A NOX CEM AND A NOX PEM. | 0.000 | BACT-PSD |
| FL-0116 | SANTA ROSA ENERGY LLC | NORTHBROOK | 4/16/99 | TURBINE, COMBUSTION, NATURAL GAS | 15.004 | 241.00 | MW | NOX | 9.8000 | PPM@15 %O2 DB ON | DRY LOW NOX BURNER | 0.000 | BACT-PSD |
| WA-0280 | EEX POWER SYSTEMS, ENCOGEN NW COGENERATION PROJECT | BELLINGHAM | 4/16/99 | TURBINES, COMBINED CYCLE COGEN, GE FRAME 6 | 15.007 | 123.00 | MW | NOX | 7.0000 | PPMDV@ 15%O2 NG | STEAM INJECTION AND SCR | 85.000 | BACT-PSD |
| WA-0280 | EEX POWER SYSTEMS, ENCOGEN NW COGENERATION PROJECT | BELLINGHAM | 4/16/99 | TURBINES, COMBINED CYCLE COGEN, GE FRAME 6 | 15.007 | 123.00 | MW | SOX | 100.000 | LB/D NG | | 0.000 | BACT-PSD |
| CA-0845 | SACRAMENTO POWER AUTHORITY CAMPBELL SOUP | SACRAMENTO | 4/13/99 | TURBINE, GAS , COMBINED CYCLE, SIEMENS V84.2 | 15.004 | 1257.00 | MMBTU/H | NOX | 3.0000 | PPMVD @ 15% O2 | SELECTIVE CATALYTIC REDUCTION AND DRY LOW NOX COMBUSTION | 0.000 | BACT |
| CA-0846 | CARSON ENERGY GROUP & CENTRAL VALLEY FINANCING AUT | ELK GROVE | 4/13/99 | TURBINE, GAS, COMBINED CYCLE, GE LM6000 | 15.004 | 450.00 | MMBTU/H | NOX | 5.0000 | PPMVD @ 15% O2 | SELECTIVE CATALYTIC REDUCTION AND WATER INJECTION ALSO HAS CARBON ABSORPTION SYSTEM IN DIGESTER TO REMOVE ORGANSILOXANES | 0.000 | BACT |
| AL-0126 | MOBILE ENERGY LLC | MOBILE | 4/9/99 | TURBINE, GAS, COMBINED CYCLE | 15.006 | 168.00 | MW | NOX | 0.0190 | LB/MMBTU | SCR & DLN COMBUSTORS DURING GAS FIRING. STEAM/WATER INJECTION DURING OIL FIRING | 0.000 | BACT-PSD |
| WY-0039 | TWO ELK GENERATION PARTNERS, LIMITED PARTNERSHIP | 15 MILES SE OF WRIGHT | 3/31/99 | TURBINE, STATIONARY | 15.004 | 33.30 | MW | NOX | 25.0000 | PPM @ 15% O2 | DRY LOW NOX BURNERS | 40.000 | BACT-PSD |
| ME-0015 | ANDROSCOGGIN ENERGY LIMITED | JAY | 3/17/99 | GAS TURBINES, COGEN, W/DUCT BURNERS | 15.007 | 675.00 | MMBTU/H TURBINE | NOX | 6.0000 | PPM @ 15% O2 NG | LOW NOX BURNERS. LOW NOX COMBUSTORS. SCR DURING GAS FIRING ONLY. | 85.000 | BACT-PSD |
| ME-0015 | ANDROSCOGGIN ENERGY LIMITED | JAY | 3/17/99 | GAS TURBINES, COGEN, W/DUCT BURNERS | 15.007 | 675.00 | MMBTU/H TURBINE | NOX | 42.0000 | PPM @ 15% O2 NG OIL | LOW NOX COMBUSTORS, LOW NOX BURNERS, WATER INJECTION DURING OIL FIRING. | 85.000 | BACT-PSD |
| NJ-0031 | UNIVERSITY OF MEDICINE & DENTISTRY OF NEW JERSEY | NEWARK | 2/17/99 | COMBUSTION TURBINE COGENERATION UNITS, 3 | 15.004 | 56.00 | MMBTU/H | NOX | 0.1670 | LB/MMBTU NAT.GAS | | 0.000 | RACT |
| ME-0014 | RUMFORD POWER ASSOCIATES | RUMFORD | 2/10/99 | TURBINE GENERATOR, COMBUSTION, NATURAL GAS | 15.004 | 1906.00 | MMBTU/H | NOX | 3.5000 | PPM @ 15% O2 | SCR AMMONIA INJECTION SYSTEM AND CATALYTIC REACTORTO REDUCE NOX. | 85.000 | BACT-PSD |
| NM-0039 | TNP TECHN, LLC (FORMERLY TX-NM POWER CO.) | LORDSBURG | 2/10/99 | GAS TURBINES | 15.004 | 375.00 | MMBTU/H | NOX | 15.0000 | PPM | WATER INJECTION FOLLOWED BY SELECTIVE CATALYTIC REDUCTION (SCR) | 95.000 | BACT-PSD |
| RI-0018 | TIVERTON POWER ASSOCIATES | TIVERTON | 2/8/99 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 265.00 | MW | NO2 | 3.5000 | PPM @ 15% O2 | SCR | 0.000 | LAER |
| NJ-0030 | HOFFMAN-LA ROCHE, NUTLEY COGEN FACILITY | NUTLEY | 2/2/99 | TURBINE, GM LM500 | 15.004 | 86.60 | MMBTU/H | NOX | 0.3400 | LB/MMBTU | | 0.000 | RACT |
| OR-0011 | HERMISTON GENERATING CO. | HERMISTON | 1/27/99 | TURBINES, NATURAL GAS (2) | 15.004 | 1698.00 | MMBTU/H | NOX | 4.5000 | PPM @ 15% O2 | SCR | 82.000 | BACT-PSD |
| CT-0130 | BRIDGEPORT ENERGY, LLC | BRIDGEPORT | 1/21/99 | TURBINES, COMBUSTION MODEL V84.3A, 2 SIEMES | 15.004 | 260.00 | MW/HRSG PER TURBINE | NOX | 6.0000 | PPM NAT. GAS | DRY LOW NOX BURNER WITH SCR | 80.000 | BACT-PSD |

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Salt F Project

Proposed Power Plant - Existing Kyrene Generating Station

RLBC Database Information - Combined Cycle Turbines

NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LA-0113 | BASF CORPORATION | GEISMAR | 1/21/99 | TURBINE, COGEN UNIT 2, GE FRAME 6 | 15.004 | 42.40 | MW | NOX | 8.0000 | PPMV NAT. GAS | STEAM INJECTION AND SCR TO LIMIT NOX TO 8 PPM FOR NATURAL GAS AND 25 PPM FOR WASTE GAS (60% H2) | 0.000 | BACT-PSD |
| DE-0014 | STAR ENTERPRISE | DELAWARE CITY | 1/20/99 | TURBINES, COMBINED CYCLE, 2 | 15.007 | 826.60 | MMBTU/H | NOX | 16.0000 | PPM @ 15% O2 SYN GAS | NITROGEN INJECTION WHILE FIRING SYNGAS AND STEAM INJECTION WHILE FIRING LSDF | 0.000 | LAER |
| DE-0014 | STAR ENTERPRISE | DELAWARE CITY | 1/20/99 | TURBINES, COMBINED CYCLE, 2 | 15.007 | 826.60 | MMBTU/H | NOX | 42.0000 | PPM @ 15% O2, DIESEL | NITROGEN INJECTION WHILE FIRING SYNGAS AND STEAM INJECTION WHILE FIRING LSDF | 0.000 | LAER |
| LA-0112 | AIR LIQUIDE AMERICA CORPORATION | GEISMAR | 1/20/99 | TURBINE GAS, GE, 7ME 7 | 15.004 | 966.00 | MMBTU/H | NOX | 9.0000 | PPMV | DRY LOW NOX TO LIMIT NOX EMISSION TO 9PPMV | 0.000 | BACT-PSD |
| PA-0148 | BLUE MOUNTAIN POWER, LP | RICHLAND | 1/12/99 | COMBUSTION TURBINE WITH HEAT RECOVERY BOILER | 15.004 | 153.00 | MW | NOX | 4.0000 | PPM @ 15% O2 | DRY LNB WITH SCR WATER INJECTION IN PLACE WHEN FIRING OIL. OIL FIRING LIMITS SET TO 8.4 PPM @15% O2 | 84.000 | LAER |
| AL-0120 | GENERAL ELECTRIC PLASTICS | BURKVILLE | 7/2/98 | COMBINED CYCLE (TURBINE AND DUCT BURNER) | 15.004 | 0.00 | | NO2 | 0.0700 | LBS/MMBTU COMBINED | DRY LOW NOX BURNER ON TURBINE AND LOW NOX BURNER ON DUCT BURNER | 0.000 | BACT-PSD |
| CO-0024 | PUBLIC SERVICE OF COLO.-FORT ST VRAIN | PLATTEVILLE | 5/19/98 | COMBINED CYCLE TURBINES (2), NATURAL | 15.004 | 471.00 | MW | NOX | 15.0000 | PPMVD, SMPL CY | DRY LOW NOX COMBUSTION SYSTEMS FOR TURBINES AND DUCT BURNERS | 0.000 | BACT-PSD |
| CO-0027 | COLO. POWER PARTNERS-BRUSH COGEN FAC | BRUSH | 5/19/98 | COGEN TURBINES W/ DUCT BURNERS & BOILERS | 15.004 | 385.00 | MM BTU/HR | NOX | 42.0000 | PPM @ 15% O2 | LOW NOX COMBUSTION RETROFIT AND WATER INJECTION | 0.000 | BACT-PSD |
| PR-0004 | ECOELECTRICA, L.P. | PENUELAS | 5/6/98 | TURBINES, COMBINED-CYCLE COGENERATION | 15.004 | 461.00 | MW | NOX, GAS | 60.0000 | LB/HR | STEAM/WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR). | 72.000 | BACT-PSD |
| PR-0004 | ECOELECTRICA, L.P. | PENUELAS | 5/6/98 | TURBINES, COMBINED-CYCLE COGENERATION | 15.004 | 461.00 | MW | NOX, OIL | 73.0000 | LB/HR | STEAM/WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR). | 72.000 | BACT-PSD |
| AL-0109 | SOUTHERN NATURAL GAS | AUBURN | 4/24/98 | 9160 HP GE MODEL M53002G NATURAL GAS FIRED TURBINE | 15.004 | 9160.00 | HP | NO2 | 53.0000 | LB/HR | | 0.000 | BACT-PSD |
| AL-0110 | SOUTHERN NATURAL GAS | WARD | 4/24/98 | 2-9160 HP GE MODEL MS3002G NATURAL GAS TURBINES | 15.004 | 9160.00 | HP | NO2 | 53.0000 | LB/HR | | 0.000 | BACT-PSD |
| AL-0115 | ALABAMA POWER COMPANY | MCINTOSH | 4/24/98 | COMBUSTION TURBINE W/ DUCT BURNER (COMBINED CYCLE) | 15.004 | 100.00 | MW | NO2 | 15.0000 | PPM | DRY LOW NOX BURNERS | 0.000 | BACT-PSD |
| CA-0793 | TEMPO PLASTICS | VISALIA | 4/23/98 | GAS TURBINE COGENERATION UNIT | 15.004 | 0.00 | | NOX | 0.1090 | LB/MMBTU | LOW-NOX COMBUSTOR | 0.000 | LAER |
| CA-0768 | NORTHERN CALIFORNIA POWER AGENCY | LODI | 3/16/98 | GE FRAME 5 GAS TURBINE | 15.004 | 325.00 | MMBTU/HR | NOX | 25.0000 | PPMVD @ 15% O2 | DRY LOW NOX BURNERS | 0.000 | LAER |
| PA-0149 | BUCKNELL UNIVERSITY | LEWISBURG | 11/30/97 | NG FIRED TURBINE, SOLAR TAURUS T-7300S | 15.004 | 5.00 | MW | NOX | 25.0000 | PPMV@15%O2 | SOLONOX BURNER: LOW NOX BURNER | 0.000 | BACT-OTHER |
| NM-0031 | LORDSBURG L.P. | LORDSBURG | 9/29/97 | TURBINE, NATURAL GAS-FIRED, ELEC. GEN. | 15.004 | 100.00 | MW | NO2 | 74.4000 | LBS/HR | DRY LOW-NOX TECHNOLOGY WHICH ADOPTS STAGED OR SCHEDULED COMBUSTION. | 80.000 | BACT-PSD |
| OR-0010 | PORTLAND GENERAL ELECTRIC CO. | BOARDMAN | 8/6/97 | TURBINES, NATURAL GAS (2) | 15.004 | 1720.00 | MMBTU | NOX | 4.5000 | PPM @ 15% O2 | SCR | 82.000 | BACT-PSD |
| OR-0010 | PORTLAND GENERAL ELECTRIC CO. | BOARDMAN | 8/6/97 | BOILERS, AUXILIARY, NATURAL GAS (2) | 11.005 | 361.00 | MMBTU | NOX | 0.1000 | LB/MMBTU | LOW NOX BURNER AND FLUE GAS RECIRCULATION | 0.000 | BACT-PSD |
| AL-0096 | MEAD COATED BOARD, INC. | PHENIX CITY | 5/31/97 | COMBINED CYCLE TURBINE (25 MW) | 15.004 | 568.00 | MMBTU/HR | NOX | 25.0000 | PPMVD@ 15% O2 (GAS) | FUEL OIL SULFUR CONTENT <=0.05% BY WEIGHT DRY LOW NOX COMBUSTOR DESIGN FIRING GAS AND DRY LOW NOX COMBUSTOR WITH WATER INJECTION FIRING OIL | 0.000 | BACT-PSD |

Ta 5-1
Salt F Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LA-0096 | UNION CARBIDE CORPORATION | HAHNVILLE | 5/31/97 | GENERATOR, GAS TURBINE | 15.004 | 1313.00 | MM BTU/HR | NOX | 25.0000 | PPMV CORR. TO 15% O2 | DRY LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIELD | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1175.00 | MMBTU/H NAT. GAS | NOX | 9.0000 | PPM @ 15% O2 | SCR, STEAM INJECTION | 91.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIELD | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1117.00 | MMBTU/H NO2 FUEL OIL | NOX | 15.0000 | PPM @ 15% O2 | SCR, STEAM INJ. | 91.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIELD | 5/7/97 | TURBINE, COMBUSTION, 2 | 15.999 | 0.00 | | NOX | 191.100 | T/YR/UNIT | | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 474.00 | X10(6) BTU/HR N. GAS | NOX | 9.0000 | PPM | SELECTIVE CATALYTIC REDUCTION (SCR) | 74.500 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 468.00 | X10(6) BTU/HR #2 OIL | NOX | 15.0000 | PPM | SCR | 80.800 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS (TOTAL) | 15.007 | 0.00 | | NOX | 69.7000 | TPY | SCR | 0.000 | BACT-PSD |
| VA-0206 | PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP | LEESBURG | 5/7/97 | TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3 | 15.007 | 10.20 | X109 SCF/YR NAT GAS | NOX | 131.000 | LB/HR(GAS); 339 OIL | DRY LOW NOX COMBUSTOR; DESIGN, WATER INJECTION | 0.000 | BACT-PSD |
| LA-0093 | FORMOSA PLASTICS CORPORATION, BATON ROUGE PLANT | BATON ROUGE | 4/28/97 | TURBINE/HSRG, GAS COGENERATION | 15.004 | 450.00 | MM BTU/HR | NOX | 9.0000 | PPMV | DRY LOW NOX BURNER/COMBUSTION DESIGN AND CONSTRUCTION. | 0.000 | BACT-PSD |
| NM-0029 | SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA | HOBBS | 3/31/97 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 100.00 | MW | NOX | 0.0000 | SEE FACILITY NOTES | DRY LOW NOX COMBUSTION | 0.000 | BACT-PSD |
| MS-0030 | SOUTHERN NATURAL GAS COMPANY | BAY SPRINGS | 3/24/97 | TURBINE, NATURAL GAS-FIRED | 15.004 | 9160.00 | HORSEPOWER | NOX | 110.000 | PPMV @ 15% O2, DRY | PROPER TURBINE DESIGN AND OPERATION | 0.000 | BACT-PSD |
| NM-0028 | SOUTHWESTERN PUBLIC SERVICE CO/CUNNINGHAM STATION | HOBBS | 12/30/96 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 100.00 | MW | NOX | 15.0000 | PPM; SEE FAC. NOTES | DRY LOW NOX COMBUSTION | 0.000 | BACT-PSD |
| AL-0089 | SOUTHERN NATURAL GAS COMPANY-SELMA COMPRESSOR STAT | SELMA | 12/18/96 | 9160 HP GE MS3002G NATURAL GAS FIRED TURBINE | 15.004 | 0.00 | | NOX | 53.0000 | LB/HR | | 0.000 | BACT-PSD |
| GA-0063 | MID-GEORGIA COGEN. | KATHLEEN | 8/19/96 | COMBUSTION TURBINE (2), NATURAL GAS | 15.004 | 116.00 | MW | NOX | 9.0000 | PPMVD | DRY LOW NOX BURNER WITH SCR | 0.000 | BACT-PSD |
| NC-0059 | CAROLINA POWER & LIGHT | GOLDSBORO | 8/19/96 | COMBUSTION TURBINE, 4 EACH | 15.007 | 1907.60 | MMBTU/HR | NOX, OIL | 512.300 | LB/HR | WATER INJECTION; FUEL SPEC: 0.04% N FUEL OIL | 0.000 | BACT-PSD |
| NC-0059 | CAROLINA POWER & LIGHT | GOLDSBORO | 8/19/96 | COMBUSTION TURBINE, 4 EACH | 15.007 | 1907.60 | MMBTU/HR | NOX, GAS | 158.000 | LB/HR | WATER INJECTION | 0.000 | BACT-PSD |
| FL-0104 | SEMINOLE HARDEE UNIT 3 | FORT GREEN | 5/31/96 | COMBINED CYCLE COMBUSTION TURBINE | 15.007 | 140.00 | MW | NOX | 15.0000 | PPM @ 15% O2 | DRY LNB STAGED COMBUSTION | 0.000 | BACT-PSD |
| FL-0102 | PANDA-KATHLEEN, L.P. | LAKELAND | 5/20/96 | COMBINED CYCLE COMBUSTION TURBINE (TOTAL 115MW) | 15.004 | 75.00 | MW | NOX | 15.0000 | PPM @ 15% O2 | DRY LOW NOX BURNER | 0.000 | BACT-PSD |
| SC-0036 | CAROLINA POWER AND LIGHT | HARTSVILLE | 4/29/96 | STATIONARY GAS TURBINE | 15.007 | 1520.00 | MMBTU/H | NOX (NG) | 25.0000 | PPMDV @ 15% O2 | WATER INJECTION | 30.000 | BACT-PSD |
| SC-0036 | CAROLINA POWER AND LIGHT | HARTSVILLE | 4/29/96 | STATIONARY GAS TURBINE | 15.007 | 1520.00 | MMBTU/H | NOX (OIL) | 62.0000 | PPMDV @ 15% O2 | WATER INJECTION | 30.000 | BACT-PSD |

Ta 5-1
Salt I Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PA-0130 | PROCTOR AND GAMBLE PAPER PRODUCTS CO (CHARMIN) | MEHOOPANY | 11/27/95 | TURBINE, NATURAL GAS | 15.004 | 580.00 | MMBTU/HR | NOX | 55.0000 | PPM @ 15% O2 | STEAM INJECTION | 75.000 | RACT |
| NY-0044 | BROOKLYN NAVY YARD COGENERATION PARTNERS L.P. | NEW YORK CITY | 6/30/95 | TURBINE, NATURAL GAS FIRED | 15.004 | 240.00 | MW | NOX | 3.5000 | PPM @ 15% O2 | SCR | 0.000 | LAER |
| NY-0068 | KAMINE/BESICORP NATURAL DAM LP | NATURAL DAM | 6/30/95 | GE FRAME 6 GAS TURBINE | 15.007 | 500.00 | MMBTU/HR | NOX | 42.0000 | PPM, 80.1 LB/HR | STEAM INJECTION | 35.000 | BACT |
| MN-0022 | LSP-COTTAGE GROVE, L.P. | COTTAGE GROVE | 5/29/95 | COMBUSTION TURBINE/GENERATOR | 15.007 | 1970.00 | MMBTU/HR | NOX | 4.5000 | PPM @ 15% O2 GAS | SELECTIVE CATALYTIC REDUCTION (SCR) | 70.000 | BACT-PSD |
| MN-0022 | LSP-COTTAGE GROVE, L.P. | COTTAGE GROVE | 5/29/95 | COMBUSTION TURBINE/GENERATOR | 15.007 | 1970.00 | MMBTU/HR | VOC | 19.0000 | LB/HR GAS | FUEL SELECTION, GOOD COMBUSTION | 0.000 | BACT-PSD |
| NJ-0013 | LAKEWOOD COGENERATION, L.P. | LAKEWOOD TOWNSHIP | 5/29/95 | TURBINES (NATURAL GAS) (2) | 15.004 | 1190.00 | MMBTU/HR (EACH) | NOX | 0.0330 | LB/MMBTU | SCR, DRY LOW NOX BURNER | 64.000 | BACT-OTHER |
| NJ-0017 | NEWARK BAY COGENERATION PARTNERSHIP, L.P. | NEWARK | 5/29/95 | TURBINES, COMBUSTION, NATURAL GAS-FIRED (2) | 15.004 | 617.00 | MMBTU/HR (EACH) | NOX | 8.3000 | PPMDV | SCR | 0.000 | BACT-PSD |
| NJ-0017 | NEWARK BAY COGENERATION PARTNERSHIP, L.P. | NEWARK | 5/29/95 | BOILER, AUXILIARY, NATURAL GAS-FIRED | 11.005 | 200.00 | MMBTU/HR | NOX | 0.0500 | LB/MMBTU | LOW NOX BURNERS, FLUE GAS RECIRCULATION (FGR) | 0.000 | BACT-PSD |
| NM-0024 | MILAGRO, WILLIAMS FIELD SERVICE | BLOOMFIELD | 5/29/95 | TURBINE/COGEN, NATURAL GAS (2) | 15.004 | 900.00 | MMCF/DAY | NO2 | 9.0000 | PPM @ 15% O2 | DRY LOW NOX (GENERAL ELECTRIC MODEL PG6541B) | 94.000 | BACT-PSD |
| NY-0061 | ANITEC COGEN PLANT | BINGHAMTON | 4/27/95 | GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001 | 15.007 | 451.00 | MMBTU/HR | NOX | 25.0000 | PPM, 41 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0062 | FULTON COGEN PLANT | FULTON | 4/27/95 | GE LM5000 GAS TURBINE | 15.007 | 500.00 | MMBTU/HR | NOX | 36.0000 | PPM, 65 LB/HR | WATER INJECTION | 58.500 | BACT |
| NY-0062 | FULTON COGEN PLANT | FULTON | 4/27/95 | STACK EMISSIONS (GAS TURBINE AND DUCT BURNER) | 11.004 | 610.00 | MMBTU/HR (TOTAL) | NOX | 36.0000 | PPM, 69.5 LB/HR | WATER INJECTION | 53.000 | BACT |
| NY-0063 | TBG COGEN COGENERATION PLANT | BETHPAGE | 4/27/95 | GE LM2500 GAS TURBINE | 15.007 | 214.90 | MMBTU/HR | NOX | 75.0000 | PPM + FBN CORRECTION | WATER INJECTION | 60.000 | BACT |
| NY-0064 | INDECK-OSWEGO ENERGY CENTER | OSWEGO | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 533.00 | LB/MMBTU | NOX | 42.0000 | PPM, 75.00 LB/HR | STEAM INJECTION | 53.000 | BACT |
| NY-0065 | KAMINE/BESICORP CARTHAGE L.P. | CARTHAGE | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 491.00 | BTU/HR | NOX | 42.0000 | PPM, 76.6 LB/HR | STEAM INJECTION | 63.000 | BACT |
| NY-0065 | KAMINE/BESICORP CARTHAGE L.P. | CARTHAGE | 4/27/95 | STACK (GAS TURBINE & DUCT BURNER) **SEE NOTE #3** | 11.004 | 540.00 | LB/MMBTU | NOX | 42.0000 | PPM, 87.4 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0071 | KAMINE SOUTH GLENS FALLS COGEN CO | SOUTH GLENS FALLS | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 498.00 | MMBTU/HR | NOX | 42.0000 | PPM, 76.6 LB/HR | WATER INJECTION | 50.000 | BACT |
| NY-0072 | KAMINE/BESICORP SYRACUSE LP | SOLVAY | 4/27/95 | SIEMENS V64.3 GAS TURBINE (EP #00001) | 15.007 | 650.00 | MMBTU/HR | NOX | 25.0000 | PPM | WATER INJECTION | 70.000 | BACT |
| NY-0073 | LOCKPORT COGEN FACILITY | LOCKPORT | 4/27/95 | (6) GE FRAME 6 TURBINES (EP #S 00001-00006) | 15.007 | 423.90 | MMBTU/HR | NOX | 42.0000 | PPM | STEAM INJECTION | 78.000 | BACT |
| NY-0075 | PILGRIM ENERGY CENTER | ISLIP | 4/27/95 | (2) WESTINGHOUSE W501D5 TURBINES (EP #S 00001&2) | 15.007 | 1400.00 | MMBTU/HR | NOX | 4.5000 | PPM, 23.6 LB/HR | STEAM INJECTION FOLLOWED BY SCR | 0.000 | BACT |
| NY-0079 | LEDERLE LABORATORIES | PEARL RIVER | 4/27/95 | (2) GAS TURBINES (EP #S 00101&102) | 15.007 | 110.00 | MMBTU/HR | NOX | 42.0000 | PPM, 18 LB/HR | STEAM INJECTION | 0.000 | BACT-PSD |
| NM-0022 | MARATHON OIL CO. - INDIAN BASIN N.G. PLAN | CARLSBAD | 4/26/95 | TURBINES, NATURAL GAS (2) | 15.004 | 5500.00 | HP | NOX | 7.4000 | LBS/HR | LEAN-PREMIXED COMBUSTION TECHNOLOGY. DRY/LOW NOX | 66.000 | BACT-PSD |

Ta 5-1
Salt I Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LA-0086 | INTERNATIONAL PAPER | MANSFIELD | 4/17/95 | TURBINE/HRSG, GAS COGEN | 15.004 | 338.00 | MM BTU/HR TURBINE | NOX | 25.0000 | PPMV 15% O2 TURBINE | DRY LOW NOX COMBUSTOR/COMBUSTION CONTROL | 0.000 | BACT |
| LA-0089 | FORMOSA PLASTICS CORPORATION, LOUISIANA | BATON ROUGE | 4/17/95 | TURBINE/HRSG, GAS COGENERATION | 15.004 | 450.00 | MM BTU/HR | NOX | 9.0000 | PPMV | DRY LOW NOX BURNER/COMBUSTION DESIGN AND CONTROL | 0.000 | LAER |
| OH-0218 | CNG TRANSMISSION | WASHINGT ON COURT HOUSE | 4/5/95 | TURBINE (NATURAL GAS) (3) | 15.004 | 5500.00 | HP (EACH) | NOX | 1.6000 | G/HP-HR* | LOW NOX COMBUSTION | 0.000 | BACT-OTHER |
| WA-0274 | NORTHWEST PIPELINE COMPANY | SUMAS | 4/5/95 | TURBINE, GAS-FIRED | 15.004 | ######## | HP | NO2 | 196.000 | PPM @ 15% O2 | ADVANCED DRY LOW NOX COMBUSTOR (BY 07/01/95) | 76.000 | BACT-PSD |
| NY-0066 | INDECK ENERGY COMPANY | SILVER SPRINGS | 3/31/95 | GE FRAME 6 GAS TURBINE EP #00001 | 15.007 | 491.00 | MMBTU/HR | NOX | 32.0000 | PPM | STEAM INJECTION | 58.200 | BACT |
| NY-0076 | TRIGEN MITCHEL FIELD | HEMPSTEA D | 3/31/95 | GE FRAME 6 GAS TURBINE | 15.007 | 424.70 | MMBTU/HR | NOX | 60.0000 | PPM, 90 LB/HR | STEAM INJECTION | 20.000 | BACT |
| NY-0077 | INDECK-YERKES ENERGY SERVICES | TONAWAND A | 3/31/95 | GE FRAME 6 GAS TURBINE (EP #00001) | 15.007 | 432.20 | MMBTU/HR | NOX | 42.0000 | PPM, 74 LB/HR | STEAM INJECTION | 35.000 | BACT |
| NY-0077 | INDECK-YERKES ENERGY SERVICES | TONAWAND A | 3/31/95 | DUCT BURNER (EP #00001) | 11.005 | 20.00 | MMBTU/HR | NOX | 0.1100 | LB/MMBT U, 2.2 LB/HR | FUEL SPEC: NATURAL GAS ONLY | 0.000 | BACT-OTHER |
| NY-0080 | PROJECT ORANGE ASSOCIATES | SYRACUSE | 3/31/95 | GE LM-5000 GAS TURBINE | 15.004 | 550.00 | MMBTU/HR | NOX | 25.0000 | PPM, 47 LB/HR | STEAM INJECTION, FUEL SPEC; NATURAL GAS ONLY | 80.000 | BACT |
| NY-0080 | PROJECT ORANGE ASSOCIATES | SYRACUSE | 3/31/95 | STACK (TURBINE AND DUCT BURNER) | 11.005 | 715.00 | MMBTU/HR | NOX | 26.0000 | PPM, 69 LB/HR | NO CONTROLS FOR NOX ON STACK *SEE TURBINE NOX DATA | 0.000 | BACT-OTHER |
| NY-0057 | MEGAN-RACINE ASSOCIATES, INC | CANTON | 3/30/95 | GE LM5000-N COMBINED CYCLE GAS TURBINE | 15.007 | 401.00 | LB/MMBTU | NOX | 42.0000 | PPMDV @ 15% O2 | WATER INJECTION | 60.000 | BACT |
| NY-0081 | LILCO SHOREHAM | HICKSVILLE | 3/30/95 | (3) GE FRAME 7 TURBINES (EP #S 00007-9) | 15.002 | 850.00 | MMBTU/HR | NOX | 55.0000 | PPM +FBN & HEAT RATE | WATER INJECTION | 30.000 | BACT |
| AL-0069 | INTERNATIONAL PAPER CO. RIVERDALE MILL | SELMA | 3/24/95 | TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER | 15.007 | 40.00 | MW | NOX | 0.0800 | LB/MMBT U (GAS) | LOW NOX BURNERS (ON THE DUCT BURNER) STEAM INJECTION INTO THE TURBINE | 0.000 | BACT-PSD |
| AZ-0010 | EL PASO NATURAL GAS | | 3/24/95 | TURBINE, GAS, SOLAR CENTAUR H | 15.004 | 5500.00 | HP | NOX | 84.9000 | PPM @ 15% O2 | LEAN BURN | 0.000 | NSPS |
| AZ-0010 | EL PASO NATURAL GAS | | 3/24/95 | TURBINE, GAS, SOLAR CENTAUR H | 15.004 | 5500.00 | HP | NOX | 42.0000 | PPM @ 15% O2 | DRY LOW NOX COMBUSTOR | 51.000 | BACT-PSD |
| AZ-0011 | EL PASO NATURAL GAS | | 3/24/95 | TURBINE, GAS, SOLAR CENTAUR H | 15.004 | 5500.00 | HP | NOX | 85.1000 | PPM @ 15% O2 | FUEL SPEC: LEAN FUEL MIX | 0.000 | NSPS |
| AZ-0011 | EL PASO NATURAL GAS | | 3/24/95 | TURBINE, GAS, SOLAR CENTAUR H | 15.004 | 5500.00 | HP | NOX | 42.0000 | PPM @ 15% O2 | DRY LOW NOX COMBUSTOR | 51.000 | BACT-PSD |
| CO-0017 | THERMO INDUSTRIES, LTD. | FT. LUPTON | 3/24/95 | TURBINE, GAS FIRED, 5 EACH | 15.004 | 246.00 | MMBTU/H | NOX | 25.0000 | PPM @ 15% O2 | DRY LOW NOX TECH. | 0.000 | BACT-PSD |
| CO-0023 | PHOENIX POWER PARTNERS | GREELEY | 3/24/95 | TURBINE (NATURAL GAS) | 15.004 | 311.00 | MMBTU/HR | NOX | 22.0000 | PPM @ 15% O2 | DRY LOW NOX COMBUSTION | 0.000 | BACT-OTHER |
| FL-0045 | CHARLES LARSEN POWER PLANT | CITY OF OF LAKELAND | 3/24/95 | TURBINE, GAS, 1 EACH | 15.004 | 80.00 | MW | NOX | 25.0000 | PPM @ 15% O2 | WET INJECTION | 0.000 | BACT-PSD |

Ta 5-1
Salt I Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FL-0052 | FLORIDA POWER AND LIGHT | NORTH PALM BEACH | 3/24/95 | TURBINE, GAS, 4 EACH | 15.004 | 400.00 | MW | NOX | 25.0000 | PPM @ 15% O2 | LOW NOX COMBUSTORS | 0.000 | BACT-PSD |
| FL-0052 | FLORIDA POWER AND LIGHT | NORTH PALM BEACH | 3/24/95 | TURBINE, CG, 4 EACH | 15.004 | 400.00 | MW | NOX | 42.0000 | PPM @ 15% O2 | LOW NOX COMBUSTORS | 0.000 | BACT-PSD |
| FL-0053 | FLORIDA POWER AND LIGHT | LAVOGROM E STATION | 3/24/95 | TURBINE, GAS, 4 EACH | 15.004 | 240.00 | MW | NOX | 42.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0054 | LAKE COGEN LIMITED | UMATILLA | 3/24/95 | TURBINE, GAS, 2 EACH | 15.004 | 42.00 | MW | NOX | 25.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| GA-0052 | SAVANNAH ELECTRIC AND POWER CO. | | 3/24/95 | TURBINES, 8 | 15.004 | 1032.00 | MMBTU/H, NAT GAS | NOX | 25.0000 | PPM @ 15% O2 | MAX WATER INJECTION | 0.000 | BACT-PSD |
| GA-0052 | SAVANNAH ELECTRIC AND POWER CO. | | 3/24/95 | TURBINES, 8 | 15.006 | 972.00 | MMBTU/H, #2 OIL | NOX | 0.0000 | SEE NOTES | MAX WATER INJECTION | 0.000 | BACT-PSD |
| GA-0053 | HARTWELL ENERGY LIMITED PARTNERSHIP | HARTWELL | 3/24/95 | TURBINE, GAS FIRED (2 EACH) | 15.004 | 1817.00 | M BTU/HR | NOX | 25.0000 | PPM @ 15% O2 | MAXIMUM WATER INJECTION | 0.000 | BACT-PSD |
| GA-0056 | GEORGIA POWER COMPANY, ROBINS TURBINE PROJECT | ROBINS AIR FORCE BASE | 3/24/95 | TURBINE, COMBUSTION, NATURAL GAS | 15.004 | 80.00 | MW | NOX | 25.0000 | PPM | WATER INJECTION, FUEL SPEC: NATURAL GAS | 0.000 | BACT-PSD |
| HI-0015 | MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA | MAUI | 3/24/95 | TURBINE, COMBINED-CYCLE COMBUSTION | 15.006 | 28.00 | MW | NOX | 42.3000 | LB/HR | WATER INJECTION | 69.000 | BACT-OTHER |
| MA-0015 | PEABODY MUNICIPAL LIGHT PLANT | PEABODY | 3/24/95 | TURBINE, 38 MW NATURAL FAS FIRED | 15.004 | 412.00 | MMBTU/HR | NOX | 25.0000 | PPM @ 15% O2 | WATER INJECTION | 0.000 | BACT-OTHER |
| MD-0017 | SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SMECO) | EAGLE HARBOR | 3/24/95 | TURBINE, NATURAL GAS FIRED ELECTRIC | 15.004 | 90.00 | MW | NO2 | 199.000 | LB/HR | WATER INJECTION | 0.000 | BACT-PSD |
| MD-0019 | BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT | PERRYMMA N | 3/24/95 | TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC | 15.004 | 140.00 | MW | NO2 | 15.0000 | PPM @ 15% O2 | DRY BURN LOW NOX BURNERS | 91.000 | BACT-PSD |
| NC-0055 | DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION | LOWESVILL E | 3/24/95 | TURBINE, COMBUSTION | 15.006 | 1247.00 | MM BTU/HR | NOX | 287.000 | LB/HR | MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION | 0.000 | BACT-PSD |
| NC-0055 | DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION | LOWESVILL E | 3/24/95 | TURBINE, COMBUSTION | 15.004 | 1313.00 | MM BTU/HR | NOX | 119.000 | LB/HR | MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION | 0.000 | BACT-PSD |
| NV-0017 | NEVADA POWER COMPANY, HARRY ALLEN PEAKING PLANT | LAS VEGAS | 3/24/95 | COMBUSTION TURBINE ELECTRIC POWER GENERATION | 15.004 | 600.00 | MW (8 UNITS 75 EACH) | NO2 | 88.6000 | TPY (EACH TURBINE ) | LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| OK-0027 | OKLAHOMA MUNICIPAL POWER AUTHORITY | PONCA CITY | 3/24/95 | TURBINE, COMBUSTION | 15.007 | 58.00 | MW | NOX (FROM OIL FUEL) | 65.0000 | PPM @ 15% O2 | COMBUSTION CONTROLS | 83.000 | BACT-OTHER |
| OK-0027 | OKLAHOMA MUNICIPAL POWER AUTHORITY | PONCA CITY | 3/24/95 | TURBINE, COMBUSTION | 15.007 | 58.00 | MW | NOX (FROM GAS FUEL) | 25.0000 | PPM @ 15% O2 | COMBUSTION CONTROLS | 83.000 | BACT-OTHER |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINE FACILITY, GAS | 15.007 | 1331.13 | X10(7) SCF/Y NAT GAS | NOX | 245.000 | TOTAL TPY | SELECTIVE CATALYTIC REDUCTION (SCR) W/ WATER INJEC | 80.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINE FACILITY, GAS | 15.007 | 7.44 | X10(7) GPY FUEL OIL | NOX | 245.000 | TOTAL TPY | SELECTIVE CATALYTIC REDUCTION (SCR) | 80.000 | BACT-PSD |

Tr 5-1
Salt F Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINES (2) [EACH WITH A SF] | 15.007 | 1.51 | X10(9) BTU/HR N GAS | NOX | 9.0000 | PPMDV/UNIT @ 15% O2 | SCR WITH WATER INJECTION | 80.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINES (2) [EACH WITH A SF] | 15.007 | 1.36 | X10(9) BTU/H #2 OIL | NOX | 66.0000 | LBS/HR/UNIT | WATER INJECTION AND SCR | 80.000 | BACT-PSD |
| FL-0068 | ORANGE COGENERATION LP | BARTOW | 1/13/95 | TURBINE, NATURAL GAS, 2 | 15.004 | 368.30 | MMBTU/H | NOX | 15.0000 | PPM @ 15% O2 | DRY LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| FL-0072 | TIGER BAY LP | FT. MEADE | 1/13/95 | TURBINE, GAS | 15.004 | 1614.80 | MMBTU/H | NOX | 15.0000 | PPM @ 15% O2 | DRY LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| FL-0078 | KISSIMMEE UTILITY AUTHORITY | INTERCESSION CITY | 1/13/95 | TURBINE, NATURAL GAS | 15.004 | 869.00 | MMBTU/H | NOX | 15.0000 | PPM @ 15% O2 | DRY LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| FL-0078 | KISSIMMEE UTILITY AUTHORITY | INTERCESSION CITY | 1/13/95 | TURBINE, NATURAL GAS | 15.004 | 367.00 | MMBTU/H | NOX | 15.0000 | PPM @ 15% O2 | DRY LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| FL-0080 | AUBURNDALE POWER PARTNERS, LP | AUBURNDALE | 1/13/95 | TURBINE,GAS | 15.004 | 1214.00 | MMBTU/H | NOX | 15.0000 | PPMVD @ 15 % O2 | DRY LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| FL-0082 | FLORIDA POWER CORPORATION POLK COUNTY SITE | BARTOW | 1/13/95 | TURBINE, NATURAL GAS (2) | 15.004 | 1510.00 | MMBTU/H | NOX | 12.0000 | PPMVD @15 % O2 | DRY LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| CA-0613 | UNOCAL | WILMINGTON | 12/5/94 | TURBINE, GAS (SEE NOTES) | 15.004 | 0.00 | | NOX | 9.0000 | PPM @ 15% O2 | SELECTIVE CATALYTIC REDUCTION (SCR), WATER INJECTN | 80.000 | BACT-OTHER |
| PA-0099 | FLEETWOOD COGENERATION ASSOCIATES | FLEETWOOD | 11/22/94 | NG TURBINE (GE LM6000) WITH WASTE HEAT BOILER | 15.004 | 360.00 | MMBTU/HR | NOX | 21.0000 | LB/HR | SCR WITH LOW NOX COMBUSTORS | 47.000 | BACT-OTHER |
| TX-0231 | WEST CAMPUS COGENERATION COMPANY | COLLEGE STATION | 10/31/94 | GAS TURBINES | 15.004 | 75.30 | MW (TOTAL POWER) | NOX | 200.000 | TPY | INTERNAL COMBUSTION CONTROLS | 0.000 | BACT-PSD |
| NY-0045 | SELKIRK COGENERATION PARTNERS, L.P. | SELKIRK | 9/13/94 | COMBUSTION TURBINES (2) (252 MW) | 15.004 | 1173.00 | MMBTU/HR (EACH) | NOX | 9.0000 | PPM GAS | STEAM INJECTION AND SCR | 0.000 | BACT-OTHER |
| NY-0045 | SELKIRK COGENERATION PARTNERS, L.P. | SELKIRK | 9/13/94 | COMBUSTION TURBINE (79 MW) | 15.004 | 1173.00 | MMBTU/HR | NOX | 25.0000 | PPM GAS | STEAM INJECTION | 0.000 | BACT-OTHER |
| NY-0046 | SARANAC ENERGY COMPANY | PLATTSBURGH | 9/13/94 | TURBINES, COMBUSTION (2) (NATURAL GAS) | 15.004 | 1123.00 | MMBTU/HR (EACH) | NOX | 9.0000 | PPM | SCR | 0.000 | BACT-OTHER |
| NY-0047 | PASNY/HOLTSVILLE COMBINED CYCLE PLANT | HOLTSVILLE | 9/13/94 | TURBINE, COMBUSTION GAS (150 MW) | 15.007 | 1146.00 | MMBTU/HR (GAS)* | NOX (FROM GAS) | 9.0000 | PPM | DRY LOW NOX | 0.000 | BACT-OTHER |
| NY-0047 | PASNY/HOLTSVILLE COMBINED CYCLE PLANT | HOLTSVILLE | 9/13/94 | TURBINE, COMBUSTION GAS (150 MW) | 15.007 | 1146.00 | MMBTU/HR (GAS)* | NOX (FROM OIL) | 42.0000 | PPM | WATER INJECTOR | 0.000 | BACT-OTHER |
| NY-0048 | KAMINE/BESICORP CORNING L.P. | SOUTH CORNING | 9/13/94 | TURBINE, COMBUSTION (79 MW) | 15.004 | 653.00 | MMBTU/HR | NOX | 9.0000 | PPM | DRY LOW NOX OR SCR | 0.000 | BACT-OTHER |
| NY-0050 | SITHE/INDEPENDENCE POWER PARTNERS | OSWEGO | 9/13/94 | TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW) | 15.004 | 2133.00 | MMBTU/HR (EACH) | NOX | 4.5000 | PPM | SCR AND DRY LOW NOX | 0.000 | BACT-OTHER |
| CA-0544 | GOAL LINE, LP ICEFLOE | ESCONDIDO | 8/4/94 | TURBINE, COMBUSTION (NATURAL GAS) (42.4 MW) | 15.004 | 386.00 | MMBTU/HR | NOX | 5.0000 | PPMVD @ 15% OXYGEN | WATER INJECTION & SCR W/ AUTOMATIC AMMONIA INJECT. | 88.000 | BACT-OTHER |
| AZ-0012 | EL PASO NATURAL GAS | | 7/20/94 | TURBINE, NAT. GAS TRANSM., GE FRAME 3 | 15.004 | ####### | HP | NOX | 225.000 | PPM @ 15% O2 | LEAN BURN | 0.000 | BACT-PSD |

Ta 5-1
Salt F Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AZ-0012 | EL PASO NATURAL GAS | | 7/20/94 | TURBINE, NAT. GAS TRANSM., GE FRAME 3 | 15.004 | ######## | HP | NOX | 42.0000 | PPM @ 15% O2 | DRY LOW NOX COMBUSTOR | 80.000 | BACT-PSD |
| CO-0018 | BRUSH COGENERATION PARTNERSHIP | BRUSH | 7/20/94 | TURBINE | 15.004 | 350.00 | MMBTU/H | NOX | 25.0000 | PPM @ 15% O2 | DRY LOW NOX BURNER | 74.000 | BACT-PSD |
| CO-0019 | COLORADO POWER PARTNERSHIP | BRUSH | 7/20/94 | TURBINES, 2 NAT GAS & 2 DUCT BURNERS | 15.004 | 385.00 | MMBTU/H EACH TURBINE | NOX | 42.0000 | PPM @ 15% O2 | WATER INJECTION | 66.000 | BACT-PSD |
| CO-0020 | CIMARRON CHEMICAL | JOHNSTOWN | 7/20/94 | TURBINE #1, GE FRAME 6 | 15.004 | 33.00 | MW | NOX | 25.0000 | PPM @ 15% O2 | WATER INJECTION | 0.000 | OTHER |
| CO-0020 | CIMARRON CHEMICAL | JOHNSTOWN | 7/20/94 | TURBINE #2, GE FRAME 6 | 15.004 | 33.00 | MW | NOX | 9.0000 | PPM @ 15% O2 | SCR | 0.000 | OTHER |
| MD-0018 | PEPCO - CHALK POINT PLANT | EAGLE HARBOR | 7/20/94 | TURBINE, 105 MW NATURAL GAS FIRED ELECTRIC | 15.004 | 105.00 | MW | NO2 | 77.0000 | PPM @ 15% O2 | DRY PREMIX AND WATER INJECTION | 0.000 | BACT-PSD |
| MD-0018 | PEPCO - CHALK POINT PLANT | EAGLE HARBOR | 7/20/94 | TURBINE, 84 MW NATURAL GAS FIRED ELECTRIC | 15.004 | 84.00 | MW | NO2 | 25.0000 | PPM @ 15% O2 | QUIET COMBUSTION AND WATER INJECTION | 0.000 | BACT-PSD |
| MD-0021 | PEPCO - STATION A | DICKERSON | 7/20/94 | TURBINE, 124 MW NATURAL GAS FIRED | 15.004 | 125.00 | MW | NO2 | 42.0000 | PPM @ 15% O2 | WATER INJECTION | 0.000 | BACT-PSD |
| OR-0007 | PACIFIC GAS TRANSMITION | MADRAS | 7/20/94 | TURBINE, NAT. GAS | 15.004 | ######## | HP | NOX | 42.0000 | PPM @ 15% O2 | LOW NOX BURNERS | 75.000 | BACT-PSD |
| OR-0009 | PACIFIC GAS TRANSMISSION COMPANY | MADRAS | 7/20/94 | TURBINE GAS, COMPRESSOR STATION | 15.004 | 110.00 | MMBTU/HR | NO2 | 199.000 | PPM @ 15% O2 | LOW NOX BURNER DESIGN | 30.000 | NSPS |
| PA-0083 | NORTHERN CONSOLIDATED POWER | NORTH EAST | 7/20/94 | TURBINES, GAS, 2 | 15.004 | 34.60 | KW EACH | NOX | 25.0000 | PPM @ 15% O2 | STEAM INJECTION/+SCR IN 1997 | 85.000 | OTHER |
| WI-0067 | WEPCU, PARIS SITE | PARIS | 7/20/94 | TURBINES, COMBUSTION (4) | 15.007 | 0.00 | | NOX (FROM NAT. GAS) | 25.0000 | PPM @ 15% O2 | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| WI-0067 | WEPCU, PARIS SITE | PARIS | 7/20/94 | TURBINES, COMBUSTION (4) | 15.007 | 0.00 | | NOX (FROM OIL) | 65.0000 | PPM @ 15% O2 | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| AL-0074 | FLORIDA GAS TRANSMISSION COMPANY | MOBILE | 5/12/94 | TURBINE, NATURAL GAS | 15.004 | ######## | BHP | NOX | 0.5800 | GM/HP HR | AIR-TO-FUEL RATIO CONTROL, DRY LOW NOX COMBUSTION | 71.000 | BACT-PSD |
| FL-0074 | FLORIDA GAS TRANSMISSION | PERRY | 4/11/94 | TURBINE, GAS | 15.004 | 131.59 | MMBTU/H | NOX | 25.0000 | PPM @ 15% O2 | DRY LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| MI-0206 | KALAMAZOO POWER LIMITED | COMSTOCK | 3/23/94 | TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS | 15.004 | 1805.90 | MMBTU/H | NOX | 15.0000 | PPMV | DRY LOW NOX TURBINES | 0.000 | BACT-PSD |
| NM-0021 | WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR | BLANCO | 3/2/94 | TURBINE, GAS-FIRED | 15.004 | ######## | HP | NOX | 42.0000 | PPM @ 15% O2 | SOLONOX COMBUSTOR, DRY LOW NOX TECHNOLOGY | 66.000 | BACT-PSD |
| CA-0418 | SOUTHERN CALIFORNIA GAS | WHEELER RIDGE | 8/4/93 | TURBINE, GAS-FIRED | 15.004 | 47.64 | MMBTU/H | NOX | 8.0000 | PPMVD @ 15% O2 | HIGH TEMPERATURE SELECTIVE CATALYTIC REDUCTION | 93.000 | BACT-PSD |
| CA-0437 | KINGSBURG ENERGY SYSTEMS | | 8/3/93 | TURBINE, NATURAL GAS FIRED, DUCT BURNER | 15.004 | 34.50 | MW | NOX | 6.0000 | PPM @ 15% O2 | SCR, STEAM INJECTION | 90.000 | BACT-PSD |
| CA-0441 | GRANITE ROAD LIMITED | | 8/3/93 | TURBINE, GAS, ELECTRIC GENERATION | 15.004 | 460.90 | MMBTU/H* | NOX | 3.5000 | PPMVD @ 15% O2 | SCR, STEAM INJECTION | 97.000 | BACT-PSD |
| NJ-0009 | NEWARK BAY COGENERATION PARTNERSHIP | NEWARK | 7/7/93 | TURBINE, NATURAL GAS FIRED | 15.004 | 585.00 | MMBTU/HR | NOX | 0.0330 | LB/MMBTU | STEAM INJECTION AND SCR | 94.000 | BACT-PSD |

Table 5-1
Salt River Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
NOx Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NV-0015 | SAGUARO POWER COMPANY | HENDERSON | 6/1/93 | COMBUSTION TURBINE GENERATOR | 15.007 | 34.50 | MW | NOX | 16.9000 | PPH (WINTER) | SELECTIVE CATALYTIC REDUCTION (SCR) | 80.000 | BACT-PSD |
| FL-0056 | ORLANDO UTILITIES COMMISSION | TITUSVILLE | 5/14/93 | TURBINE, GAS, 4 EACH | 15.004 | 35.00 | MW | NOX | 42.0000 | PPM @ 15% O2 | WET INJECTION | 70.000 | BACT-PSD |
| FL-0059 | SEMINOLE FERTILIZER CORPORATION | BARTOW | 5/14/93 | TURBINE, GAS | 15.004 | 26.00 | MW | NOX | 9.0000 | PPM @ 15% O2 | SCR | 0.000 | BACT-PSD |
| NJ-0010 | PEDRICKTOWN COGENERATION LIMITED PARTNERSHIP | OLDMANS TOWNSHIP | 4/30/93 | TURBINE, NATURAL GAS FIRED | 15.004 | 1000.00 | MMBTU/HR | NOX | 0.0440 | LB/MMBTU | STEAM INJECTION AND SCR | 93.000 | BACT-PSD |
| NJ-0011 | LINDEN COGENERATION TECHNOLOGY | LINDEN | 4/30/93 | TURBINE, NATURAL GAS FIRED | 15.004 | 50.00 | X E12 BTU/YR | NO2 | 33.8000 | LB/HR | STEAM INJECTION AND SCR | 94.500 | BACT-PSD |
| CA-0463 | SOUTHERN CALIFORNIA GAS | WHEELER RIDGE | 5/31/92 | TURBINE, GAS FIRED, SOLAR MODEL H | 15.004 | 5500.00 | HP | NOX | 8.0000 | PPM @ 15% O2 | HIGH TEMP SELECT. CAT. REDUCTION | 93.000 | BACT-PSD |
| RI-0010 | NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO. | PROVIDENCE | 5/31/92 | TURBINE, GAS AND DUCT BURNER | 15.004 | 1360.00 | MMBTU/H EACH | NOX | 9.0000 | PPM @ 15% O2, GAS | SCR | 0.000 | BACT-PSD |
| RI-0012 | ALGONQUIN GAS TRANSMISSION CO. | BURRILLVILLE | 5/31/92 | TURBINE, GAS, 2 | 15.004 | 49.00 | MMBTU/H | NOX | 100.000 | PPM @ 15% O2 | LOW NOX COMBUSTION | 0.000 | BACT-OTHER |
| LA-0079 | ENRON LOUISIANA ENERGY COMPANY | EUNICE | 10/30/91 | TURBINE, GAS, 2 | 15.004 | 39.10 | MMBTU/H | NOX | 40.0000 | PPM @ 15% O2 | H2O INJECT 0.67 LB/LB | 71.000 | BACT-PSD |
| WA-0027 | SUMAS ENERGY INC. | SUMAS | 8/1/91 | TURBINE, NATURAL GAS | 15.004 | 88.00 | MW | NOX | 6.0000 | PPM @ 15% O2 | SCR | 90.000 | BACT-PSD |

For the auxiliary boiler, LAER is not so well defined. This type of boiler is used to support the combined cycle system during startup conditions. Thus, it is used on an as-needed basis and is not used as a standard base load steam-producing boiler. Due to limited use of this boiler, it is not technically feasible to install combustion modification techniques and/or flue-gas controls.

Because of the specialized requirements of this boiler, LAER for $NO_x$ emissions is being proposed as the combustion of natural gas, 1,200 hours per year of operation, and a $NO_x$ limitation of 0.07 lb/MMBtu.

## *5.3 CO EMISSIONS*

The combustion of natural gas in the combined cycle system and auxiliary boiler will result in the potential to generate CO emissions. Proper mixing of air and fuel is important for complete combustion to occur. When a hydrocarbon fuel, such as natural gas, burns completely, the oxygen in the air combines with the hydrogen to form water ($H_20$) and with the carbon to form carbon dioxide ($CO_2$). If the combustion is incomplete, some of the carbon atoms combine with only one oxygen atom to form carbon monoxide (CO). Because oxygen is not ideally available in stoichiometric amounts, the carbon in the gas is not oxidized completely to $CO_2$ and CO is formed.

To reduce CO emissions from natural gas combustion equipment, flue gas controls can be employed. These types of control techniques include the following:

- Oxidation Catalyst — In catalytic oxidation, a catalyst is used to oxidize CO at lower temperatures. The addition of a catalyst to the basic thermal oxidation process accelerates the rate of oxidation by absorbing oxygen from the air stream and CO in the waste stream onto the catalyst surface to react to form $CO_2$ and $H_2O$. Typical control efficiencies from an oxidation catalyst are form 80 to 90 percent; or
- SCONOx — In addition to $NO_x$, The SCONOx catalyst system also removes CO emissions by oxidizing CO to $CO_2$. The reaction is shown below:

  $CO + \frac{1}{2} O_2 \rightarrow CO_2$

A more lengthy description of the SCONOx technology is described in the previous discussion of flue-gas $NO_x$ controls. As stated previously, SRP is reluctant to install the SCONOx system due to its limited use and proven reliability on larger turbines (>100 MW).

### 5.3.1 Proposed Power Plant - Control of CO Emissions

As discussed previously, SRP has selected the SCR system over the SCONOx system. Subsequently, the proposed combined cycle system will be equipped with a dry low $NO_x$ combustor, low $NO_x$ burner for the HRSG and SCR. To further reduce CO emissions, the combined cycle system will be equipped with an oxidation catalyst. This catalyst will be capable of reducing CO emissions by 90% or more.

For the auxiliary boiler, the same reasons discussed under the NOx emission category also apply to CO emissions. Thus, to minimize CO emissions, good combustion techniques will be employed.

### 5.3.2 LAER Determination for CO Emissions

A detailed listing of facilities, along with their permitted emission rates is provided in Table 5-2. The results of the evaluation revealed that LAER for CO emissions for existing combined cycle systems across the United States is:

- 6.0 parts per million volume density at 15% $O_2$ averaged over a 3-hour period.

Several combined cycle systems have been permitted at levels below 6.0 ppmvd for emissions of CO. These systems have been installed in New Jersey and California. Each system incorporated an oxidation catalyst. However, in a document prepared by the California Air Resource Board (CARB) "Guidance for Power Plant Siting and Best Available Control Technology," the agency has concluded that LAER is 6.0 ppmvd at 15% $O_2$ averaged over a 3-hour period. This emission rate is intended to apply to CO nonattainment areas within California. The agency also believes this level of emissions is reasonable given that CO emissions violations are primarily caused by concentrated motor vehicle emissions.

Based on the above information, SRP is reluctant to commit to a CO limitation less than 6.0 ppmvd at 15% $O_2$ averaged over a 3-hour period. However, SRP is committed to the installation of an oxidation catalyst, the same type of control employed by other existing facilities who have obtained permitted emission rates below 6.0 ppmvd. In defining LAER for this type of equipment, LAER may not be the lowest rate achieved. The actual rate that can be achieved will be dictated by the type of turbine selected, burner design, add-on control equipment, operating configuration and site conditions.

Subsequently, the installation of an oxidation catalyst on the combined cycle system will be capable of achieving 6.0 ppmvd @ 15% $O_2$ over a 3-hour period. Thus, this is considered to be LAER.

For auxiliary boilers, LAER is also not well defined. This type of boiler is used to support the combined cycle system during startup conditions. It is used on an as-needed basis and is not used like a standard baseload steam-producing boiler. Due to the limited use of this boiler, it is not technical feasible to install combustion modification techniques and/or flue-gas controls.

Because of the specialized requirements of this boiler, LAER for emissions of CO is being proposed as the combustion of natural gas, 1,200 hours per year of operations and good combustion techniques.

## *5.4 VOC EMISSIONS*

The combustion of natural gas in the combined cycle system and auxiliary boiler will generate emissions of VOCs. Similar to CO emissions, VOC emissions result from incomplete combustion.

T[illegible]-2
Salt [illegible] Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
CO Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCTEFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIMA | PORT ARTHUR | PENDING | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 39.00 | MW | CO | 50.0000 | | DRY LOW NOx CONTROL, FUEL GAS FIRED | | |
| | FIMA | PORT ARTHUR | PENDING | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 39.00 | Mwe | CO | 50.0000 | | SCR CATALYST CONTROL, FUEL GAS FIRED | | |
| | UNION CARBIDE CORPORATION | SEADRIFT | PENDING | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 39.00 | MW | CO | 25.0000 | | DRY LOW NOx CONTROL | | |
| | LUBBOCK POWER AND LIGHT | LUBBOCK | 1/8/99 | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 44.00 | MW | CO | 25.0000 | | SCR CATALYST CONTROL | | |
| | PANDA ONETA POWER L.P. | ONETA | 9/29/99 | COMBINED CYCLE GAS TURBINES WITH SUPPLEMENTAL DUCT BURNERS | | 1000.00 | MW | CO | 7.8000 | PPMVD | EFFICIENT COMBUSTION | | BACT |
| AL-0128 | ALABAMA POWER COMPANY - THEODORE COGENERATION | THEODORE | 6/23/99 | TURBINE, WITH DUCT BURNER | 15.004 | 170.00 | MW | CO | 0.0860 | LB/MMBTU | EFFICIENT COMBUSTION | 0.000 | BACT-PSD |
| CT-0139 | PDC EL PASO MILFORD LLC | MILFORD | 6/17/99 | TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS | 15.004 | 1.97 | MMCF/H | CO | 13.0000 | LB/H NAT GAS | OXIDATION CATALYST | 0.000 | BACT-PSD |
| CT-0140 | PDC EL PASO MILFORD LLC | MILFORD | 6/17/99 | TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS | 15.004 | 1.97 | MMCF/H | CO | 13.0000 | LB/H NAT GAS | OXIDATION CATALYST | 0.000 | BACT-PSD |
| HI-0018 | ENCOGEN HAWAII, L.P. | HAINA | 6/8/99 | TURBINES, COMBUSTION, 2 EA | 15.007 | 23.00 | MW | CO | 57.5000 | PPMVD @ 15% O2 | GOOD COMBUSTION DESIGN AND OPERATION. | 0.000 | BACT-PSD |
| HI-0019 | MAUI ELECTRIC COMPANY | MAALAEA | 6/8/99 | TURBINE, COMBUSTION, 2 EA | 15.002 | 20.00 | MW | CO | 44.0000 | PPMVD @ 15% O2 | GOOD COMBUSTION DESIGN AND OPERATION. | 0.000 | BACT-PSD |
| CA-0855 | CROCKETT COGENERATION - C&H SUGAR | CROCKETT | 4/19/99 | TURBINE, GAS, GENERAL ELECTRIC MODEL PG7221(FA) | 15.004 | 240.00 | MW | CO | 5.9000 | PPMVD @ 15% O2 | ENGELHARD OXIDATION CATALYST | 90.000 | BACT-OTHER |
| MA-0021 | MILLENNIUM POWER PARTNER, LP | CHARLTON | 4/19/99 | TURBINE, COMBUSTION, WESTINGHOUSE MODEL 501G | 15.007 | 2534.00 | MMBTU/H | CO | 0.0700 | LB/MMBTU | DRY LOW NOX COMBUSTION TECHNOLOGY IN CONJUNCTION WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0022 | BERKSHIRE POWER DEVELOPMENT, INC. | AGAWAM | 4/19/99 | TURBINE, COMBUSTION, ABB GT24 | 15.007 | 1792.00 | MMBTU/H | CO | 14.3000 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0022 | BERKSHIRE POWER DEVELOPMENT, INC. | AGAWAM | 4/19/99 | ENGINES, CHILLER, NATURAL GAS-FIRED, TWO | 15.004 | 23.40 | MMBTU/H | CO | 0.4000 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0023 | DIGHTON POWER ASSOCIATE, LP | DIGHTON | 4/19/99 | TURBINE, COMBUSTION, ABB GT11N2 | 15.004 | 1327.00 | MMBTU/H | CO | 5.9700 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| ME-0016 | GORHAM ENERGY LIMITED PARTNERSHIP | GORHAM | 4/19/99 | TURBINE, COMBINED CYCLE | 15.007 | 900.00 | MW TOTAL | CO | 5.0000 | PPM @ 15% O2 (NAT G) | 0.05% SULFUR DISTILLATE OIL #2 IS USED. EMISSION IS FROM EACH 300 MW SYSTEM. | 0.000 | BACT-PSD |
| ME-0018 | WESTBROOK POWER LLC | WESTBROOK | 4/19/99 | TURBINE, COMBINED CYCLE, TWO | 15.004 | 528.00 | MW TOTAL | CO | 15.0000 | PPM @15% O2 | USING 15 % EXCESS AIR. | 0.000 | BACT-PSD |
| ME-0019 | CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY | BUCKSPORT | 4/19/99 | TURBINE, COMBINED CYCLE, NATURAL GAS | 15.004 | 175.00 | MW | CO | 9.0000 | PPMVD @15% O2 GAS | | 0.000 | BACT-OTHER |
| ME-0020 | CASCO RAY ENERGY CO | VEAZIE | 4/19/99 | TURBINE, COMBINED CYCLE, NATURAL GAS, TWO | 15.004 | 170.00 | MW EACH | CO | 20.0000 | PPM @ 15% O2 | 15% EXCESS AIR | 0.000 | BACT-PSD |
| MI-0244 | WYANDOTTE ENERGY | WYANDOTTE | 4/19/99 | TURBINE, COMBINED CYCLE, POWER PLANT | 15.004 | 500.00 | MW | CO | 3.0000 | PPM | CATALYTIC OXIDIZER | 90.000 | LAER |

T[illegible]-2
Salt [illegible] Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
CO Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCTEFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FL-0116 | SANTA ROSA ENERGY LLC | NORTHBROOK | 4/16/99 | TURBINE, COMBUSTION, NATURAL GAS | 15.004 | 241.00 | MW | CO | 0.0000 | | DRY LOW NOX BURNER GOOD COMBUSTION PRACTICE | 0.000 | BACT-PSD |
| WA-0280 | EEX POWER SYSTEMS, ENCOGEN NW COGENERATION PROJECT | BELLINGHAM | 4/16/99 | TURBINES, COMBINED CYCLE COGEN, GE FRAME 6 | 15.007 | 123.00 | MW | CO | 10.0000 | PPMDV @ 15% O2 | | 0.000 | BACT-PSD |
| AL-0126 | MOBILE ENERGY LLC | MOBILE | 4/9/99 | TURBINE, GAS, COMBINED CYCLE | 15.006 | 168.00 | MW | CO | 0.0400 | LB/MMBTU | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| WY-0039 | TWO ELK GENERATION PARTNERS, LIMITED PARTNERSHIP | 15 MILES SE OF WRIGHT | 3/31/99 | TURBINE, STATIONARY | 15.004 | 33.30 | MW | CO | 25.0000 | PPM @ 15% O2 | | 0.000 | OTHER |
| AL-0123 | U S ALLIANCE | COOSA PINES | 3/30/99 | TURBINE, GAS COMBUSTION W/DUCT BURNER | 30.002 | 0.00 | | CO | 0.0680 | LB/MMBTU | | 0.000 | BACT-PSD |
| ME-0015 | ANDROSCOGGIN ENERGY LIMITED | JAY | 3/17/99 | GAS TURBINES, COGEN, W/DUCT BURNERS | 15.007 | 675.00 | MMBTU/H TURBINE | CO | 74.2100 | LB/H NG | CATALYTIC OXIDATION, GOOD COMBUSTION PRACTICES. | 0.000 | BACT-PSD |
| ME-0015 | ANDROSCOGGIN ENERGY LIMITED | JAY | 3/17/99 | GAS TURBINES, COGEN, W/DUCT BURNERS | 15.007 | 675.00 | MMBTU/H TURBINE | CO | 43.7300 | LB/H NG OIL | CATALYTIC OXIDATION, GOOD COMBUSTION PRACTICES. | 0.000 | BACT-PSD |
| NJ-0031 | UNIVERSITY OF MEDICINE & DENTISTRY OF NEW JERSEY | NEWARK | 2/17/99 | COMBUSTION TURBINE COGENERATION UNITS, 3 | 15.004 | 56.00 | MMBTU/H | CO | 75.0000 | PPMVD NAT. GAS | | 0.000 | RACT |
| ME-0014 | RUMFORD POWER ASSOCIATES | RUMFORD | 2/10/99 | TURBINE GENERATOR, COMBUSTION, NATURAL GAS | 15.004 | 1906.00 | MMBTU/H | CO | 15.0000 | PPM @ 15% O2 | GE DRY LOW-NOX COMBUSTOR DESIGN. GOOD COMBUSTION CONTROL. | 0.000 | BACT-PSD |
| NM-0039 | TNP TECHN, LLC (FORMERLY TX-NM POWER CO.) | LORDSBURG | 2/10/99 | GAS TURBINES | 15.004 | 375.00 | MMBTU/H | CO | 18.0000 | PPM | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| RI-0018 | TIVERTON POWER ASSOCIATES | TIVERTON | 2/8/99 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 265.00 | MW | CO | 12.0000 | PPM @ 15% O2 | GOOD COMBUSTION | 0.000 | BACT-PSD |
| OR-0011 | HERMISTON GENERATING CO. | HERMISTON | 1/27/99 | TURBINES, NATURAL GAS (2) | 15.004 | 1696.00 | MMBTU/H | CO | 15.0000 | PPM @ 15% O2 | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| CT-0130 | BRIDGEPORT ENERGY, LLC | BRIDGEPORT | 1/21/99 | TURBINES, COMBUSTION MODEL V84.3A, 2 SIEMES | 15.004 | 260.00 | MW/HRSG PER TURBINE | CO | 10.0000 | PPM GAS & OIL | PRE-MIX FUEL FAIR TO OPTIMIZE EFFICIENCY ACTUAL EMISSIONS EXPECTED BETWEEN 5-7PPM | 0.000 | BACT-PSD |
| LA-0113 | BASF CORPORATION | GEISMAR | 1/21/99 | TURBINE, COGEN UNIT 2, GE FRAME 6 | 15.004 | 42.40 | MW | CO | 83.9300 | LB/MMBTU | GOOD DESIGN, PROPER COMBUSTION TECHNIQUES, 2% EXCESS O2 | 0.000 | BACT-PSD |
| LA-0112 | AIR LIQUIDE AMERICA CORPORATION | GEISMAR | 1/20/99 | TURBINE GAS, GE, 7ME 7 | 15.004 | 966.00 | MMBTU/H | CO | 25.0000 | PPMV | GOOD EQUIPMENT DESIGN, PROPER COMBUSTION TECHNIQUEAND MIN. 2% EXCESS O2 | 0.000 | BACT-PSD |
| PA-0148 | BLUE MOUNTAIN POWER, LP | RICHLAND | 1/12/99 | COMBUSTION TURBINE WITH HEAT RECOVERY BOILER | 15.004 | 153.00 | MW | CO | 3.1000 | PPM @ 15% O2 | OXIDATION CATALYST 16 PPM @ 15% O2 WHEN FIRING NO. 2 OIL. AT 75% NG LIMIT SET TO 22.1 PPM | 80.000 | OTHER |
| AL-0120 | GENERAL ELECTRIC PLASTICS | BURKVILLE | 7/2/98 | COMBINED CYCLE (TURBINE AND DUCT BURNER) | 15.004 | 0.00 | | CO | 0.0800 | LBS/MMBTU | PROPER COMBUSTION | 0.000 | BACT-PSD |
| CO-0024 | PUBLIC SERVICE OF COLO. FORT ST VRAIN | PLATTEVILLE | 5/19/98 | COMBINED CYCLE TURBINES (2), NATURAL | 15.004 | 471.00 | MW | CO | 15.0000 | PPMVD, SMPL CY | GOOD COMBUSTION CONTROL PRACTICES. COMMITMENT TO APATTERN OF OPERATION (LOAD VARIATIONS, ETC.) TO MINIMIZE OPERATION AT HIGH EMISSIONS. | 0.000 | BACT-PSD |
| CO-0027 | COLO. POWER PARTNERS-BRUSH COGEN FAC | BRUSH | 5/19/98 | COGEN TURBINES W/ DUCT BURNERS & BOILERS | 15.004 | 385.00 | MM BTU/HR | CO | 35.0000 | PPM @ 15% O2 | GOOD COMBUSTION | 0.000 | BACT-PSD |
| PR-0004 | ECOELECTRICA, L.P. | PENUELAS | 5/6/98 | TURBINES, COMBINED-CYCLE COGENERATION | 15.004 | 461.00 | MW | CO, GAS | 33.0000 | PPMDV | COMBUSTION CONTROLS. | 0.000 | BACT-PSD |
| PA-0149 | BUCKNELL UNIVERSITY | LEWISBURG | 11/30/97 | NG FIRED TURBINE, SOLAR TAURUS T-7300S | 15.004 | 5.00 | MW | CO | 50.0000 | PPMV@15%O2 | GOOD COMBUSTION | 0.000 | BACT-OTHER |

T[illegible]-2
Salt [illegible] Project
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RLBC Database Information - Combined Cycle Turbines
CO Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCTEFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NM-0031 | LORDSBURG L.P. | LORDSBURG | 9/29/97 | TURBINE, NATURAL GAS-FIRED, ELEC. GEN. | 15.004 | 100.00 | MW | CO | 27.0000 | LBS/HR | DRY LOW-NOX TECHNOLOGY BY MAINTAINING PROPER AIR- FUEL RATIO. | 0.000 | BACT-PSD |
| OR-0010 | PORTLAND GENERAL ELECTRIC CO. | BOARDMAN | 8/6/97 | TURBINES, NATURAL GAS (2) | 15.004 | 1720.00 | MMBTU | CO | 15.0000 | PPM @ 15% O2 | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| AL-0096 | MEAD COATED BOARD, INC. | PHENIX CITY | 5/31/97 | COMBINED CYCLE TURBINE (25 MW) | 15.004 | 568.00 | MMBTU/HR | CO | 28.0000 | PPMVD@15% O2 (GAS) | PROPER DESIGN AND GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| IN-0071 | PORTSIDE ENERGY CORP. | PORTAGE | 5/31/97 | TURBINE, NATURAL GAS-FIRED | 15.004 | 63.00 | MEGAWATT | CO, POWER MODE | 40.0000 | LBS/HR | GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 40 PPMVD AT 15% OXYGEN. | 0.000 | BACT-PSD |
| IN-0071 | PORTSIDE ENERGY CORP. | PORTAGE | 5/31/97 | TURBINE, NATURAL GAS-FIRED | 15.004 | 63.00 | MEGAWATT | CO, NON-POWER MODE | 12.0000 | LBS/HR | GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 10 PPMVD AT 15% OXYGEN. | 0.000 | BACT-PSD |
| IN-0071 | PORTSIDE ENERGY CORP. | PORTAGE | 5/31/97 | BOILERS, NATURAL GAS-FIRED (2) | 11.005 | 260.00 | MMBTU/HR | CO | 40.0000 | LBS/HR POWER AUGMENT | FUEL SPEC: NG; GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| LA-0096 | UNION CARBIDE CORPORATION | HAHNVILLE | 5/31/97 | GENERATOR, GAS TURBINE | 15.004 | 1313.00 | MM BTU/HR | CO | 198.6000 | LB/HR | NO ADD-ON CONTROL GOOD COMBUSTION PRACTICE | 0.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIELD | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1175.00 | MMBTU/H NAT. GAS | CO | 62.0000 | LB/H/UNIT | FURNACE DESIGN | 91.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIELD | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1117.00 | MMBTU/H NO2 FUEL OIL | CO | 62.0000 | LB/H/UNIT | FURNACE DESIGN | 91.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIELD | 5/7/97 | TURBINE, COMBUSTION, 2 | 15.999 | 0.00 | | CO | 229.3000 | T/YR/UNIT | | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 474.00 | X10(6) BTU/HR N. GAS | CO | 11.0000 | LBS/HR | GOOD COMBUSTION | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 468.00 | X10(6) BTU/HR #2 OIL | CO | 11.0000 | LBS/HR | GOOD COMBUSTION | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS (TOTAL) | 15.007 | 0.00 | | CO | 48.2000 | TPY | GOOD COMBUSTION | 0.000 | BACT-PSD |
| VA-0206 | POTOMACK POWER PARTNERS, LIMITED PARTNERSHIP | LEESBURG | 5/7/97 | TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3 | 15.007 | 10.20 | X109 SCF/YR NAT GAS | CO | 26.0000 | LB/HR | GOOD COMBUSTION OPERATING PRACTICES | 0.000 | BACT-PSD |
| LA-0093 | FORMOSA PLASTICS CORPORATION, BATON ROUGE PLANT | BATON ROUGE | 4/28/97 | TURBINE/HSRG, GAS COGENERATION | 15.004 | 450.00 | MM BTU/HR | CO | 70.0000 | LB/HR | COMBUSTION DESIGN AND CONSTRUCTION. | 0.000 | BACT-PSD |
| NM-0029 | SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA | HOBBS | 3/31/97 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 100.00 | MW | CO | 0.0000 | SEE FACILITY NOTES | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| GA-0063 | MID-GEORGIA COGEN. | KATHLEEN | 8/19/96 | COMBUSTION TURBINE (2), NATURAL GAS | 15.004 | 116.00 | MW | CO | 10.0000 | PPMVD | COMPLETE COMBUSTION | 0.000 | BACT-PSD |
| MS-0028 | SOUTH MISSISSIPPI ELECTRIC POWER ASSOC. | MOSELL | 8/19/96 | COMBUSTION TURBINE, COMBINED CYCLE | 15.007 | 1299.00 | MMBTU/HR NAT GAS | CO | 26.3000 | PPM @ 15% O2, GAS | GOOD COMBUSTION CONTROLS | 0.000 | BACT-PSD |
| NC-0059 | CAROLINA POWER & LIGHT | GOLDSBORO | 8/19/96 | COMBUSTION TURBINE, 4 EACH | 15.007 | 1907.60 | MMBTU/HR | CO, GAS | 80.0000 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |

T[illegible]-2
Salt [illegible] Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
CO Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCTEFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FL-0104 | SEMINOLE HARDEE UNIT 3 | FORT GREEN | 5/31/96 | COMBINED CYCLE COMBUSTION TURBINE | 15.007 | 140.00 | MW | CO | 20.0000 | PPM (NAT. GAS) | DRY LNB GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0102 | PANDA-KATHLEEN, L.P. | LAKELAND | 5/20/96 | COMBINED CYCLE COMBUSTION TURBINE (TOTAL 115MW) | 15.004 | 75.00 | MW | CO | 25.0000 | PPM @ 15% O2 | COMBUSTION CONTROLS STANDARD ONLY APPLIES IF GE CT IS SELECTED, THE ABB CT WAS LESS THAN SIGNIFICANT EMIS. INCR FOR CO | 0.000 | BACT-PSD |
| SC-0036 | CAROLINA POWER AND LIGHT | HARTSVILLE | 4/29/96 | STATIONARY GAS TURBINE | 15.007 | 1520.00 | MMBTU/H | CO (NG) | 702.0000 | LB/H | PROPER OPERATION TO ACHIEVE GOOD COMBUSTION | 0.000 | BACT-PSD |
| NY-0044 | BROOKLYN NAVY YARD COGENERATION PARTNERS L.P. | NEW YORK CITY | 6/30/95 | TURBINE, NATURAL GAS FIRED | 15.004 | 240.00 | MW | CO | 4.0000 | PPM @ 15% O2 | | 0.000 | LAER |
| NY-0068 | KAMINE/BESICORP NATURAL DAM LP | NATURAL DAM | 6/30/95 | GE FRAME 6 GAS TURBINE | 15.007 | 500.00 | MMBTU/HR | CO | 0.0200 | LB/MMBTU, 10 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NJ-0013 | LAKEWOOD COGENERATION, L.P. | LAKEWOOD TOWNSHIP | 5/29/95 | TURBINES (NATURAL GAS) (2) | 15.004 | 1190.00 | MMBTU/HR (EACH) | CO | 0.0260 | LB/MMBTU | TURBINE DESIGN | 0.000 | BACT-OTHER |
| NJ-0017 | NEWARK BAY COGENERATION PARTNERSHIP, L.P. | NEWARK | 5/29/95 | TURBINES, COMBUSTION, NATURAL GAS-FIRED (2) | 15.004 | 617.00 | MMBTU/HR (EACH) | CO | 1.8000 | PPMDV | OXIDATION CATALYST | 0.000 | OTHER |
| NJ-0017 | NEWARK BAY COGENERATION PARTNERSHIP, L.P. | NEWARK | 5/29/95 | BOILER, AUXILIARY, NATURAL GAS-FIRED | 11.005 | 200.00 | MMBTU/HR | CO | 0.0400 | LB/MMBTU | BOILER DESIGN | 0.000 | OTHER |
| NM-0024 | MILAGRO, WILLIAMS FIELD SERVICE | BLOOMFIELD | 5/29/95 | TURBINE/COGEN, NATURAL GAS (2) | 15.004 | 900.00 | MMCF/DAY | CO | 27.6000 | PPM @ 15% O2 | | 0.000 | BACT-PSD |
| NY-0061 | ANITEC COGEN PLANT | BINGHAMTON | 4/27/95 | GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001 | 15.007 | 451.00 | MMBTU/HR | CO | 36.0000 | PPM, 33 LB/HR | BAFFLE CHAMBER | 80.000 | SEE NOTE #4 |
| NY-0062 | FULTON COGEN PLANT | FULTON | 4/27/95 | GE LM5000 GAS TURBINE | 15.007 | 500.00 | MMBTU/HR | CO | 107.0000 | PPM, 120 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0062 | FULTON COGEN PLANT | FULTON | 4/27/95 | STACK EMISSIONS (GAS TURBINE AND DUCT BURNER) | 11.004 | 610.00 | MMBTU/HR (TOTAL) | CO | 156.0000 | PPM, 175.0 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0063 | TBG COGEN COGENERATION PLANT | BETHPAGE | 4/27/95 | GE LM2500 GAS TURBINE | 15.007 | 214.90 | MMBTU/HR | CO | 0.1810 | LB/MMBTU | CATALYTIC OXIDIZER | 80.000 | BACT |
| NY-0064 | INDECK-OSWEGO ENERGY CENTER | OSWEGO | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 533.00 | LB/MMBTU | CO | 10.0000 | PPM, 10.00 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0065 | KAMINE/BESICORP CARTHAGE L.P. | CARTHAGE | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 491.00 | BTU/HR | CO | 10.0000 | PPM, 11.0 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0065 | KAMINE/BESICORP CARTHAGE L.P. | CARTHAGE | 4/27/95 | STACK (GAS TURBINE & DUCT BURNER) **SEE NOTE #3** | 11.004 | 540.00 | LB/MMBTU | CO | 23.0000 | PPM, 28.3 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0071 | KAMINE SOUTH GLENS FALLS COGEN CO | SOUTH GLENS FALLS | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 498.00 | MMBTU/HR | CO | 9.0000 | PPM, 11.0 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0072 | KAMINE/BESICORP SYRACUSE LP | SOLVAY | 4/27/95 | SIEMENS V64.3 GAS TURBINE (EP #00001) | 15.007 | 650.00 | MMBTU/HR | CO | 9.5000 | PPM | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0073 | LOCKPORT COGEN FACILITY | LOCKPORT | 4/27/95 | (6) GE FRAME 6 TURBINES (EP #S 00001-00006) | 15.007 | 423.90 | MMBTU/HR | CO | 10.0000 | PPM | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0075 | PILGRIM ENERGY CENTER | ISLIP | 4/27/95 | (2) WESTINGHOUSE W501D5 TURBINES (EP #S 00001&2) | 15.007 | 1400.00 | MMBTU/HR | CO | 10.0000 | PPM, 29.0 LB/HR | | 0.000 | BACT-OTHER |
| NY-0079 | LEDERLE LABORATORIES | PEARL RIVER | 4/27/95 | (2) GAS TURBINES (EP #S 00101&102) | 15.007 | 110.00 | MMBTU/HR | CO | 48.0000 | PPM, 12.6 LB/HR | | 0.000 | BACT-OTHER |

T[illegible]-2
Salt [illegible] Project
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RLBC Database Information - Combined Cycle Turbines
CO Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCTEFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NM-0022 | MARATHON OIL CO. - INDIAN BASIN N.G. PLAN | CARLSBAD | 4/26/95 | TURBINES, NATURAL GAS (2) | 15.004 | 5500.00 | HP | CO | 13.2000 | LBS/HR | LEAN-PREMIXED COMBUSTION TECHNOLOGY. | 66.000 | BACT-PSD |
| LA-0086 | INTERNATIONAL PAPER | MANSFIELD | 4/17/95 | TURBINE/HRSG, GAS COGEN | 15.004 | 338.00 | MM BTU/HR TURBINE | CO | 165.9000 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT |
| LA-0089 | FORMOSA PLASTICS CORPORATION, LOUISIANA | BATON ROUGE | 4/17/95 | TURBINE/HRSG, GAS COGENERATION | 15.004 | 450.00 | MM BTU/HR | CO | 25.8000 | LB/HR | PROPER OPERATION | 0.000 | BACT-PSD |
| OH-0218 | CNG TRANSMISSION | WASHINGTON COURT HOUSE | 4/5/95 | TURBINE (NATURAL GAS) (3) | 15.004 | 5500.00 | HP (EACH) | CO | 0.0150 | G/HP-HR | FUEL SPEC: USE OF NATURAL GAS | 0.000 | OTHER |
| NY-0066 | INDECK ENERGY COMPANY | SILVER SPRINGS | 3/31/95 | GE FRAME 6 GAS TURBINE EP #00001 | 15.007 | 491.00 | MMBTU/HR | CO | 40.0000 | PPM | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0076 | TRIGEN MITCHEL FIELD | HEMPSTEAD | 3/31/95 | GE FRAME 6 GAS TURBINE | 15.007 | 424.70 | MMBTU/HR | CO | 10.0000 | PPM, 10.0 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0077 | INDECK-YERKES ENERGY SERVICES | TONAWANDA | 3/31/95 | GE FRAME 6 GAS TURBINE (EP #00001) | 15.007 | 432.20 | MMBTU/HR | CO | 10.0000 | PPM, 10 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0080 | PROJECT ORANGE ASSOCIATES | SYRACUSE | 3/31/95 | GE LM-5000 GAS TURBINE | 15.004 | 550.00 | MMBTU/HR | CO | 92.0000 | LB/HR TEMP > 20F | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0080 | PROJECT ORANGE ASSOCIATES | SYRACUSE | 3/31/95 | STACK (TURBINE AND DUCT BURNER) | 11.005 | 715.00 | MMBTU/HR | CO | 106.4000 | LB/HR TEMP > 20F | OXIDATION CATALYST | 80.000 | BACT |
| NY-0057 | MEGAN-RACINE ASSOCIATES, INC | CANTON | 3/30/95 | GE LM5000-N COMBINED CYCLE GAS TURBINE | 15.007 | 401.00 | LB/MMBTU | CO | 0.0260 | LB/MMBTU, 11 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0081 | LILCO SHOREHAM | HICKSVILLE | 3/30/95 | (3) GE FRAME 7 TURBINES (EP #S 00007-9) | 15.002 | 850.00 | MMBTU/HR | CO | 10.0000 | PPM, 19.7 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| AL-0069 | INTERNATIONAL PAPER CO. RIVERDALE MILL | SELMA | 3/24/95 | TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER | 15.007 | 40.00 | MW | CO | 22.1000 | LB/HR | DESIGN | 0.000 | BACT-PSD |
| AZ-0010 | EL PASO NATURAL GAS | | 3/24/95 | TURBINE, GAS, SOLAR CENTAUR H | 15.004 | 5500.00 | HP | CO | 10.5000 | PPM @ 15% O2 | FUEL SPEC: LEAN FUEL MIX | 0.000 | BACT-PSD |
| AZ-0011 | EL PASO NATURAL GAS | | 3/24/95 | TURBINE, GAS, SOLAR CENTAUR H | 15.004 | 5500.00 | HP | CO | 10.5000 | PPM @ 15% O2 | FUEL SPEC: LEAN FUEL MIX | 0.000 | BACT-PSD |
| CO-0017 | THERMO INDUSTRIES, LTD. | FT. LUPTON | 3/24/95 | TURBINE, GAS FIRED, 5 EACH | 15.004 | 246.00 | MMBTU/H | CO | 25.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| CO-0023 | PHOENIX POWER PARTNERS | GREELEY | 3/24/95 | GENERATOR, STEAM, W/ DUCT BURNER | 11.005 | 50.00 | MMBTU/HR | CO | 91.1800 | TPY | FUEL SPEC: NATURAL GAS COMBUSTION | 0.000 | OTHER |
| FL-0045 | CHARLES LARSEN POWER PLANT | CITY OF OF LAKELAND | 3/24/95 | TURBINE, GAS, 1 EACH | 15.004 | 80.00 | MW | CO | 25.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0052 | FLORIDA POWER AND LIGHT | NORTH PALM BEACH | 3/24/95 | TURBINE, GAS, 4 EACH | 15.004 | 400.00 | MW | CO | 30.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0052 | FLORIDA POWER AND LIGHT | NORTH PALM BEACH | 3/24/95 | TURBINE, CG, 4 EACH | 15.004 | 400.00 | MW | CO | 33.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0053 | FLORIDA POWER AND LIGHT | LAVOGROME STATION | 3/24/95 | TURBINE, GAS, 4 EACH | 15.004 | 240.00 | MW | CO | 30.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0054 | LAKE COGEN LIMITED | UMATILLA | 3/24/95 | TURBINE, GAS, 2 EACH | 15.004 | 42.00 | MW | CO | 42.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| GA-0052 | SAVANNAH ELECTRIC AND POWER CO. | | 3/24/95 | TURBINES, 8 | 15.004 | 1032.00 | MMBTU/H, NAT GAS | CO | 9.0000 | PPM @ 15% O2 | FUEL SPEC: LOW SULFUR FUEL OIL | 0.000 | BACT-PSD |

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Salt [illegible]roject
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
CO Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCTEFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GA-0052 | SAVANNAH ELECTRIC AND POWER CO. | | 3/24/95 | TURBINES, 8 | 15.006 | 972.00 | MMBTU/H, #2 OIL | CO | 9.0000 | PPM @ 15% O2 | FUEL SPEC: LOW SULFUR FUEL OIL | 0.000 | BACT-PSD |
| GA-0053 | HARTWELL ENERGY LIMITED PARTNERSHIP | HARTWELL | 3/24/95 | TURBINE, GAS FIRED (2 EACH) | 15.004 | 1817.00 | M BTU/HR | CO | 25.0000 | PPMVD @ FULL LOAD | FUEL SPEC: CLEAN BURNING FUELS | 0.000 | BACT-PSD |
| HI-0015 | MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA | MAUI | 3/24/95 | TURBINE, COMBINED-CYCLE COMBUSTION | 15.006 | 28.00 | MW | CO | 26.9000 | LB/HR | COMBUSTION TECHNOLOGY/DESIGN | 0.000 | BACT-OTHER |
| MA-0015 | PEABODY MUNICIPAL LIGHT PLANT | PEABODY | 3/24/95 | TURBINE, 38 MW NATURAL FAS FIRED | 15.004 | 412.00 | MMBTU/HR | CO | 40.0000 | PPM @ 15% O2 | GOOD COMBUSTION PRACTICES | 0.000 | BACT-OTHER |
| MD-0019 | BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT | PERRYMMAN | 3/24/95 | TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC | 15.004 | 140.00 | MW | CO | 20.0000 | PPM @ 15% O2 | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| NC-0055 | DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION | LOWESVILLE | 3/24/95 | TURBINE, COMBUSTION | 15.006 | 1247.00 | MM BTU/HR | CO | 60.0000 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| NC-0055 | DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION | LOWESVILLE | 3/24/95 | TURBINE, COMBUSTION | 15.004 | 1313.00 | MM BTU/HR | CO | 59.0000 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| NV-0017 | NEVADA POWER COMPANY, HARRY ALLEN PEAKING PLANT | LAS VEGAS | 3/24/95 | COMBUSTION TURBINE ELECTRIC POWER GENERATION | 15.004 | 600.00 | MW (8 UNITS 75 EACH) | CO | 152.5000 | TPY (EACH TURBINE) | PRECISION CONTROL FOR THE LOW NOX COMBUSTOR | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINE FACILITY, GAS | 15.007 | 1331.13 | X10(7) SCF/Y NAT GAS | CO | 249.9000 | TOTAL TPY | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINE FACILITY, GAS | 15.007 | 7.44 | X10(7) GPY FUEL OIL | CO | 249.9000 | TOTAL TPY | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINES (2) [EACH WITH A SF] | 15.007 | 1.51 | X10(9) BTU/HR N GAS | CO | 57.0000 | LBS/HR/UNIT | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINES (2) [EACH WITH A SF] | 15.007 | 1.36 | X10(9) BTU/H #2 OIL | CO | 68.0000 | LBS/HR/UNIT | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0068 | ORANGE COGENERATION LP | BARTOW | 1/13/95 | TURBINE, NATURAL GAS, 2 | 15.004 | 368.30 | MMBTU/H | CO | 30.0000 | PPMVD | GOOD COMBUSTION | 0.000 | BACT-PSD |
| FL-0072 | TIGER BAY LP | FT. MEADE | 1/13/95 | TURBINE, GAS | 15.004 | 1614.80 | MMBTU/H | CO | 49.0000 | LB/H | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0078 | KISSIMMEE UTILITY AUTHORITY | INTERCESSI ON CITY | 1/13/95 | TURBINE, NATURAL GAS | 15.004 | 869.00 | MMBTU/H | CO | 54.0000 | LB/H | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0078 | KISSIMMEE UTILITY AUTHORITY | INTERCESSI ON CITY | 1/13/95 | TURBINE, NATURAL GAS | 15.004 | 367.00 | MMBTU/H | CO | 40.0000 | LB/H | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0080 | AUBURNDALE POWER PARTNERS, LP | AUBURNDAL E | 1/13/95 | TURBINE,GAS | 15.004 | 1214.00 | MMBTU/H | CO | 15.0000 | PPMVD | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0082 | FLORIDA POWER CORPORATION POLK COUNTY SITE | BARTOW | 1/13/95 | TURBINE, NATURAL GAS (2) | 15.004 | 1510.00 | MMBTU/H | CO | 25.0000 | PPMVD | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| CA-0613 | UNOCAL | WILMINGTON | 12/5/94 | TURBINE, GAS (SEE NOTES) | 15.004 | 0.00 | | CO | 10.0000 | PPM @ 15% O2 | OXIDATION CATALYST | 75.000 | BACT-OTHER |
| TX-0231 | WEST CAMPUS COGENERATION COMPANY | COLLEGE STATION | 10/31/94 | GAS TURBINES | 15.004 | 75.30 | MW (TOTAL POWER) | CO | 300.0000 | TPY | INTERNAL COMBUSTION CONTROLS | 0.000 | BACT |
| NY-0045 | SELKIRK COGENERATION PARTNERS, L.P. | SELKIRK | 9/13/94 | COMBUSTION TURBINES (2) (252 MW) | 15.004 | 1173.00 | MMBTU/HR (EACH) | CO | 10.0000 | PPM | COMBUSTION CONTROLS | 0.000 | BACT-OTHER |

T[illegible]-2
Salt [illegible] Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
CO Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCTEFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NY-0045 | SELKIRK COGENERATION PARTNERS, L.P. | SELKIRK | 9/13/94 | COMBUSTION TURBINE (79 MW) | 15.004 | 1173.00 | MMBTU/HR | CO | 25.0000 | PPM | COMBUSTION CONTROL | 0.000 | BACT-OTHER |
| NY-0046 | SARANAC ENERGY COMPANY | PLATTSBURGH | 9/13/94 | TURBINES, COMBUSTION (2) (NATURAL GAS) | 15.004 | 1123.00 | MMBTU/HR (EACH) | CO | 3.0000 | PPM | OXIDATION CATALYST | 0.000 | BACT-OTHER |
| NY-0047 | PASNY/HOLTSVILLE COMBINED CYCLE PLANT | HOLTSVILLE | 9/13/94 | TURBINE, COMBUSTION GAS (150 MW) | 15.007 | 1146.00 | MMBTU/HR (GAS)* | CO | 8.5000 | PPM | COMBUSTION CONTROL | 0.000 | BACT-OTHER |
| NY-0050 | SITHE/INDEPENDENCE POWER PARTNERS | OSWEGO | 9/13/94 | TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW) | 15.004 | 2133.00 | MMBTU/HR (EACH) | CO | 13.0000 | PPM | COMBUSTION CONTROLS | 0.000 | BACT-OTHER |
| AZ-0012 | EL PASO NATURAL GAS | | 7/20/94 | TURBINE, NAT. GAS TRANSM., GE FRAME 3 | 15.004 | 12000.00 | HP | CO | 60.0000 | PPM @ 15% O2 | LEAN BURN | 0.000 | BACT-PSD |
| CO-0019 | COLORADO POWER PARTNERSHIP | BRUSH | 7/20/94 | TURBINES, 2 NAT GAS & 2 DUCT BURNERS | 15.004 | 385.00 | MMBTU/H EACH TURBINE | CO | 22.4000 | PPM @ 15% O2 | | 0.000 | BACT-PSD |
| CO-0020 | CIMARRON CHEMICAL | JOHNSTOWN | 7/20/94 | TURBINE #2, GE FRAME 6 | 15.004 | 33.00 | MW | CO | 250.0000 | T/YR, LESS THAN | CO CATALYST | 0.000 | OTHER |
| PA-0083 | NORTHERN CONSOLIDATED POWER | NORTH EAST | 7/20/94 | TURBINES, GAS, 2 | 15.004 | 34.60 | KW EACH | CO | 110.0000 | T/YR | OXIDATION CATALYST | 90.000 | OTHER |
| WI-0067 | WEPCU, PARIS SITE | PARIS | 7/20/94 | TURBINES, COMBUSTION (4) | 15.007 | 0.00 | | CO | 25.0000 | LBS/HR (SEE NOTES) | | 0.000 | BACT-PSD |
| AL-0074 | FLORIDA GAS TRANSMISSION COMPANY | MOBILE | 5/12/94 | TURBINE, NATURAL GAS | 15.004 | 12600.00 | BHP | CO | 0.4200 | GM/HP HR | AIR-TO-FUEL RATIO CONTROL, DRY COMBUSTION CONTROLS | 0.000 | BACT-PSD |
| MI-0206 | KALAMAZOO POWER LIMITED | COMSTOCK | 3/23/94 | TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS | 15.004 | 1805.90 | MMBTU/H | CO | 20.0000 | PPMV | DRY LOW NOX TURBINES | 0.000 | BACT-PSD |
| NM-0021 | WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR | BLANCO | 3/2/94 | TURBINE, GAS-FIRED | 15.004 | 11257.00 | HP | CO | 50.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| CA-0418 | SOUTHERN CALIFORNIA GAS | WHEELER RIDGE | 8/4/93 | TURBINE, GAS-FIRED | 15.004 | 47.64 | MMBTU/H | CO | 7.7400 | PPM @ 15% O2 | HIGH TEMPERATURE OXIDATION CATALYST | 80.000 | BACT-PSD |
| NJ-0009 | NEWARK BAY COGENERATION PARTNERSHIP | NEWARK | 7/7/93 | TURBINE, NATURAL GAS FIRED | 15.004 | 585.00 | MMBTU/HR | CO | 0.0055 | LB/MMBTU | CATALYTIC OXIDATION | 80.000 | BACT-PSD |
| NV-0015 | SAGUARO POWER COMPANY | HENDERSON | 6/1/93 | COMBUSTION TURBINE GENERATOR | 15.007 | 34.50 | MW | CO | 9.0000 | PPH | CONVERTER (CATALYTIC) | 90.000 | BACT-PSD |
| FL-0056 | ORLANDO UTILITIES COMMISSION | TITUSVILLE | 5/14/93 | TURBINE, GAS, 4 EACH | 15.004 | 35.00 | MW | CO | 10.0000 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| CA-0463 | SOUTHERN CALIFORNIA GAS | WHEELER RIDGE | 5/31/92 | TURBINE, GAS FIRED, SOLAR MODEL H | 15.004 | 5500.00 | HP | CO | 7.7400 | PPM @ 15% O2 | HIGH TEMP OXIDATION CATALYST | 80.000 | BACT-PSD |
| RI-0010 | NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO. | PROVIDENCE | 5/31/92 | TURBINE, GAS AND DUCT BURNER | 15.004 | 1360.00 | MMBTU/H EACH | CO | 11.0000 | PPM @ 15% O2, GAS | | 0.000 | BACT-PSD |
| RI-0012 | ALGONQUIN GAS TRANSMISSION CO. | BURRILLVILLE | 5/31/92 | TURBINE, GAS, 2 | 15.004 | 49.00 | MMBTU/H | CO | 0.1140 | LB/MMBTU | GOOD COMBUSTION PRACTICES | 0.000 | BACT-OTHER |
| LA-0079 | ENRON LOUISIANA ENERGY COMPANY | EUNICE | 10/30/91 | TURBINE, GAS, 2 | 15.004 | 39.10 | MMBTU/H | CO | 60.0000 | PPM @ 15% O2 | BASE CASE, NO ADDITIONAL CONTROLS | 0.000 | BACT-PSD |

VOC emissions are released in the exhaust flue gas when some of the hydrocarbon fuel remains unburned or is partially burned during combustion. To reduce VOC emissions from combined cycle systems and an auxiliary boiler, combustion techniques and/or flue-gas controls are employed.

Generally, maximizing the time, temperature, and turbulence, provides for more efficient combustion and reduces VOC emissions. Residence time is the amount of time for the combustion gases to flow through the combustor. The longer the residence, however, the more $NO_x$ emissions are produced due to exposure of the combustion gases to high temperatures for increased periods of time.

Like CO emissions, VOC emissions have traditionally been abated with combustion controls and oxidation catalysts. In addition, due to low VOC emissions concentrations, the control of VOC emissions from gas turbines was relatively unimportant to regulators compared to those of $NO_x$ and CO. As a result, initial control of VOC emissions experienced with oxidation catalysts were more coincidental then intentional since the oxidation catalysts were initially utilized to control CO emissions. Once oxidation catalysts were required for VOC control, control efficiencies of 40 to 50 percent were apparently possible.

### 5.4.1 Proposed Power Plant - Control of VOC Emissions

The proposed power plant will employ an oxidation catalyst on the combined cycle system and good combustion techniques on the auxiliary boiler.

### 5.4.2 LAER Determination for VOC Emissions

A detailed listing of existing facilities with their permitted emission rates is provided in Table 5-3. The results for the evaluation show that LAER for emissions of VOCs for existing combined cycle systems is:

- 2.0 parts per million volume density at 15% $O_2$ averaged over a 1-hour period.

The installation of an oxidation catalyst on the combined cycle system will be capable of achieving 2.7 ppmvd @ 15% $O_2$ over a 1-hour period. Thus, this is considered LAER. The California Air Resource Board has also concluded that LAER for VOC emissions is 2.0 ppmvd at 15% $O_2$ averaged over a 1-hour period. This limitation should be achieved on a combined cycle system through the use of an oxidation catalyst.

Based on the above information, SRP is reluctant to commit to a VOC limitation of 2.0 ppmvd at 15% $O_2$. However, SRP is committed to the installation of an oxidation catalyst, the same type of control employed by other existing facilities which have obtained permit emission rates below 2.7 ppmvd. In defining LAER for this type of equipment, LAER may not be the lowest rate achieved. The actual rate that can be achieved will be dictated by the type of turbine selected, burner design add-on control equipment, operating configuration and site conditions. Based on vendor data and an assumed efficiency of 20% from the oxidation catalyst, a guarantee of 2.7 ppmvd is being provided by the system's vendors. It is possible that once the equipment is installed and becomes

Salt [illegible] Project

Proposed Power Plant - Existing Kyrene Generating Station

RLBC Database Information - Combined Cycle Turbines

VOC Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | CAS | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FIMA | PORT ARTHUR | PENDING | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 39.00 | Mwe | VOC | | 1.40 | | DRY LOW NOx CONTROL, FUEL GAS FIRED | | |
| | FIMA | PORT ARTHUR | PENDING | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 39.00 | Mwe | VOC | | 1.40 | | SCR CATALYST CONTROL, FUEL GAS FIRED | | |
| | UNION CARBIDE CORPORATION | SEADRIFT | PENDING | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 39.00 | MW | VOC | | 7.00 | | DRY LOW NOx CONTROL | | |
| | LUBBOCK POWER AND LIGHT | LUBBOCK | 1/8/99 | COMBINED CYCLE UNIT WITH HEAT RECOVERY AND SUPPLEMENTAL DUCT BURNER FIRING | | 44.00 | MW | VOC | | 10.00 | | SCR CATALYST CONTROL | | |
| | PANDA ONETA POWER L.P. | ONETA | 9/29/99 | COMBINED CYCLE GAS TURBINES WITH SUPPLEMENTAL DUCT BURNERS | | 1000.00 | MW | VOC | | 1.2000 | PPMVD | EFFICIENT COMBUSTION | | BACT |
| AL-0128 | ALABAMA POWER COMPANY - THEODORE COGENERATION | THEODORE | 6/23/99 | TURBINE, WITH DUCT BURNER | 15.004 | 170.00 | MW | VOC | VOC | 0.02 | LB/MMBTU | EFFICIENT COMBUSTION | 0.000 | BACT-PSD |
| CT-0139 | PDC EL PASO MILFORD LLC | MILFORD | 6/17/99 | TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS | 15.004 | 1.97 | MMCF/H | VOC | VOC | 3.00 | LB/H NAT GAS | COMBUSTION CONTROLS | 0.000 | BACT |
| CT-0140 | PDC EL PASO MILFORD LLC | MILFORD | 6/17/99 | TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS | 15.004 | 1.97 | MMCF/H | VOC | VOC | 3.00 | LB/H NAT GAS | COMBUSTION CONTROLS | 0.000 | BACT |
| HI-0018 | ENCOGEN HAWAII, L.P. | HAINA | 6/8/99 | TURBINES, COMBUSTION, 2 EA | 15.007 | 23.00 | MW | VOC | VOC | 6.50 | PPMVD @ 15% O2 | GOOD COMBUSTION DESIGN AND OPERATION. | 0.000 | BACT-PSD |
| HI-0019 | MAUI ELECTRIC COMPANY | MAALAEA | 6/8/99 | TURBINE, COMBUSTION, 2 EA | 15.002 | 20.00 | MW | VOC | VOC | 10.00 | PPMVD @ 15% O2 | GOOD COMBUSTION DESIGN AND OPERATION. | 0.000 | BACT-PSD |
| HI-0020 | HAWAII ELECTRIC LIGHT CO. | KEAHOLE | 6/8/99 | TURBINE, COMBUSTION, GELM 2500, 2 EA | 15.002 | 20.00 | MW | VOC | VOC | 2.50 | PPMVD @ 15% O2 | GOOD COMBUSTION DESIGN AND OPERATION. | 0.000 | BACT-PSD |
| CA-0855 | CROCKETT COGENERATION - C&H SUGAR | CROCKETT | 4/19/99 | TRUBINE, GAS, GENERAL ELECTRIC MODEL PG7221(FA) | 15.004 | 240.00 | MW | VOC | VOC | 352.60 | LB/D | ENGELHARD OXIDATION CATALYST | 50.000 | BACT-OTHER |
| MA-0021 | MILLENNIUM POWER PARTNER, LP | CHARLTON | 4/19/99 | TURBINE, COMBUSTION, WESTINGHOUSE MODEL 501G | 15.007 | 2534.00 | MMBTU/H | VOC | VOC | 0.00 | LB/MMBTU | DRY LOW NOX COMBUSTION TECHNOLOGY IN COJUNCTION WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0022 | BERKSHIRE POWER DEVELOPMENT, INC. | AGAWAM | 4/19/99 | TURBINE, COMBUSTION, ABB GT24 | 15.007 | 1792.00 | MMBTU/H | VOC | VOC | 6.30 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0022 | BERKSHIRE POWER DEVELOPMENT, INC. | AGAWAM | 4/19/99 | ENGINES, CHILLER, NATURAL GAS-FIRED, TWO | 15.004 | 23.40 | MMBTU/H | VOC | VOC | 0.30 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0023 | DIGHTON POWER ASSOCIATE, LP | DIGHTON | 4/19/99 | TURBINE, COMBUSTION, ABB GT11N2 | 15.004 | 1327.00 | MMBTU/H | VOC | VOC | 5.10 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| ME-0016 | GORHAM ENERGY LIMITED PARTNERSHIP | GORHAM | 4/19/99 | TURBINE, COMBINED CYCLE | 15.007 | 900.00 | MW TOTAL | VOC | VOC | 0.00 | LB/MMBTU NAT GAS | 0.5 % SULFUR DISTILLATE OIL #2 IS USED. EMISSION IS FROM EACH 300 MW SYSTEM. | 0.000 | BACT-PSD |
| ME-0018 | WESTBROOK POWER LLC | WESTBROOK | 4/19/99 | TURBINE, COMBINED CYCLE, TWO | 15.004 | 528.00 | MW TOTAL | VOC | VOC | 0.40 | PPM @ 15% O2 | | 0.000 | BACT-PSD |
| ME-0019 | CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY | BUCKSPORT | 4/19/99 | TURBINE, COMBINED CYCLE, NATURAL GAS | 15.004 | 175.00 | MW | VOC | VOC | 3.00 | LB/H GAS | | 0.000 | BACT-OTHER |

T[illegible]-3
Salt [illegible] Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
VOC Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | CAS | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ME-0020 | CASCO RAY ENERGY CO | VEAZIE | 4/19/99 | TURBINE, COMBINED CYCLE, NATURAL GAS, TWO | 15.004 | 170.00 | MW EACH | VOC | VOC | 1.00 | PPM | LOW NOX BURNER | 0.000 | BACT-PSD |
| MN-0035 | LSP - COTTAGE GROVE, L.P. | COTTAGE GROVE | 4/19/99 | GENERATOR, COMBUSTION TURBINE & DUCT BURNER | 15.007 | 1988.00 | MMBTU/H (CTG) | VOC | VOC | 0.01 | LB/MMBTU (NAT GAS) | NATURAL GAS COMBUSTION | 0.000 | BACT-PSD |
| AL-0126 | MOBILE ENERGY LLC | MOBILE | 4/9/99 | TURBINE, GAS, COMBINED CYCLE | 15.006 | 168.00 | MW | VOC | VOC | 0.01 | LB/MMBTU | GOOD COMBUSTION PRACTICE | 0.000 | BACT-PSD |
| CA-0810 | SACRAMENTO COGENERATION AUTHORITY P&G | SACRAMENTO | 3/17/99 | TURBINE, GAS, COMBINED CYCLE LM6000 | 15.004 | 421.40 | MMBTU/H | VOC | VOC | 1.10 | LB/H | OXIDATION CATALYST | 0.000 | BACT |
| CA-0810 | SACRAMENTO COGENERATION AUTHORITY P&G | SACRAMENTO | 3/17/99 | TURBINE, GAS, COMBINED CYCLE LM6000 | 15.004 | 421.40 | MMBTU/H | VOC | VOC | 1.10 | LB/H | OXIDATION CATALYST | 0.000 | BACT |
| CA-0813 | SEPCO | RIO LINDA | 3/17/99 | TURBINE, GAS COMBINED CYCLE GE MODEL 7 | 15.004 | 920.00 | MMBTU/H | VOC | VOC | 3.70 | LB/H | OXIDATION CATALYST | 0.000 | BACT |
| RI-0018 | TIVERTON POWER ASSOCIATES | TIVERTON | 2/8/99 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 265.00 | MW | VOC | VOC | 2.00 | PPM @ 15% O2 | GOOD COMBUSTION | 0.000 | BACT-PSD |
| PA-0148 | BLUE MOUNTAIN POWER, LP | RICHLAND | 1/12/99 | COMBUSTION TURBINE WITH HEAT RECOVERY BOILER | 15.004 | 153.00 | MW | VOC | VOC | 4.00 | PPM @ 15% O2 | OXIDATION CATALYST WHEN FIRING NO. 2 OIL EMISSION LIMIT = 4.4 PPMVD @ 15% O2. @ 75% LOAD ALTERNATE GAS LIMIT 7.6 PPM | 12.000 | LAER |
| CO-0024 | PUBLIC SERVICE OF COLO.- FORT ST VRAIN | PLATTEVILLE | 5/19/98 | COMBINED CYCLE TURBINES (2), NATURAL | 15.004 | 471.00 | MW | VOC | VOC | 1.40 | PPMVD, SMPL CY | GOOD COMBUSTION CONTROL PRACTICES. | 0.000 | BACT-PSD |
| PR-0004 | ECOELECTRICA, L.P. | PENUELAS | 5/6/98 | TURBINES, COMBINED-CYCLE COGENERATION | 15.004 | 461.00 | MW | VOC, GAS | VOC | 5.00 | PPMDV | COMBUSTION CONTROLS. | 0.000 | BACT-PSD |
| PR-0004 | ECOELECTRICA, L.P. | PENUELAS | 5/6/98 | TURBINES, COMBINED-CYCLE COGENERATION | 15.004 | 461.00 | MW | VOC, OIL | VOC | 8.00 | PPMDV | COMBUSTION CONTROL. | 0.000 | BACT-PSD |
| CA-0768 | NORTHERN CALIFORNIA POWER AGENCY | LODI | 3/16/98 | GE FRAME 5 GAS TURBINE | 15.004 | 325.00 | MMBTU/HR | VOC | VOC | 8.00 | LB/HR | NATURAL GAS AS PRIMARY FUEL | 0.000 | LAER |
| PA-0149 | BUCKNELL UNIVERSITY | LEWISBURG | 11/30/97 | NG FIRED TURBINE, SOLAR TAURUS T-7300S | 15.004 | 5.00 | MW | VOC | VOC | 25.00 | PPMV@15%O2 | GOOD COMBUSTION | 0.000 | BACT-OTHER |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIELD | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1175.00 | MMBTU/H NAT. GAS | VOC | VOC | 2.30 | LB/H/UNIT | FURNACE DESIGN | 91.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIELD | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1117.00 | MMBTU/H NO2 FUEL OIL | VOC | VOC | 5.80 | LB/H/UNIT | FURNACE DESIGN | 91.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 474.00 | X10(6) BTU/HR N. GAS | VOC | VOC | 5.00 | LBS/HR | GOOD COMBUSTION | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 468.00 | X10(6) BTU/HR #2 OIL | VOC | VOC | 5.00 | LBS/HR | GOOD COMBUSTION | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS (TOTAL) | 15.007 | 0.00 | | VOC | VOC | 21.90 | TPY | GOOD COMBUSTION | 0.000 | BACT-PSD |

T[illegible]-3
Salt [illegible] Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
VOC Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | CAS | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VA-0206 | PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP | LEESBURG | 5/7/97 | TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3 | 15.007 | 10.20 | X109 SCF/YR NAT GAS | VOC | VOC | 8.00 | LB/HR | GOOD COMBUSTION OPERATING PRACTICES | 0.000 | BACT-PSD |
| NM-0029 | SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA | HOBBS | 3/31/97 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 100.00 | MW | VOC | VOC | 0.00 | | | 0.000 | BACT-PSD |
| NM-0028 | SOUTHWESTERN PUBLIC SERVICE CO/CUNNINGHAM STATION | HOBBS | 12/30/96 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 100.00 | MW | VOC | VOC | 0.00 | SEE P2 | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| GA-0063 | MID-GEORGIA COGEN. | KATHLEEN | 8/19/96 | COMBUSTION TURBINE (2), NATURAL GAS | 15.004 | 116.00 | MW | VOC | VOC | 6.00 | PPMVD | COMPLETE COMBUSTION | 0.000 | BACT-PSD |
| MS-0028 | SOUTH MISSISSIPPI ELECTRIC POWER ASSOC. | MOSELL | 8/19/96 | COMBUSTION TURBINE, COMBINED CYCLE | 15.007 | 1299.00 | MMBTU/HR NAT GAS | VOC | VOC | 5.20 | PPM @ 15% O2, GAS | GOOD COMBUSTION CONTROLS | 0.000 | BACT-PSD |
| NC-0059 | CAROLINA POWER & LIGHT | GOLDSBORO | 8/19/96 | COMBUSTION TURBINE, 4 EACH | 15.007 | 1907.60 | MMBTU/HR | VOC, OIL | VOC | 7.00 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| NC-0059 | CAROLINA POWER & LIGHT | GOLDSBORO | 8/19/96 | COMBUSTION TURBINE, 4 EACH | 15.007 | 1907.60 | MMBTU/HR | VOC, GAS | VOC | 2.80 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| NY-0068 | KAMINE/BESICORP NATURAL DAM LP | NATURAL DAM | 6/30/95 | GE FRAME 6 GAS TURBINE | 15.007 | 500.00 | MMBTU/HR | VOC | VOC | 0.01 | LB/MMBTU, 4 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| MN-0022 | LSP-COTTAGE GROVE, L.P. | COTTAGE GROVE | 5/29/95 | COMBUSTION TURBINE/GENERATOR | 15.007 | 1970.00 | MMBTU/HR | VOC | VOC | 19.00 | LB/HR GAS | FUEL SELECTION, GOOD COMBUSTION | 0.000 | BACT-PSD |
| NJ-0013 | LAKEWOOD COGENERATION, L.P. | LAKEWOOD TOWNSHIP | 5/29/95 | TURBINES (NATURAL GAS) (2) | 15.004 | 1190.00 | MMBTU/HR (EACH) | VOC | VOC | 0.00 | LB/MMBTU | TURBINE DESIGN | 0.000 | OTHER |
| NJ-0017 | NEWARK BAY COGENERATION PARTNERSHIP, L.P. | NEWARK | 5/29/95 | TURBINES, COMBUSTION, NATURAL GAS-FIRED (2) | 15.004 | 617.00 | MMBTU/HR (EACH) | VOC | VOC | 4.00 | PPMDV | TURBINE DESIGN | 0.000 | BACT-PSD |
| NJ-0017 | NEWARK BAY COGENERATION PARTNERSHIP, L.P. | NEWARK | 5/29/95 | BOILER, AUXILIARY, NATURAL GAS-FIRED | 11.005 | 200.00 | MMBTU/HR | VOC | VOC | 0.01 | LB/MMBTU | BOILER DESIGN | 0.000 | OTHER |
| NY-0061 | ANITEC COGEN PLANT | BINGHAMTON | 4/27/95 | GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001 | 15.007 | 451.00 | MMBTU/HR | VOC | VOC | 0.01 | LB/MMBTU, 3.0 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0062 | FULTON COGEN PLANT | FULTON | 4/27/95 | GE LM5000 GAS TURBINE | 15.007 | 500.00 | MMBTU/HR | VOC | VOC | 0.00 | LB/MMBTU, 2.0 LB/HR | NO CONTROLS | 0.000 | SEE NOTE #6 |
| NY-0062 | FULTON COGEN PLANT | FULTON | 4/27/95 | STACK EMISSIONS (GAS TURBINE AND DUCT BURNER) | 11.004 | 610.00 | MMBTU/HR (TOTAL) | VOC | VOC | 0.04 | LB/MMBTU, 24 LB/HR | NO CONTROLS | 0.000 | SEE NOTE #6 |
| NY-0063 | TBG COGEN COGENERATION PLANT | BETHPAGE | 4/27/95 | GE LM2500 GAS TURBINE | 15.007 | 214.90 | MMBTU/HR | VOC | VOC | 0.01 | LB/MMBTU, 2.9 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |

T[illegible]-3
Salt F[illegible] Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
VOC Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | CAS | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NY-0064 | INDECK-OSWEGO ENERGY CENTER | OSWEGO | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 533.00 | LB/MMBTU | VOC | VOC | 0.01 | LB/MMBTU, 5.00 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0065 | KAMINE/BESICORP CARTHAGE L.P. | CARTHAGE | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 491.00 | BTU/HR | VOC | VOC | 0.01 | LB/MMBTU, 5.0 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0065 | KAMINE/BESICORP CARTHAGE L.P. | CARTHAGE | 4/27/95 | STACK (GAS TURBINE & DUCT BURNER) **SEE NOTE #3** | 11.004 | 540.00 | LB/MMBTU | VOC | VOC | 0.03 | LB/MMBTU, 15.8 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0071 | KAMINE SOUTH GLENS FALLS COGEN CO | SOUTH GLENS FALLS | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 498.00 | MMBTU/HR | VOC | VOC | 0.01 | LB/MMBTU, 5.0 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0072 | KAMINE/BESICORP SYRACUSE LP | SOLVAY | 4/27/95 | SIEMENS V64.3 GAS TURBINE (EP #00001) | 15.007 | 650.00 | MMBTU/HR | VOC | VOC | 0.01 | LB/MMBTU, 4.6 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0073 | LOCKPORT COGEN FACILITY | LOCKPORT | 4/27/95 | (6) GE FRAME 6 TURBINES (EP #S 00001-00006) | 15.007 | 423.90 | MMBTU/HR | VOC | VOC | 0.01 | LB/MMBTU, 5.0 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0075 | PILGRIM ENERGY CENTER | ISLIP | 4/27/95 | (2) WESTINGHOUSE W501D5 TURBINES (EP #S 00001&2) | 15.007 | 1400.00 | MMBTU/HR | VOC | VOC | 0.00 | LB/MMBTU, 2.53 LB/HR | | 0.000 | BACT-OTHER |
| LA-0086 | INTERNATIONAL PAPER | MANSFIELD | 4/17/95 | TURBINE/HRSG, GAS COGEN | 15.004 | 338.00 | MM BTU/HR TURBINE | VOC | VOC | 3.60 | LB/HR COMBINED | COMBUSTION CONTROLS, FUEL SELECTION | 0.000 | BACT |
| OH-0218 | CNG TRANSMISSION | WASHINGTON COURT HOUSE | 4/5/95 | TURBINE (NATURAL GAS) (3) | 15.004 | 5500.00 | HP (EACH) | VOC | VOC | 0.10 | G/HP-HR | FUEL SPEC: USE OF NATURAL GAS | 0.000 | OTHER |
| NY-0076 | TRIGEN MITCHEL FIELD | HEMPSTEAD | 3/31/95 | GE FRAME 6 GAS TURBINE | 15.007 | 424.70 | MMBTU/HR | VOC | VOC | 0.01 | LB/MMBTU, 4.5 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0080 | PROJECT ORANGE ASSOCIATES | SYRACUSE | 3/31/95 | STACK (TURBINE AND DUCT BURNER) | 11.005 | 715.00 | MMBTU/HR | VOC | VOC | 5.20 | PPM, 2.8 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0057 | MEGAN-RACINE ASSOCIATES, INC | CANTON | 3/30/95 | GE LM5000-N COMBINED CYCLE GAS TURBINE | 15.007 | 401.00 | LB/MMBTU | VOC | VOC | 0.02 | LB/MMBTU, 8.0 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| AL-0069 | INTERNATIONAL PAPER CO. RIVERDALE MILL | SELMA | 3/24/95 | TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER | 15.007 | 40.00 | MW | VOC | VOC | 8.30 | LB/HR (GAS) | DESIGN | 0.000 | BACT-PSD |
| CO-0017 | THERMO INDUSTRIES, LTD. | FT. LUPTON | 3/24/95 | TURBINE, GAS FIRED, 5 EACH | 15.004 | 246.00 | MMBTU/H | VOC | VOC | 16.70 | LB/H | | 0.000 | OTHER |
| CO-0023 | PHOENIX POWER PARTNERS | GREELEY | 3/24/95 | GENERATOR, STEAM, W/ DUCT BURNER | 11.005 | 50.00 | MMBTU/HR | VOC | VOC | 24.09 | TPY | FUEL SPEC: NATURAL GAS COMBUSTION | 0.000 | OTHER |
| FL-0052 | FLORIDA POWER AND LIGHT | NORTH PALM BEACH | 3/24/95 | TURBINE, GAS, 4 EACH | 15.004 | 400.00 | MW | VOC | VOC | 1.60 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0052 | FLORIDA POWER AND LIGHT | NORTH PALM BEACH | 3/24/95 | TURBINE, CG, 4 EACH | 15.004 | 400.00 | MW | VOC | VOC | 9.00 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0053 | FLORIDA POWER AND LIGHT | LAVOGROME STATION | 3/24/95 | TURBINE, GAS, 4 EACH | 15.004 | 240.00 | MW | VOC | VOC | 1.00 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |

T[illegible]-3
Salt [illegible] Project
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RLBC Database Information - Combined Cycle Turbines
VOC Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | CAS | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GA-0052 | SAVANNAH ELECTRIC AND POWER CO. | | 3/24/95 | TURBINES, 8 | 15.004 | 1032.00 | MMBTU/H, NAT GAS | VOC | VOC | 0.00 | LB/MMBTU | FUEL SPEC: LOW SULFUR FUEL OIL | 0.000 | BACT-PSD |
| GA-0052 | SAVANNAH ELECTRIC AND POWER CO. | | 3/24/95 | TURBINES, 8 | 15.006 | 972.00 | MMBTU/H, #2 OIL | VOC | VOC | 0.00 | LB/MMBTU | FUEL SPEC: LOW SULFUR FUEL OIL | 0.000 | BACT-PSD |
| HI-0015 | MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA | MAUI | 3/24/95 | TURBINE, COMBINED-CYCLE COMBUSTION | 15.006 | 28.00 | MW | VOC | VOC | 0.80 | LB/HR | COMBUSTION TECHNOLOGY/DESIGN | 0.000 | BACT-OTHER |
| NC-0055 | DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION | LOWESVILLE | 3/24/95 | TURBINE, COMBUSTION | 15.006 | 1247.00 | MM BTU/HR | VOC | VOC | 5.00 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| NC-0055 | DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION | LOWESVILLE | 3/24/95 | TURBINE, COMBUSTION | 15.004 | 1313.00 | MM BTU/HR | VOC | VOC | 2.00 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| NC-0055 | DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION | LOWESVILLE | 3/24/95 | TURBINE, COMBUSTION | 15.004 | 1313.00 | MM BTU/HR | BENZENE | 71-43-2 | 0.44 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINE FACILITY, GAS | 15.007 | 1331.13 | X10(7) SCF/Y NAT GAS | VOC | VOC | 97.10 | TOTAL TPY | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINE FACILITY, GAS | 15.007 | 7.44 | X10(7) GPY FUEL OIL | VOC | VOC | 97.10 | TOTAL TPY | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINES (2) [EACH WITH A SF] | 15.007 | 1.51 | X10(9) BTU/HR N GAS | VOC | VOC | 22.00 | LBS/HR/UNIT | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINES (2) [EACH WITH A SF] | 15.007 | 1.36 | X10(9) BTU/H #2 OIL | TSP /PM10 | PM | 13.00 | LBS/HR/UNIT | FUEL SPEC: CLEAN BURNING FUEL | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINES (2) [EACH WITH A SF] | 15.007 | 1.36 | X10(9) BTU/H #2 OIL | VOC | VOC | 21.00 | LBS/HR/UNIT | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0068 | ORANGE COGENERATION LP | BARTOW | 1/13/95 | TURBINE, NATURAL GAS, 2 | 15.004 | 368.30 | MMBTU/H | VOC | VOC | 10.00 | PPMVD | GOOD COMBUSTION | 0.000 | BACT-PSD |
| FL-0080 | AUBURNDALE POWER PARTNERS, LP | AUBURNDALE | 1/13/95 | TURBINE,GAS | 15.004 | 1214.00 | MMBTU/H | VOC | VOC | 6.00 | LB/H | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0082 | FLORIDA POWER CORPORATION POLK COUNTY SITE | BARTOW | 1/13/95 | TURBINE, NATURAL GAS (2) | 15.004 | 1510.00 | MMBTU/H | VOC | VOC | 7.00 | PPMVW | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| PA-0099 | FLEETWOOD COGENERATION ASSOCIATES | FLEETWOOD | 11/22/94 | NG TURBINE (GE LM6000) WITH WASTE HEAT BOILER | 15.004 | 360.00 | MMBTU/HR | VOC | VOC | 4.40 | LB/HR | GOOD COMBUSTION PRACTICES | 0.000 | BACT-OTHER |
| TX-0231 | WEST CAMPUS COGENERATION COMPANY | COLLEGE STATION | 10/31/94 | GAS TURBINES | 15.004 | 75.30 | MW (TOTAL POWER) | VOC | VOC | 38.00 | TPY | INTERNAL COMBUSTION CONTROLS | 0.000 | BACT |

T[illegible]-3
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VOC Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | CAS | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NY-0046 | SARANAC ENERGY COMPANY | PLATTSBURGH | 9/13/94 | TURBINES, COMBUSTION (2) (NATURAL GAS) | 15.004 | 1123.00 | MMBTU/HR (EACH) | VOC | VOC | 0.00 | LB/MMBTU | OXIDATION CATALYST | 0.000 | BACT-OTHER |
| CO-0018 | BRUSH COGENERATION PARTNERSHIP | BRUSH | 7/20/94 | TURBINE | 15.004 | 350.00 | MMBTU/H | VOC | VOC | 26.70 | T/YR | | 0.000 | OTHER |
| CO-0019 | COLORADO POWER PARTNERSHIP | BRUSH | 7/20/94 | TURBINES, 2 NAT GAS & 2 DUCT BURNERS | 15.004 | 385.00 | MMBTU/H EACH TURBINE | VOC | VOC | 35.20 | T/YR | | 0.000 | OTHER |
| PA-0083 | NORTHERN CONSOLIDATED POWER | NORTH EAST | 7/20/94 | TURBINES, GAS, 2 | 15.004 | 34.60 | KW EACH | VOC | VOC | 105.00 | PPM @ 15% O2 | OXIDATION CATALYST | 50.000 | OTHER |
| WI-0067 | WEPCU, PARIS SITE | PARIS | 7/20/94 | TURBINES, COMBUSTION (4) | 15.007 | 0.00 | | VOC | VOC | 9.00 | LBS/HR (SEE NOTES) | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| NM-0021 | WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR | BLANCO | 3/2/94 | TURBINE, GAS-FIRED | 15.004 | 11257.00 | HP | VOC | VOC | 25.00 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| NV-0015 | SAGUARO POWER COMPANY | HENDERSON | 6/1/93 | COMBUSTION TURBINE GENERATOR | 15.007 | 34.50 | MW | VOC | VOC | 0.80 | PPH | COMBUSTION SYSTEM | 0.000 | LAER |
| FL-0056 | ORLANDO UTILITIES COMMISSION | TITUSVILLE | 5/14/93 | TURBINE, GAS, 4 EACH | 15.004 | 35.00 | MW | VOC | VOC | 7.00 | PPM @ 15% O2 | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| CA-0463 | SOUTHERN CALIFORNIA GAS | WHEELER RIDGE | 5/31/92 | TURBINE, GAS FIRED, SOLAR MODEL H | 15.004 | 5500.00 | HP | HC | VOC | 1.94 | PPM @ 15% O2 | HIGH TEMP OXIDATION CATALYST | 50.000 | BACT-PSD |
| RI-0010 | NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO. | PROVIDENCE | 5/31/92 | TURBINE, GAS AND DUCT BURNER | 15.004 | 1360.00 | MMBTU/H EACH | VOC | VOC | 5.00 | PPM @ 15% O2 | | 0.000 | BACT-PSD |
| RI-0012 | ALGONQUIN GAS TRANSMISSION CO. | BURRILLVILLE | 5/31/92 | TURBINE, GAS, 2 | 15.004 | 49.00 | MMBTU/H | VOC | VOC | 0.02 | LB/MMBTU | GOOD COMBUSTION PRACTICES | 0.000 | BACT-OTHER |

operational, the efficiency of the oxidation catalyst could be in excess of 20%. Since the exact efficiency can not be determined prior to actual operation, a limitation of 2.7 ppmvd is being proposed as LAER.

For the auxiliary boiler LAER is not well defined. This type of boiler is used to support the combined cycle system during startup conditions. It is used on an as-needed basis and is not used like a standard baseload steam-producing boiler. Due to the limited use of this type of boiler, it is not technically feasible to install combustion modification techniques and/or flue-gas controls.

Because of the specialized requirements of this boiler, LAER for emissions of VOCs is being proposed as the combustion of natural gas, 1,200 hours per year of operations and good combustion techniques.

## *5.5 $PM_{10}$ EMISSIONS*

The combustion of natural gas in the combined cycle system and auxiliary boiler will also generate emissions of $PM_{10}$. $PM_{10}$ emissions are partially dependent on fuel composition. In addition to ash, other constituents of concern include fuel-bound sulfur and nitrogen. Natural gas has negligible amounts of all three constituents when compared to liquid or solid fuels. As a result, there should be minimal nitrate and sulfate production. To reduce $PM_{10}$ emissions from combined cycle system and auxiliary boilers, combustion techniques are typically employed.

There are a limited number of options for controlling $PM_{10}$ emissions from gas turbines. These emissions are below one micrometer in aerodynamic diameter and diluted by the high volume of exhaust from a turbine. Potential add on controls such as filtering devices, venturi scrubber, and electrostatic precipitators would be rendered less effective under these conditions and have to be scaled up in size. Neither has there been much success in reducing $PM_{10}$ emissions through combustion controls. The only meaningful control of turbine exhaust emissions has been through limiting fuel type and sulfur content. Add on control technologies are not feasible for reducing $PM_{10}$ emissions in gas turbine flue gas. As a result, the lowest $PM_{10}$ emissions are achieved through combustion regulated natural gas, along with combustion design that minimizes $NO_x$ and unburned hydrocarbons. This is also true of natural gas fired auxiliary boilers.

### 5.5.1 Proposed Power Plant - Control of $PM_{10}$ Emissions

The proposed power plant will be using natural gas in the combined cycle system and auxiliary boiler. The use of pipeline quality natural gas will keep the formation of $PM_{10}$ to a minimum. As stated previously, devices for controlling $PM_{10}$ emissions from the combustion of natural gas are not technically feasible.

### 5.5.2 LAER Determination for $PM_{10}$ Emissions

A detailed listing of existing facilities with their permitted emission rates is provided in Table 5-4. Based on the information provided in this table and the results of the $PM_{10}$ LAER evaluation, LAER for $PM_{10}$ emission from natural gas fired equipment is considered:

Salt [illegible] Project

Proposed Power Plant - Existing Kyrene Generating Station

RLBC Database Information - Combined Cycle Turbines

PM10 Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AL-0128 | ALABAMA POWER COMPANY - THEODORE COGENERATION | THEODORE | 6/23/99 | TURBINE, WITH DUCT BURNER | 15.004 | 170.00 | MW | PM | 0.0120 | LB/MMBTU | COMBUSTION OF NATURAL GAS ONLY | 0.000 | BACT-PSD |
| GA-0069 | TENUSKA GEORGIA PARTNERS, L.P. | FRANKLIN | 6/23/99 | TURBINE, COMBUSTION, SIMPLE CYCLE, 6 | 15.004 | 160.00 | MW EA | PM | 0.0100 | LB/MMBTU | PM EMISSION IS BECAUSE OF NATURAL GAS. | 0.000 | BACT-PSD |
| | PANDA ONETA POWER L.P. | ONETA | 9/29/99 | COMBINED CYCLE GAS TURBINES WITH SUPPLEMENTAL DUCT BURNERS | | 1000.00 | MW | PM10 | 1.2000 | PPMVD | DRY LOW NOx CONTROL | | BACT |
| GA-0069 | TENUSKA GEORGIA PARTNERS, L.P. | FRANKLIN | 6/23/99 | TURBINE, COMBUSTION, SIMPLE CYCLE, 6 | 15.004 | 160.00 | MW EA | PM | 0.0170 | LB/MMBTU | PM IS BECAUSE OF FUEL OIL. WHEN GROSS OUTPUT IS BELOW 123 MW PM EMISSION LIMIT IS 0.017 LB/MMBTU AND ABOVE 123 MW IS 0.013 LB/MMBTU. | 0.000 | BACT-PSD |
| CT-0139 | PDC EL PASO MILFORD LLC | MILFORD | 6/17/99 | TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS | 15.004 | 1.97 | MMCF/H | PM10 | 0.0110 | LB/MMBTU NAT GAS | NAT GAS AS PRIMARY FUEL, LOW SULFUR (0.05%W) OIL AS BACK-UP | 0.000 | BACT-PSD |
| CT-0140 | PDC EL PASO MILFORD LLC | MILFORD | 6/17/99 | TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS | 15.004 | 1.97 | MMCF/H | PM10 | 0.0110 | LB/MMBTU NAT GAS | NAT GAS AS PRIMARY FUEL, LOW SULFUR (0.05%W) OIL | 0.000 | BACT-PSD |
| HI-0018 | ENCOGEN HAWAII, L.P. | HAINA | 6/8/99 | TURBINES, COMBUSTION, 2 EA | 15.007 | 23.00 | MW | PM | 0.0200 | GR/DSCF @12% CO2 | LOW ASH AND LOW SULFUR FUELS, GOOD COMBUSTION DESIGN AND OPERATION. | 0.000 | BACT-PSD |
| HI-0019 | MAUI ELECTRIC COMPANY | MAALAEA | 6/8/99 | TURBINE, COMBUSTION, 2 EA | 15.002 | 20.00 | MW | PM | 0.0450 | GR/DSCF @ 12% CO2 | LOW ASH AND LOW SULFUR FUEL AND GOOD COMBUSTION DESIGN AND OPERATION. | 0.000 | BACT-PSD |
| HI-0020 | HAWAII ELECTRIC LIGHT CO. | KEAHOLE | 6/8/99 | TURBINE, COMBUSTION, GELM 2500, 2 EA | 15.002 | 20.00 | MW | PM | 0.0450 | GR/DSCF @ 12% O2 | LOW ASH AND LOW SULFUR FUEL. GOOD COMBUSTION DESIGN AND OPERATION. | 0.000 | BACT-PSD |
| MA-0021 | MILLENNIUM POWER PARTNER, LP | CHARLTON | 4/19/99 | TURBINE, COMBUSTION, WESTINGHOUSE MODEL 501G | 15.007 | 2534.00 | MMBTU/H | PM10 | 0.0050 | LB/MMBTU | DRY LOW NOX COMBUSTION TECHNOLOGY IN CONJUNCTION WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0022 | BERKSHIRE POWER DEVELOPMENT, INC. | AGAWAM | 4/19/99 | TURBINE, COMBUSTION, ABB GT24 | 15.007 | 1792.00 | MMBTU/H | PM | 17.4000 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| MA-0023 | DIGHTON POWER ASSOCIATE, LP | DIGHTON | 4/19/99 | TURBINE, COMBUSTION, ABB GT11N2 | 15.004 | 1327.00 | MMBTU/H | PM10 | 12.5000 | LB/H | DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL. | 0.000 | BACT-PSD |
| ME-0016 | GORHAM ENERGY LIMITED PARTNERSHIP | GORHAM | 4/19/99 | TURBINE, COMBINED CYCLE | 15.007 | 900.00 | MW TOTAL | PM | 0.0600 | LB/MMBTU NAT GAS | .05 % SULFUR DISTILLATE OIL #2 IS USED. EMISSION IS FROM EACH 300 MW SYSTEM. | 0.000 | BACT-PSD |
| ME-0018 | WESTBROOK POWER LLC | WESTBROO | 4/19/99 | TURBINE, COMBINED CYCLE, TWO | 15.004 | 528.00 | MW TOTAL | PM | 0.0600 | LB/MMBTU | | 0.000 | BACT-PSD |
| ME-0018 | WESTBROOK POWER LLC | WESTBROO | 4/19/99 | TURBINE, COMBINED CYCLE, TWO | 15.004 | 528.00 | MW TOTAL | PM10 | 0.0600 | LB/MMBTU | | 0.000 | BACT-PSD |
| ME-0019 | CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY | BUCKSPORT | 4/19/99 | TURBINE, COMBINED CYCLE, NATURAL GAS | 15.004 | 175.00 | MW | PM | 0.0600 | LB/MMBTU | | 0.000 | BACT-OTHER |
| ME-0019 | CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY | BUCKSPORT | 4/19/99 | TURBINE, COMBINED CYCLE, NATURAL GAS | 15.004 | 175.00 | MW | PM10 | 9.0000 | LB/H GAS | | 0.000 | BACT-OTHER |
| ME-0020 | CASCO RAY ENERGY CO | VEAZIE | 4/19/99 | TURBINE, COMBINED CYCLE, NATURAL GAS, TWO | 15.004 | 170.00 | MW EACH | PM | 0.0600 | LB/MMBTU | | 0.000 | BACT-PSD |
| WA-0280 | EEX POWER SYSTEMS, ENCOGEN NW COGENERATION PROJECT | BELLINGHAM | 4/16/99 | TURBINES, COMBINED CYCLE COGEN, GE FRAME 6 | 15.007 | 123.00 | MW | PM10 | 60.0000 | LB/D NG | | 0.000 | BACT-PSD |
| ME-0015 | ANDROSCOGGIN ENERGY LIMITED | JAY | 3/17/99 | GAS TURBINES, COGEN, W/DUCT BURNERS | 15.007 | 675.00 | MMBTU/H TURBINE | PM | 6.2700 | LB/H NG | GOOD COMBUSTION PRACTICES, COMBUSTION OF CLEAN FUELS. | 0.000 | BACT-OTHER |
| ME-0015 | ANDROSCOGGIN ENERGY LIMITED | JAY | 3/17/99 | GAS TURBINES, COGEN, W/DUCT BURNERS | 15.007 | 675.00 | MMBTU/H TURBINE | PM | 24.2100 | LB/H NG OIL | GOOD COMBUSTION PRACTICES, COMBUSTION OF CLEAN FUELS. | 0.000 | BACT-OTHER |
| RI-0018 | TIVERTON POWER ASSOCIATES | TIVERTON | 2/8/99 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 265.00 | MW | PM10 | 0.0090 | LB/MMBTU | GOOD COMBUSTION | 0.000 | BACT-PSD |
| LA-0113 | BASF CORPORATION | GEISMAR | 1/21/99 | TURBINE, COGEN UNIT 2, GE FRAME 6 | 15.004 | 42.40 | MW | PM10 | 5.4000 | LB/H | GOOD DESIGN, PROPER OPERATING PRACTICES, USE GASEOUS FUELS | 0.000 | BACT-PSD |

Salt Project

Proposed Power Plant - Existing Kyrene Generating Station

RLBC Database Information - Combined Cycle Turbines

PM10 Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LA-0112 | AIR LIQUIDE AMERICA CORPORATION | GEISMAR | 1/20/99 | TURBINE GAS, GE, 7ME 7 | 15.004 | 966.00 | MMBTU/H | PM10 | 18.7000 | LB/H | GOOD COMBUSTION PRACTICES AND USE CLEAN NATURAL GAS AS FUEL. | 0.000 | BACT-PSD |
| AL-0120 | GENERAL ELECTRIC PLASTICS | BURKVILLE | 7/2/98 | COMBINED CYCLE (TURBINE AND DUCT BURNER) | 15.004 | 0.00 | | PM | 0.0100 | LBS/MMBTU | CLEAN FUEL - NATURAL GAS/HYDROGEN | 0.000 | BACT-PSD |
| CO-0024 | PUBLIC SERVICE OF COLO.-FORT ST VRAIN | PLATTEVILL | 5/19/98 | COMBINED CYCLE TURBINES (2), NATURAL | 15.004 | 471.00 | MW | PM10 | 9.0000 | LBS/HR (EACH TURBINE | FUEL SPEC: COMBUSTION OF PIPE LINE QUALITY GAS. CLOSE MONITORING AND CONTROL OF THE COMBUSTION PROCESS. | 0.000 | BACT-PSD |
| PR-0004 | ECOELECTRICA, L.P. | PENUELAS | 5/6/98 | TURBINES, COMBINED-CYCLE COGENERATION | 15.004 | 461.00 | MW | PM10, GAS | 12.0000 | LB/HR | MAINTAIN EACH TURBINE IN GOOD WORKING ORDER AND IMPLEMENT GOOD COMBUSTION PRACTICES. FUEL SPEC: USE OF NG/LPG. | 0.000 | BACT-PSD |
| PR-0004 | ECOELECTRICA, L.P. | PENUELAS | 5/6/98 | TURBINES, COMBINED-CYCLE COGENERATION | 15.004 | 461.00 | MW | PM10, OIL | 59.0000 | LB/HR | MAINTAIN EACH TURBINE IN GOOD WORKING ORDER AND IMPLEMENT GOOD COMBUSTION PRACTICES. FUEL SPEC: USE OF NG/LPG. | 0.000 | BACT-PSD |
| PR-0004 | ECOELECTRICA, L.P. | PENUELAS | 5/6/98 | TURBINES, COMBINED-CYCLE COGENERATION | 15.004 | 461.00 | MW | PM10, COOLING TOWER | 0.0015 | % OF FLOW | TWO STAGE MIST ELIMINATOR TO RESTRICT DRIFT. | 0.000 | BACT-OTHER |
| AL-0109 | SOUTHERN NATURAL GAS | AUBURN | 4/24/98 | 9160 HP GE MODEL M53002G NATURAL GAS FIRED TURBINE | 15.004 | 9160.00 | HP | PM10 | 10.9500 | TPY | FUEL SPEC: NATURAL GAS | 0.000 | BACT-PSD |
| AL-0110 | SOUTHERN NATURAL GAS | WARD | 4/24/98 | 2-9160 HP GE MODEL MS3002G NATURAL GAS TURBINES | 15.004 | 9160.00 | HP | PM10 | 10.9500 | TPY | FUEL SPEC: NATURAL GAS | 0.000 | BACT-PSD |
| CA-0793 | TEMPO PLASTICS | VISALIA | 4/23/98 | GAS TURBINE COGENERATION UNIT | 15.004 | 0.00 | | PM10 | 0.0120 | LB/MMBTU | LUBE OIL VENT COALESCER. OPACITY LIMIT APPLIES TO LUBE OIL VENTS. | 0.000 | LAER |
| CA-0768 | NORTHERN CALIFORNIA POWER AGENCY | LODI | 3/16/98 | GE FRAME 5 GAS TURBINE | 15.004 | 325.00 | MMBTU/HR | PM10 | 4.3000 | LB/DAY | NATURAL GAS, AIR INTAKE COOLER, VENTING THE LUBE OIL VENT INTO THE EXHAUST STREAM OF THE TURBINE FOR OXIDATION OF THE SMOKE | 0.000 | LAER |
| NM-0031 | LORDSBURG L.P. | LORDSBURG | 9/29/97 | TURBINE, NATURAL GAS-FIRED, ELEC. GEN. | 15.004 | 100.00 | MW | PM | 5.3000 | LBS/HR | HIGH COMBUSTION EFFICIENCY USE OF NO.2 LOW SULFUR FUEL OIL (LESS THAN 0.05% BY WT.) | 0.000 | BACT-PSD |
| AL-0096 | MEAD COATED BOARD, INC. | PHENIX CITY | 5/31/97 | COMBINED CYCLE TURBINE (25 MW) | 15.004 | 568.00 | MMBTU/HR | PM | 2.5000 | LBS/HR (GAS) | PRIMARY FUEL IS NATURAL GAS WITH BACKUP FUEL AS DISTILLATE OIL. EFFICIENT OPERATION OF THE COMBUSTION TURBINE | 0.000 | BACT-PSD |
| IN-0071 | PORTSIDE ENERGY CORP. | PORTAGE | 5/31/97 | TURBINE, NATURAL GAS-FIRED | 15.004 | 63.00 | MEGAWATT | PM/PM | 5.0000 | LBS/HR | | 0.000 | BACT-PSD |
| LA-0096 | UNION CARBIDE CORPORATION | HAHNVILLE | 5/31/97 | GENERATOR, GAS TURBINE | 15.004 | 1313.00 | MM BTU/HR | PM10 | 18.3000 | LB/HR | NO CONTROL CLEAN FUEL | 0.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIE | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1175.00 | MMBTU/H NAT. GAS | PM | 5.0000 | E-3 LB/MMBTU | FUEL SPEC: CLEAN BURN FUEL | 91.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIE | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1175.00 | MMBTU/H NAT. GAS | PM10 | 5.0000 | E-3 LB/MMBTU | FUEL SPEC: CLEAN BURN FUEL | 91.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIE | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1117.00 | MMBTU/H NO2 FUEL OIL | PM | 3.5000 | E-2 LB/MMBTU | FUEL SPEC: CLEAN BURN FUEL | 91.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIE | 5/7/97 | TURBINE, COMBUSTION | 15.999 | 1117.00 | MMBTU/H NO2 FUEL OIL | PM10 | 3.5000 | E-2 LB/MMBTU | FUEL SPEC: CLEAN BURN FUEL | 91.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIE | 5/7/97 | TURBINE, COMBUSTION, 2 | 15.999 | 0.00 | | PM | 82.2000 | T/YR/UNIT | | 0.000 | BACT-PSD |
| VA-0184 | BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP | CHESTERFIE | 5/7/97 | TURBINE, COMBUSTION, 2 | 15.999 | 0.00 | | PM10 | 82.2000 | T/YR/UNIT | | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 474.00 | X10(6) BTU/HR N. GAS | TSP | 0.0053 | LB/MMBTU | FUEL SPEC: CLEAN BURN FUEL | 0.000 | BACT-PSD |

Salt [illegible] Project

Proposed Power Plant - Existing Kyrene Generating Station

RLBC Database Information - Combined Cycle Turbines

PM10 Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 474.00 | X10(6) BTU/HR N. GAS | PM10 | 0.0053 | LB/MMBTU | FUEL SPEC: CLEAN BURN FUEL | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 468.00 | X10(6) BTU/HR #2 OIL | TSP | 0.0360 | LB/MMBTU | FUEL SPEC: CLEAN BURN FUEL | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS | 15.007 | 468.00 | X10(6) BTU/HR #2 OIL | PM10 | 0.0360 | LB/MMBTU | FUEL SPEC: CLEAN BURN FUEL | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS (TOTAL) | 15.007 | 0.00 | | TSP | 74.6000 | TPY | FUEL SPEC: CLEAN BURN FUEL | 0.000 | BACT-PSD |
| VA-0190 | BEAR ISLAND PAPER COMPANY, L.P. | ASHLAND | 5/7/97 | TURBINE, COMBUSTION GAS (TOTAL) | 15.007 | 0.00 | | PM10 | 74.6000 | TPY | FUEL SPEC: CLEAN BURN FUEL | 0.000 | BACT-PSD |
| VA-0206 | PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP | LEESBURG | 5/7/97 | TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3 | 15.007 | 10.20 | X109 SCF/YR NAT GAS | TSP/Pf | 1.0000 | LB/HR | FUEL SPEC: CLEAN BURNING FUELS | 0.000 | BACT-PSD |
| NM-0029 | SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA | HOBBS | 3/31/97 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 100.00 | MW | PM10 | 0.0000 | | | 0.000 | BACT-PSD |
| NM-0028 | SOUTHWESTERN PUBLIC SERVICE CO/CUNNINGHAM STATION | HOBBS | 12/30/96 | COMBUSTION TURBINE, NATURAL GAS | 15.004 | 100.00 | MW | PM10 | 0.0000 | SEE P2 | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| GA-0063 | MID-GEORGIA COGEN. | KATHLEEN | 8/19/96 | COMBUSTION TURBINE (2), NATURAL GAS | 15.004 | 116.00 | MW | PM | 18.0000 | LB/HR | CLEAN FUEL | 0.000 | BACT-PSD |
| MS-0028 | SOUTH MISSISSIPPI ELECTRIC POWER ASSOC. | MOSELL | 8/19/96 | COMBUSTION TURBINE, COMBINED CYCLE | 15.007 | 1299.00 | MMBTU/HR NAT GAS | PM | 8.1000 | LB/HR, GAS | GOOD COMBUSTION CONTROLS | 0.000 | BACT-PSD |
| NC-0059 | CAROLINA POWER & LIGHT | GOLDSBORO | 8/19/96 | COMBUSTION TURBINE, 4 EACH | 15.007 | 1907.60 | MMBTU/HR | PM/PM10, OIL | 17.0000 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| NC-0059 | CAROLINA POWER & LIGHT | GOLDSBORO | 8/19/96 | COMBUSTION TURBINE, 4 EACH | 15.007 | 1907.60 | MMBTU/HR | PM/PM10, GAS | 9.0000 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0104 | SEMINOLE HARDEE UNIT 3 | FORT GREEI | 5/31/96 | COMBINED CYCLE COMBUSTION TURBINE | 15.007 | 140.00 | MW | PM/PM10 | 7.0000 | LB/HR (NAT. GAS) | DRY LNB FUEL SPEC: LOW S OIL, LIMITED OPERATION ON OIL. GOOD COMBUSTION | 0.000 | BACT-PSD |
| SC-0036 | CAROLINA POWER AND LIGHT | HARTSVILLE | 4/29/96 | STATIONARY GAS TURBINE | 15.007 | 1520.00 | MMBTU/H | PM (NO | 5.9000 | LB/H | PROPER OPERATION TO ACHIEVE GOOD COMBUSTION | 0.000 | BACT-PSD |
| SC-0036 | CAROLINA POWER AND LIGHT | HARTSVILLE | 4/29/96 | STATIONARY GAS TURBINE | 15.007 | 1520.00 | MMBTU/H | PM (OI | 22.0000 | LB/H | PROPER OPERATION TO ACHIEVE GOOD COMBUSTION | 0.000 | BACT-PSD |
| NY-0068 | KAMINE/BESICORP NATURAL DAM LP | NATURAL DA | 6/30/95 | GE FRAME 6 GAS TURBINE | 15.007 | 500.00 | MMBTU/HR | PM,PM | 0.0000 | SEE NOTE #1 | FUEL SPECIFICATION | 0.000 | BACT-OTHER |
| MN-0022 | LSP-COTTAGE GROVE, L.P. | COTTAGE GI | 5/29/95 | COMBUSTION TURBINE/GENERATOR | 15.007 | 1970.00 | MMBTU/HR | PM10 | 10.7000 | LB/HR GAS | FUEL SELECTION; GOOD COMBUSTION | 0.000 | BACT-PSD |
| NJ-0013 | LAKEWOOD COGENERATION, L.P. | LAKEWOOD TOWNSHIP | 5/29/95 | TURBINES (NATURAL GAS) (2) | 15.004 | 1190.00 | MMBTU/HR (EACH) | PM | 0.0023 | LB/MMBTU | TURBINE DESIGN | 0.000 | BACT-OTHER |
| NJ-0017 | NEWARK BAY COGENERATION PARTNERSHIP, L.P. | NEWARK | 5/29/95 | TURBINES, COMBUSTION, NATURAL GAS-FIRED (2) | 15.004 | 617.00 | MMBTU/HR (EACH) | TSP | 0.0060 | LB/MMBTU | TURBINE DESIGN | 0.000 | OTHER |
| NJ-0017 | NEWARK BAY COGENERATION PARTNERSHIP, L.P. | NEWARK | 5/29/95 | TURBINES, COMBUSTION, NATURAL GAS-FIRED (2) | 15.004 | 617.00 | MMBTU/HR (EACH) | PM10 | 0.0060 | LB/MMBTU | TURBINE DESIGN | 0.000 | BACT-PSD |
| NM-0024 | MILAGRO, WILLIAMS FIELD SERVICE | BLOOMFIELD | 5/29/95 | TURBINE/COGEN, NATURAL GAS (2) | 15.004 | 900.00 | MMCF/DAY | PM10 | 0.0000 | SEE P2 DESC. | COMBUSTION AIR FILTERS; GOOD COMBUSTION PRACTICE AND MAINTENANCE | 0.000 | BACT-PSD |
| NY-0061 | ANITEC COGEN PLANT | BINGHAMTO | 4/27/95 | GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001 | 15.007 | 451.00 | MMBTU/HR | PM,PM | 0.0050 | LB/MMBTU, 2.0 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.1% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0062 | FULTON COGEN PLANT | FULTON | 4/27/95 | GE LM5000 GAS TURBINE | 15.007 | 500.00 | MMBTU/HR | PM,PM | 0.0240 | LB/MMBTU, 12.0 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.3% BY WEIGHT | 0.000 | BACT-OTHER |

Salt Project

Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
PM10 Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NY-0062 | FULTON COGEN PLANT | FULTON | 4/27/95 | STACK EMISSIONS (GAS TURBINE AND DUCT BURNER) | 11.004 | 610.00 | MMBTU/HR (TOTAL) | PM,PM | 0.0240 | LB/MMBTU, 13.1 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.3% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0063 | TBG COGEN COGENERATION PLANT | BETHPAGE | 4/27/95 | GE LM2500 GAS TURBINE | 15.007 | 214.90 | MMBTU/HR | PM,PM | 0.0240 | LB/MMBTU, 5.0 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.037% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0064 | INDECK-OSWEGO ENERGY CENTER | OSWEGO | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 533.00 | LB/MMBTU | PM,PM | 0.0080 | LB/MMBTU, 5.00 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.27% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0065 | KAMINE/BESICORP CARTHAGE L.P. | CARTHAGE | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 491.00 | BTU/HR | PM,PM | 0.0050 | LB/MMBTU, 3.0 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.20% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0065 | KAMINE/BESICORP CARTHAGE L.P. | CARTHAGE | 4/27/95 | STACK (GAS TURBINE & DUCT BURNER) **SEE NOTE #3** | 11.004 | 540.00 | LB/MMBTU | PM,PM | 0.0050 | LB/MMBTU, 3.0 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.20% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0071 | KAMINE SOUTH GLENS FALLS COGEN CO | SOUTH GLENS FALLS | 4/27/95 | GE FRAME 6 GAS TURBINE | 15.007 | 498.00 | MMBTU/HR | PM,PM | 0.0050 | LB/MMBTU, 3.0 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.20% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0071 | KAMINE SOUTH GLENS FALLS COGEN CO | SOUTH GLENS FALLS | 4/27/95 | DUCT BURNER (SEE NOTE #3) | 11.004 | 44.00 | MMBTU/HR | PM,PM | 0.0050 | LB/MMBTU, 3.0 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.20% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0072 | KAMINE/BESICORP SYRACUSE LP | SOLVAY | 4/27/95 | SIEMENS V64.3 GAS TURBINE (EP #00001) | 15.007 | 650.00 | MMBTU/HR | PM,PM | 0.0080 | LB/MMBTU, 5.8 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.15% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0073 | LOCKPORT COGEN FACILITY | LOCKPORT | 4/27/95 | (6) GE FRAME 6 TURBINES (EP #S 00001-00006) | 15.007 | 423.90 | MMBTU/HR | PM,PM | 0.0060 | LB/MMBTU, 2.5 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.20% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0075 | PILGRIM ENERGY CENTER | ISLIP | 4/27/95 | (2) WESTINGHOUSE W501D5 TURBINES (EP #S 00001&2) | 15.007 | 1400.00 | MMBTU/HR | PM,PM | 0.0070 | LB/MMBTU, 7.20 LB/HR | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.05% BY WEIGHT | 0.000 | BACT-OTHER |
| NY-0079 | LEDERLE LABORATORIES | PEARL RIVE | 4/27/95 | (2) GAS TURBINES (EP #S 00101&102) | 15.007 | 110.00 | MMBTU/HR | PM,PM | 0.0000 | SEE NOTE #2 | FUEL SPEC: SULFUR CONTENT NOT TO EXCEED 0.30% BY WEIGHT | 0.000 | BACT-OTHER |
| OH-0218 | CNG TRANSMISSION | WASHINGT ON COURT HOUSE | 4/5/95 | TURBINE (NATURAL GAS) (3) | 15.004 | 5500.00 | HP (EACH) | PM | 0.0350 | LB/MMBTU | FUEL SPEC: USE OF NATURAL GAS | 0.000 | OTHER |
| NY-0066 | INDECK ENERGY COMPANY | SILVER SPR | 3/31/95 | GE FRAME 6 GAS TURBINE EP #00001 | 15.007 | 491.00 | MMBTU/HR | PM,PM | 0.0060 | LB/MMBTU, 2.5 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0076 | TRIGEN MITCHEL FIELD | HEMPSTEAD | 3/31/95 | GE FRAME 6 GAS TURBINE | 15.007 | 424.70 | MMBTU/HR | PM,PM | 0.0060 | LB/MMBTU, 2.9 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0077 | INDECK-YERKES ENERGY SERVICES | TONAWAND | 3/31/95 | GE FRAME 6 GAS TURBINE (EP #00001) | 15.007 | 432.20 | MMBTU/HR | TSP/PI | 0.0070 | LB/MMBTU, 2.5 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0080 | PROJECT ORANGE ASSOCIATES | SYRACUSE | 3/31/95 | STACK (TURBINE AND DUCT BURNER) | 11.005 | 715.00 | MMBTU/HR | PM,PM | 0.0330 | LB/MMBTU, 25 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0057 | MEGAN-RACINE ASSOCIATES, INC | CANTON | 3/30/95 | GE LM5000-N COMBINED CYCLE GAS TURBINE | 15.007 | 401.00 | LB/MMBTU | PM,PM | 0.0280 | LB/MMBTU, 12 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| NY-0081 | LILCO SHOREHAM | HICKSVILLE | 3/30/95 | (3) GE FRAME 7 TURBINES (EP #S 00007-9) | 15.002 | 850.00 | MMBTU/HR | PM10 | 0.0120 | LB/MMBTU, 10.2 LB/HR | NO CONTROLS | 0.000 | BACT-OTHER |
| AL-0069 | INTERNATIONAL PAPER CO. RIVERDALE MILL | SELMA | 3/24/95 | TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER | 15.007 | 40.00 | MW | PM10 | 0.0100 | LB/MMBTU (GAS) | FUEL SPECIFICATION | 0.000 | BACT-PSD |
| CO-0017 | THERMO INDUSTRIES, LTD. | FT. LUPTON | 3/24/95 | TURBINE, GAS FIRED, 5 EACH | 15.004 | 246.00 | MMBTU/H | PM | 25.8000 | LB/H | FUEL SPEC: NATURAL GAS FIRED | 0.000 | OTHER |
| CO-0023 | PHOENIX POWER PARTNERS | GREELEY | 3/24/95 | GENERATOR, STEAM, W/ DUCT BURNER | 11.005 | 50.00 | MMBTU/HR | PM10 | 20.2000 | TPY | FUEL SPEC: NATURAL GAS COMBUSTION | 0.000 | BACT-OTHER |
| FL-0045 | CHARLES LARSEN POWER PLANT | CITY OF OF LAKELAND | 3/24/95 | TURBINE, GAS, 1 EACH | 15.004 | 80.00 | MW | PM | 0.0060 | LB/MMBTU | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0052 | FLORIDA POWER AND LIGHT | NORTH PALM BEACH | 3/24/95 | TURBINE, GAS, 4 EACH | 15.004 | 400.00 | MW | PM | 18.0000 | LB/H | COMBUSTION CONTROL | 0.000 | BACT-PSD |

Salt [illegible] Project
Proposed Power Plant - Existing Kyrene Generating Station
RLBC Database Information - Combined Cycle Turbines
PM10 Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FL-0052 | FLORIDA POWER AND LIGHT | NORTH PALM BEACH | 3/24/95 | TURBINE, CG, 4 EACH | 15.004 | 400.00 | MW | PM | 19.0000 | LB/H | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0053 | FLORIDA POWER AND LIGHT | LAVOGROME REPOWERING STATION | 3/24/95 | TURBINE, GAS, 4 EACH | 15.004 | 240.00 | MW | PM | 15.4000 | LB/H | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| FL-0054 | LAKE COGEN LIMITED | UMATILLA | 3/24/95 | TURBINE, GAS, 2 EACH | 15.004 | 42.00 | MW | PM | 0.0065 | LB/MMBTU | COMBUSTION CONTROL, FUEL SPEC: CLEAN FUEL | 0.000 | BACT-PSD |
| GA-0052 | SAVANNAH ELECTRIC AND POWER CO. | | 3/24/95 | TURBINES, 8 | 15.004 | 1032.00 | MMBTU/H, NAT GAS | PM | 0.0060 | LB/MMBTU | FUEL SPEC: LOW SULFUR FUEL OIL | 0.000 | BACT-PSD |
| GA-0052 | SAVANNAH ELECTRIC AND POWER CO. | | 3/24/95 | TURBINES, 8 | 15.006 | 972.00 | MMBTU/H, #2 OIL | PM | 0.0120 | LB/MMBTU | FUEL SPEC: LOW SULFUR FUEL OIL | 0.000 | BACT-PSD |
| GA-0053 | HARTWELL ENERGY LIMITED PARTNERSHIP | HARTWELL | 3/24/95 | TURBINE, GAS FIRED (2 EACH) | 15.004 | 1817.00 | M BTU/HR | PM | 0.0064 | LB/M BTU | FUEL SPEC: CLEAN BURNING FUELS | 0.000 | BACT-PSD |
| HI-0015 | MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA | MAUI | 3/24/95 | TURBINE, COMBINED-CYCLE COMBUSTION | 15.006 | 28.00 | MW | PM | 19.7000 | LB/HR | COMBUSTION TECHNOLOGY/DESIGN | 0.000 | BACT-OTHER |
| NC-0055 | DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION | LOWESVILLE | 3/24/95 | TURBINE, COMBUSTION | 15.004 | 1313.00 | MM BTU/HR | PM10 | 5.0000 | LB/HR | COMBUSTION CONTROL | 0.000 | BACT-PSD |
| NV-0017 | NEVADA POWER COMPANY, HARRY ALLEN PEAKING PLANT | LAS VEGAS | 3/24/95 | COMBUSTION TURBINE ELECTRIC POWER GENERATION | 15.004 | 600.00 | MW (8 UNITS 75 EACH) | PM10 | 30.6000 | TPY (EACH TURBINE) | PRECISION CONTROL FOR THE COMBUSTOR | 0.000 | BACT-PSD |
| OK-0027 | OKLAHOMA MUNICIPAL POWER AUTHORITY | PONCA CITY | 3/24/95 | TURBINE, COMBUSTION | 15.007 | 58.00 | MW | PM | 0.0125 | LB/MMBTU | FUEL SPEC: USE OF DISTILLATE FUEL | 90.000 | BACT-OTHER |
| SC-0021 | CAROLINA POWER AND LIGHT CO. | DARLINGTON | 3/24/95 | TURBINE, I.C. | 15.007 | 80.00 | MW | PM | 15.0000 | LB/H | | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINE FACILITY, GAS | 15.007 | 1331.13 | X10(7) SCF/Y NAT GAS | TSP/PM | 50.6000 | TOTAL TPY | FUEL SPEC: CLEAN BURNING FUEL | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINE FACILITY, GAS | 15.007 | 7.44 | X10(7) GPY FUEL OIL | TSP/PM | 50.6000 | TOTAL TPY | FUEL SPEC: CLEAN BURNING FUEL | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINES (2) [EACH WITH A SF] | 15.007 | 1.51 | X10(9) BTU/HR N GAS | TSP/PM | 8.0000 | LBS/HR/UNIT | FUEL SPEC: CLEAN BURNING FUEL | 0.000 | BACT-PSD |
| VA-0189 | GORDONSVILLE ENERGY L.P. | FAIRFAX | 3/24/95 | TURBINES (2) [EACH WITH A SF] | 15.007 | 1.36 | X10(9) BTU/H #2 OIL | TSP/PM | 13.0000 | LBS/HR/UNIT | FUEL SPEC: CLEAN BURNING FUEL | 0.000 | BACT-PSD |
| FL-0068 | ORANGE COGENERATION LP | BARTOW | 1/13/95 | TURBINE, NATURAL GAS, 2 | 15.004 | 368.30 | MMBTU/H | PM | 5.0000 | LB/H | GOOD COMBUSTION | 0.000 | BACT-PSD |
| FL-0072 | TIGER BAY LP | FT. MEADE | 1/13/95 | TURBINE, GAS | 15.004 | 1614.80 | MMBTU/H | PM | 9.0000 | LB/H | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0078 | KISSIMMEE UTILITY AUTHORITY | INTERCESSION CITY | 1/13/95 | TURBINE, NATURAL GAS | 15.004 | 869.00 | MMBTU/H | PM | 7.0000 | LB/H | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0078 | KISSIMMEE UTILITY AUTHORITY | INTERCESSION CITY | 1/13/95 | TURBINE, NATURAL GAS | 15.004 | 367.00 | MMBTU/H | PM | 9.0000 | LB/H | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0080 | AUBURNDALE POWER PARTNERS, LP | AUBURNDALE | 1/13/95 | TURBINE,GAS | 15.004 | 1214.00 | MMBTU/H | PM | 0.0136 | LB/MMBTU | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| FL-0082 | FLORIDA POWER CORPORATION POLK COUNTY SITE | BARTOW | 1/13/95 | TURBINE, NATURAL GAS (2) | 15.004 | 1510.00 | MMBTU/H | PM | 9.0000 | LB/H | GOOD COMBUSTION PRACTICES | 0.000 | BACT-PSD |
| PA-0099 | FLEETWOOD COGENERATION ASSOCIATES | FLEETWOOD | 11/22/94 | NG TURBINE (GE LM6000) WITH WASTE HEAT BOILER | 15.004 | 360.00 | MMBTU/HR | PM | 8.0000 | LB/HR | | 0.000 | BACT-OTHER |
| TX-0231 | WEST CAMPUS COGENERATION COMPANY | COLLEGE ST | 10/31/94 | GAS TURBINES | 15.004 | 75.30 | MW (TOTAL POWER) | PM10 | 52.0000 | TPY | INTERNAL COMBUSTION CONTROLS | 0.000 | BACT |
| NY-0045 | SELKIRK COGENERATION PARTNERS, L.P. | SELKIRK | 9/13/94 | COMBUSTION TURBINES (2) (252 MW) | 15.004 | 1173.00 | MMBTU/HR (EACH) | PM/PM | 0.0040 | LB/MMBTU GAS (BASE) | COMBUSTION CONTROLS AND FUEL SPEC: LOW SULFUR OIL | 0.000 | BACT-OTHER |

Salt [illegible]bject
Proposed Power Plant - Existing Kyrene Generating Station
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PM10 Emissions

| RBLCID | FACILITY | CITY | LAST UPDATE | PROCESS | PROC TYPE | THRU PUT | THRUPUT UNIT | POLL. | PRIM EMISS | PRIME UNIT | CTRLDESC | PCT EFFIC | BASIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NY-0045 | SELKIRK COGENERATION PARTNERS, L.P. | SELKIRK | 9/13/94 | COMBUSTION TURBINE (79 MW) | 15.004 | 1173.00 | MMBTU/HR | PM/PM | 0.0040 | LB/MMBTU, GAS | COMBUSTION CONTROLS AND FUEL SPEC: LOW SULFUR OIL | 0.000 | BACT-OTHER |
| NY-0046 | SARANAC ENERGY COMPANY | PLATTSBUR | 9/13/94 | TURBINES, COMBUSTION (2) (NATURAL GAS) | 15.004 | 1123.00 | MMBTU/HR (EACH) | PM/PM | 0.0062 | LB/MMBTU | COMBUSTION CONTROLS | 0.000 | BACT-OTHER |
| NY-0048 | KAMINE/BESICORP CORNING L.P. | SOUTH COR | 9/13/94 | TURBINE, COMBUSTION (79 MW) | 15.004 | 653.00 | MMBTU/HR | PM/PM | 0.0080 | LB/MMBTU | COMBUSTION CONTROL | 0.000 | BACT-OTHER |
| CO-0018 | BRUSH COGENERATION PARTNERSHIP | BRUSH | 7/20/94 | TURBINE | 15.004 | 350.00 | MMBTU/H | PM10 | 9.9000 | T/YR | | 0.000 | OTHER |
| CO-0018 | BRUSH COGENERATION PARTNERSHIP | BRUSH | 7/20/94 | TURBINE | 15.004 | 350.00 | MMBTU/H | PM | 9.9000 | T/YR | | 0.000 | OTHER |
| CO-0019 | COLORADO POWER PARTNERSHIP | BRUSH | 7/20/94 | TURBINES, 2 NAT GAS & 2 DUCT BURNERS | 15.004 | 385.00 | MMBTU/H EACH TURBINE | PM10 | 12.4000 | T/YR | | 0.000 | OTHER |
| CO-0019 | COLORADO POWER PARTNERSHIP | BRUSH | 7/20/94 | TURBINES, 2 NAT GAS & 2 DUCT BURNERS | 15.004 | 385.00 | MMBTU/H EACH TURBINE | PM | 12.4000 | T/YR | | 0.000 | OTHER |
| PA-0098 | GRAYS FERRY CO. GENERATION PARTNERSHIP | PHILADELPH | 7/20/94 | GENERATOR, STEAM | 15.007 | 450.00 | MMBTU | PM | 0.1000 | LB/MMBTU* | DRY LOW NOX BURNER, COMBUSTION CONTROL | 0.000 | BACT-OTHER |
| WI-0067 | WEPCU, PARIS SITE | PARIS | 7/20/94 | TURBINES, COMBUSTION (4) | 15.007 | 0.00 | | PM | 12.0000 | LBS/HR | GOOD COMBUSTION | 0.000 | BACT-PSD |
| NV-0015 | SAGUARO POWER COMPANY | HENDERSON | 6/1/93 | COMBUSTION TURBINE GENERATOR | 15.007 | 34.50 | MW | PM | 2.5000 | PPH | COMBUSTION SYSTEM | 0.000 | LAER |
| RI-0010 | NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO. | PROVIDENC | 5/31/92 | TURBINE, GAS AND DUCT BURNER | 15.004 | 1360.00 | MMBTU/H EACH | PM | 0.0050 | LB/MMBTU, GAS | | 0.000 | BACT-PSD |

- Pipeline natural gas with a sulfur content of approximately 1 grain/100 scf.

The combined cycle system and auxiliary boiler will be limited to using pipeline natural gas. Thus, this is consistent with the approach used to achieve LAER.

To control PM emissions from the cooling tower, SRP is proposing the state-of-the-art mist eliminators. These eliminators are designed to achieve a drift of only 0.0005%. This should represent LAER for mechanical draft type cooling towers.

## *5.6 POLLUTANT EMISSION OFFSETS*

The second requirement for new sources locating in a nonattainment area is to obtain air pollutant emission offsets. This essentially involves reducing actual air pollutant emissions in a nonattainment area to adequately offset the increase in air pollutant emissions from a new source. Thus, air pollutant emissions from the proposed SRP power plant must be offset by reductions in air pollutant emissions for which the area has been designated as nonattainment and for which the source is classified as major. This would apply to emissions of $NO_x$, CO, $PM_{10}$ and VOCs from the proposed power plant. Emission offsets may be obtained by reductions in emissions from the source, or from any other source in existence within the allowable offset area, which reductions must commence by the startup date of the new source. Credit for an offset can only be used if it has not been relied upon in demonstrating attainment or in demonstrating reasonable further progress (RFP), and if it has not been relied upon previously in issuing a permit or permit revision pursuant to Rule 240, Sections 301-305 or not otherwise required under this rule or under any provision of the SIP.

The emission offset is not sufficient unless reductions of total emissions for the particular pollutant for which the offset is required will be:

- Obtained from sources in the allowable offset area;
- A surplus emission, which is an emission reduction not required by current regulations in the State Implementation Plan (SIP); not already relied upon for SIP planning purposes; and not used by the source to meet any other regulatory requirement, including, at the time emission reduction credits (ERCs) are used, Reasonable Available Control Technology (RACT), Reasonable Further Progress (RFP), or milestones therefor, or demonstration of attainment;
- Contemporary with the operation of the new source;
- An emission enforceable by the Administrator;
- A quantifiable emission based on emission factors, stack tests, monitored values, operating rates and averaging times, process or production inputs, modeling or other measurement practices;
- Sufficient to satisfy the Control Officer that the emissions from the new major source, together with the offset, will result in RFP for that pollutant;
- Only intrapollutant emission offsets shall be allowed; and

- RFP shall mean compliance with the schedule of annual incremental reductions in emissions of the applicable air pollutant prescribed by the Control Officer based on air quality modeling.

The baseline of total emissions from any sources in existence or sources which have obtained a permit or permit revision pursuant to Rule 240, regardless of whether or not such sources are in actual operation at the time of application for the permit or permit revision shall be the total actual emissions at the time the application is filed. In addition, the baseline of total emissions shall consist of all emission limitations included as conditions on federally enforceable permits except that the offset baseline shall be the actual emissions of the source from which the offset credit is obtained where:

- No emissions limitations are applicable to a source from which offsets are being sought; or
- The demonstration of RFP and attainment of ambient air quality standards is based upon the actual emissions of sources located within a designated nonattainment area.

Where the emission limitations for a particular pollutant allow greater emissions than the potential emission rate of the source for that pollutant, the baseline shall be the potential emission rate at the time of application for the permit or permit revision pursuant to this rule, and emissions offset credit shall be allowed only for control below the potential emission rate. Emissions reductions achieved by shutting down an existing source or permanently reducing production or operating hours below baseline levels may be credited, as long as the work force to be affected has been notified of the proposed shutdown or reduction.

As stated in Maricopa County Rules, Section 307 "Special Requirements for Sources of VOC or Oxides of Nitrogen in Ozone Nonattainment Areas Classified as Serious or Severe," any new major source with potential to emit VOC or $NO_x$ emissions in an $O_3$ nonattainment area classified as serious, shall obtain emission offset at a ratio of 1.2:1. This means that for every new ton of emissions, 1.2 tons must be obtained from source reductions in the nonattainment area. Thus, emissions of $NO_x$ and VOC from the proposed power plant must be offset as follows:

| Nonattainment Area Air Pollutant | Proposed Power Plant Emission Rate (tons/year) | Emission Offset Ratio | Required Offsets (tons/year) |
|---|---|---|---|
| $NO_x$ | 96.9 | 1.2 | 116.3 |
| VOC | 36.5 | 1.2 | 43.8 |

For emissions of CO and $PM_{10}$, the emission offset requirement is not as well defined as that for emissions of $NO_x$ and VOCs. According to Section 306.2(f), "An offset shall not be sufficient unless reductions of total emissions for CO and $PM_{10}$ are sufficient to satisfy to the regulatory agency that emissions from the new source, together with the emissions offsets, will result in reasonable further progress towards attaining the NAAQS." Section 4.7 provides the results of the net air quality

benefit demonstration performed for emission of CO and $PM_{10}$ from the proposed power plant. These demonstrations show that the following emission offsets were sufficient to demonstrate a net air quality benefit.

| Nonattainment Area Air Pollutant | Proposed Power Plant Emission Rate (tons/year) | Proposed Offset Rate (tons/year) |
|---|---|---|
| CO | 145.6 | 145.6 |
| $PM_{10}$ | 83.3 | 83.3 |

### 5.6.1 Emission Offsets – $NO_x$ Emissions

The first step in defining acceptable emission offsets, is to define the area where offsets can be obtained. According to Maricopa County Rule (Section 306.11) the allowable offset area shall refer to the geographical area in which are located the sources whose emissions are being sought for purposes of offsetting emissions from a new major source. For the proposed power plant, the allowable offset area for emissions of $NO_x$ is the nonattainment area.

SRP has been investigating potential $NO_x$ emission offset sources within Maricopa County. This investigation included discussions with local community leaders, county planning members and industrial facility managers. The purpose of these discussions was to identify possible alternatives for reducing $NO_x$ emissions from existing sources located in Maricopa County. Based on these discussions, SRP is in the process of establishing agreements with local companies to obtain $NO_x$ offsets. This would be accomplished by either shutting down existing emitting units or restricting hours of operation. Furthermore, SRP will be limiting hours of operation on the existing units at Kyrene. This voluntary operation limit will also provide $NO_x$ emission credit.

As stated previously, the proposed project is required to obtain $NO_x$ emission offsets at a rate of 1.2 to 1. Since the proposed power plant will have the potential to emit 96.9 tons/year of $NO_x$ emissions, emission offsets at a rate of 116.3 tons/year would be required. Based on the list above, SRP is proposing to secure 116.3 tons/year of $NO_x$ emission offsets and satisfy the emissions offset requirement.

### 5.6.2 Emission Offsets – VOC Emissions

As with emissions of $NO_x$, Maricopa County rules allow emission offsets for emissions of VOCs to be obtained within the $O_3$ nonattainment area. Subsequently, SRP has been investigating potential VOC emission offset sources within Maricopa County. This investigation included discussions with local community leaders, county planning members and industrial facility managers. The purpose of these discussions was to identify possible alternatives for reducing VOC emissions from existing sources located in Maricopa County. Based on these discussions, SRP is in the process of developing agreements with local companies to obtain VOC offsets. This would be accomplished by either shutting down existing emitting units or restricting hours of operation. Furthermore, SRP

will be limiting hours of operation on the existing units at Kyrene. This voluntary operational limit will also provide VOC emission credit.

As stated previously, the proposed project is required to obtain VOC emission offsets at a rate of 1.2 to 1. Since the proposed power plant will have the potential to emit 36.5 tons/year of VOC emissions, emission offsets of 43.8 tons/year would be required. Based on the list above, SRP is proposing to secure 43.8 tons/year of VOC emission offsets and satisfy the emissions offset requirement.

### 5.6.3 Emission Offsets – CO Emissions

SRP has been investigating potential CO emission offset sources within Maricopa County. This investigation has included discussions with local community leaders, county planning members and industrial facility managers. The purpose of these discussions was to identify possible alternatives for reducing CO emissions from existing sources located in Maricopa County, including area sources and mobile sources. Based on these discussions, SRP has been focusing on establishing agreements with local companies to obtain CO offsets. This would be accomplished by either shutting down existing emitting units, restricting hours of operation, converting gas fired equipment to electric and implementing mobile source emission reduction programs. Furthermore, SRP will be limiting hours of operation on the existing units at Kyrene. This voluntary operational limit will also provide CO emission credit.

As stated previously, the proposed project is required to obtain sufficient emission offsets to support that a net air quality benefit will be achieved. Based on the results of the net air quality benefit demonstration performed for emission of CO, emission offsets of 145.6 tons/year were sufficient to show a net air quality benefit. Thus, based on the list above, SRP is proposing to secure 145.6 tons/year of CO emission offsets and satisfy the emissions offset requirement.

### 5.6.4 Emission Offsets – $PM_{10}$ Emissions

SRP has been investigating potential $PM_{10}$ emission offset sources within Maricopa County. This investigation included discussions with local community leaders, county planning members and industrial facility managers. The purpose of these discussions was to identify possible alternatives for reducing $PM_{10}$ emissions from existing sources located in Maricopa County. Based on these discussions, SRP has identified the following sources as potential $PM_{10}$ emission offsets:

- Canal bank paving and stabilization;
- Mobile emission reduction credits; and
- Road paving;

SRP will secure the offsets prior to issuance of the air quality permit.

As stated previously, the proposed project is required to obtain sufficient emission offsets to show a net air quality benefit. Since the proposed power plant will have the potential to emit 83.3 tons/year of $PM_{10}$ emissions, a minimum emission offset of 83.3 tons/year would be required. A net air quality benefit demonstration was performed using the minimum offset of 83.3 tons/year. The outcome of this demonstration showed that a minimum offset would result in a net air quality improvement. As a result, SRP is proposing to secure 83.3 tons/year of $PM_{10}$ emission offsets, which should satisfy the emissions offset requirement.

## *5.7 NET AIR QUALITY BENEFIT DEMONSTRATION FOR NONATTAINMENT AREA POLLUTANTS ($NO_2$, VOC, $PM_{10}$ AND CO)*

The third required analysis is a demonstration that the proposed new source in conjunction with emission offsets will provide a net air quality benefit. Since the proposed power plant will have the potential to emit $NO_x$, VOC, $PM_{10}$ and CO in excess of the major source threshold levels, a net air quality benefit demonstration must be performed for each.

Provided below is a discussion on the net air quality benefit demonstration for emissions of $NO_x$, VOC, $PM_{10}$ and CO.

### $NO_2$ Net Air Quality Benefit Demonstration

This pollutant has been determined to be a precursor to the formation of ozone. Maricopa County Rules and USEPA Region IX personnel have concluded that obtaining emission offsets of 1.2 to 1 is sufficient to demonstrate that a net air quality benefit will be achieved.

### VOC Net Air Quality Benefit Demonstration

Since VOC emissions are considered a precursor to the formation of $O_3$, an air quality impact assessment is traditionally not performed for this air pollutant. According to county, state and federal air regulations, a net air quality benefit analysis is not required if sufficient offsets are obtained. Since the proposed power plant will be obtaining emission offsets at a rate of at least 1.2 to 1, no net air quality impact assessment is required for emissions of VOCs.

### $PM_{10}$ Net Air Quality Benefit Demonstration

As stated in Maricopa County rules (Section 306.6) a net air quality benefit shall mean either of the following:

a) A reduction in the number of violations of the applicable Arizona ambient air quality standards within the allowable offset area; or

b) The average of the ambient concentrations within the allowable offset area with the offsets is less than the average ambient concentrations without the offsets.

To demonstrate compliance with criterion b) above, the following steps were performed:

1. Establish an emissions offset threshold greater than 1 to 1. Since Maricopa County has not established an emission offset threshold greater than 1 to 1, Step 2 was followed to demonstrate compliance with b) above.

2. Conducted an air quality impact analysis for $PM_{10}$ emissions as follows:

   - Using the Industrial Source Complex (ISC) dispersion model, determine the annual and 24-hour impacts (concentrations in ug/m$^3$) on ambient air quality based on potential $PM_{10}$ emissions from the proposed power plant. $PM_{10}$ emissions sources associated with the proposed power plant are the one combined cycle system, auxiliary boiler, emergency generator, emergency fire water pump and mechanical draft cooling tower. (Terrain elevations were included in this analysis.)
   - If the annual and 24-hour impacts (concentration in ug/m$^3$) on ambient air quality are determined to be insignificant (less than the $PM_{10}$ annual and 24-hour significance levels – 1.0 ug/m$^3$ and 5.0 ug/m$^3$, respectively,) then the allowable offset area is defined as Maricopa County.
   - If the annual and 24-hour impacts on ambient air quality are determined to be significant, then the allowable offset area is defined as only the area where significant concentrations were determined.

As shown in Section 6.0, Table 6-6, predicted annual and 24-hour impacts from the proposed plant were determined to be less than the corresponding significance level. Subsequently, based on guidance provided by Maricopa County, a net air quality benefit will be achieved since the following criteria has been met:

- Emission offsets will be obtained at a ratio of at least 1 to 1. In other words, the $PM_{10}$ emissions from the proposed plant will be offset equally with reductions from existing PM10 emission sources; and
- The air quality impact due to $PM_{10}$ emissions from the proposed plant were determined to be less than the annual and 24-hour significance levels established by the USEPA.

**CO Net Air Quality Benefit Demonstration**

As stated in Maricopa County rules (Section 306.6) a net air quality benefit shall mean either of the following:

a) A reduction in the number of violations of the applicable Arizona ambient air quality standards within the allowable off set area; or

b) The average of the ambient concentrations within the allowable offset area with the offsets is less than the average ambient concentrations without the offsets.

To demonstrate compliance with criterion b) above, the following steps were performed:

3. Establish an emissions offset threshold greater than 1 to 1. Since Maricopa County has not established an emission offset threshold greater than 1 to 1, Step 2 was followed to demonstrate compliance with b) above.

4. Conducted an air quality impact analysis for CO emissions as follows:

   - Using the ISC dispersion model, determine the 1-hour and 8-hour impacts (concentrations in ug/m$^3$) on ambient air quality based on potential CO emissions from the proposed power plant. CO emissions sources associated with the proposed power plant are the one combined cycle system, auxiliary boiler, emergency generator, and emergency fire water pump. (Terrain elevations were included in this analysis.)
   - If the 1-hour and/or 8-hour impacts (concentration in ug/m$^3$) on ambient air quality are determined to be insignificant (less than the CO 1-hour and 8-hour significance levels of 2,000 ug/m$^3$ and 500 ug/m$^3$, respectively), then the allowable offset area is defined as Maricopa County.
   - If the 1-hour and 8-hour impacts on ambient air quality are determined to be significant, then the allowable offset area is defined as only the area where significant concentrations were determined.

As shown in Section 6.0, Table 6-5, predicted 1-hour and 8-hour impacts from the proposed plant were determined to be less than the corresponding significance level. Subsequently, based on guidance provided by Maricopa County, a net air quality benefit will be achieved since the following criteria has been met:

- Emission offsets will be obtained at a ratio of at least 1 to 1. In other words, the CO emissions from the proposed plant will be offset equally with reductions from existing CO emission sources; and
- The air quality impact due to CO emissions from the proposed plant were determined to be less than the 1-hour and 8-hour significance levels established by the USEPA.

## *5.8 ALTERNATIVE SITE ANALYSIS*

The fourth and final specialized analysis required for major new sources located in nonattainment areas is an alternative site analysis. As stipulated by local, state and federal permitting requirements, an analysis of alternative sites, sizes, production processes and environmental control techniques

must be performed for the proposed source. In addition, the analysis must demonstrate that the benefits of the new source significantly outweigh the social and environmental costs imposed as a result of its location, construction, and modification.

SRP has conducted a comprehensive analysis of the requirements for electrical power demands in and around Maricopa County. Based on this analysis, it was determined that constructing and operating a new plant at the existing Kyrene Generating Station was the best location based on technical, environmental and economic constraints.

SRP has selected this site based on the following criteria:

- Available land;
- Compatible land use;
- Availability of gas supplies;
- Availability of renewable water supplies;
- Ability to beneficially reuse waste water;
- Availability of air emission offsets;
- Access and support to local power transmission and distribution system;
- Minimum land use impacts; and
- Minimum impact to biological resources.

The following set of questions and responses is intended to address and satisfy the requirements for an alternative site analysis.

**Question No. 1**
Have the potential and real adverse environmental effects of the proposed power plant been avoided to the maximum extent possible?

**Response to Question No. 1**
The potential and real adverse environmental effect of the proposed power plant have been avoided by installing air pollution control equipment and obtaining emissions offsets. The proposed combined cycle system will be equipped with a dry, low $NO_x$ combustor, low $NO_x$ burner, selective catalytic reduction system and oxidation catalyst. The inclusion of these air pollution control devices will achieve the lowest achievable emission rates for emissions of $NO_x$, CO, $PM_{10}$, and VOC. The proposed control devices will be capable of reducing $NO_x$, CO, and VOC emissions by 90%, 90% and 20%, respectively.

In addition to the proposed air pollution control techniques, SRP will obtain emission offsets at a ratio of 1.2 to 1 for emissions of $NO_x$ and VOCs from the proposed power plant. This correlated to a net reduction of approximately 19 tons/year of $NO_x$ emissions and 7 tons/year of VOC emissions, and no increase in emissions of $PM_{10}$ and CO. The combination of the installation of air pollution control devices and emission offsets will actually decrease the environmental impacts in the proposed plant site area due to emissions of $NO_x$, CO, $PM_{10}$ and VOCs.

**Question No. 2**
Do the social and economic benefits of the proposed project outweigh the environmental impacts of the project?

**Response to Question No. 2**
The proposed power plant will result in an insignificant impact on air quality. In addition, the combination of the proposed power plant with existing sources in the Tempe area will not cause or lead to a violation of the National Ambient Air Quality Standards (NAAQS). These standards have been developed to protect human health and welfare. Furthermore, the Kyrene site will minimize impacts to land and water. New transmission lines and their associated land use impacts will not be required to deliver power to the local electrical service area. The Kyrene site also has the ability to use renewable water resources as well as beneficially reuse plant waste water.

Since this proposed power plant will not significantly affect the environment, the social and economic benefits of the plant substantially outweigh the minimal environment effects. The proposed power plant will result in the following social and economic benefits:

- The proposed power plant will result in new jobs;
- The proposed power plant will provide 250 MW of electrical power to the local grid;
- The proposed power plant will provide lower cost electricity than other sites because of the existing electric, gas and water infrastructure; and
- The proposed power plant will provide a mechanism for meeting future electrical demands.

**Question No. 3**
Have alternative projects that would offer more protection to the environment than the proposed plant without unduly curtailing non-environmental benefits been considered?

**Response to Question No. 3**
SRP's power demands have increased drastically because of growth in the SRP electric service area. This growth is anticipated to continue over the next several years. SRP's current power resources are insufficient to meet the forecasted load.

SRP examined several options to manage the load growth including 1) purchasing power from other utilities or from power marketers, 2) deploying demand side management techniques to control peak load, 3) developing renewable energy sources, 4) encouraging conservation, 5) building new fossil fuel plants outside of the metropolitan area, and 6) building new fossil fuel plants inside the metropolitan area. Due to current transmission constraints on importing power into the Phoenix metropolitan area in the summer months options 1 and 5 would require significant investment in new high voltage transmission lines. Plus such projects would carry their own environmental impact associated with the new transmission lines to broad areas of the state. SRP has made significant past attempts to encourage options 2 and 4. Those ideas have not proven to be economically viable and any demand reduction realized is not under the control of the utility. In other words, it is not possible to truly count on such demand reductions being applicable on the days of highest customer load. Although option 3 is an admirable choice the alternatives to SRP are far more costly than the use of traditional fossil fuel plants. A new fossil fuel plant in the metropolitan area was thus considered to be the most reliable option for meeting future customer power demand.

SRP then considered numerous alternatives for new fossil fuel generation. Based on the factors described in Question #1, SRP determined that a natural gas combined cycle power plant at the existing Kyrene site would be the most environmentally compatible option for new generation.

**Question No. 4**
Have alternative sites been considered which would offer more protection to the environment than the proposed plant without unduly curtailing non-environmental benefits?

**Response to Question No. 4**
Alternative sites were considered. Kyrene is considered the best choice among the alternatives. Alternative sites could be either within the nonattainment area or outside of it. The ideal site would require no new transmission lines to connect the plant to the area of rapidly growing demand, the East Valley of the Phoenix Metropolitan area. Transmission lines would have both a cost and environmental impact.

Any site outside the nonattainment area would mean new high voltage transmission line requirements back to the East Valley. That results in additional environmental impacts, costs and the potential for problems on the transmission line, leading to reduced reliability. An important part

of the project requirement is to improve the long-term reliability of the electric system. Fewer components are preferred to more. No new high voltage transmission is preferred.

Within the nonattainment area there are some sites that mean no associated transmission line requirements (other than short interconnections on the site itself). The selected site at Kyrene is such a site and is currently used for an electric generating plant. It is the only site currently used for generation that is within the area where the demand is outgrowing the combination of transmission capacity and local generation. Other sites would mean a change to the current land use and have the associated impacts of that change.

Other attributes of the selected site are its access to renewable water resources, availability of offsets for air emissions, and a relative absence of archaeological artifacts. The plant would use state-of-the-art technology to reduce emissions to the lowest achievable rate as required for new sources locating within the nonattainment area. Furthermore, emission offsets would be secured thus reducing total emissions into the urban airshed and helping improve air quality in the Maricopa County nonattainment area.

# 6 ATTAINMENT AREA PROVISIONS

A person proposing to construct a new major source in an attainment area must comply with specific requirements prior to issuance of a construction permit. These requirements, which are stipulated in the Prevention of Significant Deterioration (PSD) regulations apply to sources that emit significant amounts of attainment area air pollutants. This regulation states that no stationary source shall begin actual construction without a permit that stipulates that the source has met the following requirements:

- Conduct a Control Technology Review- A new stationary source shall apply Best Available Control Technology (BACT) for each attainment area air pollutant that it would have the potential to emit in significant amounts;
- Conduct a Source Impact Analysis- A demonstration shall be performed that shows the allowable increases of significant attainment area air pollutants from the proposed source would not cause or contribute to air pollution in violation of a) any NAAQS or b) Class I or Class II increment;
- Conduct an air quality analysis- An analysis shall be performed to define the ambient air quality for each significant attainment area air pollutant in the area that the major new source would affect; and
- Conduct additional impact analyses – An analysis shall be performed of the impairment to visibility, soils and vegetation that would occur as a result of the new source's significant levels of air pollutants. In addition, an analysis of the general commercial, residential, industrial and other growth associated with the new source's significant air pollutants is also required.

The following subsection presents a discussion on how the proposed power plant will comply with each of the PSD requirements stipulated above. As discussed in the previous section, Maricopa County is classified as attainment for $NO_2$ and $SO_2$. Based on the potential to emit air pollutant emission rates (Refer to Section 2.0) associated with the proposed power plant, only emissions of $NO_x$ have been estimated to exceed the major source threshold. The threshold levels that trigger applicability of the PSD regulations is 100 tons/year. The existing Kyrene power plant has the potential to emit in excess of 100 tons/year of $NO_x$ emissions. Since emissions of $NO_x$ from the proposed plant (96.9 t/yr) will exceed the modification threshold significance level of 40 t/yr, emissions of $NO_x$ from the proposed plant would be subject to PSD review.

The proposed power plant's potential emissions of $SO_2$ have been estimated to be less that 6 tons/year. Since this emission rate does not exceed the PSD trigger level (significant emission rate) of 40 tons/year, emissions of $SO_2$ would not be required to demonstrate compliance with the PSD regulations.

For purposes of this application, NAAQS analyses have been performed and are included within this section. This type of analysis is generally required under the PSD regulations. However, to

adequately demonstrate that the proposed power plant will not cause or contribute to a violation of the NAAQS, this type of demonstration has also been preformed for emissions of $NO_x$, CO, $PM_{10}$, and $SO_2$. Due to the chemical complexity of emissions of VOC, no air quality impact assessment was performed or is required by county, state or federal air pollution regulations.

## *6.1 CONTROL TECHNOLOGY REVIEW- BEST AVAILABLE CONTROL TECHNOLOGY DEMONSTRATION*

As previously discussed, SRP's proposed power plant is subject to the PSD regulations for emissions of $NO_x$. These regulations mandate that a case-by-case Best Available Control Technology (BACT) analysis be performed for each piece of equipment associated with the new source that has the potential to emit that air pollutant subject to PSD.

### 6.1.1 BACT Definition and Applicability

The definition of BACT may be found in Section 165(a)(4) of the Clean Air Act, in the PSD regulations under 40 CFR 52.21(j). BACT is defined as:

> *...an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Clean Air Act which would be emitted from any proposed major stationary source or major expansion project which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or expansion project through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant that would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. If the Administrator determines that technological or economic limitations on the application of the measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by the implementation of such design, equipment, work practice, or operation, and shall provide for compliance by means which achieve equivalent results.*

### 6.1.2 BACT – $NO_x$ Emissions

As presented in Section 5.0, a LAER demonstration was performed for emissions of $NO_x$. This type of demonstration results in an emission limitation that is more stringent than that obtained from a BACT demonstration conducted under the PSD regulations. Subsequently, a detailed BACT analysis following USEPA's top down approach was not performed for emissions of $NO_x$, since LAER will be achieved for emissions of $NO_x$ from the proposed power plant.

The following $NO_x$ control techniques and resulting $NO_x$ emission rates which were defined as meeting LAER, should satisfy the control technology review requirement established in the PSD regulations.

- Combined Cycle System – 2.0 ppmvd at 15% $O_2$ over a 1-hour period and 2.5 ppmvd at 15% $O_2$ over a 3-hour period. To achieve these levels, the combined cycle system will be equipped with a dry low $NO_x$ combustor on the turbine, low $NO_x$ burner on the supplemental duct burner associated with the HRSG and an SCR system.
- Auxiliary Boiler – A low $NO_x$ burner capable of achieving 0.07 lbs of $NO_x$ per MMBtu/hour, 1,200 hours of operation per year and the combustion of natural gas;
- Emergency Generator – 0.19 tons/year of $NO_x$, 37.5 hours per year of operation and the combustion of diesel fuel; and
- Emergency Fire Water Pump – 0.18 tons/year of $NO_x$, 37.5 hours per year of operation and the combustion of diesel fuel.

## *6.2 AIR QUALITY IMPACT ASSESSMENT*

In accordance with Maricopa County Rule 240, Section 308, air quality dispersion modeling analyses were performed to assess the ambient air quality impact of the proposed SRP power plant. A detailed description of the modeling approach and data requirements for the assessment of air quality impact due to the proposed project is included in this section.

### 6.2.1 Description of Air Quality Dispersion Model

The air quality modeling analyses employed USEPA's Industrial Source Complex (ISC3) model (USEPA, 1995a). The ISC3 model is recommended as a guideline model for assessing the impact of aerodynamic downwash (40 CFR 40465-40474 and Maricopa County Rule 240, Section 308).

The ISC3 model (Version 99155) consists of two programs: a short-term model (ISCST3) and a long-term model (ISCLT3). The difference in these programs is that the ISCST3 program utilizes an hourly meteorological data base, while ISCLT3 is a sector-averaged program using a frequency of occurrence based on categories of wind speed, wind direction, and atmospheric stability. The ISCST3 model was used for all pollutants. Major features of the ISC3 model are as follows:

- Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1971 and 1975);
- The influence of building wakes on plume transport and dispersion is evaluated by the Huber and Snyder Method (1976, 1977) for physical stack heights that are greater than $h_b + 0.5\ l_b$, where $h_b$ is the building height and $l_b$ is the lesser of the building height or width, and by the Schulman and Scire Method (1980a, 1980b, 1985, 1986) for stack heights that are less than $h_b + 0.5\ l_b$;
- Terrain truncation algorithm;

- Regulatory default option;
- Calm wind treatment of NWS meteorological data;
- Buoyancy-induced plume rise algorithm;
- Procedures suggested by Briggs (1973) for evaluating stack-tip downwash;
- Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations;
- Capability of simulating line, volume, and area sources;
- Concentration estimates for 1 hour to annual average;
- Use of COMPLEX I model algorithms to determine concentrations of receptors located in complex terrain (i.e., terrain height higher than plume height); and
- Capability of selecting the higher of the simple and complex terrain calculations on an hour-by-hour, source-by-source, and receptor-by-receptor basis for receptors in intermediate terrain (i.e., terrain between release height and plume height).

Details of the algorithms employed by ISC3 may be found in the *User's Guide for ISC* (USEPA, 1995a). The regulatory default option was selected such that USEPA guideline requirements were met.

Emission sources at the proposed SRP power plant will be influenced by aerodynamic downwash. Since downwash is a function of projected building width and height, it is necessary to account for the changes in building projection as they relate to changes in wind direction. Once these projected dimensions are determined, they can be used as input to the ISC3 model.

In October 1993, USEPA released the Building Profile Input Program (BPIP) to determine wind direction - dependent building dimensions. The BPIP algorithms as described in the User's Guide (USEPA, 1993), have been incorporated into the commercially available BREEZEWAKE program. The BREEZEWAKE program was used to determine the wind direction-dependent building dimensions for input to the ISC3 model.

The BPIP program builds a mathematical representation of each building to determine projected building dimensions and its potential zone of influence. These calculations are performed for 36 different wind directions (at 10 degree intervals). For example, the BPIP building dimensions for a wind direction orientation of 30 degrees will be used for wind directions between 26 and 35 degrees. If the BPIP program determines that a source is under the influence of several potential building wakes, the structure or combination of structures which has the greatest influence ($h_b$ + 1.5 $l_b$) is selected for input to the ISCST3 model. Conversely, if no building wake effects are predicted to occur for a source for a particular wind direction, or if the worst-case building dimensions for that direction yield a wake region height less than the source's physical stack height, building parameters are set equal to zero for that wind direction. For this case, wake effect algorithms are not exercised when the model is run. The building wake criteria influence zone is 5 $l_b$ downwind, 2 $l_b$ upwind, and 0.5 $l_b$ crosswind. These criteria are based on recommendations by

USEPA. The input to the BREEZEWAKE preprocessing program consisted of proposed power plant exhaust stacks (one combined cycle system, an auxiliary boiler, a cooling tower, an emergency generator and emergency fire water pump) and building dimensions. Figure 6-1 illustrates the emission sources in relation to building structures considered in the Good Engineering Practice (GEP) stack height analysis.

### 6.2.2 Databases for Air Quality Assessment

The databases required for the air quality impact assessment included source emission data, meteorological data and receptor points. The following sections describe the databases required to perform the air quality impact assessment.

#### 6.2.2.1 Emission Inventory Data

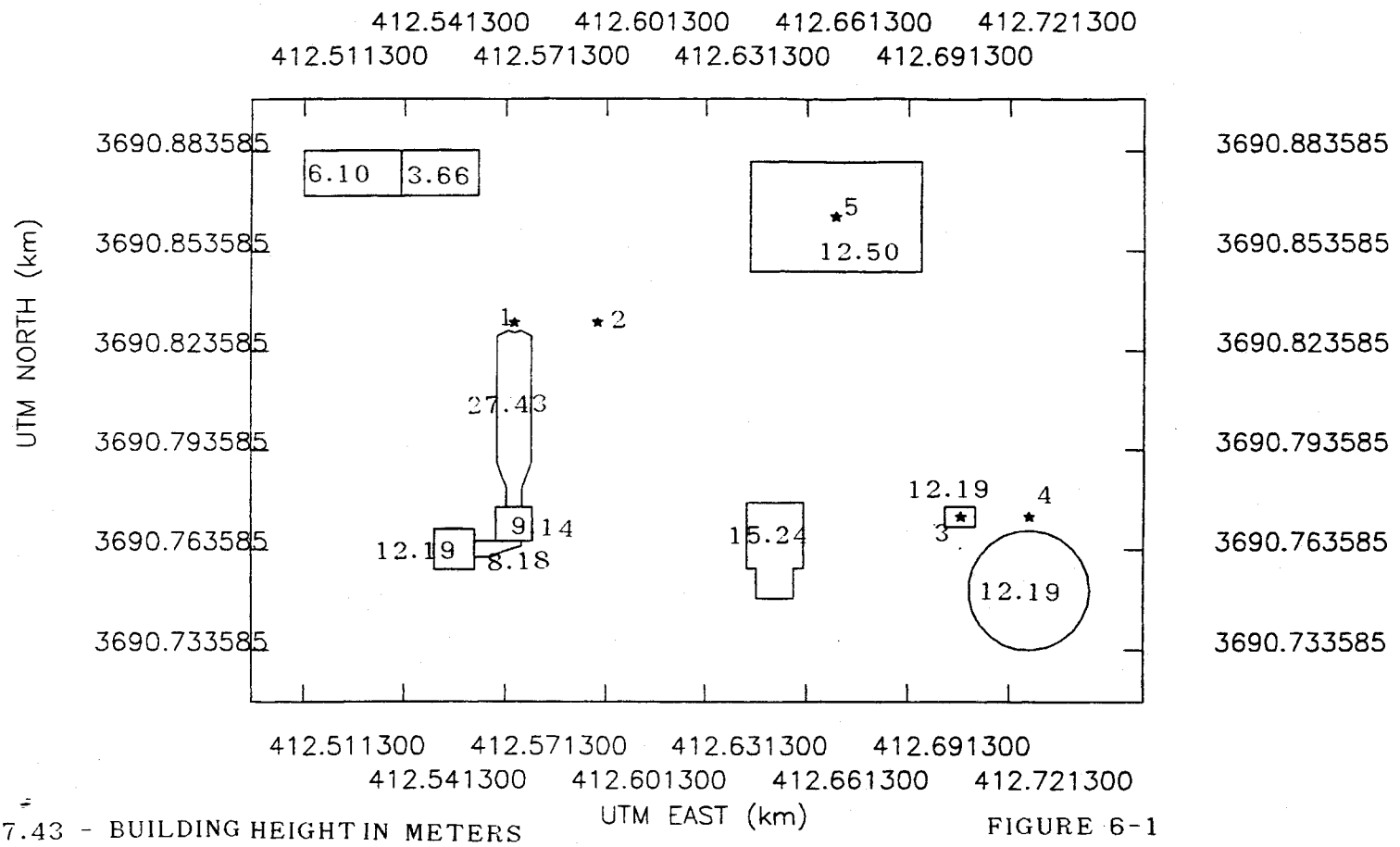
The emission inventory of the proposed power plant included the combined cycle system exhaust stacks, the representative exhaust stack for the cooling tower, the exhaust stack for the auxiliary boiler, the emergency generator exhaust stack and the emergency fire water pump exhaust stack. Tables 6-1 and 6-2 present the criteria and toxic air pollutant emission inventories, respectively, of the proposed power plant.

The proposed combined cycle systems can operate at various loads. In order to identify a worst case dispersion scenario for the combined cycle systems, a worst case load (corresponding to the maximum predicted ground level concentration) analysis was performed for emissions of each pollutant ($NO_x$, CO, $PM_{10}$ and $SO_2$) for each of the 8 operating scenarios (refer to Table 6-3). Modeling results of the load analysis are also presented in Table 6-3. The worst case load for each pollutant is identified in Table 6-3.

Normal operation for the proposed SRP power plant will consist of operation of the combined cycle system and the cooling tower. The two emergency sources (generator and fire water pump) were modeled in the normal operating scenario since these sources will be tested periodically and could potentially operate during normal facility operations. The auxiliary boiler will be used to assist the combined cycle systems during cold, warm and hot startup conditions. For purposes of this application, the auxiliary boiler was modeled along with the combined cycle system and emergency equipment.

The combined cycle system was modeled along with the cooling tower, emergency generator, emergency fire water pump, and auxiliary boiler. It is noted that modeled $NO_x$ emissions from the emergency generator and the emergency fire water pump were based on operating these emergency sources 37.5 hours each per year and were spread out over the duration of the entire year (8,760 hours). This approach was used since $NO_2$ concentrations are based on an annual averaging period. For the auxiliary boiler, the $NO_x$ emission rate was based on 1,200 hours of operation per year. A similar approach was used for short term impacts (3, 8, and 24-hour averaging periods) to reflect a maximum of 1-hour operation per 24-hour period for the emergency equipment. Operation of the auxiliary boiler was not limited for the short term averaging periods stated above.

# SRP — KYRENE DOWNWASH ANALYSIS




27.43 - BUILDING HEIGHT IN METERS

★ EXHAUST STACK
1 COMBUSTION TURBINE
2 AUX.BOILER
3 EMERG FIRE PUMP
4 EMERG GENERATOR
5 COOLING TOWER

FIGURE 6-1

LOCATION OF EMISSION SOURCES
IN RELATION TO BUILDING STRUCTURES

**TABLE 6-1**
**SALT RIVER PROJECT PROPOSED POWER PLANT**
**KYRENE GENERATING STATION**
**AIR QUALITY IMPACT ASSESSMENT EMISSION INVENTORY**

| SOURCE IDENTIFICATION | ISC SOURCE # | EMISSIONS - LBS/HR | EMISSIONS - G/S | STACK HEIGHT (M) | STACK TEMPERATURE (K) | STACK VELOCITY (M/S) | STACK DIAMETER (M) |
|---|---|---|---|---|---|---|---|
| **NOX ANNUAL - WITH STARTUP** | | | | | | | |
| TURBINE | 1 | 21.03 | 2.65 | 45.72 | 355.9 | 18.73 | 5.49 |
| BOILER | 2 | 0.99 | 0.125 | 41.15 | 405.4 | 13.72 | 1.07 |
| EMERGENCY FIRE PUMP | 3 | 0.04 | 5.04E-03 | 3.05 | 533.1 | 9.14 | 0.1 |
| EMERGENCY GENERATOR | 4 | 0.05 | 6.3E-03 | 3.05 | 533.1 | 9.14 | 0.1 |
| COOLING TOWER | 5 | N/A | N/A | 12.50 | 303.7 | 9.83 | 9.14 |
| **CO 1-HOUR - WITH STARTUP** | | | | | | | |
| TURBINE | 1 | 760.24 | 95.79 | 45.72 | 355.9 | 18.73 | 5.49 |
| BOILER | 2 | 6.63 | 0.84 | 41.15 | 405.4 | 13.72 | 1.07 |
| EMERGENCY FIRE PUMP | 3 | 2.07 | 0.261 | 3.05 | 533.1 | 9.14 | 0.1 |
| EMERGENCY GENERATOR | 4 | 2.24 | 0.282 | 3.05 | 533.1 | 9.14 | 0.1 |
| COOLING TOWER | 5 | N/A | N/A | 12.50 | 303.7 | 9.83 | 9.14 |
| **CO 8-HOUR - WITH STARTUP** | | | | | | | |
| TURBINE | 1 | 108.65 | 13.69 | 45.72 | 355.9 | 18.73 | 5.49 |
| BOILER | 2 | 6.63 | 0.84 | 41.15 | 405.4 | 13.72 | 1.07 |
| EMERGENCY FIRE PUMP | 3 | 0.26 | 0.033 | 3.05 | 533.1 | 9.14 | 0.1 |
| EMERGENCY GENERATOR | 4 | 0.28 | 0.035 | 3.05 | 533.1 | 9.14 | 0.1 |
| COOLING TOWER | 5 | N/A | N/A | 12.50 | 303.7 | 9.83 | 9.14 |
| **PM ANNUAL** | | | | | | | |
| TURBINE | 1 | 18.00 | 2.268 | 45.72 | 355.9 | 18.73 | 5.49 |
| BOILER | 2 | 0.14 | 0.018 | 41.15 | 405.4 | 13.72 | 1.07 |
| EMERGENCY FIRE PUMP | 3 | 0.003 | 3.78E-04 | 3.05 | 533.1 | 9.14 | 0.1 |
| EMERGENCY GENERATOR | 4 | 0.003 | 3.78E-04 | 3.05 | 533.1 | 9.14 | 0.1 |
| COOLING TOWER | 5 | 0.85 | 0.1071 | 12.50 | 303.7 | 9.83 | 9.14 |
| **PM 24-HOUR** | | | | | | | |
| TURBINE | 1 | 18.00 | 2.268 | 45.72 | 355.9 | 18.73 | 5.49 |
| BOILER | 2 | 0.99 | 0.125 | 41.15 | 405.4 | 13.72 | 1.07 |
| EMERGENCY FIRE PUMP | 3 | 0.030 | 3.78E-03 | 3.05 | 533.1 | 9.14 | 0.1 |
| EMERGENCY GENERATOR | 4 | 0.030 | 3.78E-03 | 3.05 | 533.1 | 9.14 | 0.1 |
| COOLING TOWER | 5 | 0.85 | 0.1071 | 12.50 | 303.7 | 9.83 | 9.14 |
| **SO2 ANNUAL, 24 HOUR AND 3 HOUR** | | | | | | | |
| TURBINE | 1 | 1.20 | 0.151 | 45.72 | 355.9 | 18.73 | 5.49 |
| BOILER | 2 | 0.277 | 0.035 | 41.15 | 405.4 | 13.72 | 1.07 |
| EMERGENCY FIRE PUMP | 3 | 0.130 | 0.016 | 3.05 | 533.1 | 9.14 | 0.1 |
| EMERGENCY GENERATOR | 4 | 0.140 | 0.018 | 3.05 | 533.1 | 9.14 | 0.1 |
| COOLING TOWER | 5 | NA | NA | 12.50 | 303.7 | 9.83 | 9.14 |

**Table 6-2**
**Salt River Project**
**Proposed Power Plant - Existing Kyrene Generating Station**
**Hazardous Air Pollutant Emission Estimates - Modeling Analysis**

| POLLUTANT | COMBINED CYCLE SYSTEM* (TONS/YEAR) | DUCT BURNER* (TONS/YEAR) | AUXILIARY BOILER (TONS/YEAR) | EMERGENCY EQUIPMENT (TONS/YEAR) | TOTAL (TONS/YEAR) |
|---|---|---|---|---|---|
| 1,3-Butadiene | 2.58E-03 | - | - | 1.20E-06 | 2.58E-03 |
| 2-Chloronaphthalene | 1.60E-06 | - | - | - | 1.60E-06 |
| 2-Methylnaphthalene | 3.11E-05 | 1.17E-05 | 1.40E-06 | - | 4.42E-05 |
| 3-Methylchloranthene | - | 8.78E-07 | 1.05E-07 | - | 9.83E-07 |
| 7,12-Dimethylbenz(a)anthracen | - | 7.80E-06 | 9.32E-07 | - | 8.73E-06 |
| Acenaphthene | 1.12E-04 | 8.78E-07 | 1.05E-07 | 4.37E-08 | 1.13E-04 |
| Acenaphthylene | 8.65E-05 | 8.78E-07 | 1.05E-07 | 1.56E-07 | 8.76E-05 |
| Acetaldehyde | 4.04E-01 | 4.33E-03 | 8.56E-04 | 2.36E-05 | 4.09E-01 |
| Acrolein | 1.39E-01 | - | - | 2.85E-06 | 1.39E-01 |
| Anthracene | 1.99E-04 | 1.17E-06 | 1.40E-07 | 5.76E-08 | 2.00E-04 |
| Arsenic | - | 9.75E-05 | 1.16E-05 | - | 1.09E-04 |
| Benzene | 8.00E-02 | 2.10E-03 | 5.07E-04 | 2.87E-05 | 8.27E-02 |
| Benzo(a)anthracene | 1.33E-04 | 8.78E-07 | 1.05E-07 | 5.17E-08 | 1.34E-04 |
| Benzo(a)pyrene | 8.18E-05 | 5.85E-07 | 6.99E-08 | 5.79E-09 | 8.25E-05 |
| Benzo(b)fluoranthene | 6.65E-05 | 8.78E-07 | 1.05E-07 | 3.05E-09 | 6.75E-05 |
| Benzo(e)pyrene | 3.20E-06 | - | - | - | 3.20E-06 |
| Benzo(g,h,i)perylene | 8.06E-05 | 5.85E-07 | 6.99E-08 | | 8.13E-05 |
| Benzo(k)fluoranthene | 6.47E-05 | 8.78E-07 | 1.05E-07 | 4.77E-09 | 6.57E-05 |
| Beryllium | - | 7.31E-06 | 6.99E-07 | - | 8.01E-06 |
| Cadmium | - | 6.70E-04 | 6.41E-05 | - | 7.35E-04 |
| Chromium VI | - | 8.53E-04 | 8.15E-05 | - | 9.35E-04 |
| Chrysene | 1.48E-04 | 8.78E-07 | 1.05E-07 | 1.09E-08 | 1.49E-04 |
| Cobalt | - | 5.12E-05 | 4.89E-06 | - | 5.61E-05 |
| Dibenz(a,h)anthracene | 1.38E-04 | 5.85E-07 | 6.99E-08 | - | 1.39E-04 |
| Dichlorobenzene | - | 5.85E-04 | 6.99E-05 | - | 6.55E-04 |
| Ethylbenzene | 1.92E-01 | - | - | - | 1.92E-01 |
| Fluoranthene | 2.54E-04 | 1.46E-06 | 1.75E-07 | 2.34E-07 | 2.56E-04 |
| Fluorene | 3.41E-04 | 1.37E-06 | 1.63E-07 | 8.99E-07 | 3.44E-04 |
| Formaldehyde | 4.26E+00 | 1.08E-01 | 1.29E-02 | 3.63E-05 | 4.38E+00 |
| Hexane | 1.52E+00 | 8.78E-01 | 1.05E-01 | - | 2.51E+00 |
| Indeno(1,2,3-cd)pyrene | 1.38E-04 | 8.78E-07 | 1.05E-07 | 1.15E-08 | 1.39E-04 |
| Lead | - | - | - | - | 0.00E+00 |
| Manganese | - | 2.32E-04 | 2.21E-05 | - | 2.54E-04 |
| Mercury | - | 1.58E-04 | 1.51E-05 | - | 1.74E-04 |
| Naphthalene | 9.77E-03 | 2.97E-04 | 3.55E-05 | 2.61E-06 | 1.01E-02 |
| Nickel | - | 1.28E-03 | 1.22E-04 | - | 1.40E-03 |
| N-nitrosodimethylamine | - | - | - | - | 0.00E+00 |
| N-nitrosomorpholine | - | - | - | - | 0.00E+00 |
| Perylene | 4.12E-06 | - | - | - | 4.12E-06 |
| Phenanthrene | 1.84E-03 | 8.29E-06 | 9.90E-07 | 9.05E-07 | 1.85E-03 |
| Polycyclic Aromatic Hydrocarbon | 1.32E-02 | - | - | - | 1.32E-02 |
| Propylene | - | - | - | - | 0.00E+00 |
| Propylene Oxide | 2.81E-01 | - | - | - | 2.81E-01 |
| Pyrene | 1.63E-04 | 2.44E-06 | 2.91E-07 | 1.47E-07 | 1.66E-04 |
| Selenium | - | 1.46E-05 | 1.40E-06 | - | 1.60E-05 |
| Toluene | 7.80E-01 | 1.66E-03 | 1.98E-04 | 1.26E-05 | 7.82E-01 |
| Trimethylamine | - | - | - | - | 0.00E+00 |
| Xylene | 3.84E-01 | - | - | 8.78E-06 | 3.84E-01 |

**Grand Total** **9.19**

* = Controlled Emission Estimate

T[illegible] 6-3

## SUMMARY OF PREDICTED CONCENTRATIONS FROM THE VARIOUS OPERATING CONDITIONS

| CASE # | ANNUAL AVG | 1-HOUR AVG | 3-HOUR AVG | 8-HOUR AVG | 24-HOUR AVG | STACK HEIGHT (m) | STACK DIAMETER (m) | STACK TEMPERATURE (K) | STACK VELOCITY (m/s) |
|---|---|---|---|---|---|---|---|---|---|
| CASE 1 | 0.161 | 3.18 | 2.20 | 1.38 | 0.72 | 45.72 | 5.49 | 362.5 | 19.39 |
| CASE 2 | 0.163 | 3.26 | 2.30 | 1.41 | 0.73 | 45.72 | 5.49 | 362.0 | 18.36 |
| CASE 3 | 0.163 | 3.24 | 2.33 | 1.41 | 0.73 | 45.72 | 5.49 | 366.4 | 17.61 |
| CASE 4 | 0.165 | 3.37 | 2.34 | 1.43 | 0.74 | 45.72 | 5.49 | 355.9 | 18.73 |
| CASE 5 | 0.165 | 3.35 | 2.38 | 1.44 | 0.74 | 45.72 | 5.49 | 359.2 | 17.91 |
| CASE 6 | 0.166 | 3.52 | 2.49 | 1.45 | 0.75 | 45.72 | 5.49 | 366.4 | 16.18 |
| CASE 7 | 0.168 | 3.69 | 2.59 | 1.48 | 0.76 | 45.72 | 5.49 | 366.4 | 15.34 |
| CASE 8 | **0.169** | **3.87** | **2.69** | **1.50** | **0.78** | 45.72 | 5.49 | 366.4 | 14.5 |

**The above concentrations are model results based on a unit emission rate of 1.0 g/s. The 1998 meteorological data was used for this analysis.**
**Bolded concentrations represent the worst case load for a particular averaging period.**

**The tables below reflect the worst case load incorporating vendor emission data.**

| $NO_x$ Annual Average | |
|---|---|
| CASE 1 | 0.33 |
| CASE 2 | 0.32 |
| CASE 3 | 0.30 |
| **CASE 4** | **0.37** |
| CASE 5 | 0.35 |
| CASE 6 | 0.26 |
| CASE 7 | 0.24 |
| CASE 8 | 0.22 |

**Bolded concentrations represent the worst case load for a particular averaging period.**

| CO | 1-Hour | 8-Hour |
|---|---|---|
| CASE 1 | 3.97 | 1.72 |
| CASE 2 | 3.86 | 1.67 |
| CASE 3 | 3.63 | 1.58 |
| **CASE 4** | **7.01** | **2.97** |
| CASE 5 | 6.71 | 2.88 |
| CASE 6 | 3.33 | 1.37 |
| CASE 7 | 3.21 | 1.29 |
| CASE 8 | 3.07 | 1.19 |

**Bolded concentrations represent the worst case load for a particular averaging period.**

| $SO_2$ | Annual | 3-Hour | 24-Hour |
|---|---|---|---|
| CASE 1 | 0.022 | 0.30 | 0.10 |
| CASE 2 | 0.021 | 0.29 | 0.09 |
| CASE 3 | 0.021 | 0.29 | 0.09 |
| **CASE 4** | **0.025** | **0.35** | **0.11** |
| CASE 5 | 0.023 | 0.33 | 0.10 |
| CASE 6 | 0.017 | 0.25 | 0.08 |
| CASE 7 | 0.015 | 0.23 | 0.07 |
| CASE 8 | 0.015 | 0.24 | 0.07 |

**Bolded concentrations represent the worst case load for a particular averaging period.**

| $PM_{10}$ | Annual | 24-Hour |
|---|---|---|
| CASE 1 | 0.62 | 2.76 |
| CASE 2 | 0.59 | 2.63 |
| CASE 3 | 0.55 | 2.48 |
| **CASE 4** | **0.66** | **2.96** |
| CASE 5 | 0.63 | 2.81 |
| CASE 6 | 0.51 | 2.30 |
| CASE 7 | 0.48 | 2.18 |
| CASE 8 | 0.45 | 2.09 |

**Bolded concentrations represent the worst case load for a particular averaging period.**

*****Conclusion: Case 4 is the worst case load for all pollutants/averaging periods.*****

#### 6.2.2.2 Meteorological Data

The meteorological data used in the dispersion modeling analyses consisted of five years (1994-1998) of hourly surface observations from the Phoenix, Arizona National Weather Service Station (Sky Harbor International Airport) and coincident mixing heights from Tucson, Arizona (1994-1998). Surface observations consist of hourly measurements of wind direction, wind speed, and temperature, and estimates of ceiling height and cloud cover. The upper air station provides a daily morning and afternoon mixing height value as determined from the twice-daily radiosonde measurements. These surface and upper air data were processed into a format suitable for dispersion modeling by USEPA's RAMMET program (Turner and Novak, 1978). RAMMET utilizes the Turner Classification Scheme (Turner, 1970) to estimate the dispersive capacity of the atmosphere. Using the surface observations of wind speed and cloud cover combined with an estimate of insolation based on solar altitude, a stability class category is assigned for each hour of meteorological surface data. The twice-daily mixing height values are interpolated by a USEPA scheme (USEPA, 1974) to obtain hourly mixing height values. The USEPA developed rural and urban interpolation methods to account for the effects of the surrounding area on development of the mixing layer boundary. The urban scheme was used to determine hourly mixing heights representative of the area in the vicinity of the proposed expansion project site.

Annual wind roses for the 1994-1998 database are presented in Figures 3-1 through 3-5, respectively. A 5-year composite wind rose is shown in Figure 3-6.

Since the meteorological data were collected at a National Weather Service station, it is assumed to meet the required criteria. Missing meteorological parameters were substituted using standard filling practices according to EPA guidelines. The anemometer height at the Sky Harbor International Airport is 10 meters.

#### 6.2.2.3 Receptor Grid

The receptor grid for the ISC3 dispersion model was designed to identify the maximum air quality impact due to the proposed power plant, along with receptors placed at nearby Indian reservations. The receptor grid consisted of 1,659 receptors extending to 8 km from the proposed SRP power plant. Since the emission sources associated with the proposed power plant have stack heights less than GEP stack height, receptors were closely spaced (25 meters) along the plant boundary to identify the influence of aerodynamic building downwash. The following receptor spacing was used:

- Locations at 25 m spacing along the property boundary of the proposed power plant;
- 100 m spacing from the plant property boundary to 1 km;
- 500 m spacing from 1 km out from the proposed power plant to 8 km; and
- Additional receptors were also located along the boundary of Indian reservations located within 50 km of the proposed power plant.

Receptor elevations were included for all receptor points and were determined using data from USGS topographical maps. The base elevation of the proposed power plant is 1,190 feet. The receptor grid is illustrated in Figures 6-2 and 6-3. Figure 6-4 presents the locations of emission sources in relation to the site boundary receptors.

6.2.2.4 Background Concentrations

Background concentrations are typically added to maximum predicted concentrations to demonstrate compliance with the NAAQS if the proposed facility has a significant air quality impact. The representative background concentrations used in the NAAQS compliance demonstrations are presented in the table below.

| Pollutant | Averaging Period | Concentration ($\mu g/m^3$) | Year Data Collected | Monitor Location |
|---|---|---|---|---|
| $NO_2$ | Annual | 45.0 | 1999 | South Scottsdale |
| $PM_{10}$ | Annual | 32.4 | 1999 | Mesa |
| $PM_{10}$ | 24-Hour | 71.0 | 1999 | Mesa |
| CO | 1-Hour | 6286 | 1999 | South Scottsdale |
| CO | 8-Hour | 4222 | 1999 | South Scottsdale |
| $SO_2$ | Annual | 2.7 | 1999 | South Scottsdale |
| $SO_2$ | 3-Hour | 46.8 | 1999 | South Scottsdale |
| $SO_2$ | 24-Hour | 13.0 | 1999 | South Scottsdale |
| $O_3$ | 1-Hour | 0.097/0.105 ppm | 1999 | Chandler & Mesa* |

- *Note: It is important to point out that the maximum 1-hour ozone levels measured during 1999 at the monitoring stations located in 1). Chandler (approximately 5 miles southeast of the Kyrene Station) was 0.097 part per million (ppm) and 2). Mesa (less than 10 miles northeast of the Kyrene Station) was 0.105 ppm. These concentrations are below the NAAQS established by USEPA of 0.12 ppm. Impacts due to VOC emissions from the proposed plant should not significantly impact the concentration levels measured at either the Chandler or Mesa monitoring stations.*

**$NO_x$ Modeling Demonstration**

**Step 1 - Significant Impact Analysis**

Since $NO_2$ is subject to PSD review, emissions of $NO_x$ from the proposed power plant were modeled using the representative databases described above. This analysis consisted of using the ISCST dispersion model in conjunction with 5-years of hourly meteorological data (including startup emissions from the combined cycle system, auxiliary boiler and emergency sources). The purpose of this analysis was to determine whether the proposed power plant's emissions of $NO_x$ will have

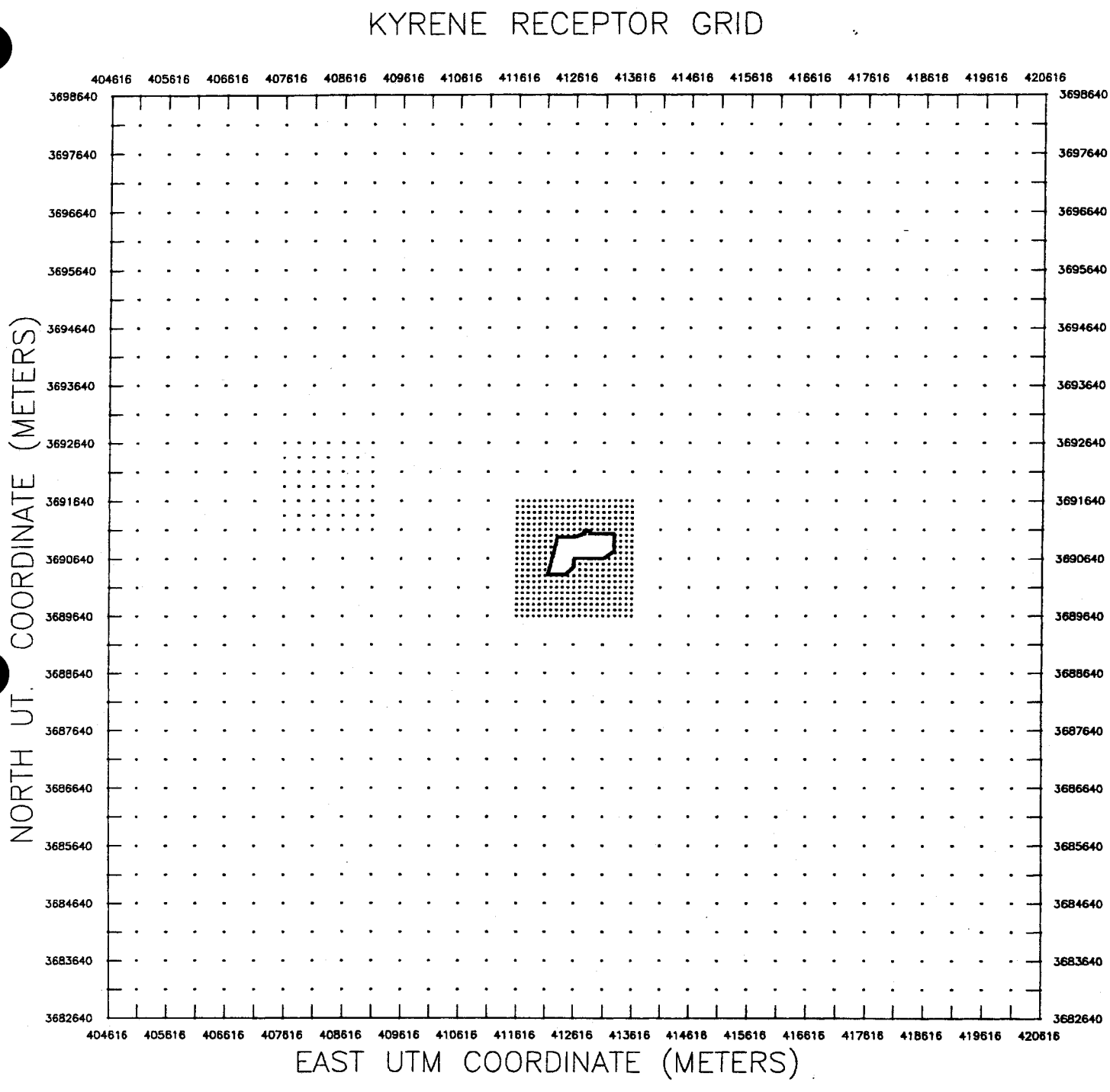



FIGURE 6-2

RECEPTOR GRID FOR AIR QUALITY IMPACT ANALYSES

• RECEPTOR POINT

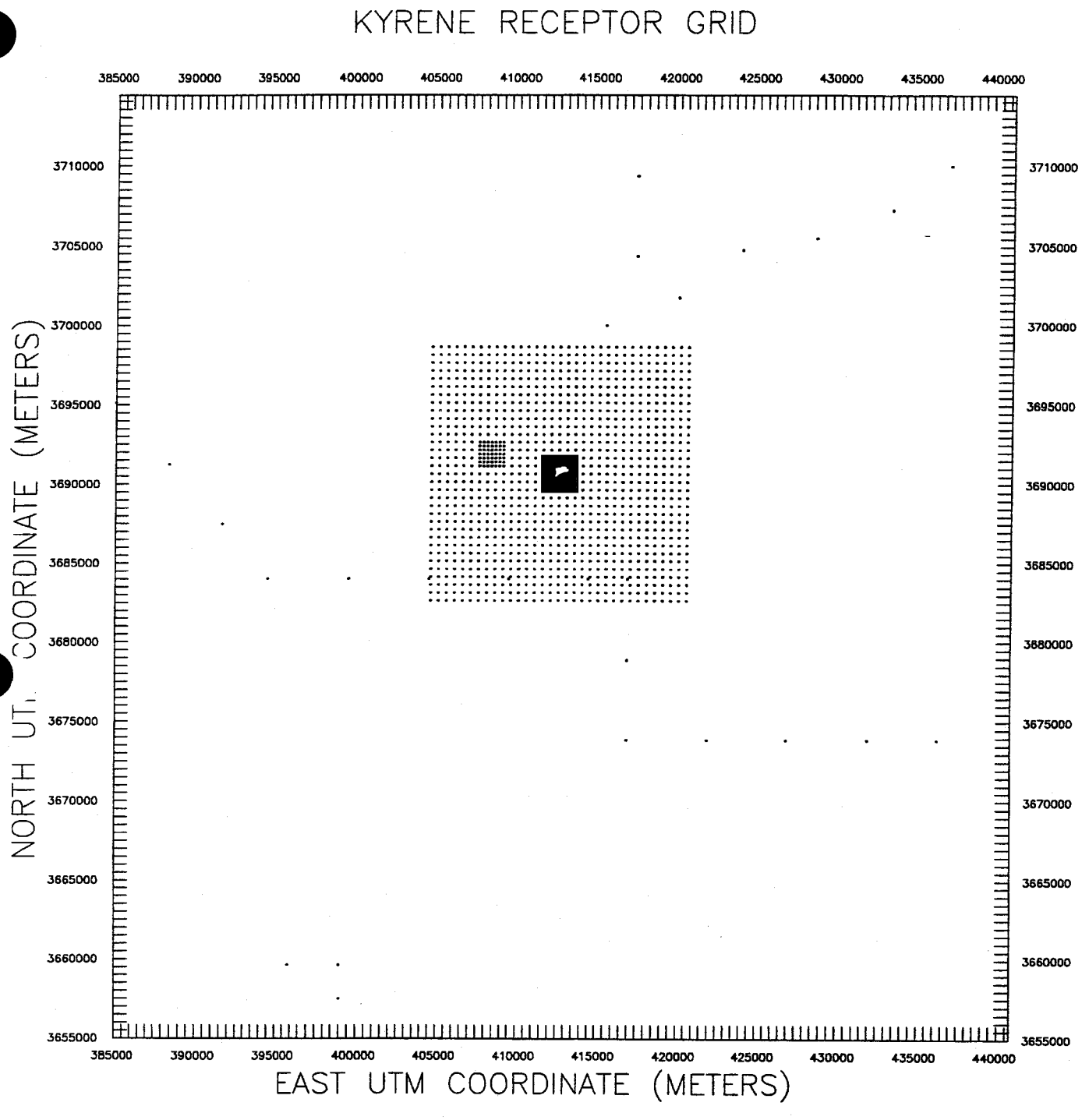



FIGURE 6-2

RECEPTOR GRID FOR AIR QUALITY IMPACT ANALYSES

• RECEPTOR POINT

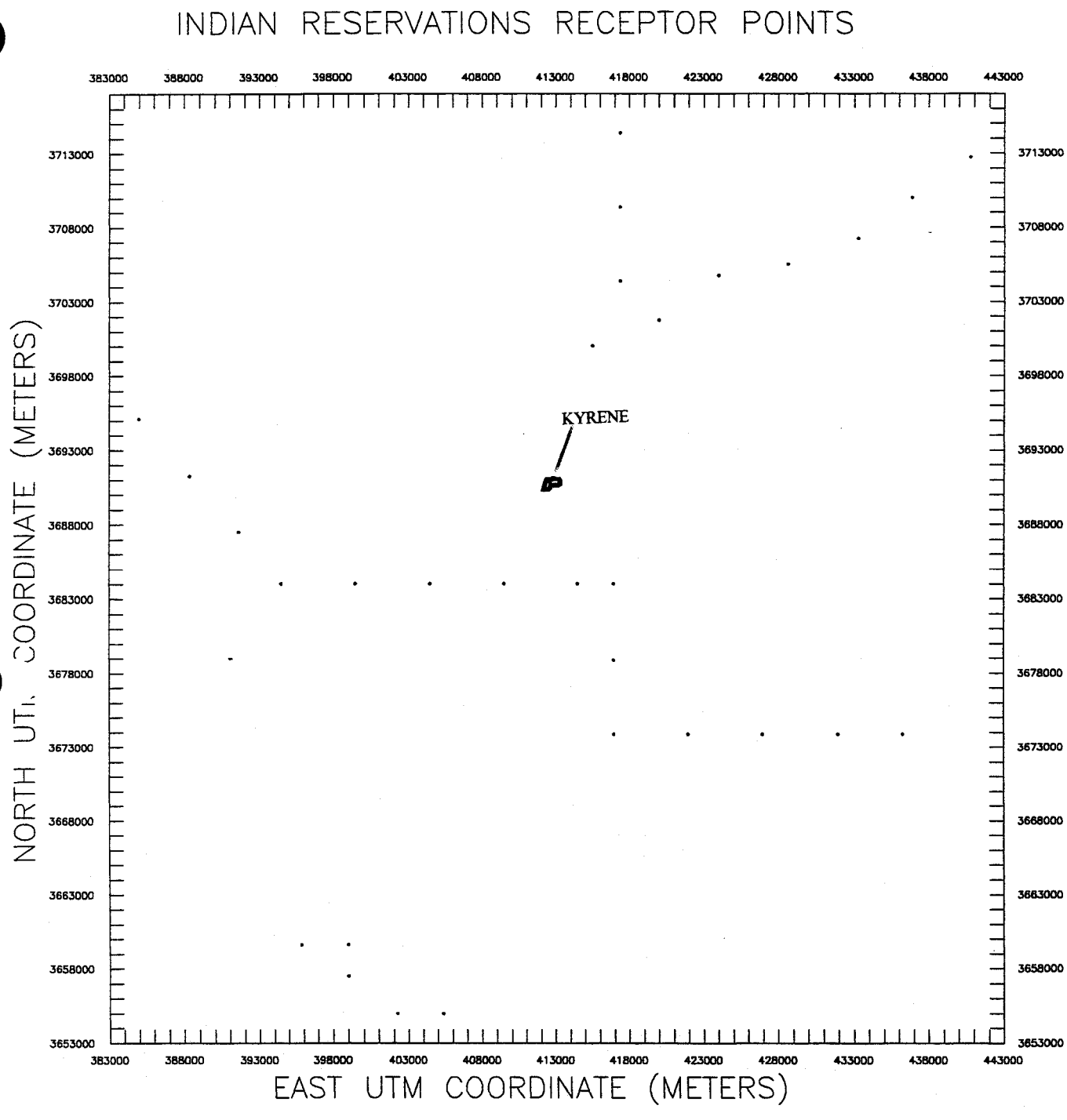
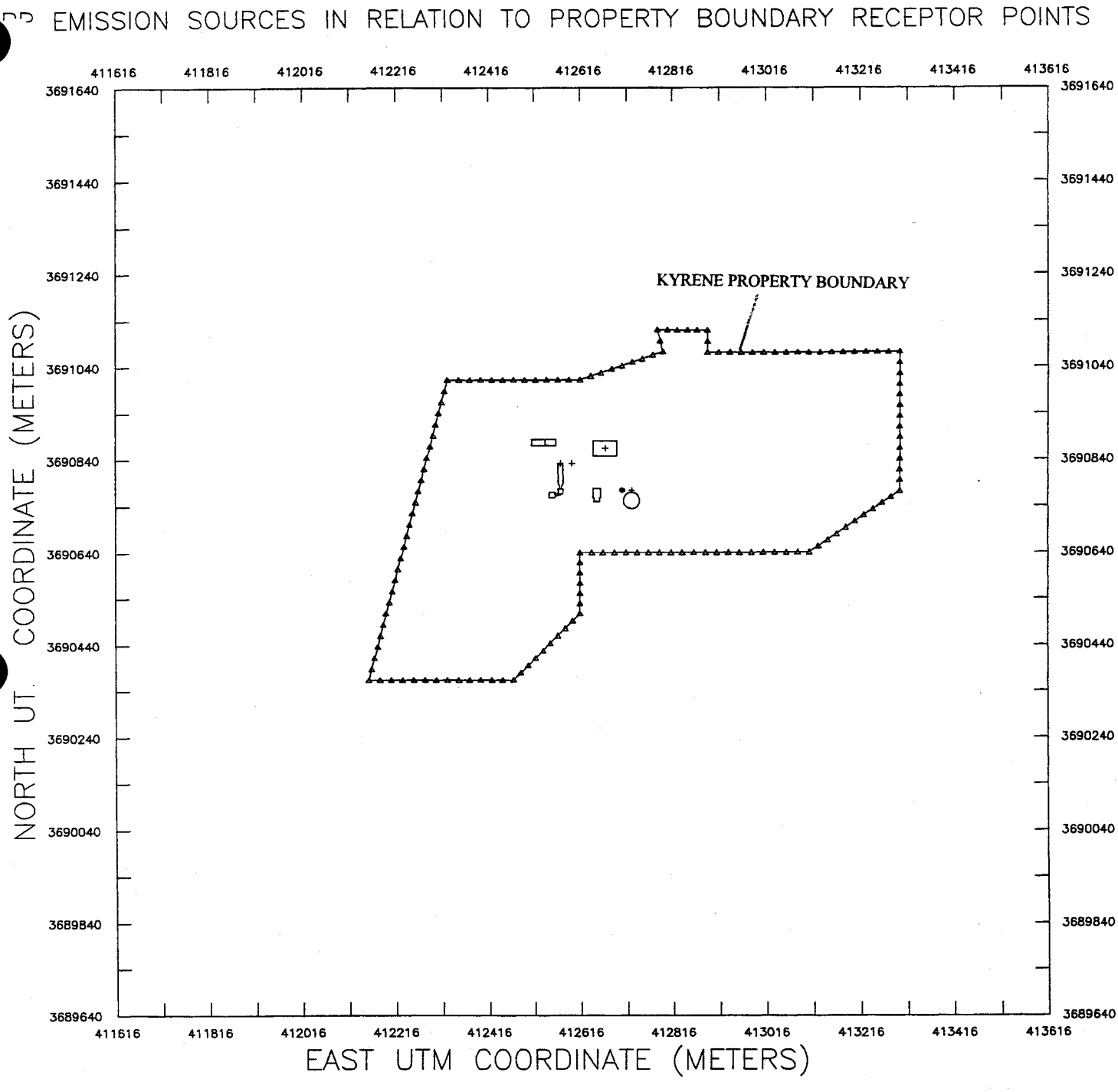



FIGURE 6-3

RECEPTOR GRID-INDIAN RESERVATIONS

● RECEPTOR POINT




EMISSION SOURCE

RECEPTOR POINT

FIGURE 6-4
LOCATION OF EMISSION SOURCES
IN RELATION TO PROPERTY BOUNDARY

a significant impact on ambient air quality. If emissions of $NO_x$ result in maximum predicted annual concentrations exceeding the significant impact concentration of 1.0 $\mu g/m^3$, then the proposed plant will be considered to have a significant impact on air quality, requiring additional modeling analyses. Table 6-4 presents the maximum predicted annual average concentrations for the proposed power plant (under worst case operating conditions). As shown in Table 6-4, the proposed power plant will have an insignificant impact on ambient $NO_2$ air quality. Therefore, no additional modeling analyses were performed for emissions of $NO_x$ from the proposed power plant.

Under the PSD program, if a proposed source has an insignificant impact on ambient air quality, an applicant applying for a construction permit under this program, is usually not required to go beyond a preliminary analysis in order to make necessary showing of compliance. A preliminary analysis consists of a determination of the air quality impacts from the proposed source only. The PSD program requires that two compliance demonstrations be performed. These demonstrations requires an applicant to show that the proposed source will not cause or contribute to air pollution in violation of any NAAQS or PSD increment concentrations. The specific concentration levels have been established by USEPA and are presented in Table 4-1(Section 4.0).

Since the proposed power plant will have an insignificant impact on air quality, a refined analysis (incorporating existing emissions sources in the area surrounding the proposed plant site) was not required by the Maricopa County regulatory agency. This approach is consistent with USEPA's guidance under the PSD program. However, to demonstrate that the proposed plant will not cause or contribute to air pollution in violation of any NAAQS or PSD increment, Steps 2 and 3 below, discuss the appropriate compliance demonstrations that were employed for this air permit application.

**Step 2 - Compliance with $NO_2$ PSD Increments**

Since the proposed power plant was shown under Step 1 above, to have an insignificant impact on $NO_2$ air quality, only $NO_x$ emission sources associated with the proposed power plant (worst case operating conditions for the combined cycle system, auxiliary boiler and emergency sources) were evaluated to demonstrate compliance with the annual PSD Class II increment of 25 $\mu g/m^3$. As presented in Table 6-4, maximum predicted $NO_2$ concentrations are several orders of magnitude below the PSD Class II increment of 25 $\mu g/m^3$.

An $NO_2$ Class I increment analysis was also performed at the Superstition Class I area. The results obtained from this analysis (refer to Table 6-12 in Section 6.5) also demonstrate that the proposed power plant will not exceed the Class I increment concentration of 0.1 $ug/m^3$ on an annual basis.

T. 6-4

**SUMMARY OF MAXIMUM PREDICTED $NO_2$ CONCENTRATIONS FROM THE PROPOSED POWER PLANT AT THE EXISTING KYRENE GENERATING STATION**

| AVERAGING PERIOD | DATA PERIOD | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($\mu g/m^3$) | SIGNIFICANT IMPACT INCREMENT ($\mu g/m^3$) |
|---|---|---|---|---|---|
| | YEAR | EAST | NORTH | | |
| ANNUAL | 1994 | 409.116 | 3692.140 | 0.44 | 1 |
| ANNUAL | 1995 | 409.116 | 3692.140 | 0.55 | 1 |
| ANNUAL | 1996 | 409.116 | 3692.140 | 0.45 | 1 |
| ANNUAL | 1997 | 409.116 | 3692.140 | 0.44 | 1 |
| ANNUAL | 1998 | 409.116 | 3692.140 | 0.46 | 1 |

| AVERAGING PERIOD | DATA PERIOD | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($\mu g/m^3$) | PSD CLASS II INCREMENT ($\mu g/m^3$) |
|---|---|---|---|---|---|
| | YEAR | EAST | NORTH | | |
| ANNUAL | 1994 | 409.116 | 3692.140 | 0.44 | 25 |
| ANNUAL | 1995 | 409.116 | 3692.140 | 0.55 | 25 |
| ANNUAL | 1996 | 409.116 | 3692.140 | 0.45 | 25 |
| ANNUAL | 1997 | 409.116 | 3692.140 | 0.44 | 25 |
| ANNUAL | 1998 | 409.116 | 3692.140 | 0.46 | 25 |

| AVERAGING PERIOD | DATA PERIOD | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($\mu g/m^3$) | BACKGROUND CONCENTRATION ($\mu g/m^3$) | COMBINED CONCENTRATION ($\mu g/m^3$) | NAAQS ($\mu g/m^3$) |
|---|---|---|---|---|---|---|---|
| | YEAR | EAST | NORTH | | | | |
| ANNUAL | 1994 | 409.116 | 3692.140 | 0.44 | 45 | 45.44 | 100 |
| ANNUAL | 1995 | 409.116 | 3692.140 | 0.55 | 45 | 45.55 | 100 |
| ANNUAL | 1996 | 409.116 | 3692.140 | 0.45 | 45 | 45.45 | 100 |
| ANNUAL | 1997 | 409.116 | 3692.140 | 0.44 | 45 | 45.44 | 100 |
| ANNUAL | 1998 | 409.116 | 3692.140 | 0.46 | 45 | 45.46 | 100 |

**Step 3 - Compliance with $NO_2$ NAAQS**

$NO_x$ emissions sources associated with the proposed power plant under (worst case operating conditions for the combined cycle system, auxiliary boiler and emergency sources) were assessed (ISCST with the 5-year meteorological database) to demonstrate compliance with the annual NAAQS established by USEPA. The refined analysis, which includes other significant existing sources in the area surrounding the proposed power plant site, was not performed due to the outcome of Step 1. As stated previously, a refined analysis is not required by USEPA or Maricopa County, if the proposed sources air pollutants have an insignificant impact on air quality.

To demonstrate that the proposed power plant will not cause or contribute to a violation of the NAAQS, the maximum predicted annual average $NO_2$ concentrations obtained from the dispersion modeling analyses were added to the representative background concentration and compared to the annual NAAQS. The NAAQS have been established by the USEPA under the Clean Air Act. The representative background annual concentration is 45.0 $\mu g/m^3$. This concentration represents the annual $NO_2$ concentration measured for calendar year 1999 at the South Scottsdale Monitor (Scottsdale Road and Thomas Road). As presented in Table 6-4, maximum predicted annual $NO_2$ concentrations in conjunction with a representative background concentration, are less than 50% of the NAAQS of 100 $\mu g/m^3$.

**CO Modeling Demonstration**

**Step 1 - Significant Impact Analysis**

Emissions of CO from the proposed power plant were modeled using the representative databases described above. This analysis consisted of using the ISCST dispersion model in conjunction with 5 years of hourly meteorological data (worst case operating conditions for the combined cycle system, auxiliary boiler and emergency sources). The purpose of this analysis was to determine whether the proposed power plant's emissions of CO would have a significant impact on ambient air quality. If emissions of CO result in maximum predicted 1-hour and 8-hour concentrations exceed the significant impact increments of 2000 $\mu g/m^3$, and 500 $\mu g/m^3$, respectively, then the proposed plant will be considered to have a significant impact on air quality. Table 6-5 presents the maximum predicted 1-hour and 8-hour concentrations, respectively. As shown in Table 6-5 the proposed power plant will have an insignificant impact on CO air quality. Although additional modeling analyses are not required by the nonattainment area new source permitting regulations, a NAAQS compliance demonstration was performed to demonstrate that the proposed power plant would not cause or contribute to a violation of the NAAQS.

TA 6-5

SUMMARY OF MAXIMUM PREDICTED CO CONCENTRATIONS
FROM THE PROPOSED POWER PLANT - EXISTING KYRENE GENERATING STATION

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($ug/m^3$) | SIGNIFICANT IMPACT INCREMENT ($ug/m^3$) |
|---|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | | |
| 1-HOUR HIGHEST | 1994 | 5-Aug | 11 | 412.424 | 3691.012 | 320.6 | 2000 |
| 1-HOUR HIGHEST | 1995 | 15-Jun | 15 | 412.661 | 3691.027 | 317.9 | 2000 |
| 1-HOUR HIGHEST | 1996 | 1-Jul | 14 | 412.448 | 3691.012 | 341.0 | 2000 |
| 1-HOUR HIGHEST | 1997 | 3-Feb | 9 | 412.715 | 3690.640 | 448.9 | 2000 |
| 1-HOUR HIGHEST | 1998 | 1-Jan | 1 | 412.715 | 3690.640 | 485.1 | 2000 |
| | | | | | | | |
| 8-HOUR HIGHEST | 1994 | 15-Apr | 8 | 410.616 | 3691.140 | 20.7 | 500 |
| 8-HOUR HIGHEST | 1995 | 3-Oct | 8 | 410.116 | 3691.640 | 23.5 | 500 |
| 8-HOUR HIGHEST | 1996 | 19-Nov | 8 | 410.116 | 3691.640 | 27.2 | 500 |
| 8-HOUR HIGHEST | 1997 | 23-Apr | 24 | 412.940 | 3691.072 | 27.7 | 500 |
| 8-HOUR HIGHEST | 1998 | 5-Dec | 8 | 408.866 | 3691.640 | 21.7 | 500 |

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($ug/m^3$) | BACKGROUND CONCENTRATION ($ug/m^3$) | TOTAL CONCENTRATION ($ug/m^3$) | NAAQS ($ug/m^3$) |
|---|---|---|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | | | | |
| 1-HOUR HIGHEST | 1994 | 5-Aug | 11 | 412.424 | 3691.012 | 320.6 | 6286 | 6607 | 40000 |
| 1-HOUR HIGHEST | 1995 | 15-Jun | 15 | 412.661 | 3691.027 | 317.9 | 6286 | 6604 | 40000 |
| 1-HOUR HIGHEST | 1996 | 1-Jul | 14 | 412.448 | 3691.012 | 341.0 | 6286 | 6627 | 40000 |
| 1-HOUR HIGHEST | 1997 | 3-Feb | 9 | 412.715 | 3690.640 | 448.9 | 6286 | 6735 | 40000 |
| 1-HOUR HIGHEST | 1998 | 1-Jan | 1 | 412.715 | 3690.640 | 485.1 | 6286 | 6771 | 40000 |
| | | | | | | | | | |
| 8-HOUR HIGHEST | 1994 | 15-Apr | 8 | 410.616 | 3691.140 | 20.7 | 4222 | 4243 | 10000 |
| 8-HOUR HIGHEST | 1995 | 3-Oct | 8 | 410.116 | 3691.640 | 23.5 | 4222 | 4246 | 10000 |
| 8-HOUR HIGHEST | 1996 | 19-Nov | 8 | 410.116 | 3691.640 | 27.2 | 4222 | 4249 | 10000 |
| 8-HOUR HIGHEST | 1997 | 23-Apr | 24 | 412.940 | 3691.072 | 27.7 | 4222 | 4250 | 10000 |
| 8-HOUR HIGHEST | 1998 | 5-Dec | 8 | 408.866 | 3691.640 | 21.7 | 4222 | 4244 | 10000 |

**Step 2 - Compliance with CO NAAQS**

To support issuance of the construction permit, a demonstration was performed to show that the proposed power plant would not cause a violation of the CO NAAQS. This demonstration consisted of determining the maximum predicted highest 1-hour and 8-hour concentrations from Step 1. These concentrations were then added to representative background concentrations and compared with the 1-hour (40,000 $\mu g/m^3$) and 8-hour (10,000 $\mu g/m^3$) NAAQS.

The representative background concentrations used in the CO NAAQS compliance demonstration were selected from monitoring data collected during calendar year 1999. The monitor selected was located in South Scottsdale, Arizona. This monitor was selected based on its location in a community setting. The background concentrations used are 6286 $\mu g/m^3$ for the 1-hour averaging period and 4222 $\mu g/m^3$ for the 8-hour averaging period. Table 6-5 presents the highest 1-hour and 8-hour predicted concentrations associated with the proposed power plant sources, respectively. As presented in these tables, maximum predicted 1-hour and 8-hour highest concentrations from the proposed power plant are well below the respective CO NAAQS. In fact these concentrations are less than 10% of the NAAQS established by the USEPA under the Clean Air Act.

**$PM_{10}$ Modeling Demonstration**

**Step 1 - Significant Impact Analysis**

Emissions of $PM_{10}$ from the proposed power plant were modeled using the representative databases described above. This analysis consisted of using the ISCST dispersion model in conjunction with 5 years of hourly meteorological data (one combined cycle system, cooling tower, auxiliary boiler and emergency sources). The purpose of this analysis was to determine whether the proposed power plant's emissions of $PM_{10}$ would have a significant impact on ambient air quality. If emissions of $PM_{10}$ result in maximum predicted annual and 24-hour concentrations exceeding the significant impact increments of 1 $\mu g/m^3$, and 5 $\mu g/m^3$, respectively, then the proposed power plant will be considered to have a significant impact on air quality. Table 6-6 presents the maximum predicted annual and 24-hour concentrations for the proposed power plant sources, respectively. As shown in Table 6-6 the proposed power plant's $PM_{10}$ emission sources will have an insignificant impact on $PM_{10}$ air quality. Although additional modeling analyses are not required, a NAAQS compliance demonstration was performed to support issuance of the construction permit.

**Step 2 - Compliance with $PM_{10}$ NAAQS**

To support issuance of the construction permit, a demonstration was performed to show that the proposed plant (under worst case operating conditions) would not cause or lead to a violation of the $PM_{10}$ NAAQS. This demonstration consisted of determining the maximum predicted annual average

**SUMMARY OF MAXIMUM PR TED $PM_{10}$ CONCENTRATIONS**
**FROM THE PROPOSED POWER PLANT - EXISTING KYRENE GENERATING STATION**

| AVERAGING PERIOD | DATA PERIOD | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($ug/m^3$) | SIGNIFICANT IMPACT INCREMENT ($ug/m^3$) |
|---|---|---|---|---|---|---|
| | YEAR | DATE | EAST | NORTH | | |
| ANNUAL | 1994 | - | 410.616 | 3691.140 | 0.39 | 1 |
| ANNUAL | 1995 | - | 409.116 | 3692.140 | 0.48 | 1 |
| ANNUAL | 1996 | - | 409.116 | 3692.140 | 0.39 | 1 |
| ANNUAL | 1997 | - | 409.116 | 3692.140 | 0.39 | 1 |
| ANNUAL | 1998 | - | 409.116 | 3692.140 | 0.40 | 1 |
| | | | | | | |
| 24-HOUR HIGHEST | 1994 | 9-Apr | 412.964 | 3691.072 | 2.32 | 5 |
| 24-HOUR HIGHEST | 1995 | 5-Jan | 412.988 | 3691.072 | 2.83 | 5 |
| 24-HOUR HIGHEST | 1996 | 19-Nov | 410.116 | 3691.640 | 2.61 | 5 |
| 24-HOUR HIGHEST | 1997 | 23-Apr | 412.916 | 3691.072 | 3.08 | 5 |
| 24-HOUR HIGHEST | 1998 | 6-Mar | 412.892 | 3691.072 | 2.11 | 5 |

| AVERAGING PERIOD | DATA PERIOD | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($ug/m^3$) | PSD CLASS II INCREMENT ($ug/m^3$) |
|---|---|---|---|---|---|---|
| | YEAR | DATE | EAST | NORTH | | |
| ANNUAL | 1994 | - | 410.616 | 3691.140 | 0.39 | 17 |
| ANNUAL | 1995 | - | 409.116 | 3692.140 | 0.48 | 17 |
| ANNUAL | 1996 | - | 409.116 | 3692.140 | 0.39 | 17 |
| ANNUAL | 1997 | - | 409.116 | 3692.140 | 0.39 | 17 |
| ANNUAL | 1998 | - | 409.116 | 3692.140 | 0.40 | 17 |
| | | | | | | |
| 24-HOUR HIGHEST | 1994 | 9-Apr | 412.964 | 3691.072 | 2.32 | 30 |
| 24-HOUR HIGHEST | 1995 | 5-Jan | 412.988 | 3691.072 | 2.83 | 30 |
| 24-HOUR HIGHEST | 1996 | 19-Nov | 410.116 | 3691.640 | 2.61 | 30 |
| 24-HOUR HIGHEST | 1997 | 23-Apr | 412.916 | 3691.072 | 3.08 | 30 |
| 24-HOUR HIGHEST | 1998 | 6-Mar | 412.892 | 3691.072 | 2.11 | 30 |

| AVERAGING PERIOD | DATA PERIOD | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($ug/m^3$) | BACKGROUND CONCENTRATION ($ug/m^3$) | TOTAL CONCENTRATION ($ug/m^3$) | NAAQS ($ug/m^3$) |
|---|---|---|---|---|---|---|---|---|
| | YEAR | DATE | EAST | NORTH | | | | |
| ANNUAL | 1994 | - | 410.616 | 3691.140 | 0.39 | 32.4 | 32.8 | 50 |
| ANNUAL | 1995 | - | 409.116 | 3692.140 | 0.48 | 32.4 | 32.9 | 50 |
| ANNUAL | 1996 | - | 409.116 | 3692.140 | 0.39 | 32.4 | 32.8 | 50 |
| ANNUAL | 1997 | - | 409.116 | 3692.140 | 0.39 | 32.4 | 32.8 | 50 |
| ANNUAL | 1998 | - | 409.116 | 3692.140 | 0.40 | 32.4 | 32.8 | 50 |
| | | | | | | | | |
| 24-HOUR HIGHEST | 1994 | 9-Apr | 412.964 | 3691.072 | 2.32 | 71 | 73.3 | 150 |
| 24-HOUR HIGHEST | 1995 | 5-Jan | 412.988 | 3691.072 | 2.83 | 71 | 73.8 | 150 |
| 24-HOUR HIGHEST | 1996 | 19-Nov | 410.116 | 3691.640 | 2.61 | 71 | 73.6 | 150 |
| 24-HOUR HIGHEST | 1997 | 23-Apr | 412.916 | 3691.072 | 3.08 | 71 | 74.1 | 150 |
| 24-HOUR HIGHEST | 1998 | 6-Mar | 412.892 | 3691.072 | 2.11 | 71 | 73.1 | 150 |

and highest 24-hour concentrations from Step 1. These concentrations were then added to representative background concentrations and compared with the annual (50 $\mu g/m^3$) and 24-hour (150 $\mu g/m^3$) NAAQS.

The representative background concentrations used in the $PM_{10}$ NAAQS compliance demonstration were selected from monitoring data collected during calendar year 1999. The monitor selected is located in Mesa, Arizona. This monitor was selected based on its location in a community setting. The background concentrations used are 32.4 $\mu g/m^3$ for the annual period and 71.0 $\mu g/m^3$ for the 24-hour averaging period. Table 6-6 presents the maximum predicted annual average and highest 24-hour concentrations associated with the $PM_{10}$ emission sources from the proposed power plant. As presented in these tables, maximum predicted annual average and 24-hour highest concentrations from the proposed power plant are well below the respective $PM_{10}$ NAAQS.

**$SO_2$ Modeling Demonstration**

**Step 1 - Significant Impact Analysis**

Emissions of $SO_2$ from the proposed power plant were assessed using the representative databases described above. It is understood that this analysis is not required since the proposed power plant is not subject to PSD review. Emissions of $SO_2$ from the proposed power plant were modeled using the representative databases described above. This analysis consisted of using the ISCST dispersion model in conjunction with 5-years of hourly meteorological data (one combined cycle system, auxiliary boiler and emergency sources). The purpose of this analysis was to determine whether the proposed power plant's emissions of $SO_2$ would have a significant impact on ambient air quality. If emissions of $SO_2$ result in maximum predicted annual, 3-hour and 24-hour concentrations exceeding the significant impact increments of 1 $\mu g/m^3$, 25 $\mu g/m^3$ and 5 $\mu g/m^3$, respectively, then the proposed power plant will be considered to have a significant impact on air quality. Table 6-7 presents the maximum predicted annual, 3-hour and 24-hour concentrations from the proposed power plant, respectively. As shown in Table 6-7 the proposed power plant will have an insignificant impact on $SO_2$ air quality. Although additional modeling analyses are not required, a NAAQS compliance demonstration was performed to support issuance of the construction permit.

**Step 2 - Compliance with $SO_2$ NAAQS**

To support issuance of the construction permit, a demonstration was performed to show that the proposed plant would not cause a violation of the $SO_2$ NAAQS. This demonstration consisted of determining the maximum predicted annual and highest 3-hour and 24-hour concentrations from Step 1. These concentrations were then added to representative background concentrations and compared with the annual (80 $\mu g/m^3$), 3-hour (1,300 $\mu g/m^3$) and 24-hour (365 $\mu g/m^3$) NAAQS.

**TABLE 6-7**
**SUMMARY OF MAXIMUM PREDICTED SO2 CONCENTRATIONS**
**FROM THE PROPOSED POWER PLANT - EXISTING KYRENE GENERATING STATION**

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION (ug/m³) | SIGNIFICANT IMPACT INCREMENT (ug/m³) |
|---|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | | |
| ANNUAL HIGHEST | 1994 | - | - | 412.813 | 3690.640 | 0.36 | 1 |
| ANNUAL HIGHEST | 1995 | - | - | 412.297 | 3690.892 | 0.39 | 1 |
| ANNUAL HIGHEST | 1996 | - | - | 412.297 | 3690.892 | 0.34 | 1 |
| ANNUAL HIGHEST | 1997 | - | - | 412.297 | 3690.892 | 0.35 | 1 |
| ANNUAL HIGHEST | 1998 | - | - | 412.297 | 3690.892 | 0.37 | 1 |
| 24-HOUR HIGHEST | 1994 | 12-Jan | - | 412.690 | 3690.640 | 2.89 | 5 |
| 24-HOUR HIGHEST | 1995 | 5-Jun | - | 412.764 | 3690.640 | 2.49 | 5 |
| 24-HOUR HIGHEST | 1996 | 15-Dec | - | 412.690 | 3690.640 | 2.84 | 5 |
| 24-HOUR HIGHEST | 1997 | 21-Feb | - | 412.690 | 3690.640 | 3.86 | 5 |
| 24-HOUR HIGHEST | 1998 | 30-Oct | - | 412.837 | 3690.640 | 3.10 | 5 |
| 3-HOUR HIGHEST | 1994 | 27-Jan | 21 | 412.739 | 3690.640 | 13.70 | 25 |
| 3-HOUR HIGHEST | 1995 | 5-Jun | 3 | 412.764 | 3690.640 | 18.22 | 25 |
| 3-HOUR HIGHEST | 1996 | 1-Aug | 24 | 412.764 | 3690.640 | 12.07 | 25 |
| 3-HOUR HIGHEST | 1997 | 4-May | 24 | 412.715 | 3690.640 | 12.80 | 25 |
| 3-HOUR HIGHEST | 1998 | 1-May | 21 | 412.764 | 3690.640 | 12.24 | 25 |

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION (ug/m³) | PSD CLASS II INCREMENT (ug/m³) |
|---|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | | |
| ANNUAL HIGHEST | 1994 | - | - | 412.813 | 3690.640 | 0.36 | 20 |
| ANNUAL HIGHEST | 1995 | - | - | 412.297 | 3690.892 | 0.39 | 20 |
| ANNUAL HIGHEST | 1996 | - | - | 412.297 | 3690.892 | 0.34 | 20 |
| ANNUAL HIGHEST | 1997 | - | - | 412.297 | 3690.892 | 0.35 | 20 |
| ANNUAL HIGHEST | 1998 | - | - | 412.297 | 3690.892 | 0.37 | 20 |
| 24-HOUR HIGHEST | 1994 | 12-Jan | - | 412.690 | 3690.640 | 2.89 | 91 |
| 24-HOUR HIGHEST | 1995 | 5-Jun | - | 412.764 | 3690.640 | 2.49 | 91 |
| 24-HOUR HIGHEST | 1996 | 15-Dec | - | 412.690 | 3690.640 | 2.84 | 91 |
| 24-HOUR HIGHEST | 1997 | 21-Feb | - | 412.690 | 3690.640 | 3.86 | 91 |
| 24-HOUR HIGHEST | 1998 | 30-Oct | - | 412.837 | 3690.640 | 3.10 | 91 |
| 3-HOUR HIGHEST | 1994 | 27-Jan | 21 | 412.739 | 3690.640 | 13.70 | 512 |
| 3-HOUR HIGHEST | 1995 | 5-Jun | 3 | 412.764 | 3690.640 | 18.22 | 512 |
| 3-HOUR HIGHEST | 1996 | 1-Aug | 24 | 412.764 | 3690.640 | 12.07 | 512 |
| 3-HOUR HIGHEST | 1997 | 4-May | 24 | 412.715 | 3690.640 | 12.80 | 512 |
| 3-HOUR HIGHEST | 1998 | 1-May | 21 | 412.764 | 3690.640 | 12.24 | 512 |

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION (ug/m³) | BACKGROUND CONCENTRATION (ug/m³) | TOTAL CONCENTRATION (ug/m³) | NAAQS (ug/m³) |
|---|---|---|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | | | | |
| ANNUAL HIGHEST | 1994 | - | - | 412.813 | 3690.640 | 0.36 | 2.7 | 3.06 | 80 |
| ANNUAL HIGHEST | 1995 | - | - | 412.297 | 3690.892 | 0.39 | 2.7 | 3.09 | 80 |
| ANNUAL HIGHEST | 1996 | - | - | 412.297 | 3690.892 | 0.34 | 2.7 | 3.04 | 80 |
| ANNUAL HIGHEST | 1997 | - | - | 412.297 | 3690.892 | 0.35 | 2.7 | 3.05 | 80 |
| ANNUAL HIGHEST | 1998 | - | - | 412.297 | 3690.892 | 0.37 | 2.7 | 3.07 | 80 |
| 24-HOUR HIGHEST | 1994 | 12-Jan | - | 412.690 | 3690.640 | 2.89 | 13 | 15.89 | 365 |
| 24-HOUR HIGHEST | 1995 | 5-Jun | - | 412.764 | 3690.640 | 2.49 | 13 | 15.49 | 365 |
| 24-HOUR HIGHEST | 1996 | 15-Dec | - | 412.690 | 3690.640 | 2.84 | 13 | 15.84 | 365 |
| 24-HOUR HIGHEST | 1997 | 21-Feb | - | 412.690 | 3690.640 | 3.86 | 13 | 16.86 | 365 |
| 24-HOUR HIGHEST | 1998 | 30-Oct | - | 412.837 | 3690.640 | 3.10 | 13 | 16.10 | 365 |
| 3-HOUR HIGHEST | 1994 | 27-Jan | 21 | 412.739 | 3690.640 | 13.70 | 46.8 | 60.50 | 1300 |
| 3-HOUR HIGHEST | 1995 | 5-Jun | 3 | 412.764 | 3690.640 | 18.22 | 46.8 | 65.02 | 1300 |
| 3-HOUR HIGHEST | 1996 | 1-Aug | 24 | 412.764 | 3690.640 | 12.07 | 46.8 | 58.87 | 1300 |
| 3-HOUR HIGHEST | 1997 | 4-May | 24 | 412.715 | 3690.640 | 12.80 | 46.8 | 59.60 | 1300 |
| 3-HOUR HIGHEST | 1998 | 1-May | 21 | 412.764 | 3690.640 | 12.24 | 46.8 | 59.04 | 1300 |

TA[illegible]6-7

SUMMARY OF MAXIMUM PREDICTED SO2 CONCENTRATIONS
FROM THE PROPOSED POWER PLANT - EXISTING KYRENE GENERATING STATION

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($ug/m^3$) | RULE 32 CONCENTRATION ($ug/m^3$) |
|---|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | | |
| 1-HOUR | 1994 | 7-Aug | 1 | 412.715 | 3690.640 | 19.60 | 850 |
| 1-HOUR | 1995 | 28-Jan | 22 | 412.715 | 3690.640 | 19.71 | 850 |
| 1-HOUR | 1996 | 7-Mar | 21 | 412.715 | 3690.640 | 19.72 | 850 |
| 1-HOUR | 1997 | 3-Feb | 9 | 412.715 | 3690.640 | 28.04 | 850 |
| 1-HOUR | 1998 | 1-Jan | 1 | 412.715 | 3690.640 | 30.18 | 850 |
| | | | | | | | |
| 24-HOUR | 1994 | 12-Jan | - | 412.690 | 3690.640 | 2.89 | 250 |
| 24-HOUR | 1995 | 5-Jun | - | 412.764 | 3690.640 | 2.49 | 250 |
| 24-HOUR | 1996 | 15-Dec | - | 412.690 | 3690.640 | 2.84 | 250 |
| 24-HOUR | 1997 | 21-Feb | - | 412.690 | 3690.640 | 3.86 | 250 |
| 24-HOUR | 1998 | 30-Oct | - | 412.837 | 3690.640 | 3.10 | 250 |
| | | | | | | | |
| 72-HOUR | 1994 | 12-Jan | - | 412.690 | 3690.640 | 2.89 | 120 |
| 72-HOUR | 1995 | 5-Jun | - | 412.764 | 3690.640 | 2.49 | 120 |
| 72-HOUR | 1996 | 15-Dec | - | 412.690 | 3690.640 | 2.84 | 120 |
| 72-HOUR | 1997 | 21-Feb | - | 412.690 | 3690.640 | 3.86 | 120 |
| 72-HOUR | 1998 | 30-Oct | - | 412.837 | 3690.640 | 3.10 | 120 |

The representative background concentrations used in the $SO_2$ NAAQS compliance demonstration were selected from monitoring data collected during calendar year 1999. The monitor selected was located in Scottsdale (Scottsdale Road and Thomas Road). This monitor was selected based on its location in a community setting. The background concentrations used are 2.7 $\mu g/m^3$ for the annual averaging period, 46.8 $\mu g/m^3$ for the 3-hour averaging period and 13.0 $\mu g/m^3$ for the 24-hour averaging period. Table 6-7 presents the maximum predicted annual average and highest 3-hour and 24-hour concentrations for the proposed power plant, respectively. As presented in these tables, maximum predicted annual average and 3-hour and 24-hour highest concentrations from the proposed power plant are well below the respective $SO_2$ NAAQS.

**Step 3 - Compliance with Rule 32**

Emissions of $SO_2$ from the proposed power plant were modeled and compared to the 1-hour, 24-hour and 72-hour concentrations of 850 $\mu g/m^3$, 250 $\mu g/m^3$ and 120 $\mu g/m^3$, respectively. Table 6-7 presents the modeling results of this analysis for the proposed power plant. Since the ISC dispersion model is not capable of simulating a 72-hour averaging period, the 24-hour predicted concentrations were used to demonstrate compliance with the 72-hour acceptable level. This is a conservative assumption, since the predicted 24-hour concentrations will also be greater than a 72-hour average concentration. Additionally, emissions of sulfuric acid from the proposed power plant were modeled and compared to the 24-hour concentration of 15 $\mu g/m^3$. The modeling results of this analysis are presented in Table 6-8. Compliance with Rule 32 is demonstrated as the model predicted concentrations are below the respective compliance concentrations. For purposes of this analysis it was assumed that 100% of the $SO_2$ emissions would convert to sulfuric acid emissions. This is an extremely conservative approach, since only a small percentage converts to sulfuric acid. The approach was selected based on the minimum impact of $SO_2$ emissions on air quality.

## *6.3 HAZARDOUS AIR POLLUTANT IMPACT ASSESSMENT*

The Arizona Department of Health Services has developed health-based guidelines for contaminants in air, referred to as the Arizona Ambient Air Quality Guidelines (AAAQGs). The proposed power plant has the potential to emit hazardous air pollutants (HAPs) and toxic air pollutants. Facility emissions of these pollutants were modeled from each emitting source with a unit emission rate of 1 gram per second using the dispersion model and databases discussed above. The ISCST dispersion model calculated the annual, 1-hour and 24-hour average concentrations. The estimated toxic air pollutant emission rate associated with the proposed power plant was then ratioed to the unit emission rate. The resultant ratio was multiplied by the model-predicted concentration and compared to the appropriate AAAQG(s) for that air toxic pollutant. Table 6-9 (contains several spreadsheets) presents the results of the toxic air pollutant modeling demonstration for the proposed power plant. As shown in the table, the proposed power plant is in compliance with the respective AAAQGs.

TA[illegible]6-8

SUMMARY OF MAXIMUM PREDICTED SULFURIC ACID CONCENTRATIONS
FROM THE PROPOSED POWER PLANT - EXISTING KYRENE GENERATING STATION

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($ug/m^3$) | RULE 32 CONCENTRATION ($ug/m^3$) |
|---|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | | |
| 24-HOUR HIGHEST | 1994 | 12-Jan | - | 412.690 | 3690.640 | 2.89 | 15 |
| 24-HOUR HIGHEST | 1995 | 5-Jun | - | 412.764 | 3690.640 | 2.49 | 15 |
| 24-HOUR HIGHEST | 1996 | 15-Dec | - | 412.690 | 3690.640 | 2.84 | 15 |
| 24-HOUR HIGHEST | 1997 | 21-Feb | - | 412.690 | 3690.640 | 3.86 | 15 |
| 24-HOUR HIGHEST | 1998 | 30-Oct | - | 412.837 | 3690.640 | 3.10 | 15 |

## 6.4 $NO_2$ PSD AMBIENT AIR QUALITY MONITORING REQUIREMENT

The proposed power plant is subject to PSD review for $NO_2$. Preconstruction ambient air quality monitoring for up to a 1-year period may be required for each pollutant subject to PSD review. An applicant may be exempted from this requirement if there are existing air quality monitoring data representative of the site, or if the annual $NO_2$ impacts from the proposed plant are less than the annual monitoring de minimis concentration of 14.0 $\mu g/m^3$.

As shown in Table 6-10 the proposed power plant will result in predicted $NO_2$ concentrations that are well below the monitoring de minimis concentration. In addition, existing ambient monitors are also strategically located throughout Maricopa County that adequately represent $NO_2$ background levels. Thus, it is SRP's understanding, that it may be exempt from the preconstruction ambient air quality monitoring requirement for $NO_2$ which is a requirement under the PSD program.

## 6.5 ADDITIONAL AIR QUALITY IMPACT ANALYSES

$NO_2$, $PM_{10}$, CO and $SO_2$ emissions from the proposed power plant were modeled and concentrations were predicted at the Gila River, Maricopa Ak Chin, and Salt River Indian Reservations. Table 6-11 summarizes the overall maximum predicted concentrations at these Indian Reservations.

Analyses of the impact of the proposed power plant's air pollutant emissions associated with construction and related growth are presented in this section in accordance with Maricopa County Rule 240, Section 308. Assessment of the impact on soil, vegetation, and visibility are also presented in this section. A qualitative approach to these analyses was necessary for those areas in which analytical techniques are not well established.

### 6.5.1 Construction and Growth Impacts

Construction impacts on air quality will consist mainly of the relatively minor amounts of pollutants emitted from construction equipment required for site preparation and from fugitive dust emissions. General construction vehicles (both gasoline- and diesel-powered) and other diesel-powered engines will be used. These engines emit minor amounts of VOC, $SO_2$, CO, $NO_2$, and PM. The contaminants are expected to cause localized, temporary increases in existing air quality levels, but are not expected to cause any adverse impacts on or beyond the site boundary. Fugitive dust emissions will probably be the most noticeable impact during construction. Dust will be associated with ground excavation, cut-and-fill operations, and other activities. The amount of dust will vary from day to day, depending on the level of activity and the weather. Overall, PM concentrations beyond the power plant boundary, due to fugitive dust from construction activities, should add only minimally to existing background PM levels in the area. Various control techniques (if so required) will be taken to prevent PM from becoming airborne.

The operation of the proposed power plant will result in minimal growth in the area. The air quality impact due to the associated residential growth will be in the form of additional automobile emissions, which will be dispersed over a large area and, therefore, have negligible impact. Commercial growth is anticipated to occur at a gradual rate in the future. Commercial growth, of

**TABLE 6-9**
**SUMMARY OF MAXIMUM PREDICTED AIR TOXIC CONCENTRATIONS FROM THE PROPOSED POWER PLANT AT THE EXISTING KYRENE GENERATING STATION**

**Combustion Turbine**

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION (µg/m³) |
|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | |
| ANNUAL | 1998 | - | - | 409.116 | 3692.140 | 0.16 |
| 1-HOUR | 1998 | 09/02 | 13 | 412.472 | 3691.012 | 3.37 |
| 24-HOUR | 1998 | 11/01 | - | 409.116 | 3691.390 | 0.74 |

**Auxiliary Boiler**

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION (µg/m³) |
|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | |
| ANNUAL | 1998 | - | - | 412.303 | 3690.916 | 1.47 |
| 1-HOUR | 1998 | 07/22 | 20 | 412.309 | 3690.940 | 18.47 |
| 24-HOUR | 1998 | 03/03 | - | 412.309 | 3690.940 | 4.66 |

**Emergency Fire Pump**

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION (µg/m³) |
|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | |
| ANNUAL | 1998 | - | - | 412.837 | 3690.640 | 10.41 |
| 1-HOUR | 1998 | 01/01 | 01 | 412.715 | 3690.640 | 890.42 |
| 24-HOUR | 1998 | 12/24 | - | 412.690 | 3690.640 | 93.55 |

**Emergency Generator**

| AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION (µg/m³) |
|---|---|---|---|---|---|---|
| | YEAR | DAY | HOUR ENDING | EAST | NORTH | |
| ANNUAL | 1998 | - | - | 412.837 | 3690.640 | 10.34 |
| 1-HOUR | 1998 | 12/24 | 01 | 412.715 | 3690.640 | 943.43 |
| 24-HOUR | 1998 | 12/24 | - | 412.715 | 3690.640 | 94.55 |

**Facility Total***

| AVERAGING PERIOD | MAXIMUM PREDICTED CONCENTRATION (µg/m³) |
|---|---|
| ANNUAL | 22.38 |
| 1-HOUR | 1855.69 |
| 24-HOUR | 193.50 |

***Facility total concentrations are summed from all proposed emission sources regardless of receptor location and the data period.**

**The above concentrations are model results based on a unit emission rate of 1.0 g/s. The 1998 meteorological data was used for this analysis.**

TA[illegible]6-9

SUMMARY OF MAXIMUM PREDICTED ANNUAL AVERAGE AIR TOXIC CONCENTRATIONS FROM THE PROPOSED POWER PLANT AT THE EXISTING KYRENE GENERATING STATION

| Chemical Name | Predicted Annual Concentration | | | | | |
|---|---|---|---|---|---|---|
| | Combustion Turbine (µg/m3) | Duct Burner (µg/m3) | Auxiliary Boiler (µg/m3) | Emergency Fire Pump (µg/m3) | Emergency Generator (µg/m3) | Facility Total (µg/m3) |
| 1,3-Butadiene | 1.19E-05 | - | - | 4.05E-05 | 4.35E-05 | 9.58E-05 |
| 2-Methylnaphthalene | 1.43E-07 | 5.39E-08 | 4.31E-07 | - | - | 6.29E-07 |
| 3-Methylchloranthrene | - | 4.04E-09 | 3.24E-08 | - | - | 3.64E-08 |
| Acrolein | 6.42E-04 | - | - | 9.57E-05 | 1.03E-04 | 8.40E-04 |
| Arsenic | - | 4.49E-07 | 3.60E-06 | - | - | 4.04E-06 |
| Benzene | 3.68E-04 | 9.67E-06 | 1.56E-04 | 9.65E-04 | 1.04E-03 | 2.54E-03 |
| Benzo(a)anthracene | 6.12E-07 | 4.04E-09 | 3.24E-08 | 1.74E-06 | 1.87E-06 | 4.25E-06 |
| Benzo(a)pyrene | 3.76E-07 | 2.69E-09 | 2.16E-08 | 1.95E-07 | 2.09E-07 | 8.04E-07 |
| Beryllium | - | 2.69E-08 | 2.16E-07 | - | - | 2.43E-07 |
| Cadmium | - | 2.47E-06 | 1.98E-05 | - | - | 2.22E-05 |
| Chromium VI | - | - | - | - | - | 0.00E+00 |
| Dibenzo(a,h)anthracene | 6.36E-07 | 2.69E-09 | 2.16E-08 | 6.03E-07 | 6.48E-07 | 1.91E-06 |
| 1,2-Dichlorobenzene | - | - | - | - | - | 0.00E+00 |
| 1,4-Dichlorobenzene | - | - | - | - | - | 0.00E+00 |
| Ethylbenzene | 8.84E-04 | - | - | - | - | 8.84E-04 |
| Formaldehyde | 1.96E-02 | 4.96E-04 | 3.97E-03 | 1.22E-03 | 1.31E-03 | 2.66E-02 |
| Hexane | 7.01E-03 | 4.04E-03 | 3.24E-02 | - | - | 4.34E-02 |
| Lead | - | - | - | - | - | 0.00E+00 |
| Manganese | - | 8.53E-07 | 6.83E-06 | - | - | 7.68E-06 |
| Mercury | - | 5.83E-07 | 4.67E-06 | - | - | 5.26E-06 |
| Naphthalene | 4.50E-05 | 1.37E-06 | 1.10E-05 | 8.77E-05 | 9.43E-05 | 2.39E-04 |
| Nickel | - | 4.71E-06 | 3.77E-05 | - | - | 4.25E-05 |
| N-nitrosodimethylamine | - | - | - | - | - | 0.00E+00 |
| Propylene Oxide | 1.29E-03 | - | - | - | - | 1.29E-03 |
| Selenium | - | 5.39E-08 | 4.31E-07 | - | - | 4.85E-07 |
| Toluene | 3.59E-03 | 7.63E-06 | 6.11E-05 | 4.23E-04 | 4.55E-04 | 4.54E-03 |
| Xylene | 1.77E-03 | - | - | 2.95E-04 | 3.17E-04 | 2.38E-03 |

T[illegible] 6-9

SUMMARY OF MAXIMUM PREDICTED 1-HOUR AIR TOXIC CONCENTRATIONS
FROM THE PROPOSED POWER PLANT AT THE EXISTING KYRENE
GENERATING STATION

| Chemical Name | Predicted 1-Hour Concentration | | | | | |
|---|---|---|---|---|---|---|
| | Combustion Turbine (µg/m3) | Duct Burner (µg/m3) | Auxiliary Boiler (µg/m3) | Emergency Fire Pump (µg/m3) | Emergency Generator (µg/m3) | Facility Total (µg/m3) |
| 1,3-Butadiene | 2.50E-04 | - | - | 3.46E-03 | 3.97E-03 | 7.68E-03 |
| 2-Methylnaphthalene | 3.02E-06 | 1.13E-06 | 5.42E-06 | - | - | 9.57E-06 |
| 3-Methylchloranthrene | - | 8.51E-08 | 4.07E-07 | - | - | 4.92E-07 |
| Acrolein | 1.35E-02 | - | - | 8.19E-03 | 9.38E-03 | 3.11E-02 |
| Arsenic | - | 9.45E-06 | 4.52E-05 | - | - | 5.46E-05 |
| Benzene | 7.76E-03 | 2.04E-04 | 1.97E-03 | 8.26E-02 | 9.46E-02 | 1.87E-01 |
| Benzo(a)anthracene | 1.29E-05 | 8.51E-08 | 4.07E-07 | 1.49E-04 | 1.70E-04 | 3.32E-04 |
| Benzo(a)pyrene | 7.93E-06 | 5.67E-08 | 2.71E-07 | 1.66E-05 | 1.91E-05 | 4.40E-05 |
| Beryllium | - | 5.67E-07 | 2.71E-06 | - | - | 3.28E-06 |
| Cadmium | - | 5.20E-05 | 2.48E-04 | - | - | 3.00E-04 |
| Chromium VI | - | - | - | - | - | 0.00E+00 |
| Dibenzo(a,h)anthracene | 1.34E-05 | 5.67E-08 | 2.71E-07 | 5.16E-05 | 5.91E-05 | 1.24E-04 |
| 1,2-Dichlorobenzene | - | - | - | - | - | 0.00E+00 |
| 1,4-Dichlorobenzene | - | - | - | - | - | 0.00E+00 |
| Ethylbenzene | 1.86E-02 | - | - | - | - | 1.86E-02 |
| Formaldehyde | 4.13E-01 | 1.04E-02 | 4.99E-02 | 1.04E-01 | 1.20E-01 | 6.98E-01 |
| Hexane | 1.48E-01 | 8.51E-02 | 4.07E-01 | - | - | 6.39E-01 |
| Lead | - | - | - | - | - | 0.00E+00 |
| Manganese | - | 1.80E-05 | 8.58E-05 | - | - | 1.04E-04 |
| Mercury | - | 1.23E-05 | 5.87E-05 | - | - | 7.10E-05 |
| Naphthalene | 9.47E-04 | 2.88E-05 | 1.38E-04 | 7.51E-03 | 8.60E-03 | 1.72E-02 |
| Nickel | - | 9.93E-05 | 4.74E-04 | - | - | 5.74E-04 |
| N-nitrosodimethylamine | - | - | - | - | - | 0.00E+00 |
| Propylene Oxide | 2.73E-02 | - | - | - | - | 2.73E-02 |
| Selenium | - | 1.13E-06 | 5.42E-06 | - | - | 6.56E-06 |
| Toluene | 7.56E-02 | 1.61E-04 | 7.68E-04 | 3.62E-02 | 4.15E-02 | 1.54E-01 |
| Xylene | 3.72E-02 | - | - | 2.52E-02 | 2.89E-02 | 9.14E-02 |

TABLE 6-9

SUMMARY OF MAXIMUM PREDICTED 24-HOUR AIR TOXIC CONCENTRATIONS FROM THE PROPOSED POWER PLANT AT THE EXISTING KYRENE GENERATING STATION

| Chemical Name | Predicted 24-Hour Concentration | | | | | |
|---|---|---|---|---|---|---|
| | Combustion Turbine (µg/m3) | Duct Burner (µg/m3) | Auxiliary Boiler (µg/m3) | Emergency Fire Pump (µg/m3) | Emergency Generator (µg/m3) | Facility Total (µg/m3) |
| 1,3-Butadiene | 5.49E-05 | - | - | 3.64E-04 | 3.97E-04 | 8.16E-04 |
| 2-Methylnaphthalene | 6.63E-07 | 2.49E-07 | 1.37E-06 | - | - | 2.28E-06 |
| 3-Methylchloranthrene | - | 1.87E-08 | 1.03E-07 | - | - | 1.21E-07 |
| Acrolein | 2.97E-03 | - | - | 8.60E-04 | 9.40E-04 | 4.77E-03 |
| Arsenic | - | 2.08E-06 | 1.14E-05 | - | - | 1.35E-05 |
| Benzene | 1.70E-03 | 4.47E-05 | 4.96E-04 | 8.68E-03 | 9.48E-03 | 2.04E-02 |
| Benzo(a)anthracene | 2.83E-06 | 1.87E-08 | 1.03E-07 | 1.56E-05 | 1.71E-05 | 3.57E-05 |
| Benzo(a)pyrene | 1.74E-06 | 1.25E-08 | 6.84E-08 | 1.75E-06 | 1.91E-06 | 5.48E-06 |
| Beryllium | - | 1.25E-07 | 6.84E-07 | - | - | 8.08E-07 |
| Cadmium | - | 1.14E-05 | 6.27E-05 | - | - | 7.41E-05 |
| Chromium VI | - | - | - | - | - | 0.00E+00 |
| Dibenzo(a,h)anthracene | 2.94E-06 | 1.25E-08 | 6.84E-08 | 5.42E-06 | 5.93E-06 | 1.44E-05 |
| 1,2-Dichlorobenzene | - | - | - | - | - | 0.00E+00 |
| 1,4-Dichlorobenzene | - | - | - | - | - | 0.00E+00 |
| Ethylbenzene | 4.09E-03 | - | - | - | - | 4.09E-03 |
| Formaldehyde | 9.07E-02 | 2.29E-03 | 1.26E-02 | 1.10E-02 | 1.20E-02 | 1.29E-01 |
| Hexane | 3.24E-02 | 1.87E-02 | 1.03E-01 | - | - | 1.54E-01 |
| Lead | - | - | - | - | - | 0.00E+00 |
| Manganese | - | 3.94E-06 | 2.17E-05 | - | - | 2.56E-05 |
| Mercury | - | 2.70E-06 | 1.48E-05 | - | - | 1.75E-05 |
| Naphthalene | 2.08E-04 | 6.33E-06 | 3.48E-05 | 7.89E-04 | 8.62E-04 | 1.90E-03 |
| Nickel | - | 2.18E-05 | 1.20E-04 | - | - | 1.41E-04 |
| N-nitrosodimethylamine | - | - | - | - | - | 0.00E+00 |
| Propylene Oxide | 5.99E-03 | - | - | - | - | 5.99E-03 |
| Selenium | - | 2.49E-07 | 1.37E-06 | - | - | 1.62E-06 |
| Toluene | 1.66E-02 | 3.53E-05 | 1.94E-04 | 3.80E-03 | 4.16E-03 | 2.48E-02 |
| Xylene | 8.18E-03 | - | - | 2.65E-03 | 2.90E-03 | 1.37E-02 |

COMPARISON OF MAXIMUM PR[illegible]D AIR TOXIC CONCENTRATIONS
FROM THE PROPOSED POWER PLANT AT THE EXISTING KYRENE
GENERATING STATION WITH THE AAAQGs

| Chemical Name | Predicted 1-Hour Concentration From The Proposed Facility (µg/m3) | 1-Hour AAAQG (µg/m3) | Below AAAQG? | Predicted 24-Hour Concentration From The Proposed Facility (µg/m3) | 24-Hour AAAQG (µg/m3) | Below AAAQG? | Predicted Annual Concentration From The Proposed Facility (µg/m3) | Annual AAAQG (µg/m3) | Below AAAQG? |
|---|---|---|---|---|---|---|---|---|---|
| 1,3-Butadiene | 7.68E-03 | 5.00 | YES | 8.16E-04 | 1.3 | YES | 9.58E-05 | 3.60E+00 | YES |
| 2-Methylnaphthalene | 9.57E-06 | — | YES | 2.28E-06 | — | YES | 6.29E-07 | — | YES |
| 3-Methylchloranthrene | 4.92E-07 | — | YES | 1.21E-07 | — | YES | 3.64E-08 | — | YES |
| Acrolein | 3.11E-02 | 6.3 | YES | 4.77E-03 | 2 | YES | 8.40E-04 | — | YES |
| Arsenic | 5.46E-05 | 0.06 | YES | 1.35E-05 | 0.02 | YES | 4.04E-06 | 2.30E-04 | YES |
| Benzene | 1.87E-01 | 170 | YES | 2.04E-02 | 44 | YES | 2.54E-03 | 1.20E-01 | YES |
| Benzo(a)anthracene | 3.32E-04 | 6 | YES | 3.57E-05 | 1.6 | YES | 4.25E-06 | 4.80E-03 | YES |
| Benzo(a)pyrene | 4.40E-05 | 0.67 | YES | 5.48E-06 | 0.18 | YES | 8.04E-07 | 4.80E-04 | YES |
| Beryllium | 3.28E-06 | 0.06 | YES | 8.08E-07 | 0.02 | YES | 2.43E-07 | 4.20E-04 | YES |
| Cadmium | 3.00E-04 | 0.77 | YES | 7.41E-05 | 0.2 | YES | 2.22E-05 | 5.60E-04 | YES |
| Chromium VI | 0.00E+00 | 0.02 | YES | 0.00E+00 | 0.0044 | YES | 0.00E+00 | 1.20E-05 | YES |
| Dibenzo(a,h)anthracene | 1.24E-04 | 0.67 | YES | 1.44E-05 | 0.18 | YES | 1.91E-06 | 4.80E-04 | YES |
| 1,2-Dichlorobenzene | 0.00E+00 | 9000 | YES | 0.00E+00 | 2400 | YES | 0.00E+00 | — | YES |
| 1,4-Dichlorobenzene | 0.00E+00 | 200 | YES | 0.00E+00 | 53 | YES | 0.00E+00 | 1.50E-01 | YES |
| Ethylbenzene | 1.86E-02 | 4500 | YES | 4.09E-03 | 3500 | YES | 8.84E-04 | — | YES |
| Formaldehyde | 6.98E-01 | 25 | YES | 1.29E-01 | 16 | YES | 2.66E-02 | 7.60E-02 | YES |
| Hexane | 6.39E-01 | 5400 | YES | 1.54E-01 | 1400 | YES | 4.34E-02 | — | YES |
| Lead | - | NAAQS | YES | - | NAAQS | YES | - | — | YES |
| Manganese | 1.04E-04 | 25 | YES | 2.56E-05 | 7.9 | YES | 7.68E-06 | — | YES |
| Mercury | 7.10E-05 | 1.5 | YES | 1.75E-05 | 0.4 | YES | 5.26E-06 | — | YES |
| Naphthalene | 1.72E-02 | 630 | YES | 1.90E-03 | 400 | YES | 2.39E-04 | — | YES |
| Nickel | 5.74E-04 | 0.45 | YES | 1.41E-04 | 0.12 | YES | 4.25E-05 | 2.10E-03 | YES |
| N-nitrosodimethylamine | 0.00E+00 | 0.1 | YES | 0.00E+00 | 0.03 | YES | 0.00E+00 | 7.10E-05 | YES |
| Propylene Oxide | 2.73E-02 | 370 | YES | 5.99E-03 | 98 | YES | 1.29E-03 | 2.70E-01 | YES |
| Selenium | 6.56E-06 | 6 | YES | 1.62E-06 | 1.6 | YES | 4.85E-07 | — | YES |
| Toluene | 1.54E-01 | 4400 | YES | 2.48E-02 | 3000 | YES | 4.54E-03 | — | YES |
| Xylene | 9.14E-02 | 5400 | YES | 1.37E-02 | 3500 | YES | 2.38E-03 | — | YES |

TA[illegible]6-10

SUMMARY OF MAXIMUM PREDICTED $NO_2$ CONCENTRATIONS
FROM THE PROPOSED POWER PLANT AT THE EXISTING KYRENE
GENERATING STATION FOR COMPARISON WITH THE MONITORING DEMINIMIS CONCENTRATION

| AVERAGING PERIOD | DATA PERIOD | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION ($\mu g/m^3$) | MONITORING DEMINIMS ($\mu g/m^3$) |
|---|---|---|---|---|---|
| | YEAR | EAST | NORTH | | |
| ANNUAL | 1994 | 409.116 | 3692.140 | 0.44 | 14 |
| ANNUAL | 1995 | 409.116 | 3692.140 | 0.55 | 14 |
| ANNUAL | 1996 | 409.116 | 3692.140 | 0.45 | 14 |
| ANNUAL | 1997 | 409.116 | 3692.140 | 0.44 | 14 |
| ANNUAL | 1998 | 409.116 | 3692.140 | 0.46 | 14 |

TABLE 5-11

**SUMMARY OF MAXIMUM PREDICTED NO2, PM10, CO AND SO2 CONCENTRATIONS AT NEARBY INDIAN RESERVATIONS FROM THE PROPOSED POWER PLANT - EXISTING KYRENE GENERATING STATION**

| POLLUTANT | AVERAGING PERIOD | DATA PERIOD | | | RECEPTOR LOCATION (KM) | | MAXIMUM PREDICTED CONCENTRATION AT NEARBY INDIAN RESERVATIONS* (ug/m$^3$) |
|---|---|---|---|---|---|---|---|
| | | YEAR | DAY | HOUR ENDING | EAST | NORTH | |
| NO2 | ANNUAL HIGHEST | 1996 | - | - | 391.625 | 3687.500 | 0.03 |
| PM10 | ANNUAL HIGHEST | 1996 | - | - | 391.625 | 3687.500 | 0.03 |
| | 24-HOUR HIGHEST | 1997 | 18-Jan | - | 404.500 | 3684.000 | 0.47 |
| CO | 1-HOUR HIGHEST | 1998 | 24-Dec | 5 | 409.500 | 3684.000 | 153.6 |
| | 8-HOUR HIGHEST | 1995 | 20-Nov | 24 | 399.500 | 3684.000 | 5.6 |
| SO2 | ANNUAL HIGHEST | 1994 | - | - | 416.950 | 3684.000 | 0.002 |
| | 3-HOUR HIGHEST | 1996 | 1-Aug | 24 | 414.500 | 3684.000 | 0.16 |
| | 24-HOUR HIGHEST | 1997 | 18-Jan | - | 404.500 | 3684.000 | 0.03 |

* The nearest Indian Reservation boundarys relative to the Kyrene Generating Station were modeled with representative receptor points. The Indian Reservations modeled included:

Gila River Indian Reservation
Maricopa AK Chin Indiana Reservation
Salt River Indian Reservation

The concentrations presented above are the maximums for each pollutant/averaging period predicted over the five year meteorological data period.

course, will add to the background pollutant concentrations. Based on the maximum predicted concentrations associated with the proposed power plant, there is sufficient air resource available for future development in the Tempe area.

### 6.5.2 Impact on Soil and Vegetation

The secondary NAAQS are intended to protect the public welfare from adverse effects of airborne effluents. This protection extends to agricultural soil. As demonstrated in Section 6, maximum predicted pollutant concentrations from the proposed power plant are well below the secondary NAAQS for all pollutants. As discussed in Section 6, the proposed power plant has an insignificant impact on ambient air quality. Since the secondary NAAQS protect impact on human welfare, no significant adverse impact on soil is anticipated due to the proposed power plant.

The effects of gaseous air pollutants on vegetation may be classified into three rather broad categories: acute, chronic, and long-term. Acute effects are those that result from relatively short (less than 1 month) exposures to high concentrations of pollutants. Chronic effects occur when organisms are exposed for months or even years to certain threshold levels of pollutants. Long-term effects include abnormal changes in ecosystems and subtle physiological alterations in organisms. Acute and chronic effects are caused by the gaseous pollutant acting directly on the organism, whereas long-term effects may be indirectly caused by secondary agents such as changes in soil pH. $SO_2$ enters the plant primarily through the leaf stomata and passes into the intercellular spaces of the mesophyll, where it is absorbed on the moist cell walls and combined with water to form sulfurous acid and sulfite salts. Plant species show a considerable range of sensitivity to $SO_2$. This range is the result of complex interactions among microclimatic (temperature, humidity, light, etc.), edaphic, phenological, morphological, and genetic factors that influence plant response (USEPA, 1973).

$NO_2$ may affect vegetation either by direct contact of $NO_2$ with the leaf surface or by solution in water drops, becoming nitric acid. Acute and chronic threshold injury levels for $NO_2$ are much higher than those for $SO_2$ (USEPA, 1971).

As discussed in Section 5.2, maximum predicted ambient concentrations from the proposed power plant are well below the ambient air quality standards which are designed to protect public health and welfare from any known or adverse effects of air pollutants, including effects on vegetation.

### 6.5.3 Impact on Visibility (Regional Haze Analysis)

The proposed power plant will result in a significant net increase in emissions of regulated air pollutants and therefore subject the project to review under PSD. A further requirement of PSD includes the special protection of air quality and air quality related values (AQRV) at potentially affected nearby Class I areas. Assessment of the potential impact to visibility (regional haze analysis) is required if the source is located within 100 km of a Class I area. An evaluation may be requested if the source is within 200 km of a Class I area.

There are three Class I areas within 100 km of the proposed power plant site as shown in Figure 6-5. The distance from Kyrene to the nearest boundary of the Superstition Class I area is less than 50 km (45 km) and the distances to the others are about 70 km and 100 km for Mazatzal and Pine Mountain, respectively. Because of the proximity of the Class I areas to the Kyrene site, a Tier 2 assessment of the potential impact to regional haze was completed along with a long-range significant impact assessment.

The modeling was conducted based on guidance contained in the *Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998a), *the Federal Land Managers Air Quality Related Values (FLAG) draft report* (October 1999) and used the CALPUFF (version 990228) model to calculate concentrations within Class I area equivalent distance rings of receptors. The CALPUFF modeling methodology included

- Stack and emission characteristics from Section 2 with modeled emissions of $NO_x$, $SO_2$, and $PM_{10}$ used to calculate impacts of $NO_2$, $NO_3$, $HNO_3$, $SO_2$, $SO_4$, and $PM_{10}$.

- Five years (1994-1998) of representative nearby meteorological data (Phoenix surface data) augmented with roughness, precipitation, solar radiation, and relative humidity parameters;

- Four rings of receptors coincident with the Class I area boundaries as shown in Figure 6.5;

- Terrain heights for each receptor in the receptor ring coincident with the average, minimum, and maximum elevations determined for the Class I area topography at the ring distance; and

- Default CALPUFF settings and a partial plume path terrain adjustment.

The output from the CALPUFF modeling was processed in CALPOST to calculate the potential impact on visual range in the vicinity of the Class I area. The potential effects were determined through calculation of the 24-hour concentrations of $NO_3$, and $SO_4$, and the subsequent use of the IWAQM equations to determine the potential change in extinction. Any calculated impairment exceeding 5 percent of current background levels indicates the potential to affect the Class I area and could require a Tier 3 CALPUFF analysis. In accordance with the Federal Land Managers Air Quality Related Values Workgroup (FLAG) recommendations, the CALPOST analysis assumed a constant background visual range (BVR) of 224 km or 17.6 $Mm^{-1}$.

A second iteration was done to assess the concentrations at the equivalent Class I area distances versus the proposed significant impact levels. CALPUFF modeling for this iteration was done without chemical transformation.

Because the nearest boundary to the Superstition Class I area is less than 50 km (the range suggested by IWAQM as appropriate to begin long range transport modeling using CALPUFF) the potential visual impacts were assessed for this area using USEPA's screening model for visibility impacts

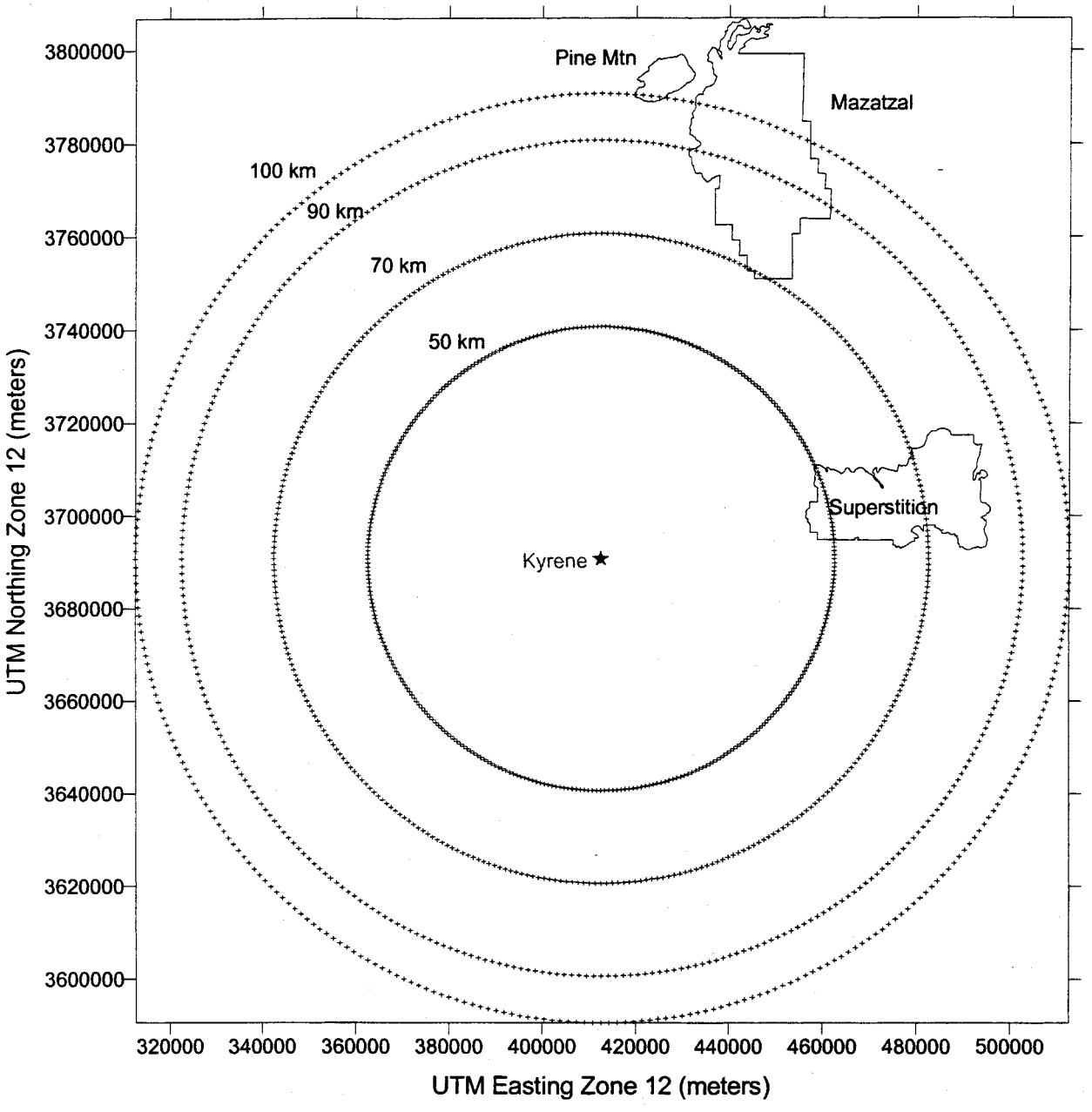



Figure 6-5 Kyrene – Salt River Project – CALPUFF Receptor Grid

called VISCREEN. The potential significant impacts for the less than 50 km distant Superstition area were calculated using ISCST3 and receptors coincident with the Superstition boundary.

6.5.3.1 Results of the Analyses

Once the CALPUFF modeling was completed using the settings and input parameters discussed above, calculation of visibility impairment was completed using the CALPOST post-processed output files. CALPOST was run using standard inputs to return the short-term 24-hour concentrations of $NO_3$, $SO_4$, and $PM_{10}$.

The potential affect on visibility and regional haze at the Superstition Class I area was determined from the short-term concentrations of $NO_3$, $SO_4$, and $PM_{10}$. The visibility analysis was performed by calculating the change in light-extinction based on the estimated air quality impacts from the project.

Light-extinction, or the sum of light scattering and absorption (represented by the coefficient, $b_{ext}$), was calculated based on Section 3.2 of the IWAQM Phase 2 guidance (December 1998). The maximum calculated concentrations for sulfate ($SO_4$), and nitrate ($NO_3$) were used in the IWAQM formulas. The formula for $b_{ext}$ assumes sulfates and nitrates exist in the form of ammonium sulfate [$(NH_4)_2SO_4$] and ammonium nitrate ($NH_4NO_3$), and therefore a conversion is made by multiplying the maximum 24-hour concentration of sulfate or nitrate by the mass ratio of $(NH_4)_2SO_4$ to $SO_4^{2-}$ or $NH_4NO_3$ to $NO_3^-$.

Extinction coefficients for nitrates and sulfates were calculated by multiplying the concentrations of ammonium sulfate and ammonium nitrate by a dry scattering coefficient of 3.0 square meters per gram ($m^2/g$). The $(NH_4)_2SO_4$ and $NH_4NO_3$ concentrations were also multiplied by relative humidity factors determined from the FLAG report, (i.e., f(RH)). The $PM_{10}$ impacts were included in the visibility calculations by applying a scattering coefficient of 1.0 $m^2/g$ to the maximum modeled 24-hour $PM_{10}$ concentration. The fine particles are considered to be non-hygroscopic and therefore were not subject to the humidity factor. All of the extinction coefficients, in inverse megameters ($Mm^{-1}$), were then summed to yield the total light-extinction coefficient for the proposed source ($b_{source}$).

The aggregate source light-extinction ($b_{source}$) was divided by the current background light-extinction coefficient appropriate for the Superstition area (17.6 $Mm^{-1}$) to determine the potential change in extinction. Results of the analysis are shown in Table 6-12. The results indicate that the potential effect on regional haze is less than the 5 percent threshold and therefore the proposed power plant should not impact visibility in the Superstition Wilderness or the more distant Class I areas.

Results of the VISCREEN analysis for the visual impacts at Superstition for the 45 kilometer (km) distance from Kyrene are shown in Table 6-12. As shown, under average daytime viewing conditions the impacts are within the conservative screening criteria and therefore these results also suggest that the proposed power plant's emissions should not affect visibility at Superstition.

Results of the significant impact assessment are shown in Table 6-12 for both the ISCST3 and CALPUFF iterations. The ISC impacts are for those Superstition Class I area receptors within 50 km of Kyrene and the CALPUFF results apply to those 50 km and beyond equivalent distance rings of receptors. As shown, the results indicate that the proposed power plant will have an insignificant impact to air quality. It is noted that these analyses were only performed for the nearest (Superstition) Class I area. It is assumed that impacts at the more distant Class I areas will be less.

**Table 6-12 Kyrene – Salt River Project – CALPUFF Screen Regional Haze Impacts**

| Pollutant | Averaging Period | Maximum Modeled Impact ($\mu g/m^3$) | Year of Data Yielding Maximum Impact | Location of Maximum Impact (UTM)[a] | | | Calculated Kyrene Extinction ($Mm^{-1}$) | Background Extinction ($Mm^{-1}$) | Percent Change in Extinction | Does Change Exceed 5 Percent Threshold ? |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (km) | Y (km) | Z (meters msl) | | | | |
| $NO_3$ | 24-hour | 0.0537 | 1994 | 462.000 | 3698.462 | 900 | 0.634 | 17.6 | 3.6 | No |
| $SO_4$ | 24-hour | 0.1975 | 1997 | 363.376 | 3699.323 | 900 | | | | |
| $PM_{10}$ | 24-hour | 0.0024 | 1994 | 462.547 | 3693.257 | 900 | | | | |

[a] - Receptors used in CALPUFF analysis are from the 50 km ring of receptors representative of the distance from Kyrene to Superstition.

**Table 6-12 Kyrene – Salt River Project – VISCREEN Calculated Impacts at Superstition for Two Meteorological Conditions**

| Background | Theta | Azimuth | Distance | Alpha | Delta E | | Contrast | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Criteria | Plume | Criteria | Plume |
| *Worst Case Default VISCREEN Meteorological Conditions – 1 m/s; F stability* | | | | | | | | |
| Sky | 10 | 155 | 80 | 14 | 2.00 | 2.146* | 0.05 | 0.038 |
| Sky | 140 | 155 | 80 | 14 | 2.00 | 0.387 | 0.05 | -0.013 |
| Terrain | 10 | 84 | 45 | 84 | 2.00 | 4.287* | 0.05 | 0.032 |
| Terrain | 140 | 84 | 45 | 84 | 2.00 | 0.213 | 0.05 | 0.003 |
| *Average Morning Viewing Conditions – 2.5 m/s; D stability* | | | | | | | | |
| Sky | 10 | 155 | 80 | 14 | 2.00 | 0.353 | 0.05 | 0.006 |
| Sky | 140 | 155 | 80 | 14 | 2.00 | 0.063 | 0.05 | -0.002 |
| Terrain | 10 | 84 | 45 | 84 | 2.00 | 0.486 | 0.05 | 0.004 |
| Terrain | 140 | 84 | 45 | 84 | 2.00 | 0.023 | 0.05 | 0.000 |

* - Exceeds screening visual impact criteria.

**Table 6-12 Kyrene – Salt River Project – Class I Significant Impact Results - Superstition**

| Pollutant | Averaging Period | Maximum Modeled Concentration ($\mu g/m^3$) | Year of Data Yielding Maximum Concentration | Location of Maximum Impact (UTM)[a] | | | Class I Significant Impact Level | Does Kyrene Impact Exceed Class I Level ? |
|---|---|---|---|---|---|---|---|---|
| | | | | X (meters) | Y (meters) | Z (meters msl) | | |
| *ISCST3 Results at Supserstition* | | | | | | | | |
| $NO_2$ | Annual | 0.0039 | 1994 | 458928 | 3694813 | 625 | 0.1 | No |
| $PM_{10}$ | 24-hour | 0.032 | 1994 | 457349 | 3696392 | 640 | 0.3 | No |
| | Annual | 0.0036 | 1994 | 458928 | 3694813 | 625 | 0.2 | No |
| $SO_2$ | 3-hour | 0.012 | 1996 | 458370 | 3710876 | 609 | 1.0 | No |
| | 24-hour | 0.002 | 1996 | 458370 | 3710876 | 609 | 0.2 | No |
| | Annual | 0.0002 | 1994 | 458928 | 3694813 | 625 | 0.1 | No |
| *CALPUFF Results at 50 km Ring of Receptors – Equivalent Distance to Superstition* | | | | | | | | |
| $NO_2$ | Annual | 0.044 | 1996 | 364320 | 3703581 | 900 | 0.1 | No |
| $PM_{10}$ | 24-hour | 0.198 | 1997 | 363376 | 3699323 | 900 | 0.3 | No |
| | Annual | 0.042 | 1996 | 364320 | 3703581 | 900 | 0.2 | No |
| $SO_2$ | 3-hour | 0.060 | 1995 | 367676 | 3712559 | 900 | 1.0 | No |
| | 24-hour | 0.018 | 1997 | 363376 | 3699323 | 900 | 0.2 | No |
| | Annual | 0.004 | 1996 | 364101 | 3702736 | 900 | 0.1 | No |

[a] – Receptors used in ISC analysis represent Superstition boundary receptors only. Receptors used in CALPUFF analysis are the maximum from the 50 km ring of receptors which are not necessarily located at Superstition.

## 7 SUMMARY

This report demonstrates that the proposed 250 MW natural gas-fired combined cycle facility at SRP's existing Kyrene Generating Station will not adversely impact air quality. The key conclusions from this analysis are:

1. The plant will be equipped with state-of-the-art control technology;

2. Based on a 250 MW combined cycle plant with the aforementioned emission controls, the power plant will have the potential to emit the following air pollutants and quantities:

- Oxides of Nitrogen ($NO_x$) ≈ 96.9 tons/year;
- Carbon Monoxide (CO) ≈ 145.6 tons/year;
- Particulate Matter less than 10 microns in aerodynamic diameter ($PM_{10}$) ≈ 83.3 tons/year;
- Sulfur Dioxide ($SO_2$) ≈ 5.4 tons/year;
- Volatile Organic Compounds (VOCs) ≈ 36.5 tons/year; and
- Hazardous Air Pollutants (HAPs) <25 tons/year (aggregate), and <10 tons/year (individual).

3. SRP will be required to secure an air quality control permit from Maricopa County. Because the plant is located in the Maricopa County nonattainment area, SRP's permit application will need to demonstrate conformance with Nonattainment Area New Source Review for emissions of $NO_x$, CO, $PM_{10}$ and VOCs. SRP will also need to demonstrate conformance with the Prevention of Significant Deterioration (PSD) regulations for emission of $NO_x$. These demonstrations require that SRP meet the following:

   Lowest Achievable Emission Rate: The proposed equipment will be designed to achieve the most stringent air pollutant emission rates (for $NO_x$, CO, $PM_{10}$ and VOC) being achieved at similar sources across the United States. As stated previously, these rates will be achieved by using the state-of-the-art air pollution control equipment.

   Emission Offsets: The proposed plant will be required to demonstrate that emissions offsets have been obtained at a ratio of 1.2 to 1 for emissions of $NO_x$ and VOC (116.3 and 43.8 tons/year, respectively) and at least 1 to 1 for emissions of CO and $PM_{10}$ (145.6 and 83.3 tons/year, respectively). These offsets reflect existing sources that have shut down or are proposing to shut down/install air pollution control equipment prior to operation of the proposed power plant. Emission offsets represent a decrease in actual emissions within Maricopa County.

   Best Available Control Technology – The proposed project is required to demonstrate that it will employ the Best Available Control Technology (BACT) for equipment that will have the potential to emit emissions of $NO_x$. As stated above, the proposed project will be

installing state-of-the-art air pollution control technology. This technology is considered LAER, which can be several orders of magnitude more stringent than that considered BACT.

Additional Air Quality Impact Analysis - The proposed project is expected to have a minimal impact on residential, commercial or industrial growth in the area surrounding the Kyrene site. In addition any related impact on air quality during the construction phase of the proposed plant is also expected to be minimal. Appropriate measures will be employed by SRP to minimize any fugitive dust that may be generated during the construction phase.

4. SRP conducted air quality modeling analyses to determine the impact on air quality in the nonattainment area (urban airshed) and at nearby Class I areas. For the urban airshed analysis, SRP used EPA's ISC air dispersion model to predict concentrations from the proposed power plant under worst-case operating conditions. The maximum predicted concentrations and corresponding significant threshold levels are as follows:

| ***Air Pollutant*** | ***Predicted Concentration*** | ***Significance Level*** |
|---|---|---|
| $NO_x$ (Annual) | 0.5 ug/m3 | 1 |
| CO (1-Hour) | 485 ug/m3 | 2000 |
| CO (8-Hour) | 28 ug/m3 | 500 |
| $PM_{10}$ (Annual) | 0.5 ug/m3 | 1 |
| $PM_{10}$ (24-Hour) | 3.1 ug/m3 | 5 |
| $SO_2$ (Annual) | 0.4 ug/m3 | 1 |
| $SO_2$ (3-Hour) | 18.2 ug/m3 | 25 |
| $SO_2$ (24-Hour) | 3.9 ug/m3 | 5 |

The maximum predicted concentrations were all below the significance levels developed by USEPA and are several orders of magnitude below the NAAQS developed by the USEPA to protect human health and welfare.

The modeling results at the Superstition Class I area indicate that the proposed power plant should not impact visibility or significantly impact air quality in that Class I area or the more distant Class I areas. It is noted that these analyses were only performed for the nearest (Superstition) Class I area. It is assumed that impacts at the more distant Class I areas will be less.

5. In addition to the proposed air pollution control techniques, SRP will obtain emission offsets at a ratio of 1.2 to 1 for emissions of $NO_x$ and VOCs from the proposed power plant. This correlated to a net reduction of approximately 19 tons/year of $NO_x$ emissions and 7 tons/year of VOC emissions, and no increase in emissions of $PM_{10}$ and CO. The combination of the installation of air pollution control devices and emission offsets will actually decrease the environmental impacts in the proposed plant site area.

SRP has been investigating potential $NO_x$, CO and VOC emission offset sources within Maricopa County. This investigation included discussions with local community leaders, county planning members and industrial facility managers. The purpose of these discussions was to identify possible alternatives for reducing $NO_x$ CO and VOC emissions from existing sources located in Maricopa County. Based on these discussions, SRP has been focusing on establishing agreements with local companies to obtain these offsets. This will be accomplished by either shutting down existing emitting units, restricting hours of operation, converting gas powered equipment to electric, and pursuing mobile emission reduction projects. Furthermore, SRP will be limiting hours of operation on the existing units at Kyrene. This voluntary operation limit will also provide $NO_x$ emission credit.

SRP has been investigating potential $PM_{10}$ emission offset sources within Maricopa County. This investigation included discussions with local community leaders, county planning members and industrial facility managers. The purpose of these discussions was to identify possible alternatives for reducing $PM_{10}$ emissions from existing sources located in Maricopa County. Based on these discussions, SRP has identified the following sources as potential $PM_{10}$ emission offsets:

- Canal bank paving and stabilization;
- Mobile emission reduction credits; and
- Road paving.

SRP will secure the offsets prior to issuance of the air quality permit.

6. As stipulated by local, state and federal permitting requirements, an analysis of alternative sites, sizes, production processes and environmental control techniques must be performed for the proposed source. In addition, the analysis must demonstrate that the benefits of the new source significantly outweighs the social and environmental costs imposed as a result of its location, construction, and modification.

   SRP has conducted a comprehensive analysis of the requirements for electrical power demands in and around Maricopa County. Based on this analysis, it was determined that constructing and operating a new plant at the existing Kyrene Generating Station was the best location based on technical, environmental and economic constraints.

   SRP has selected this site based on the following criteria:

- Available land;
- Compatible land use;
- Availability of gas supplies;
- Availability of renewable water supplies;

- Ability to beneficially reuse waste water;
- Availability of air emission offsets;
- Access and support to local power transmission and distribution system; and
- Minimum land use impacts; and minimum impact to biological resources.

7. SRP will secure all required permits from the Maricopa County Environmental Services Department (MCESD). MCESD has been delegated authority by USEPA for Prevention of Significant Deterioration, Nonattainment Area New Source Review (NANSR), and Title V Operational Permits requirements, as well as the primary authority for air permit approvals for new and modified sources.

## 8 REFERENCES

Auer, A.H. (1978): "Correlation of Land Use and Cover with Meteorological Anomalies," Journal of Applied Meteorology, Volume 17, pp. 636-643.

Briggs, G.A. (1971): "Some Recent Analyses of Plume Rise Observations," Proceedings of the Second International Clean Air Congress, Edited by Englund, H.M., and Berry, W.T., Academic Press, pp. 1029-1032.

Huber, A., and Snyder, A. (1976): "Building Wake Effects on Short Stack Effluents," Preprints of the American Meteorological Society Third Symposium on Atmospheric Turbulence, Diffusion, and Air Quality, Raleigh, North Carolina.

Huber, A. (1977): "Incorporating Building/Terrain Wake Effects on Stack Effluents," Preprints of the American Meteorological Society - Air Pollution Control Association Joint Conference on Applications of Air Pollution Meteorology, Salt Lake City, Utah (November).

Irwin, J.S. (1979): "Proposed Criteria for Selection of Urban Versus Rural Dispersion Coefficients," Meteorology and Assessment Division, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina.

Schulman, L.L., S.R. Hanna, and D.W. Heinold (1985): "Evaluation of Proposed Downwash Expansion projects to the Industrial Source Complex Model," Environmental Research and Technology, Inc., P-B810-012, January 1985.

Schulman, L.L., and S.R. Hanna (1986): "Evaluation of Downwash Expansion projects to the Industrial Source Complex Model," J. Air Pollution Control Association 36(3), 258-264.

Schulman, L.L., and J.S. Scire (1980a): "Buoyant Line and Point Source (BLP) Dispersion Model User's Guide. Document P073048, Environmental Research and Technology, Inc., Concord, MA.

Scire, J.S., and L.L. Schulman (1980b): "Modeling Plume Rise from Low-Level Buoyant Line and Point Sources," Proceedings Second Joint Conference on Applications of Air Pollution Meteorology, 24-28 March, New Orleans, LA, 133-139.

Turner, D.B. (1970): "Workbook of Atmospheric Dispersion Estimates," AP-26, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina.

Turner, D.B., and Novak, J.H. (1978): "User's Guide for RAMMET, Volume I - Algorithm Description and Use," EPA-600/8-78-016a, Environmental Sciences Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina.

U.S. Environmental Protection Agency (1971): "Air Quality Criteria for Nitrogen Oxides," AP-84, Air Pollution Control Office, Washington, D.C.

___ (1973): "Air Quality Criteria for Sulfur Oxides," EPA-R3-73-030, National Environmental Research Center, Research Triangle Park, North Carolina.

___(1973): "Diffusion Estimation for Small Emissions," ATDL Contribution No. 79 (Draft), Air Resources, Atmospheric Turbulence and Diffusion Laboratory, NOAA, Oak Ridge, Tennessee.

___ (1974): "Applying Atmospheric Simulation Models to Air Quality Maintenance Area," Guidelines for Air Quality Maintenance Planning and Analysis 12, Publication No. OAQPS 1.2-031, EPA-450/4-74-013.

___ (1975): "Plume Rise Predictions," Lectures on Air Pollution and Environmental Impact Analysis, American Meteorological Society, Boston, Massachusetts.

___ (1985): "Guideline for Determination of Good Engineering Practice Stack Height" (Technical Support Document for the Stack Height Regulations). EPA-450/4-80-023LR. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

___ (1986): "Guidelines on Air Quality Models-Revised," EPA-450/2-78-027R, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

___ (1990): "New Source Review Workshop Manual," USEPA, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

___ (1993): "User's Guide to the Building Profile Input Program," EPA-454/R-93-038, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

___ (1995a): "User's Guide for the Industrial Source Complex (ISC3) Dispersion Model," EPA-454/b-95-003a, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

___ (1996): "Compilation of Air Pollutant Emission Factors," AP-42, Fifth Edition, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

___ (1998): "Compilation of Air Pollutant Emission Factors," AP-42, Fifth Edition, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

___ (1998a): Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts

___ (1999): CALPUFF (Version 990228)

# EXHIBIT C
# AREAS OF BIOLOGICAL WEALTH

# EXHIBIT C
# AREAS OF BIOLOGICAL WEALTH

*As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:*

*"Describe any areas in the vicinity of the proposed site or route which are unique because of biological wealth or because they are habitats for rare and endangered species. Describe the biological wealth or species involved, and state the effects, if any, the proposed facilities will have thereon."*

## BIOLOGICAL WEALTH

There are no areas of biological wealth within the Kyrene plant property. The site is composed of flat barren land. The vegetation on the site is composed of several weedy herbaceous plants, grasses, and a few scattered shrubs and trees. A large proportion of plant species are exotic species that have become naturalized. Areas that have not already been developed are maintained to prevent excessive plant growth. Two water canals with hardened concrete sides and bottoms are present adjacent to or within the project site. These canals do not support aquatic or riparian vegetation.

## POTENTIAL EFFECTS

Table C-1 lists plants and animals known from Maricopa County that are threatened, endangered, or otherwise sensitive. This list was compiled from information obtained through publications and websites from U.S. Fish and Wildlife Service (USFWS), Arizona Game and Fish Department (AGFD), and Arizona Department of Agriculture. Of the species listed in Table C-1, California leaf-nosed bats, great egrets, snowy egrets, peregrine falcons, belted kingfishers, and crested saguaros could occur on the site.

California leaf-nosed bats are threatened by vandalism and disturbance at roost sites and by a general limit to the number of roost sites this bat can use during the winter (AGFD 1996). California leaf-nosed bats roost in mine shafts or caves which are not present at the Kyrene Generating Facility. Foraging habitat for these bats includes Sonoran desertscrub, which is extensive in southern Arizona. This species is not expected to be impacted by expansion of the Kyrene site because impacts to foraging areas is not listed as a threat to the species.

Great and snowy egrets could forage along the water canals within the Kyrene site. Egrets found within the Kyrene site would be transitory individuals. Both species are colonial breeders, with rookeries restricted largely to the lower Colorado River (Monson and Phillips 1981). Any egrets that may be at the Kyrene site during construction would be disturbed and likely leave the area. Impacts to either of these herons are expected to be negligible.

Peregrine falcons could potentially utilize the Kyrene Generating Facility; however, the presence of this falcon would be a rare event. Peregrine falcons may perch on tall buildings and structures at the Kyrene Generating Facility while hunting. If present, these falcons are likely to be disturbed by the construction and leave the site. Impacts to peregrine falcons are expected to be negligible.

Belted kingfishers could also forage along the water canals within the Kyrene site mostly during the winter (Witzeman et al. 1997). This bird would not breed within the Kyrene site, so impacts to this species would be limited to disturbance during construction. Impacts are expected to be negligible.

Crested or Fan-top saguaros are a rare growth form caused by freezing or mechanical injury to the saguaro's apical meristem (Steenbergh and Lowe 1983). No crested saguaros were observed during the visit to the project site.

**TABLE C-1**
**SPECIAL STATUS WILDLIFE AND PLANT SPECIES KNOWN FROM MARICOPA COUNTY**

Key: Federal Status: E = Endangered T = Threatened C = Candidate
State Status: SC = Special Concern HS = Highly Safeguarded

| Common Name | Scientific Name | Habitat | Federal Status | State Status | Habitat Present in Project Area |
|---|---|---|---|---|---|
| **MAMMALS** | | | | | |
| California leaf-nosed bat | Macrotus californicus | Primarily cave and mine dwellers, mostly in Sonoran desertscrub | | SC | Yes |
| Lesser long-nosed bat | Leptonycteris curasoae yerbabuenae | Desertscrub with agave and columnar cacti present as food plants | E | SC | No |
| Red bat | Lasiurus borealis | Over ponds, along waterways, among oaks, sycamores, walnuts, cottonwoods, and pine-fir forest | | SC | No |
| Southern yellow bat | Lasiurus ega | Associated with Washington fan palms | | SC | No |
| Spotted bat | Euderma maculatum | Uneven cliffs within 1 mile of a riparian situation | | SC | No |
| Jaguar | Panthera onca | Generally distributed | | SC | No |
| Chihuahuan pronghorn | Antilocapra americana mexicana | Plains and meadows of shortgrass from the deserts of the south to the high plateaus of the north | | SC | No |
| Sonoran pronghorn | Antilocapra americana sonoriensis | Broad, intermountain alluvial valleys with creosote-bursage and paloverde-mixed cacti | E | SC | No |
| **BIRDS** | | | | | |
| American bittern | Botaurus lentiginosus | Marshy areas | | SC | No |
| Least bittern | Ixobrychus exilis | Cattail marshes | | SC | No |
| Great egret | Ardea alba | Ponds, streams, and marshes | | SC | Yes |
| Snowy egret | Egretta thula | Ponds, streams, and marshes | | SC | Yes |

**TABLE C-1**
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Key: Federal Status: E = Endangered T = Threatened C = Candidate
State Status: SC = Special Concern HS = Highly Safeguarded

| Common Name | Scientific Name | Habitat | Federal Status | State Status | Habitat Present in Project Area |
|---|---|---|---|---|---|
| Black-bellied whistling duck | Dendrocygna autumnalis | Ponds | | SC | No |
| Osprey | Pandion haliaetus | Near lakes and streams | | SC | No |
| Mississippi kite | Ictinia mississippiensis | Riparian areas | | SC | No |
| Bald eagle | Haliaeetus leucocephalus | Large trees or cliffs near water (reservoirs, rivers and streams) with abundant prey | T | SC | No |
| Northern goshawk | Accipiter gentilis | Generally distributed | | SC | No |
| Gray hawk | *Asturina nitida* | Riparian areas in Sonoran zones | | SC | No |
| Common black-hawk | *Buteogallus anthracinus* | Riparian areas in Sonoran zones | | SC | No |
| Ferruginous hawk | *Buteo regalis* | Dry open country, fields | | SC | No |
| Peregrine falcon | *Falco peregrinus* | Cliffs near Salt River reservoir, generally distributed, tops of tall urban buildings | | SC | Yes |
| Yuma clapper rail | *Rallus longirostris yumanensis* | Fresh water and brackish marshes | E | SC | No |
| Snowy plover | *Charadrius alexandrinus* | Ponds | | SC | No |
| Western yellow-billed cuckoo | *Coccyzus americanus* | Riparian areas of lower Sonoran zone | | SC | No |
| Cactus ferruginous pygmy-owl | *Glaucidium brasilianum cactorum* | Mature cottonwood/willow, mesquite bosques, and Sonoran desertscrub | E | SC | No |
| Mexican spotted owl | *Strix occidentalis lucida* | Nests in canyons and dense forests with multi-layered foliage structure | T | SC | No |
| Belted kingfisher | *Ceryle alcyon* | Ponds, streams, and canals | | SC | Yes |
| Southwestern willow flycatcher | *Empidonax trailli extimus* | Cottonwood/willow and tamarisk vegetation communities along rivers and streams | E | SC | No |
| Tropical kingbird | *Tyrannus melancholicus* | Lowlands near water, often nests in cottonwood | | SC | No |
| **REPTILES AND AMPHIBIANS** | | | | | |
| Chiricahua leopard frog | *Rana chiricahuensis* | Rocky streams and other wetlands | C | SC | No |
| Lowland leopard frog | *Rana yavapaiensis* | Restricted to permanent waters: pools of foothill streams, overflow ponds | | SC | No |
| Desert tortoise | *Gopherus agassizii* | Riverbanks, washes, dunes, and rocky slopes | | SC | No |

**TABLE C-1**
**SPECIAL STATUS WILDLIFE AND PLANT SPECIES KNOWN FROM MARICOPA COUNTY**

Key: Federal Status: E = Endangered T = Threatened C = Candidate
State Status: SC = Special Concern HS = Highly Safeguarded

| Common Name | Scientific Name | Habitat | Federal Status | State Status | Habitat Present in Project Area |
|---|---|---|---|---|---|
| Arizona skink | *Eumeces gilberti arizonensis* | Piñon-juniper woodland and yellow pine forest | | SC | No |
| Narrow-headed garter snake | *Thamnophis rufipunctatus* | Piñon-juniper and oak-pine belts to ponderosa pine forests along clear, permanent, or semi-permanent rocky streams | | SC | No |
| **FISH** | | | | | |
| Colorado squawfish | *Ptychocheilus lucius* | Water deeper than a meter and with strong to moderate currents | E | SC | No |
| Bonytail chub | *Gila elegans* | Eddies and pools, not in swift currents | E | SC | No |
| Spikedace | *Meda fulgida* | Shallow water, often near the downstream ends of riffles or in eddies | T | SC | No |
| Razorback sucker | *Xyrauchen texanus* | Riverine and lacustrine areas, generally not in fast-moving water and may use backwaters | E | SC | No |
| Desert pupfish | *Cyprinodon macularius macularius* | Shallow springs, small streams, and marshes; tolerates saline and warm water | E | SC | No |
| Gila topminnow | *Poeciliopsis occidentalis occidentalis* | Concentrates in shallow water, especially where aquatic vegetation or debris is present | E | SC | No |
| **PLANTS** | | | | | |
| Arizona agave | *Agave arizonica* | Transition zone between oak-juniper woodland and mountain mahogany oak scrub | E | HS | No |
| Hohokam agave | *Agave murpheyi* | In Maricopa County, found in Paradise Valley | | HS | No |
| Arizona cliffrose | *Purshia subintegra* | Characteristic white soils or tertiary limestone lakebed deposits | E | HS | No |
| Crested or Fan-top saguaro | *Carnegiea gigantea* | Rocky hillsides and outwash slopes | | HS | Yes |
| Arizona hedgehog cactus | *Echinocereus triglochidiatus arizonicus* | Ecotone between interior chaparral and madrean evergreen woodland | E | HS | No |
| Acuna cactus | *Echinomastus erectocentrus acunensis* | Limestone hills and flatlands in western lower Sonoran desert | C | HS | No |
| Lemmon fleabane | *Erigeron lemmoni* | Cliff areas within Fish Creek Canyon in Maricopa County | C | HS | No |

Sources: Arizona Department of Agriculture 1999; AGFD 1996; Hoffmeister 1986; Stebbins 1985; USFWS 1999a, 1999b, 1999c.

## REFERENCES CITED


Arizona Department of Agriculture. 1999. Protected Native Plants by Categories web site: http://agriculture.state.az.us/psd/protplantlst.htm. Arizona Department of Agriculture. Accessed July 26, 1999.

Arizona Game and Fish Department. 1996. Wildlife of Special Concern in Arizona (Public Review Draft). Arizona Game and Fish Department, Phoenix, Arizona. 23 pp.

Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press, Tucson, Arizona. 602 pp.

Monson G. and A.R. Phillips. 1981. Annotated checklist of the birds of Arizona. Second edition. University of Arizona Press. 240 pp.

Stebbins, R.C. 1985. Western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts. 336 pp.

Steenbergh, W.F. and C.H. Lowe. 1983. Ecology of the Saguaro: III. Scientific Monograph Series, No. 17. U. S. Department of the Interior, National Park Service, Washington, D.C.

U.S. Fish and Wildlife Service. 1999a. Endangered species web page: www.fws.gov/r9endspp/statl-r2.html#lnkAZ. U.S. Fish and Wildlife Service. Accessed June 16, 1999.

_____. 1999b. Endangered and threatened wildlife and plants; review of plant and animal taxa that are candidates or proposed for listing as endangered or threatened; annual notice of findings on recycled petitions; annual description of progress on listing actions; proposed rule. Federal Register 64(205):57534-57547.

U.S. Fish and Wildlife Service. 1999c. Endangered species list web page: http://ifw2es.fws.gov/EndangeredSpecies/Lists/ListSpecies.cfm. Arizona Ecological Services. Accessed December 9, 1999.

Witzeman, J.L., S.R. Demaree and E.L. Radke. 1997. Birds of Phoenix and Maricopa County, Arizona. Maricopa County Audubon Society, Phoenix, Arizona. 153 pp.

# EXHIBIT D
# BIOLOGICAL RESOURCES

# EXHIBIT D
# BIOLOGICAL RESOURCES

As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*"List the fish, wildlife, plant life, and associated forms of life in the vicinity of the proposed site or route and describe the effects, if any, other proposed facilities will have thereon."*

## BIOLOGICAL RESOURCES

Tables D-1, D-2, D-3, and D-4 list the species of mammals, birds, reptiles and amphibians, and fish that could occupy the project site. Table D-5 lists the plant species that were observed on the site.

## POTENTIAL EFFECTS

The biological resources on the Kyrene Generating Facility are typical of highly disturbed urban sites. Wildlife that utilize the site include species that are well adapted to human altered landscapes. The potential effects to biological resources from expansion of the generating facility are expected to be limited to direct impacts to fossorial mammals and lizards during construction and displacement of other more mobile wildlife species. Natural plant communities and associated assemblages of wildlife no longer exist on the Kyrene site. Impacts to biological resources will be limited to the project site and are expected to be negligible to plant and wildlife populations.

## REFERENCES CITED


Elias, T.S. 1989. Field Guide to North American Trees. Grolier, Danbury Connecticut. 948 pp.

Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press, Tucson, Arizona. 602 pp.

Jeager, E.C. 1941. Desert Wild Flowers. Stanford University Press, Stanford, California. 322 pp.

Jones, J.K. Jr., R.S. Hoffman, D.W. Rice, C. Jones, R.J. Baker and M.D. Engstrom. 1992. Revised checklist of North American mammals north of Mexico, 1991. Occasional Papers The Museum Texas Tech University. No 146. 23 pp.

Kearney, T.H. and R.H. Peebles. 1960. Arizona Flora. University of California Press, Berkeley, California. 1085 pp.

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Phoenix, Arizona. 293 pp.

Stebbins, R.C. 1985. Western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts. 336 pp.

Witzeman, J.L., S.R. Demaree and E.L. Radke. 1997. Birds of Phoenix and Maricopa County, Arizona. Maricopa County Audubon Society, Phoenix, Arizona. 15 3pp.

**TABLE D-1**
**MAMMAL SPECIES IN THE VICINITY OF THE SITE**

| Common Name | Scientific Name | Habitat |
|---|---|---|
| Desert shrew | *Notiosorex crawfordi* | Any arid habitat with ample cover, in oak belt, among junipers, desertscrub, and riparian |
| Cave myotis | *Myotis velifer* | Inhabit mine shafts, tunnels, caves, under bridges in desert areas, never far from water source - tanks, canal |
| Yuma myotis | *Myotis yumanensis* | Where water is present - Colorado and Little Colorado rivers, irrigation canals, permanent ponds, streams |
| Big brown bat | *Eptesicus fuscus* | In wooded areas and desertscrub |
| Southern yellow bat | *Lasiurus ega* | Associated with California fan palms (*Washingtonia filifera*) |
| Townsend's big-eared bat | *Plecotus townsendi* | Caves or mine tunnels, buildings in desertscrub |
| Pallid bat | *Antrozous pallidus* | Attics of houses, roofs of barns and sheds, old mine tunnels, crevices in cliffs, under bridges in desertscrub |
| American free-tailed bat | *Tadarida brasiliensis* | Caves and mines, old buildings or bridges in desertscrub and foothills of some higher mountains |
| Pocketed free-tailed bat | *Tadarida femorosacca* | Rocky cliffs and slopes of southern deserts, also use manmade shelters such as roofing tiles of buildings |
| Desert cottontail | *Sylvilagus audubonii* | Desertscrub, as high as junipers or oak belt |
| Black-tailed jack rabbit | *Lepus californicus* | Deserts to open scrub forests, grazed lands, croplands |
| Botta's pocket gopher | *Thomomys bottae* | Nearly every habitat with sufficient tuberous roots and plant material, and soil is suitable for digging tunnels |
| Arizona pocket mouse | *Perognathus amplus* | Mohave and Sonoran desertscrub and parts of Great Basin desertscrub |
| Western harvest mouse | *Reithrodontomys megalotis* | Wide variety of habitats and elevations, along streams, bottomlands, fences, around irrigated areas |
| Deer mouse | *Peromyscus maniculatus* | Sonoran desertscrub along intermittent creek beds or canals |
| Arizona cotton rat | *Sigmodon arizonae* | Desert areas or along canals and banks of small streams |
| House mouse* | *Mus musculus* | In and around houses, buildings, cultivated fields, manmade dumps, edge of towns |
| Coyote | *Canis latrans* | Every habitat |

*exotic/introduced species
Sources: Hoffmeister 1986; Jones 1992

| TABLE D-2<br>BIRD SPECIES IN THE VICINITY OF THE SITE | | |
|---|---|---|
| **Common Name** | **Scientific Name** | **Habitat** |
| Pied-billed grebe | *Podilymbus podiceps* | Lakes, ponds, streams, and canals |
| Double-crested cormorant | *Phalacrocorax auritus* | Lakes, ponds, streams, and aqueducts |
| Snowy egret | *Egretta thula* | Ponds, streams, and marshes |
| Great egret | *Casmerodius albus* | Ponds, streams, and marshes |
| Great blue heron | *Ardea herodias* | Lakes, ponds, streams, canals, and marshes |
| Green heron | *Butorides striatus* | Lakes, ponds, streams, marshes, and canals |
| Black-crowned night-heron | *Nycticorax nycticorax* | Lakes, ponds, marshes, and streams |
| Black-bellied whistling-duck | *Dendrocygna autumnalis* | Ponds |
| Canada goose | *Branta canadensis* | Lakes, ponds, and fields |
| Green-winged teal | *Anas crecca* | Lakes, ponds, and streams |
| Mallard | *Anas platyrhynchos* | Lakes, ponds, streams, and canals |
| Northern pintail | *Anas acuta* | Lakes, ponds, and streams |
| Cinnamon teal | *Anas cyanoptera* | Ponds, streams, and canals |
| Northern shoveler | *Anas clypeata* | Lakes, ponds, and streams |
| Gadwall | *Anas strepera* | Lakes, ponds, and streams |
| American wigeon | *Anas americana* | Lakes, ponds, and streams |
| Ring-necked duck | *Aythya collaris* | Lakes and ponds |
| Common merganser | *Mergus merganser* | Lakes, ponds, and streams |
| Ruddy duck | *Oxyura jamaicensis* | Lakes and ponds |
| Turkey vulture | *Cathartes aura* | Generally distributed |
| Bald eagle | *Haliaeetus leucocephalus* | Lakes and rivers |
| Red-tailed hawk | *Buteo jamaicensis* | Generally distributed |
| Osprey | *Pandion haliaetus* | Lakes and streams |
| American kestrel | *Falco sparverius* | Generally distributed |
| Peregrine falcon | *Falco peregrinus* | Cliffs near Salt River Reservoir, generally distributed, tops of tall urban buildings |
| Common moorhen | *Gallinula chloropus* | Streams, marshes, and ponds |
| American coot | *Fulica americana* | Lakes, ponds, streams, and marshes |
| Killdeer | *Charadrius vociferus* | Ponds, streams, and fields |
| Black-necked stilt | *Himantopus mexicanus* | Ponds and marshes |
| Greater yellowlegs | *Tringa melanoleuca* | Lakes, ponds, streams, and flooded fields |
| Spotted sandpiper | *Actitis macularia* | Lakes, ponds, streams, and canals |
| Least sandpiper | *Calidris minutilla* | Ponds and streams |
| Long-billed dowitcher | *Limnodromus scolopaceus* | Ponds and streams |
| Common snipe | *Gallinago gallinago* | Ponds, marshes, streams, and wet fields |
| Wilson's phalarope | *Phalaropus tricolor* | Lakes and ponds |
| Ring-billed gull | *Larus delawarensis* | Lakes, ponds, and streams |
| Rock dove* | *Columba livia* | Suburban and agricultural areas |
| White-winged dove | *Zenaida asiatica* | Sonoran zones |
| Mourning dove | *Zenaida macroura* | Generally distributed, mainly in agricultural and suburban areas |
| Inca dove | *Columbina inca* | Suburban areas, farmyards, and fields |
| Western screech owl | *Otus kennicottii* | Riparian woodlands, Sonoran desert, and suburban areas |
| Great horned owl | *Bubo virginianus* | Riparian woodlands, Sonoran desert, and suburban areas |

| TABLE D-2<br>BIRD SPECIES IN THE VICINITY OF THE SITE | | |
|---|---|---|
| **Common Name** | **Scientific Name** | **Habitat** |
| Lesser nighthawk | *Chordeiles acutipennis* | Lower Sonoran desert |
| Black-chinned hummingbird | *Archilochus alexandri* | Suburban and riparian areas in Sonoran desert |
| Anna's hummingbird | *Calypte anna* | Suburban areas, riparian areas, and fields in Sonoran desert |
| Belted kingfisher | *Ceryle alcyon* | Ponds, streams, and canals |
| Gila woodpecker | *Melanerpes uropygialis* | Lower Sonoran zone |
| Ladder-backed woodpecker | *Picoides scalaris* | Riparian and desert areas in the Sonoran desert |
| Red-shafted northern flicker | *Colaptes cafer* | Transition zone forests, lowlands |
| Gilded flicker | *Colaptes chrysoides* | Desert and riparian areas in lower Sonoran desert |
| Black phoebe | *Sayornis nigricans* | Streams and ponds |
| Common raven | *Corvus corax* | Upper Sonoran desert, generally distributed |
| Cactus wren | *Campylorhynchus brunneiccapillus* | Lower Sonoran desert, upper Sonoran mesquite habitat |
| Northern mockingbird | *Mimus polyglottos* | Suburban areas in Sonoran desert |
| European starling* | *Sturnus vulgaris* | Sonoran desert |
| Abert's towhee | *Pipilo aberti* | Riparian areas, suburban areas, lower Sonoran desert |
| Brewer's sparrow | *Spizella breweri* | Sonoran desert, field edges, and suburban areas |
| White-crowned sparrow | *Zonotrichia leucophrys* | Suburban, riparian, and other brushy areas in Sonoran desert |
| Great-tailed grackle | *Quiscalus mexicanus* | Riparian areas, ponds, marshes, farmyards, and suburban areas |
| Brown-headed cowbird | *Molothrus ater* | Generally distributed, feedlots and fields |
| House finch | *Carpodacus mexicanus* | Riparian and suburban areas, farmlands, and desert in Sonoran desert |
| House sparrow* | *Passer domesticus* | Wherever humans live |
| *exotic/introduced species<br>Source: Witzeman et al. 1997 | | |

| TABLE D-3<br>REPTILE AND AMPHIBIAN SPECIES IN THE VICINITY OF THE SITE | | |
|---|---|---|
| **Common Name** | **Scientific Name** | **Habitat** |
| Southern spadefoot | *Scaphiopus multiplicatus* | Sandy or gravelly soil in desert grassland, shortgrass plains, creosote bush and sagebrush desert, mixed grassland and chaparral, piñon-juniper and pine-oak woodlands, and open pine forests |
| Couch spadefoot | *Scaphiopus couchii* | Shortgrass plains, mesquite savannah, creosote bush desert, thornforest and tropical deciduous forest and other areas of low rainfall |
| Woodhouse toad | *Bufo woodhousei* | Sandy areas in grassland, sagebrush flats, woods, desert streams, valleys, floodplains, farms, and city backyards, breeds in quiet water of streams, marshes, lakes, freshwater pools, and irrigation ditches |
| Great plains toad | *Bufo cognatus* | Prairies or deserts, primarily a grassland species, breeds in shallow temporary pools or quite water of streams, marshes, irrigation ditches, and flooded fields |
| Sonoran desert toad | *Bufo alvarius* | Ranges from arid mesquite-creosote bush lowlands and arid grasslands into oak-sycamore-walnut groves in mountain canyons, often found near permanent water of springs, reservoirs, canals, and streams, and frequents temporary pool |
| Lowland leopard frog | *Rana yavapaiensis* | Desert, grassland, oak and oak-pine woodland, entering the permanent pools of foothill streams, overflow ponds and side channels of major rivers, and permanent springs and stock tanks |
| Bullfrog* | *Rana catesbeiana* | Wide variety of habitats with permanent water |
| Western banded gecko | *Coleonyx variegatus* | Ranges from creosote bush flats and sagebrush desert to the piñon-juniper belt, often associated with rocks and crevices |
| Mediterranean gecko* | *Hemidactylus turcicus* | Urban environments |
| Zebra-tailed lizard | *Callisaurus draconoides* | Washes, desert pavement, and hardpan where plant growth is scant |
| Long-tailed brush lizard | *Urosaurus graciosus* | Loose sand and scattered bushes and trees, creosote bush, burrobush, galleta grass, catclaw, mesquite, and paloverde |
| Side-blotched lizard | *Uta stansburiana* | Sand, rock, hardpan, or loam with grass, shrubs, and scattered trees |
| Desert horned lizard | *Phrynosoma platyrhinos* | Arid lands–sandy flats, alluvial fans, along washes, at the edge of dunes |
| Western whiptail | *Cnemidophorus tigris* | Firm soil, sandy, or rocky ground in deserts and semi-arid habitats usually where plants are sparse with open areas |
| Coachwhip | *Masticophis flagellum* | Sandy or rocky ground in desert, prairie, scrubland, juniper-grassland, woodland, thornforest, and farmland, avoids dense vegetation |
| Western patch-nosed snake | *Salvadora hexalepis* | Sandy and rocky lower slopes of mountains, low dry creosote bush plains, grasslands, chaparral, sagebrush plains, piñon-juniper woodland, and desertscrub |
| Gopher snake | *Pituophis melanoleucus* | Sand, loam, rock or hardpan soils in desert, prairie, brushland, woodland, open coniferous forest, and farmland |
| Glossy snake | *Arizona elegans* | Sandy or loamy open areas–light shrubby to barren desert, sagebrush flats, grassland, chaparral-covered slopes, and woodland |
| Long-nosed snake | *Rhinocheilus lecontei* | Deserts, prairies, and shrubland |

| TABLE D-3<br>REPTILE AND AMPHIBIAN SPECIES IN THE VICINITY OF THE SITE | | |
|---|---|---|
| **Common Name** | **Scientific Name** | **Habitat** |
| Western shovel-nosed snake | *Chionactis occipitalis* | In the desert in washes, dunes, sandy flats, loose soil, and rocky hillsides with sandy gullies or pockets of sand among rocks, vegetation is sparse |
| Nightsnake | *Hypsiglena torquata* | Rocky and sandy areas in grassland, chaparral, sagebrush flats, deserts, woodlands, moist mountain meadows, thornscrub, and thornforest |
| Western diamondback rattlesnake | *Crotalus atrox* | Sandy flats to rocky upland areas in desert, grassland, shrubland, woodland, pine forests, and rank growth of river bottoms |
| *exotic/introduced species<br>Source: Stebbins 1985 | | |

| TABLE D-4<br>FISH SPECIES IN THE VICINITY OF THE SITE | | |
|---|---|---|
| **Common Name** | **Scientific Name** | **Habitat Type** |
| White amure* (Grass carp) | *Ctenopharyngodon idellus* | Ponds and canals where it has been introduced to control aquatic vegetation |
| Threadfin shad* | *Dorosoma petenense* | Rivers and lakes in temperatures that do not drop below 9°C |
| Carp* | *Cyprinus carpio* | Almost all waters of the state below 2,000 meters elevation |
| Golden shiner* | *Notemiqonus crysoleucus* | Shallow, mud-bottomed, oeverflow ponds along creeks and rivers |
| Roundtail chub | *Gila robusta* | Pools and eddies of rivers, often concentrating in swift, swirling waters below rapids |
| Gila chub | *Gila intermedia* | Smaller creeks, cienegas, and some artificial impoundments |
| Longfin dace | *Agosia chrysogaster* | Ranges from low, hot sandy-bottomed desert streams to clear cooler brooks in the lower reaches of conifer zones |
| Red shiner* | *Notropis lutrensis* | Thrives under conditions of intermittency, high turbidities, and high temperatures |
| Fathead Minnow* | *Pimephales promelas* | Quiet, muddy streams, surviving in small pools of intermittent streams |
| Gila sucker | *Catastomus insignis* | Gravelly or rocky pools, relatively deep quite waters |
| Gila-mountain sucker | *Pantosteus clarki* | Rapids, swift areas |
| Channel catfish* | *Ictalurus punctatus* | Forage over swift riffles |
| Black bullhead* | *Ictalurus melas* | Relatively quiet turbid waters |
| Yellow bullhead* | *Ictalurus natalis* | Clear, rocky-bottomed, intermediate-sized streams |
| Mosquito fish* | *Gambusia affinis* | Ranges from clear cool springs to turbid hot stock tanks |
| Sailfin molly* | *Poecilia latipinna* | Canals and wastewater ponds, along shallow margins of streams and ponds, avoiding currents and deeper water |
| Largemouth bass* | *Micropterus salmoides* | Lakes, ponds, reservoirs, slow-moving downstream portions of larger streams |
| Green sunfish* | *Chaenobryttus cyanellus* | Rocky situations or lakes or streams |
| Bluegill* | *Lepomis macrochirus* | Rservoirs and ponds below 2,500 meters elevation |
| Black crappie* | *Pomoxis nigromaculatus* | Clear, cool, sparsely vegetated, acidic waters |
| Tilapia* | *Tilapia* spp. | Canals and backwaters, introduced to control aquatic vegetation |
| *exotic/introduced species<br>Source: Minckley 1973 | | |

| TABLE D-5<br>SPECIES OF PLANTS OBSERVED ON THE KYRENE SITE | |
|---|---|
| **Common Name** | **Scientific Name** |
| Johnsongrass* | *Sorghum halapense* |
| Sticky-stem, Spiderling | *Boerhaavia* sp. |
| Russian thistle* | *Salsola iberica* |
| Velvet mesquite | *Prosopis velutina* |
| Tamarisk, Salt cedar* | *Tamarisk pentandra* |
| Desert broom | *Baccharis sarathroides* |
| Jimmyweed | *Haplopappus heterophyllus* |
| *exotic/ornamental<br>Sources: Elias 1989; Jeager 1941; Kearney and Peebles 1960 | |

# EXHIBIT E
# SCENIC AREAS, HISTORIC SITES AND STRUCTURES, ARCHAEOLOGICAL SITES

# EXHIBIT E
# SCENIC AREAS, HISTORIC SITES AND STRUCTURES, AND ARCHAEOLOGICAL SITES

As stated in Arizona Corporation Commission Rules of Practice and Procedure R-14-3-219:

*"Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."*

## SCENIC AREAS

The proposed KEP is located on the north-central portion of the existing plant site in Tempe, Arizona. As shown in Figure A-3, the site is characterized by large scale existing industrial (utility) development on the plant site itself with a mixture of office, business park, warehouse, light industrial, retail, open space, and residential areas in the vicinity.

The visual resource study considers the existing visual conditions of the Kyrene site and identifies visual impacts associated with effects to the visual character (setting) and sensitive viewers based on the introduction of new facilities. Mitigation measures that address visual impacts resulting from the addition of new facilities, as well as enhancement measures developed in conjunction with input from the CWG, public and agencies, are also presented. The visual study includes a specific discussion of the following:

- Inventory Methods
- Inventory Results
- Impact Assessment
- Mitigation Measures
- Environmental Enhancement Measures

### Inventory Methods

The visual inventory consisted of (1) characterizing the existing visual character of the site, local, and regional area; and (2) identifying representative key observation points (KOPs) including residential areas, recreational areas, and transportation routes from which viewers, who may have a concern for the scenic resources, are located. The visual character and KOPs were determined through the interpretation of aerial photography, field review, and the use of computer simulations.

## Inventory Results

Inventory results, including the documentation of the visual character and the identification of representative KOPs within the context of the site, local, and regional areas, are described below.

### Site Area

The visual character of the site is dominated by power generating facilities and associated infrastructure including cooling towers, storage tanks, pole yard, transmission switchyards, administration buildings, and other ancillary facilities. The existing power generating and support facilities (including 230kV switchyard) are generally located in the northeastern corner of the property, larger transmission facilities (500kV switchyard) are situated in the southwestern portion of the site, and administration buildings (Tempe Service Center) are located along the very southern edge of the site off of Elliot Road. The City of Tempe's General Plan 2020 characterizes the site as an existing utilities and communications area and future industrial area.

Primary viewers on site include employees of the plant and customers to SRP's Tempe Service Center. Views to the proposed new plant site are generally in context with or partially screened by existing facilities; however, off site and open views to adjacent mixed and recreational use occur from the outer perimeter of the site.

### Local Area

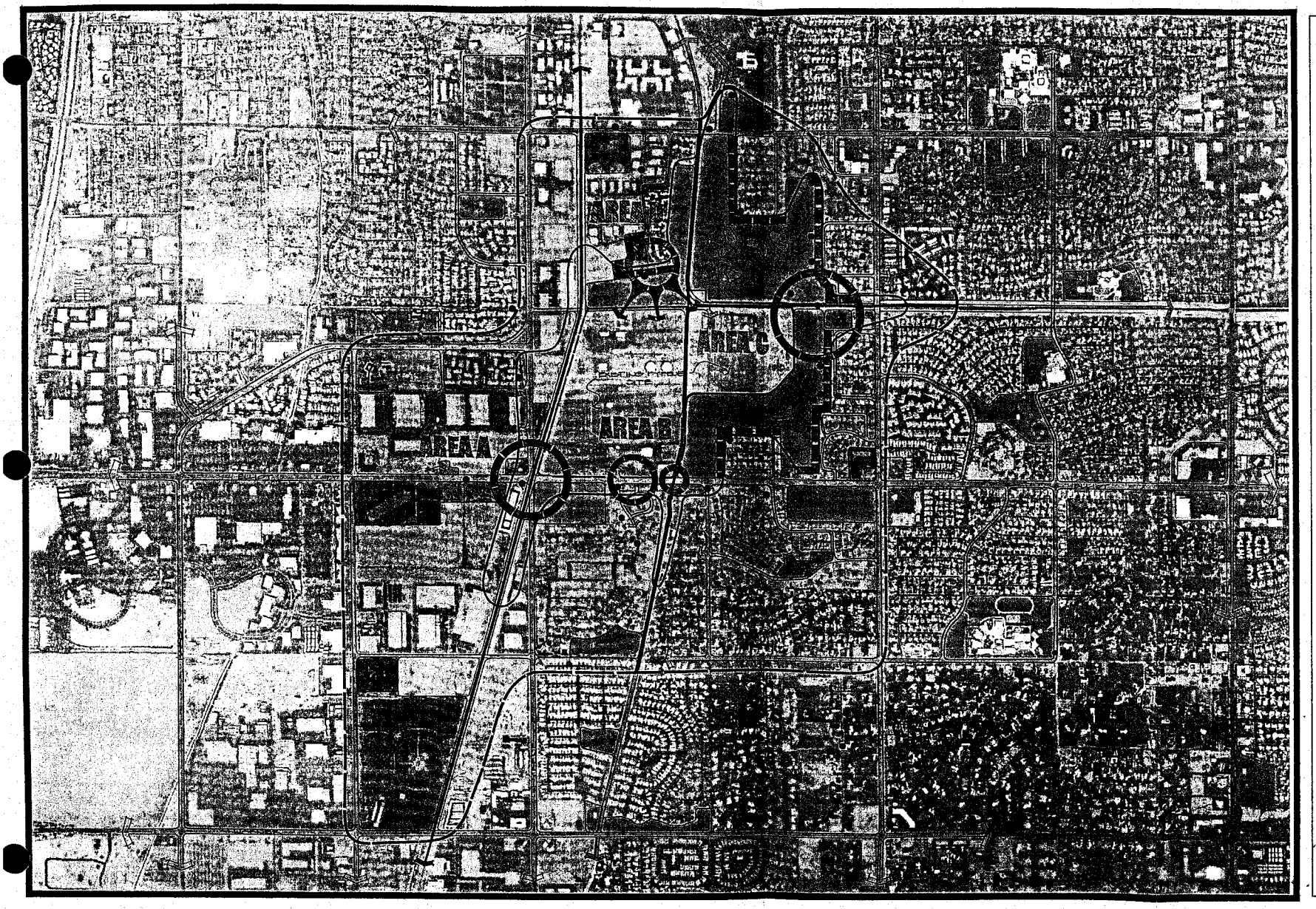
The existing and planned visual character of the local area immediately surrounding the plant includes a mixture of office/warehouse, light industrial, retail, open space, and residential development. Elliot Road, a major arterial street, borders the site to the south; the Union Pacific Railroad is located on the western boundary; and Ken McDonald Golf Course borders the northern and eastern sides of the plant. A portion of the Western Canal is located on the northeast edge of the site near the existing Kyrene plant.

The location of potential KOPs in the local area was determined first by identifying zones of influence where the surrounding community is likely to experience views to the proposed facilities. This area was determined through field studies that were conducted using a "lift" or crane that was placed in the approximate location of the originally proposed facilities and raised to 150 feet to simulate the height of the emission stacks proposed for the new facilities.

Using the crane as a reference, a team of four visual resource specialists toured the local area and identified selective locations where the highest elements of the proposed plant could be visible. Upon completion of the studies, two zones were mapped that define visibility in the local area (Figure E-1). The immediate zone of influence within the local area included locations adjacent to the project site out to a distance where the crane, simulating emission stack height, is estimated to be a noticeable and dominant factor from on-the-ground views. The extended zone of influence included the area beyond the immediate zone where occasional views occur but are less dominant.

FIGURE E-1
LOCAL AREA

11 x 17
Color




# LOCAL AREA

## Figure E-1

## Legend

**Projected Land Use and Circulation: Tempe General Plan**

- Open Space/Golf Course
- Retail
- Industrial
- Educational
- Government
- Mixed Use
- Residential < or = to 8 du/ac
- Residential > or = to 8 du/ac

- Immediate Area of Influence
- Extended Area of Influence
- Water: Canals, Lakes
- Open Space Corridors
- Issue Area
- Sample Viewpoints

— SCALE IN FEET —

0 400 800 1600 2400

SOURCES: TEMPE GENERAL PLAN AND FIELD INTERPRETATION

Kyrene Expansion Project

DRAFT 6/02/00

Representative KOPs in the immediate zone of influence including residential, commercial, recreational, and transportation viewers were identified and views were characterized according to the visibility of facilities associated with the existing and proposed plant. In general, visibility from KOPs is locally governed by factors such as existing vegetation, buildings, on-site electrical facilities, and orientation of the viewers within the area. However, unrestricted visibility to many of the existing plant facilities from KOPs within residential, recreational, and retail areas frequently occurs in the absence of intervening screening elements.

### Regional Area

The visual character of the regional area, similar to the local area, includes a range of office/business park/warehouse, light industrial, industrial, retail, and suburban landscape settings, some of which are in a state of transition as infill within the City of Tempe and surrounding areas continues to develop. KOPs in this area include recreational, transportation, and residential viewers. Views of the project site from the regional area primarily occur under circumstances where viewers are located in elevated positions (e.g., I-10 overpasses and multi-story buildings) or aligned with major linear corridors (roads and railroads) providing visibility to the site.

## Impact Assessment

The visual impact assessment evaluated the changes in landscape character (setting), and the resulting effects to sensitive viewers (KOPs) that the proposed expansion would have in context with the site, local, and regional areas.

### Landscape Character

The proposed expansion would have a very limited, if any, direct effect to the character of the site. The existing facilities currently in place at Kyrene are of a character, location, and size that have and will continue to dominate the site vicinity, including areas immediately adjacent to the existing plant. This area has and is planned to remain industrial in character; hence, the new plant is considered to be consistent with this setting.

### Sensitive Viewers (KOPs)

Impacts to viewers were determined by evaluating the change in views resulting from the introduction of proposed expansion facilities (plant, cooling towers, etc.) from representative KOPs identified during the visual inventory. These included transportation, residential, or recreational views at locations ranging from site and local areas (immediate zones of influence on Figure E-1) to key regional transportation views as illustrated on Figure F-1 (in Exhibit F).

Views to existing plant facilities and potential views to proposed new facilities were analyzed from these representative viewpoint locations. A majority of the KOPs have views to the planned facilities in conjunction with the existing facilities currently in operation. In many cases, views to planned facilities from these locations are partially screened by these facilities, or intervening buildings and vegetation.

Potential negative impacts to viewers in the immediate zone of influence are expected to be minimal, with the exception of areas immediately north of the plant site, including those from Ken McDonald Golf Course and residences in this area located along the course perimeter. Views from the extended local area of influence and regional views will primarily be confined to portions of the proposed emission stack (150 feet high). Mitigation and enhancement measures (described later in this section) affectively address many of these potential negative impacts, and in certain cases actually result in an overall improvement to existing views from some of the KOPs in the immediate zone of influence.

## Mitigation Measures

To reduce potential visual impacts, SRP will implement several mitigation measures including specialized architectural treatments and coloring of new facilities to reduce visual contrast and enhance the appearance of the new plant, landscape buffering and walls to provide visual screening in appropriate locations (particularly the north side of the plant across from La Estancia Apartments), and a lighting plan for proposed facilities in order to reduce effects on light emissions into local neighborhoods and the night sky.

In particular, the coloring of the plant will be critical, especially to address extended and regional area views in which only the emission stack will be visible. At the time of this submittal SRP intends to use colors in a light gray spectrum in order to reduce contrast with the background (often sky). Different hues of gray are also anticipated for other elements of the plant including the cooling towers and HRSG.

## Environmental Enhancement Measures

Throughout the planning process, several visual issues were identified by the CWG and the public regarding the existing general appearance of the Kyrene Plant. In particular, visibility to the 500kV switchyard (southwest corner of the site), consideration of changing the color of the existing emission stacks, the current effects of lighting at night in the area of the Tempe Service Center off of Elliot Road, and selective off-site views to existing facilities were of concern.

Although these are impacts associated with existing conditions on site independent of the proposed plant, SRP has committed to several enhancements as a part of the KEP including (1) the change in color to selective plant facilities (emissions stacks), (2) additional screening of the 500kV switchyard, (3) berming in conjunction with additional landscape treatments in selective areas to further reduce visibility and integrate the existing site with the immediate

surroundings, (4) a lighting plan for existing facilities on site (currently being implemented), and (5) a selective off-site tree planting program at selective locations to reduce future and existing plant visibility.

At the time of this CEC application, SRP is continuing to work with the Design Focus Group for the KEP (outgrowth of the CWG), including local residents, the City of Tempe, and other interested parties in the refinement of these and additional enhancements for the site. The appearance of initial concepts resulting from these meetings are described and illustrated in Exhibit G. As discussed in the planning process overview (Exhibit B), this group will continue to review concepts and finalize plans for the KEP.

## CULTURAL ENVIRONMENT

This study was completed to address the Corporation Commission Rules of Practice and Procedure by determining if any historic properties, including prehistoric and historic archaeological sites and historic structures, were present in the project area and what effects, if any, the proposed KEP might have on the resources.

Humans have lived in southern Arizona for at least 12,000 years beginning with the Paleoindian period. Except in the southernmost part of Arizona, evidence of the Paleoindian culture is generally limited to isolated projectile points. There is only limited evidence of a prehistoric occupation of the lower Salt River area during the succeeding Archaic period, prior to the advent of the Hohokam cultural tradition (Hackbarth 1992). The Hohokam occupied the Phoenix Basin and much of southern Arizona for a period of about 1,500 years until approximately AD 1450. The culture probably represents an indigenous development from the previous Archaic period. The Hohokam are generally characterized by their Red-on-buff pottery. Archaeological sites consist of a variety of settlement types ranging from seasonally occupied farmsteads to large agricultural communities that practiced canal irrigation. Some of the more obvious features common to large settlements are canal systems and other water-control features, ball courts, platform mounds, and compound architecture. Other features include pithouses, various size thermal and non-thermal pits, human and faunal burials, and middens.

There is no evidence of permanent habitation of the lower Salt River for about 400 years following the Hohokam occupation. The area was within the territorial range of the Pima (Akimel O'otam) (Ezell 1983) but was also used for resource procurement, travel, and raiding by the Maricopa, Yavapai, and Apache (Dene). People speaking closely related Piman dialects occupied southern Arizona and northwestern Mexico prior to European contact (Ezell 1983; Spier 1970). Many Pima consider themselves the descendants of the Hohokam and there is evidence that the Pima at least interacted with the Hohokam (Ezell 1983; Teague 1989). The modern Pima are a coalescence of the agriculturally oriented Piman groups that occupied the Gila and San Pedro rivers at the time of Spanish contact.

The present Maricopa represent a combination of five Yuman-speaking groups that migrated up the Gila River Valley from the Colorado River Valley to escape internecine conflict with the

Quechan and Mohave, also Yuman speakers. The first two groups to settle along the lower Gila River moved prior to European exploration, possibly as early as the AD 1200s (Harwell and Kelly 1983). These groups formed an alliance with the Pima and eventually all were living along the Gila River, upstream from its confluence with the Salt River. The first use of the name Maricopa was in 1846 "...as an all-inclusive designation for the Yuman-speaking population of the Salt and Gila valleys"(Ezell 1963). The Gila River Indian Reservation was established in 1859; the tribal entity is the Gila River Indian Community.

Deteriorating environmental conditions along the Gila River due to drought and up-stream water diversion by Euroamerican and Mexican settlers, caused some Pima and Maricopa to move into the Salt River Valley to farm in the late 1860s and early 1870s, with the Maricopa moving first (Hackenberg 1974). These people settled on the north and south sides of the Salt River, providing the basis of Salt River Indian Reservation, established in 1879 by the Executive Order of Rutherford B. Hayes (Zarbin 1997). The tribal entity is the Salt River Pima-Maricopa Indian Community.

The Spanish were the first non-aboriginal government to claim the area in the 1500s; Mexico controlled the area after its independence from Spain in 1821. Neither country established any permanent settlements north of the Tucson area. Control of present Arizona north of the Gila River was ceded to the United States with the Treaty of Guadalupe Hidalgo in 1848, which ended the war with Mexico. The Gadsden Purchase of 1853 sold that portion of Arizona between the Gila River and the international border to the United States.

The lower Salt River was resettled in the 1860s and 1870s after the establishment of Camp McDowell, later Fort McDowell, in 1865 on the Verde River (Barnes 1979). By 1878, Phoenix, Lehi, and Mesa had been founded (Barnes 1979). In 1871, Charles Trumbull Hayden settled in the area that was to become Tempe. Hayden established a flour mill and river ferry; the first post office was established as Hayden's Ferry in 1872. In 1873, the town of San Pablo was laid out for the Mexican residents of the area. Darrel Duppa suggested the name Tempe because of the area's resemblance to the Vale of Tempe in Greece. Tempe eventually encompassed both Hayden's Mill and San Pablo. The post office was renamed Tempe in 1879 and the city was incorporated in 1894 (Barnes 1979). The proposed project area was annexed in 1973.

The original economy of Tempe was based on agriculture. The land that comprises the SRP Kyrene facility was settled and patented between 1887 and 1907 (SRP Research Archives Staff 1999). The United States Reclamation Service obtained the rights-of-way and built the Western Canal and the Kyrene Branch of the Western Canal by late 1912 (SRP Research Archives Staff 1999), consolidating the irrigation system in this area.

## CULTURAL RESOURCE INVENTORY

### Methods

A cultural resources study was completed to determine if any historic properties, including historic archaeological sites and structures and prehistoric archaeological sites, were present in the proposed project area and what effects, if any, the proposed KEP might have on the resources.

Previous research adjacent to the proposed project area, SRP records, and an archaeological map of the Phoenix Basin were reviewed.

An archival search was conducted at the following institutions and agencies:

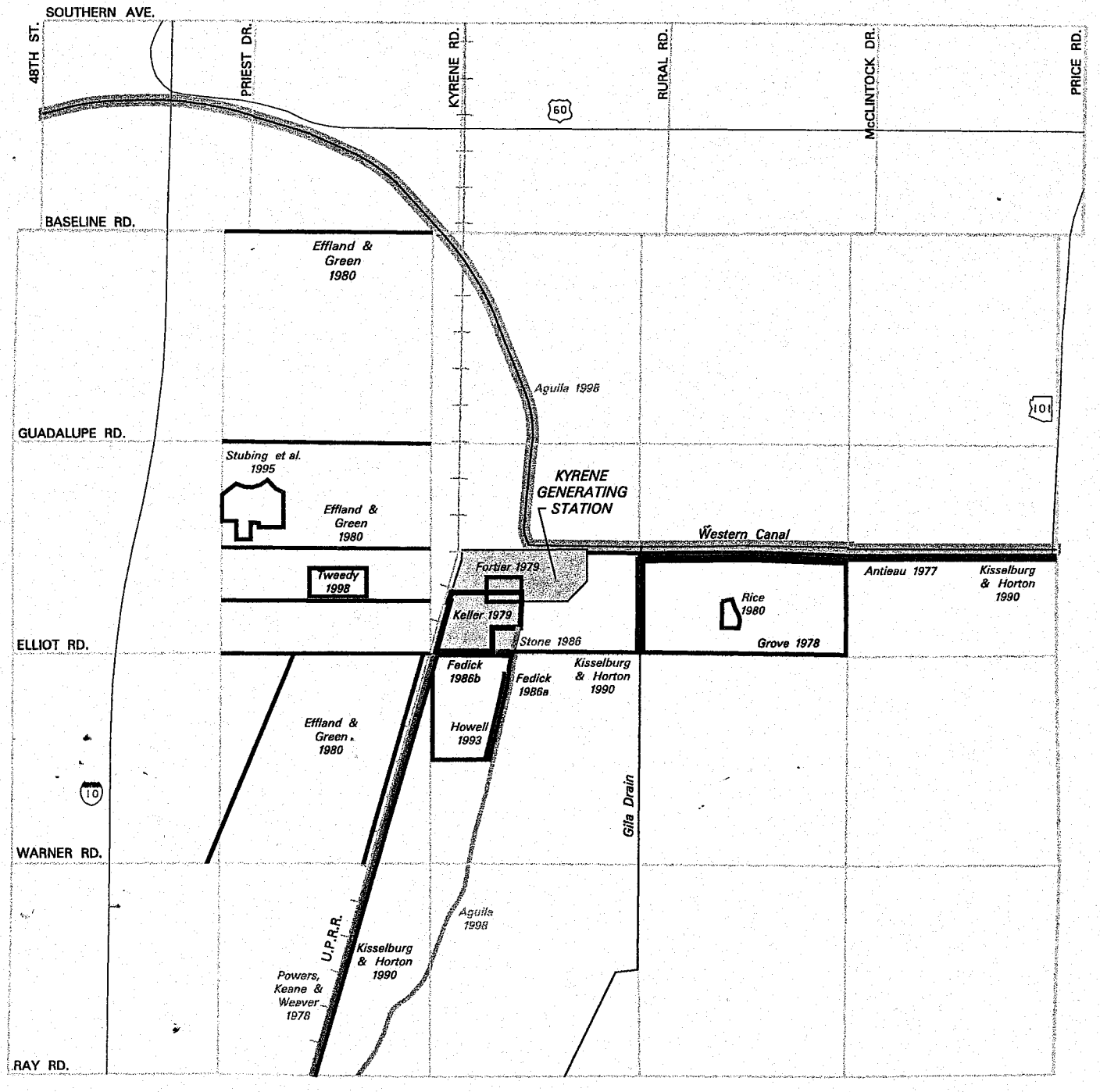
- Arizona State Historic Preservation Office (SHPO)
- Arizona State Museum (ASM)
- Arizona State University, Department of Anthropology (ASU); AZSITE database; Midvale files housed at Hayden Library
- Bureau of Land Management, General Land Office (BLM)
- Mesa Southwest Museum (MSM)
- Museum of Northern Arizona
- Pueblo Grande Museum (PGM)
- Salt River Project

Additionally, a recent Class 3 inventory survey of the SRP water transmission system was completed (Aguila 1998). The records search for that project was conducted at ASM including the Gila Pueblo records, ASU, BLM, MSM, PGM, SHPO, SRP, and the Tempe Historical Society. A pedestrian survey of the water system was conducted although the area within the Kyrene Generating Station/Tempe Service Center was not inspected because of limited access. SRP Cultural Resources personnel prior to any present project activities inspected the proposed project area. The results of the archival search are presented Table E-1 and Figure E-2.

### Historic Sites and Structures

Ten historic properties are located within 2 miles of the proposed project area; these are presented in Table E-2 and Figure E-3.

Figure E-2
Archaeological Project Areas
11 x 8 ½ Color




# Archaeological Project Areas

## Figure E-2

SRP makes no representation as to the accuracy of this mapping product nor as to its fitness for a particular purpose.

NORTH

© 2000 Salt River Project (SRP)

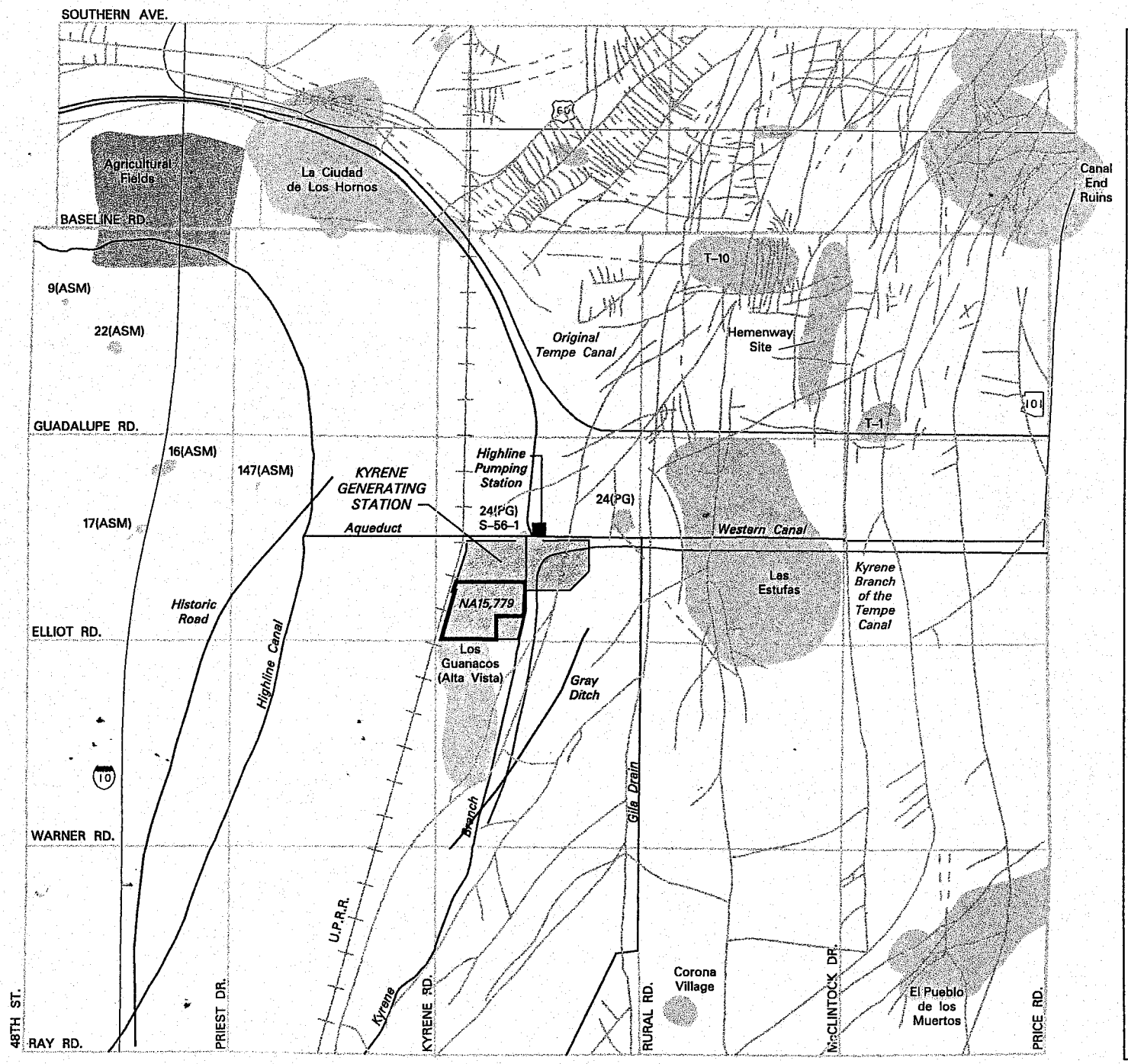
Scale in Miles

0 .25 .50 .75 1

Kyrene Expansion Project

6/13/2000 CAR:[KYRENE]KEPSABMAP.DGN

FIGURE E-3
ARCHAEOLOGICAL, HISTORICAL, CULTURAL MAP
11 x 8 ½ color




# Archaeological, Historical, Cultural Map

## Figure E-3

## Legend

PREHISTORIC CANAL

PREHISTORIC SITES

SRP makes no representation as to the accuracy of this mapping product nor as to its fitness for a particular purpose.

NORTH

© 2000 Salt River Project (SRP)

Scale in Miles

0 .25 .50 .75 1

SOURCE: DIGITIZED FROM "MARICOPA COUNTY, ARIZONA GUADALUPE QUADRANGLE ARCHAEOLOGY MAP" COMPUTER CARTOGRAPHY BY GEO-MAP, INC., TUCSON, AZ 1992. SCALE 1:24000

Kyrene Expansion Project

6/13/2000 CAR:[KYRENE]KEPSABMAHC.DGN

**TABLE E-1**
**SUMMARY OF PUBLISHED REPORTS AND PROJECT FINDINGS OF PROJECTS OUTSIDE THE SRP KYRENE PROPERTY AND PROJECTS INSIDE THE KYRENE PROPERTY**

| Reference | Project | Size & Location | Findings |
|---|---|---|---|
| Turney 1929 | Prehistoric Irrigation Canals Map | Lower Salt River Valley | Alta Vista mapped in Sections 15 and 16, T1S, R4E; unnamed prehistoric buildings mapped in Sections 10 and 11, T1S, R4E; Los Muertos mapped as covering 3+ mile diameter centered on Sections 23 and 24, T1S, R4E. |
| Haury 1945 | Hemenway Southwestern Archaeological Expedition, 1887-1888 | 2 miles north and slightly west of Los Muertos; 2 miles southeast of Los Hornos | Los Guanacos; named for the cache of figurines found there; described as a Colonial-Sedentary period village. |
| Antieau 1977 | TNF to Kyrene Transmission Line Survey | Line parallels south bank of Western Canal in E2 of Section 10 and entire length of Section 11, T1S, R4E. | AZ U:9:71 (ASU); Hohokam habitation site, Sedentary period. |
| Grove 1978 | Knoell Tempe Unit 9 Survey | 320-acre parcel, S2 of Section 11, T1S, R4E. | AZ U:9:71 (ASU); linear artifact scatter running north-south through W2 of SW4 of Section 11; extension of site previously mapped by Antieau (1977); recommended archaeological testing. |
| Blank 1978 | Knoell Tempe Unit 9 Testing | N/A | N/A |
| Rice 1980 | Knoell Tempe Unit 9 Monitoring | xx-acre parcel central portion of S2 of Section 11, T1S, R4E | AZ U:9:71 (ASU); monitoring during grading revealed canals, an horno, and several midden areas; Sedentary period. |
| Effland and Green 1980 | Kyrene EHV Transmission Line Survey | 1-mile transect along the north boundary of Section 4; four east-west, 1-mile transects in Section 10; two SE-NW, 1-mile transects in Section 16, T1S, R4E. | No sites identified, but recommendation was made to avoid some corridor alternatives because of potential for encountering cultural resources. |
| Kisselburg and Horton 1990 | El Paso Natural Gas Line Monitoring | Sections 10, 11, 12, 15, 16, 21, T1S, R4E. | Four canals recorded in vicinity of AZ U:9:71 (ASU). |
| Stubing et al. 1995 | Pascua Yaqui Tribe Survey | 23 acres contained mostly in the N2, SW4, NW4 of Section 9, T1S, R4E. | AZ U:9:147 (ASM), low-density sherd and lithic scatter considered a Hohokam gathering or collecting camp; considered ineligible for NRHP. |
| Tweedy 1998 | South Hardy Drive and West Grove Parkway Survey | 22 acres contained mostly in the S2, NW4, SE4 of Section 9, T1S, R4E. | SHPO inventory #3432-I; no report on file. Use of inventory number without a report number indicates no cultural remains were found. |

**TABLE E-1**
**SUMMARY OF PUBLISHED REPORTS AND PROJECT FINDINGS OF PROJECTS OUTSIDE THE SRP KYRENE PROPERTY AND PROJECTS INSIDE THE KYRENE PROPERTY**

| Reference | Project | Size & Location | Findings |
|---|---|---|---|
| Aguila 1998 | SRP Canals | Western Canal in Sections 3, 10, and 11; Kyrene Branch Canal in Sections 10 and 15 | Artifacts were found in the vicinity of previously recorded sites AZ U:9:71 (ASU), NA15,779, AZ U:9:24 (PG), and AZ U:9:116 (ASM). |
| **SRP Kyrene Property** | | | |
| Keller 1979 | Kyrene 500kV Receiving Station Survey | 55 acres in the S2, SW4 of Section 10, T1S, R4E. | NA/15,779; a late Colonial or Sedentary period site with some late Classic activity. Artifacts were concentrated in northern half of the survey area but found across the parcel. Testing of artifact concentrations was recommended. |
| Fortier 1979 | Kyrene Tank Yard Monitoring | 11.9 acre parcel in the S2, NE4, SW4 of Section 10, T1S, R4E. | 1 prehistoric feature (roasting pit/oven) and artifacts; suggested to be a component of AZ U:9:24 (PG). |
| Fedick 1986b | SRP Central Support Complex Survey | 103 acres in the NW4 of Section 15, T1S, R4E | AZ U:9:48 (ASU), artifact scatter measuring 457 x 91 m along Kyrene Canal in eastern third of survey parcel. Recommended avoidance or testing for eligibility. |
| Fedick 1986a | SRP Central Support Complex Testing | 610 x 91 m parcel paralleling west side of Kyrene Branch Canal in the NW4 of Section 15, T1S, R4E | AZ U:9:48 (ASU), Los Guanacos; 25 archaeological features identified in trenches, including a house floor, borrow pits, burials, an horno, and trash-filled pits. Remains are potentially eligible, data recovery program is recommended. |
| Stone 1986 | Sanitary Sewer Line, Kyrene Steam Plant Monitoring | 350-m long trench along west side of Kyrene Branch Canal in S2, SE4, SW4 of Section 10, T1S, R4E | Artifacts observed on surface and subsurface, but no features. If site was present, it has been substantially disturbed by earthwork associated with canal construction. |
| Howell 1993 | Los Guanacos Data Recovery | 450 x 92 m parcel paralleling west side of Kyrene Branch Canal in the NW4 of Section 15, T1S, R4E | AZ U:9:116 (ASM), Los Guanacos; data recovery of area previously tested by Fedick (1986a); 72 archaeological features examined including adobe compound rooms, wall segments, pit structures, hornos, and burials; occupation dated between late Sedentary through late Classic period. |

| TABLE E-2<br>HISTORIC PROPERTIES WITHIN 2 MILES OF THE PROPOSED PROJECT AREA | | | | |
|---|---|---|---|---|
| **Property** | **Constructed** | **Location** | **Affected** | **Eligibility** |
| Gila Drain | 1914-1921 | T1S, R4E, Sec. 11 | No | Not eligible |
| Gray Ditch | Unknown | T1S, R4E, Sec. 15 | No | Unknown |
| Highline Canal | 1912 | T1S, R4E, Sec. 10 | No | Yes |
| Highline Pumping Station (Original) | 1913-14 | T1S, R4E, Sec. 10 | No | Unknown |
| Kyrene Branch of the Tempe Canal | 1880s | T1S, R4E, Sec. 10 | No | Unknown |
| Kyrene Branch of the Western Canal | 1912 | T1S, R4E, Sec. 10 | No | Yes |
| Union Pacific Railroad | 1887 | T1S, R4E, Sec. 10 | No | Potentially |
| Tempe Canal | 1871-1900 | T1S, R4E, Sec. 10 | No | Unknown |
| Western Canal | 1911-13 | T1S, R4E, Sec. 10 | No | Yes |
| Historic Road | By 1870 | T1S, R4E, Sec. 9 | No | Unknown |

Gray Ditch, the original Highline Pumping Station, the Kyrene Branch of the Tempe Canal, the Tempe Canal, and the historic road are no longer evident due to urbanization. The Gila Drain near the proposed project area has been piped and retains no integrity. The Highline Canal aqueduct, the Kyrene Branch of the Western Canal, the Union Pacific Railroad, and the Western Canal are adjacent to the proposed project area.

## Prehistoric Sites

Eleven prehistoric sites are located within two miles of the proposed project area; these are presented in Table E-3 and Figure E-3.

| TABLE E-3<br>PREHISTORIC PROPERTIES WITHIN 2 MILES OF THE PROPOSED PROJECT AREA | | | | |
|---|---|---|---|---|
| **Site Number** | **Site Name** | **Location** | **Affected** | **Eligibility** |
| AZ U:9:16(ASM) | None | T1S, R4E, Sec. 8 | No | Unknown |
| AZ U:9:17(ASM) | None | T1S, R4E, Sec. 8 | No | Unknown |
| AZ U:9:48(ASM) | Los Hornos | T1N, R4E, Sec. 32, 33; T1S, R4E, Sec. 3, 4 | No | Potentially |
| AZ U:9:116(ASM) | Los Guanacos | T1S, R4E, Sec. 10, 15 | Yes | Potentially |
| AZ U:9:147(ASM) | None | T1S, R4E, Sec. 9 | No | No |
| AZ U:9:71(ASU) | Las Estufas | T1S, R4E, Sec. 2, 11, 12, 14 | No | Potentially |
| AZ U:9:24(PG) | None | T1S, R4E, Sec. 10 | Yes | Potentially |
| NA15,799 | None | T1S, R4E, Sec. 10 | Yes | Potentially |
| Turney-1 (T-1) | None | T1S, R4E, Sec. 1 | No | Potentially |
| Turney-10 (T-10) | None | T1S, R4E, Sec. 2 | No | Potentially |
| None | "Hemenway" Site | T1S, R4E, Sec. 1, 2 | No | Potentially |
| None | Agricultural Fields | T1N, R4E, Sec. 32; T1S, R4E, Sec. 5 | No | Potentially |

Three prehistoric archaeological sites have been recorded in, or adjacent to, the proposed project area. These are sites AZ U:9:24/(PG), AZ U:9:116/(ASM), and NA15,799 (see Figure E-3). All are affiliated with the Hohokam culture and have Preclassic- and Classic-period components. Site AZ U:9:24/(PG) is recorded as extending into the proposed project area; NA15,799 is adjacent to the southern edge of the proposed project area; Site AZ U:9:116/(ASM) is recorded to the south of the proposed project area. Recent archaeological testing for the proposed project has located subsurface cultural materials related to the Preclassic- and Classic-period Hohokam within the Tank and Pole yards at the Kyrene facility. These materials suggest that the three previously recorded sites are part of a more extensive occupation of the area than previously supposed and have no clear separation.

## Conclusions

The construction of the generation station will impact any archaeological features in the immediate area through ground disturbance. A total of 123 subsurface prehistoric and historic features including prehistoric human remains was located within the existing Tank and Pole yards during the recent testing program. The preliminary testing reports are presented in Exhibit E-1. The suggested boundary of Site AZ U:9:24/(PG) extends into the northeastern corner of the Pole Yard and several subsurface cultural features were located at the western periphery of the suggested site boundary.

Sites AZ U:9:24(PG), AZ U:9:116(ASM), and NA15,799 are considered to be potentially eligible for inclusion to the National Register of Historic Places (NRHP) under Criterion D, the sites have provided and could provide additional data concerning the prehistoric occupation of this area. The prehistoric materials located during the testing of the Tank and Pole yards are undoubtedly part of this prehistoric site complex and are considered to be eligible under Criterion D.

The federal EPA will be the lead federal agency for the project because they are the permitting agency. The EPA will consult with State Historic Preservation Office regarding cultural resources. Other concerned groups will be Native American tribes and the public. This consultation will formally determine the area of potential effect and make recommendations on how to mitigate any adverse impacts to cultural resources. Mitigation will probably involve a data recovery program including excavation of subsurface cultural material. A Programmatic Agreement will be implemented detailing required activities. An Advisory on Burial Discoveries or burial agreement will need to be developed by the Arizona State Museum for compliance with ARS 41-865, which protects human burials and associated objects on private lands. Any modern human remains will be protected in situ and the Tempe Police Department will be notified immediately.

## REFERENCES


Aguila, Lourdes

1998 *Cultural Resources Survey of the Salt River Project Canals, Maricopa County, Arizona (revised)*. Cultural Resources Report No. 100. Archaeological Consulting Services, Ltd., Tempe.

Antieau, John M.

1977 Investigations of Archaeological Sites along the 500kV Tonto National Forest Boundary to Kyrene Transmission Line Route, Coronado Station Project, Pinal and Maricopa Counties, Arizona. Office of Cultural Resource Management, Department of Anthropology, Arizona State University, Tempe.

Barnes, Will C.

1979 *Arizona Place Names*. Revised and enlarged by Byrd H. Granger. The University of Arizona Press, Tucson.

Blank, Laurie

1978 OCRM Report No. 78-158. Office of Cultural Resource Management, Arizona State University, Tempe.

Effland, Richard W., Jr. and Margerie Green

1980 .An Assessment of Cultural Resources for the Proposed APS Kyrene EHV Transmission Line Project. Archaeological Consulting Services, Ltd., Tempe.

Ezell, Paul H.

1983 History of the Pima. In *Southwest*, edited by Alfonso Ortiz, pp. 149-160. Handbook of North American Indians, vol. 10, W. C. Sturtevant, general editor. Smithsonian Institution, Washington, D. C.

1963 *The Maricopas, An Identification From Documentary Sources*. Anthropological Papers of the University of Arizona Number 6. The University of Arizona Press, Tucson.

Fedick, Scott L.

1986a *Archaeological Testing and Evaluation of AZ U:9:48(ASU): A Prehistoric Hohokam Habitation Site in Tempe, Maricopa County, Arizona*. Technical Report No. 86-91. Archaeological Research Services, Inc., Tempe.

1986b A Cultural Resources Survey of the Proposed Salt River Project Central Support Complex Parcel in Tempe, Maricopa County, Arizona. Archaeological Research Services, Inc., Tempe.

Fortier, Edward M.
1979 *Archaeological Monitoring of the Construction and Modification of Fuel Oil Dikes at the Kyrene Generating Station, Maricopa County, Arizona.* Archaeological Research Services, Inc., Tempe.

GEO-MAP, Inc.
1992 Central Phoenix Basin Archaeology Map. GEO-MAP, Inc., Tucson.

Grove, Laurel K.
1978 *An Archaeological Clearance Survey of the Proposed Knoell Tempe 9 Community Development, Tempe, Arizona.* OCRM Report No. 78-155, Arizona State University, Tempe.

Hackbarth, Mark R.
1992 *Prehistoric and Historic Occupation of the Lower Verde River Valley: The State Route 87 Verde Bridge Project.* Northland Research, Inc., Flagstaff.

Hackenberg, Robert A.
1974 *Pima-Maricopa Indians Aboriginal Land Use and Occupancy of the Pima-Maricopa Indians.* 2 vols. American Indian Ethnohistory, Indians of the Southwest, David Agee Horr, editor. Garland Publishing Inc., New York

Harwell, Henry O. and Marsha C. S. Kelly
1983 In *Southwest*, edited by Alfonso Ortiz, pp. 71-85. Handbook of North American Indians, vol. 10, W. C. Sturtevant, general editor. Smithsonian Institution, Washington, D. C.

Haury, Emil W.
1945 *The Excavation of Los Muertos and Neighboring Ruins in the Salt River Valley, Southern Arizona.* Papers of the Peabody Museum of American Archaeology and Ethnology, Vol. 24, No. 1. Cambridge.

Howell, Todd L.
1993 *Archaeological Investigations at Los Guanacos: Exploring Cultural Changes in Late Hohokam Society.* Northland Research, Inc., Flagstaff.

Keller, Donald R.
1979 Archaeological Investigations for Salt River Project Kyrene 500 kV Receiving Station, Private Land, Maricopa County, Arizona. Report A-79-34. On file, Museum of Northern Arizona, Flagstaff.

Kisselburg, JoAnne and Sarah L. Horton
1990 Monitoring of the Construction of the El Paso Natural Gas Pipeline Between Guadalupe Road and the Gila River Indian Community, Maricopa County, Arizona. Ms. on file, Archaeological Consulting Services, Ltd., Tempe.

Rice, Glen
1980 Letter to Ms. Joyce Manigold, Knoell Homes, Phoenix, Arizona, dated 29 October 1980. On file, Office of Cultural Resource Management, Arizona State University, Tempe.

Spier, Leslie
1970 [1933] *Yuman Tribes of the Gila River*. Cooper Square Publishers, Inc. New York.

SRP Research Archives Staff
1999 Land Use History: Kyrene Property. Salt River Project, Tempe.

Stone, Lyle M.
1986 Cultural Resources Survey and Monitoring for a Salt River Project Sanitary Sewer Line Construction Project at the Kyrene Steam Plant, Tempe, Maricopa County, Arizona. Archaeological Research Services, Inc., Tempe.

Stubing, Michael, Douglas R. Mitchell and Dee A. Jones
1995 *An Archaeological Survey of a 23 Acre Parcel for Pascua Yaqui Tribe in Guadalupe, Maricopa County, Arizona*. Archaeological Report No. 95-129. SWCA, Inc., Environmental Consultants, Phoenix.

Teague, Lynn S.
1989 The Postclassic and the Fate of the Hohokam. In *The 1982-1984 Excavations at Las Colinas*, vol. 6, edited by Lynn S. Teague, pp. 145-167. Archaeological Series 162, Arizona State Museum, University of Arizona, Tucson.

Tweedy, Jennifer
1998 A Cultural Resources Survey of an Approximately 22 Acre Study Area Located at the Southeast Corner of South Hardy Drive and West Grove Parkway, Tempe, Maricopa County, Arizona. Archaeological Research Services, Inc., Tempe.

Turney, Omar
1929 Prehistoric Irrigation in Arizona. Phoenix.

Zarbin, Earl
1997 *Two Sides of the River: Salt River Valley Canals, 1867-1902*. Salt River Project, Tempe.

# EXHIBIT E-1
# CULTURAL PRELIMINARY TESTING REPORTS

6 March 2000

Mr. Richard Anduze
Environmental Planning, PAB 355
Salt River Project
PO Box 52025
Phoenix, AZ 85072-2025

Dear Rick,

Desert Archaeology, Inc., has completed archaeological testing in the Tank Yard of the Kyrene Generating Station. Testing commenced on 14 February 2000 under the direction of Kathleen Henderson and Ellen Ruble and was completed, including backfilling of all trenches, on 29 February 2000. A total of 261.5 person-hours (32.7 person-days) was expended in this effort. The fieldwork was conducted in accordance with the testing plan prepared by Desert Archaeology (Ruble 2000). The purpose of the testing was to determine if buried cultural remains were present, and if they were found, to evaluate them in terms of their preservation, extent, and potential to yield information that can contribute to existing knowledge of the history and prehistory of the area.

A total of 767 linear meters of trench was cut (Table 1), resulting in the discovery of 38 archaeological features (Table 2). The trenching provides a 3.5 percent sample of the testable area of the Tank Yard, extending east from the proposed new switchyard's western boundary. Excluded from the total area (39,600 $m^2$) were the immediate area of the fuel tanks (ca. 9,779 $m^2$) and the paved area between the railroad spur and the northern fuel tank berm (ca. 6,664 $m^2$).

The identified features were all prehistoric and include types commonly associated with Hohokam villages: pithouses, hornos, borrow pits, small pits, and a settling basin (Table 2). Based on the presence of abundant quantities of redware ceramics in combination with lesser quantities of buffware in the features' fill, a late Sedentary to early Classic period age is projected for these remains. A map of the features' locations is provided in Figure 1. The map shows a clustering of features immediately west of the western tank and another cluster to the east of the eastern tank. Fewer features were identified south and north of the tanks, but collectively they suggest the potential for encountering archaeological remains in most of the Tank Yard area. As the remains are typical of Hohokam village sites, and undoubtedly represent a portion of the site of Los Guanacos, a National Register eligible site, their further study has the potential for contributing important information about the prehistoric past. Hence, it will be recommended in the final testing report that a data recovery program be implemented if construction proceeds in the Tank Yard.

Sincerely,

T. Kathleen Henderson, Ph.D.
Desert Archaeology, Inc.
PO Box 66663
Phoenix, AZ 85082-6663

cc: John L. Keane, Salt River Project
William Doelle, Patricia Castalia, Desert Archaeology

**Table 1.** Tank Yard trench characteristics.

| Trench Number | Length (m) | Maximum Depth (m) | Direction | Location | Features Present |
|---|---|---|---|---|---|
| 1 | 29.0 | 1.00 | N-S | West Tank Yard | - |
| 2 | 27.0 | 1.27 | N-S | West Tank Yard | - |
| 3 | 39.5 | 1.22 | N-S | West Tank Yard | 8 |
| 4 | 48.5 | 1.00 | N-S | West Tank Yard | - |
| 5 | 42.3 | 1.00 | N-S | West Tank Yard | 1, 2, 3, 4, 5 |
| 6 | 44.1 | 0.88 | N-S | West Tank Yard | 6, 7, 9 |
| 7 | 58.3 | 1.20 | N-S | East Tank Yard | 10, 12, 16, 17, 32 |
| 8 | 56.7 | 1.27 | N-S | East Tank Yard | 11, 13 |
| 9 | 44.3 | 1.40 | N-S | East Tank Yard | 14 |
| 10 | 48.8 | 1.10 | E-W | South Tank Yard | - |
| 11 | 39.0 | 1.32 | E-W | South Tank Yard | 25, 26, 27 |
| 12 | 39.5 | 1.35 | E-W | South Tank Yard | 28 |
| 13 | 39.4 | 1.30 | E-W | South Tank Yard | 29, 41, 42 |
| 14 | 33.5 | 1.40 | E-W | North Tank Yard | - |
| 15 | 38.0 | 1.31 | E-W | North Tank Yard | 34 |
| 16 | 38.5 | 1.32 | E-W | North Tank Yard | 15 |
| 17 | 21.6 | 1.20 | E-W | North Tank Yard | 33 |
| 18 | 18.0 | 1.15 | N-S | West Tank Yard | 35, 36 |
| 19 | 16.1 | 1.20 | N-S | West Tank Yard | 18, 20, 21, 22, 23, 24, 30 |
| 20 | 22.0 | 1.25 | N-S | East Tank Yard | 31 |
| 21 | 11.0 | 1.45 | NW-SE | East Tank Yard | 31 |
| 22 | 11.7 | 1.54 | E-W | East Tank Yard | - |

**Table 2.** Archaeological features identified in the Tank Yard.

| Feature Number | Feature Type | Trench Number | Trench Side | Depth BGS (m) | Max. Feature Length (m) | Max. Feature Depth (m) | General Location |
|---|---|---|---|---|---|---|---|
| 1 | Pithouse | 5 | Both | 0.05 | 2.85* | 0.18 | West Tank Yard |
| 2 | Pithouse | 5 | Both | 0.05 | 0.77* | 0.37 | West Tank Yard |
| 3 | Pit, large | 5 | Both | 0.25 | 1.45 | 0.30 | West Tank Yard |
| 4 | Pit, small | 5 | Both | 0.32 | 1.45 | 0.63 | West Tank Yard |
| 5 | Pit, small | 5 | Both | 0.23 | 0.60 | 0.46 | West Tank Yard |
| 6 | Possible pithouse | 6 | East | 0.31 | 1.27 | 0.14 | West Tank Yard |
| 7 | Pit, small | 6 | East | 0.17 | 1.30 | 0.29 | West Tank Yard |
| 8 | Pit, small | 3 | Both | 0.25 | 0.83 | 0.60 | West Tank Yard |
| 9 | Pit, bell shaped | 6 | East | 0.15 | 0.90 | 0.69 | West Tank Yard |
| 10 | Possible pithouse | 7 | Both | 0.19 | 3.40* | 0.34 | East Tank Yard |
| 11 | Possible pithouse | 8 | Both | 0.09 | 3.21 | 0.30 | East Tank Yard |
| 12 | Pit, small | 7 | West | 0.42 | 0.91 | 0.34 | East Tank Yard |
| 13 | Pit, small | 8 | East | 0.14 | 0.25 | 0.30 | East Tank Yard |
| 14 | Pit, small | 9 | East | 0.60 | 0.30 | 0.10 | East Tank Yard |
| 15 | Pit, small | 16 | North | 0.44 | 0.64 | 0.33 | North Tank Yard |
| 16 | Possible pithouse | 7 | East | 0.25 | 1.65 | 0.20 | East Tank Yard |
| 17 | Borrow pit | 7 | East | 0.40 | 2.15 | 0.75 | East Tank Yard |
| 18 | Pit, small | 19 | West | 0.40 | 0.33* | 0.22 | West Tank Yard |
| 19 | Pit, small | 19 | East | 0.29 | 0.35 | 0.25 | West Tank Yard |
| 20 | Horno | 19 | Both | 0.25 | 2.10 | 0.95 | West Tank Yard |
| 21 | Borrow pit | 19 | Both | 0.26 | 2.84* | 0.87 | West Tank Yard |
| 22 | Pit, small | 19 | West | 0.19 | 0.24 | 0.21 | West Tank Yard |
| 23 | Roasting pit | 19 | West | 0.80 | 0.26 | 0.13 | West Tank Yard |
| 24 | Borrow pit | 19 | Both | 0.44 | 4.75* | 0.77 | West Tank Yard |
| 25 | Pit, small | 11 | South | 0.38 | 0.49* | 0.32 | South Tank Yard |
| 26 | Pit, small | 11 | South | 0.51 | 0.42 | 0.06 | South Tank Yard |
| 27 | Pit, small | 11 | North | 0.33 | 0.58 | 0.38 | South Tank Yard |
| 28 | Horno | 12 | North | 0.54 | 1.46 | 0.48 | South Tank Yard |
| 29 | Pithouse | 13 | North | 0.55 | 2.75 | 0.21 | South Tank Yard |
| 30 | Borrow pit | 19 | Both | 0.45 | 2.60 | 0.62 | West Tank Yard |
| 31 | Settling basin | 7, 20, 21 | Both[1] | 0.22 | 27+ | 0.73 | East Tank Yard |
| 32 | Borrow pit | 7 | East | 0.35 | 1.70 | 0.80 | East Tank Yard |
| 33 | Pithouse | 17 | North | 0.30 | 2.15 | 0.08 | North Tank Yard |
| 34 | Pit, small | 15 | South | 0.45 | 0.32 | 0.38 | North Tank Yard |
| 35 | Pit, small | 18 | East | 0.47 | 1.70 | 0.41 | West Tank Yard |
| 36 | Pit, small | 18 | Both | 0.39 | 1.40 | 0.51 | West Tank Yard |
| 41 | Pithouse | 13 | North | 0.60 | 1.55 | 0.10 | South Tank Yard |
| 42 | Borrow pit | 13 | North | 0.80 | 1.48 | 0.50 | South Tank Yard |

BGS = below ground surface
* Feature is truncated by the end of the trench.
[1] Only a small remnant of Feature 31 is apparent on the northeast side of Trench 21.

15 March 2000

Mr. Richard Anduze
Environmental Planning, PAB 355
Salt River Project
PO Box 52025
Phoenix, AZ 85072-2025

Dear Rick,

Desert Archaeology, Inc., has completed archaeological testing along the proposed new gas line for the proposed new generating station and the realigned route of the existing gas line to the present Kyrene Generating Station. Testing commenced on 21 February 2000 under the direction of Kathleen Henderson and was completed, including backfilling of all but one trench, on 8 March 2000. A total of 72.5 person-hours (9.1 person-days) was expended in this effort. The purpose of the testing was to determine if buried cultural remains were present, and if they were found, to evaluate them in terms of their preservation, extent, and potential to yield information that can contribute to existing knowledge of the history and prehistory of the area. The fieldwork was conducted in accordance with the testing plan prepared by Desert Archaeology (Ruble 2000).

A total of 442 linear meters of trench was cut (Table 1), resulting in the discovery of four archaeological features (Table 2). The trenching provides a 41.5 percent sample of the gas line's route, estimated at 1,065 m (595 m along the Kyrene Station's western boundary; 240 m from the western boundary to the northern access road into the Tank Yard; 230 m running east-west south of the Tank Yard). The recommended sample fraction was 50 percent, but achieving this sample was difficult given the presence of utilities and other obstructions. Moreover, it was clear from the negative results along the western boundary of the Kyrene property that additional trenching to meet a 50 percent goal was unnecessary.

The identified features were all prehistoric pits. All were found in the northwest corner of the Tank Yard (Figure 1). The four pits contained abundant quantities of ceramics, including Sacaton and possibly Casa Grande Red-on-buff. The decorated types suggest the pits were filled sometime during the late Sedentary to early Classic period. Because diagnostic decorated ceramics are present in the pits, further study could contribute important information toward our knowledge of Los Guanacos. Even minor excavations, such as excavating control units to obtain a volumetric sample of artifacts, would be informative. Hence, it will be recommended that these features be included as part of any data recovery program implemented for the Kyrene Expansion Project.

Although features were not identified elsewhere in trenches along the gas line route, four prehistoric features were identified during the Tank Yard testing between the proposed realigned gas line and the south fence of the Tank Yard (Figure 1). The features, which include two pithouses, an horno, and a borrow pit, indicate a high potential for additional prehistoric remains to occur in their vicinity. It is expected that clearance for the line could be achieved in conjunction with any data recovery efforts undertaken in this portion of the Kyrene property.

For the most part, sediments exposed in the gas line trenches west and southwest of the Tank Yard were sterile. Thus, clearance can be recommended for the gas line's construction from the southwest corner of the Kyrene property up to the Tank Yard's western fence.

Sincerely,

T. Kathleen Henderson, Ph.D.
Desert Archaeology, Inc.
PO Box 66663
Phoenix, AZ 85082-6663

cc: John L. Keane, Salt River Project
William Doelle, Patricia Castalia, Desert Archaeology

**Table 1.** Gas Line trench characteristics.

| Trench Number | Length (m) | Maximum Depth (m) | Direction | Location | Features Present |
|---|---|---|---|---|---|
| 23 | 20.7 | 1.25 | E-W | Northwest Tank Yard | 37, 38, 39 |
| 24 | 20.5 | 1.25 | E-W | Northwest Tank Yard | 40 |
| 25 | 39.5 | 1.30 | E-W | Central Reclamation | - |
| 26 | 41.0 | 1.20 | E-W | EHV Yard | - |
| 27 | 49.8 | 1.30 | N-S | EHV Yard | - |
| 28 | 50.0 | 1.30 | E-W | South of Tank Yard | - |
| 29 | 67.8 | 1.22 | N-S | EHV Yard | - |
| 30 | 73.0 | 1.55 | N-S | 500 kV Switchyard | - |
| 31 | 45.1 | 1.25 | N-S | Tempe Service Center | - |
| 32 | 19.7 | 1.15 | N-S | Tempe Service Center | - |
| 33 | 14.9 | 1.30 | N-S | Tempe Service Center | - |

**Table 2.** Archaeological features identified along the Gas Line.

| Feature Number | Feature Type | Trench Number | Trench Side | Depth BGS (m) | Max. Feature Length (m) | Max. Feature Depth (m) | General Location |
|---|---|---|---|---|---|---|---|
| 37 | Pit, small | 23 | Both | 0.31 | 0.85 | 0.25 | NW Tank Yard |
| 38 | Pit, small | 23 | Both | 0.17 | 0.80 | 0.49 | NW Tank Yard |
| 39 | Pit, large | 23 | Both | 0.29 | 2.08 | 0.73 | NW Tank Yard |
| 40 | Pit, large | 24 | Both | 0.38 | 3.95 | 0.69 | NW Tank Yard |

BGS = below ground surface

15 May 2000

Mr. Richard Anduze
Environmental Planning, PAB 355
Salt River Project
PO Box 52025
Phoenix, AZ 85072-2025

Dear Rick,

Desert Archaeology, Inc., has completed archaeological testing in the Pole Yard of the Kyrene Generating Station. Testing commenced on 12 April 2000 under the direction of Kathleen Henderson and was completed, including backfilling of all trenches, on 5 May 2000. A total of 467.5 person-hours (58.4 person-days) was expended in this effort. The fieldwork was conducted in accordance with the testing plan prepared by Desert Archaeology (Ruble 2000). The purpose of the testing was to determine if buried cultural remains were present, and if they were found, to evaluate them in terms of their preservation, extent, and potential to yield information that can contribute to existing knowledge of the history and prehistory of the area.

A total of 1,565 linear meters of trench was cut during testing (Table 1), resulting in the discovery of 81 archaeological features (Table 2). The trenching provides a 2.9 percent sample of the testable area of the Pole Yard, extending east from the proposed new generating station's western boundary. Excluded from the total area (44,370 $m^2$) were the roughly 17-m-wide, east-west corridor containing the railroad spur and underlying utilities (3,825 $m^2$), and the paved area extending west of the Pole Yard entrance road that is presently used for parking and Central Reclamation access (2,375 $m^2$).

In addition to standard backhoe trenching and feature recording, excavations were conducted to recover materials associated with five cremation burials encountered during the trenching. These materials were repatriated to the Gila River Indian Community immediately following their excavation (27 April 2000, pursuant to Agreement A.R.S. §41-844, Case #00-14).

All but two of the identified archaeological features are prehistoric. The exceptions are recent historic/modern and include what were identified in trench profile as an irrigation ditch (Feature 97, Trench 48) and an extramural surface (Feature 67, Trench 45) (see Figure 1). Inspection of aerial photographs and maps supplied by Salt River Project indicate the extramural surface represents the remains of a tool shed built sometime between 1954 and1961, and which was apparently demolished in 1974. The ditch consisted of a band of uniform, finely to moderately textured sand, extending the length of Trench 48 immediately below the 20-30 cm compacted gravel capping the Pole Yard surface. The sand contained abundant quantities of mollusk shells indicating its riverine source. This sand was also observed in thin lenses below the gravel in adjacent trenches, suggesting the ditch's sediments were spread during preparation of the Pole Yard surface. The ditch is not visible on either 1934 or 1949 aerial photographs depicting the agricultural field upon which the Pole Yard was built, suggesting the ditch's construction postdates this time. Due to the relatively recent age of the features and the fact that it is unlikely that their further study would yield information important to our understanding of the historic era, neither can be considered eligible for National Register listing.

The 79 prehistoric features include types commonly associated with Hohokam villages: pithouses, an horno, borrow pits, other large and small pits, and secondary cremations (Table 2). Based on the presence of abundant quantities of buffware ceramics, many rendered in the Sacaton style, in combination with an occasional redware sherd in the features' fill, a Sedentary period age is projected for these remains.

A map of the features' locations is provided in Figure 1. The map reveals three clusters of pithouses, situated in the southeast, northeast, and northwest quarters of the Pole Yard. Because no trenches could be cut in the

railroad spur corridor, it is possible that additional houses are present in the untested eastern half, and the houses there actually form a band of residence running roughly northwest-southeast through the Pole Yard. Four of the five cremations are also obviously clustered. Two occurred in closely spaced trenches north of the northwest pithouse cluster, and two others in closely spaced trenches roughly midway between the northwest and southeast pithouse clusters. The fact that two cremations — relatively small features whose chance of being intercepted by a trench are low — were encountered in the same area strongly suggests the occurrence of distinct cemetery areas. There is a high probability that multiple burials are present at these locations. Further, given the high degree of residential activity in the project area and occurrence of the fifth cremation among the pithouses, additional burials are likely to be encountered in the residential areas.

The prehistoric remains found during testing indicate a substantial portion of a Hohokam village is present in the Pole Yard. The village is undoubtedly a part of Los Guanacos (AZ U:9:116 [ASM]), a National Register eligible site. Further study of these remains has a high potential to contribute important information about the prehistoric past. As such, it will be recommended in the final testing report that a data recovery program be implemented if construction proceeds in the Pole Yard.

Sincerely,

T. Kathleen Henderson, Ph.D.
Desert Archaeology, Inc.
509 South 48th Street, Suite 104
Tempe, AZ 85281

cc: John L. Keane, Salt River Project
William Doelle, Patricia Castalia, Desert Archaeology
Barnaby Lewis, Gila River Indian Community

**Table 1.** Pole Yard trench characteristics.

| Trench Number | Length (m) | Maximum Depth (m) | Direction | Location | Features Present |
|---|---|---|---|---|---|
| 37 | 78.7 | 1.42 | N-S | SE Pole Yard | - |
| 38 | 67.2 | 1.46 | N-S | SE Pole Yard | 55, 56, 57, 58, 62, 63 |
| 39 | 67.1 | 1.55 | N-S | SE Pole Yard | 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 54, 64 |
| 40 | 67.2 | 1.58 | N-S | SE Pole Yard | 59, 60, 61, 65 |
| 41 | 67.5 | 1.42 | N-S | SE Pole Yard | 122, 123 |
| 42 | 71.0 | 1.31 | N-S | SW Pole Yard | 120 |
| 43 | 72.9 | 1.33 | N-S | SW Pole Yard | 111, 112, 113, 114, 115, 116, 117, 118, 119 |
| 44 | 71.9 | 1.30 | N-S | SW Pole Yard | 109, 110 |
| 45 | 72.0 | 1.43 | N-S | NE Pole Yard | 66, 67 |
| 46 | 74.0 | 1.36 | N-S | NE Pole Yard | - |
| 47 | 75.0 | 1.49 | N-S | NE Pole Yard | 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83 |
| 48 | 75.7 | 1.33 | N-S | NW Pole Yard | 97, 98 |
| 49 | 76.6 | 1.25 | N-S | NW Pole Yard | 100, 101, 102, 103 |
| 50 | 77.6 | 1.23 | N-S | NW Pole Yard | - |
| 51 | 48.9 | 1.22 | N-S | SE Pole Yard | 70 |
| 52 | 35.0 | 1.31 | N-S | NE Pole Yard | - |
| 53 | 71.8 | 1.43 | N-S | NE Pole Yard | 68, 69 |
| 54 | 73.2 | 1.40 | N-S | NE Pole Yard | 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 124 |
| 55 | 72.4 | 1.27 | N-S | NE Pole Yard | 95 |
| 56 | 72.8 | 1.22 | N-S | NE Pole Yard | 96 |
| 57 | 19.5 | 1.25 | N-S | SW Pole Yard | 121 |
| 58 | 19.5 | 1.27 | N-S | SW Pole Yard | - |
| 59 | 28.2 | 1.30 | N-S | NW Pole Yard | 99 |
| 60 | 10.1 | 1.23 | N-S | NW Pole Yard | - |
| 61 | 28.4 | 1.28 | N-S | NW Pole Yard | 104, 105, 106, 107 |
| 62 | 9.7 | 1.23 | N-S | NW Pole Yard | 108 |
| 63 | 61.5 | 1.24 | N-S | NW Pole Yard | - |

**Table 2.** Archaeological features identified in the Pole Yard.

| Feature Number | Feature Type | Trench Number | Trench Side | Depth BGS (m) | Max. Feature Length (m) | Max. Feature Depth (m) | General Location |
|---|---|---|---|---|---|---|---|
| 43 | Pithouse | 39 | Both | 0.49 | 2.07 | 0.23 | SE pole yard |
| 44 | Pithouse | 39 | West | 0.70 | 2.98 | 0.16 | SE pole yard |
| 45 | Pit, small | 39 | Both | 0.63 | 1.40 | 0.52 | SE pole yard |
| 46 | Pithouse | 39 | Both | 0.62 | 3.27 | 0.37 | SE pole yard |
| 47 | Pithouse | 39 | Both | 0.62 | 3.50 | 0.30 | SE pole yard |
| 48 | Pit, small | 39 | West | 0.64 | 0.68 | 0.33 | SE pole yard |
| 49 | Pit, small | 39 | West | 0.63 | 0.70 | 0.39 | SE pole yard |
| 50 | Possible pithouse | 39 | East | 0.67 | 2.17 | 0.37 | SE pole yard |
| 51 | Pithouse | 39 | Both | 0.62 | 2.28 | 0.18 | SE pole yard |
| 52 | Pithouse | 39 | West | 0.73 | 1.40 | 0.15 | SE pole yard |
| 54 | Pithouse | 39 | Both | 0.70 | 4.85 | 0.15 | SE pole yard |
| 55 | Pithouse | 38 | Both | 0.60 | 5.09 | 0.32 | SE pole yard |
| 56 | Pithouse | 38 | Both | 0.66 | 1.20 | 0.20 | SE pole yard |
| 57 | Secondary cremation | 38 | West | 0.72 | 0.35 | 0.21 | SE pole yard |
| 58 | Horno | 38 | Both | 0.68 | 1.20 | 0.50 | SE pole yard |
| 59 | Pit, large | 40 | Both | 0.66 | 5.05 | 0.90 | SE pole yard |
| 60 | Pit, large | 40 | West | 0.48 | 2.30 | 0.62 | SE pole yard |
| 61 | Pit, large | 40 | West | 0.59 | 1.94 | 0.69 | SE pole yard |
| 62 | Pithouse | 38 | East | 0.66 | 3.11 | 0.04 | SE pole yard |
| 63 | Hearth | 38 | West | 1.12 | 0.30 | 0.13 | SE pole yard |
| 64 | Pithouse | 39 | Both | 0.50 | 2.50* | 0.32 | SE pole yard |
| 65 | Pit, small | 40 | West | 0.55 | 0.53 | 0.37 | SE pole yard |
| 66 | Pithouse | 45 | Both | 0.48 | 5.66 | 0.20 | NE pole yard |
| 67 | Historic surface | 45 | Both | 0.24 | 6.37 | 0.17 | NE pole yard |
| 68 | Roasting pit | 53 | West | 0.38 | 0.95 | 0.13 | NE pole yard |
| 69 | Pithouse | 53 | Both | 0.55 | 4.75 | 0.25 | NE pole yard |
| 70 | Pit, large | 51 | Both | 0.67 | 1.55 | 0.32 | SE pole yard |
| 71 | Pithouse | 47 | Both | 0.43 | 3.11 | 0.25 | NE pole yard |
| 72 | Pithouse | 47 | Both | 0.70 | 3.36 | 0.22 | NE pole yard |
| 73 | Pit, small | 47 | East | 0.57 | 0.35 | 0.22 | NE pole yard |
| 74 | Pit, small | 47 | East | 0.57 | 0.61 | 0.16 | NE pole yard |
| 75 | Pit, large | 47 | East | 0.57 | 2.70 | 0.45 | NE pole yard |
| 76 | Pithouse | 47 | West | 0.62 | 1.59 | 0.25 | NE pole yard |
| 77 | Pithouse | 47 | West | 0.54 | 2.10 | 0.16 | NE pole yard |
| 78 | Pithouse | 47 | Both | 0.49 | 2.03 | 0.17 | NE pole yard |
| 79 | Pit, small | 47 | East | 0.64 | 0.73 | 0.34 | NE pole yard |
| 80 | Pithouse | 47 | Both | 0.30 | 3.86 | 0.26 | NE pole yard |
| 81 | Pithouse | 47 | Both | 0.20 | 3.90 | 0.08 | NE pole yard |
| 82 | Pit, small | 47 | East | 0.43 | 0.80 | 0.31 | NE pole yard |
| 83 | Pit, small | 47 | East | 0.40 | 1.20 | 0.30 | NE pole yard |

| Feature Number | Feature Type | Trench Number | Trench Side | Depth BGS (m) | Max. Feature Length (m) | Max. Feature Depth (m) | General Location |
|---|---|---|---|---|---|---|---|
| 84 | Roasting pit | 54 | Both | 0.46 | 0.88 | 0.20 | NE pole yard |
| 85 | Pithouse | 54 | West | 0.34 | 2.23 | 0.11 | NE pole yard |
| 86 | Pithouse | 54 | Both | 0.37 | 2.51 | 0.09 | NE pole yard |
| 87 | Bell pit | 54 | Both | 0.60 | 1.31 | 0.51 | NE pole yard |
| 88 | Pithouse | 54 | Both | 0.45 | 3.38 | 0.40 | NE pole yard |
| 89 | Pithouse | 54 | Both | 0.43 | 3.38 | 0.11 | NE pole yard |
| 90 | Pithouse | 54 | Both | 0.38 | 2.54 | 0.09 | NE pole yard |
| 91 | Pithouse | 54 | Both | 0.40 | 4.52 | 0.15 | NE pole yard |
| 92 | Pit, small | 54 | East | 0.38 | 0.95 | 0.46 | NE pole yard |
| 93 | Pithouse | 54 | Both | 0.35 | 4.98 | 0.13 | NE pole yard |
| 94 | Pithouse | 54 | Both | 0.46 | 3.35 | 0.16 | NE pole yard |
| 95 | Pithouse | 55 | East | 0.64 | 4.35 | 0.38 | NE pole yard |
| 96 | Roasting pit | 56 | West | 0.55 | 0.97 | 0.20 | NE pole yard |
| 97 | Historic ditch | 48 | West | 0.26 | 75.7* | 0.33 | NW pole yard |
| 98 | Pit, large | 48 | West | 0.58 | 1.43 | 0.18 | NW pole yard |
| 99 | Pit, large | 59 | Both | 0.53 | 2.45 | 0.13 | NW pole yard |
| 100 | Pithouse | 49 | Both | 0.54 | 3.42 | 0.26 | NW pole yard |
| 101 | Pithouse | 49 | Both | 0.55 | 5.39 | 0.27 | NW pole yard |
| 102 | Secondary cremation | 49 | West | 0.54 | 0.68 | 0.29 | NW pole yard |
| 103 | Possible pithouse | 49 | West | 0.33 | 1.38 | 0.28 | NW pole yard |
| 104 | Possible pithouse | 61 | Both | 0.44 | 4.39 | 0.24 | NW pole yard |
| 105 | Borrow pit | 61 | Both | 0.48 | 1.82 | 0.50 | NW pole yard |
| 106 | Pithouse | 61 | Both | 0.58 | 2.55 | 0.22 | NW pole yard |
| 107 | Borrow pit | 61 | Both | 0.45 | 3.41 | 0.59 | NW pole yard |
| 108 | Secondary cremation | 62 | East | 0.60 | 0.35 | 0.30 | NW pole yard |
| 109 | Pit, small | 44 | East | 0.42 | 1.15 | 0.88 | SW pole yard |
| 110 | Borrow pit | 44 | Both | 0.43 | 11.95 | 0.79 | SW pole yard |
| 111 | Borrow pit | 43 | East | 0.52 | 0.97 | 0.62 | SW pole yard |
| 112 | Borrow pit | 43 | East | 0.56 | 0.74 | 0.68 | SW pole yard |
| 113 | Borrow pit | 43 | East | 0.52 | 1.34 | 0.72 | SW pole yard |
| 114 | Borrow pit | 43 | Both | 0.47 | 1.90 | 0.73 | SW pole yard |
| 115 | Pit, small | 43 | East | 0.44 | 0.48 | 0.23 | SW pole yard |
| 116 | Pit, small | 43 | West | 0.76 | 0.51 | 0.57 | SW pole yard |
| 117 | Pit, small | 43 | East | 0.75 | 0.27 | 0.43 | SW pole yard |
| 118 | Borrow pit | 43 | East | 0.76 | 1.13 | 0.53 | SW pole yard |
| 119 | Borrow pit | 43 | West | 0.80 | 2.05 | 0.50 | SW pole yard |
| 120 | Secondary cremation | 42 | West | 0.67 | 0.25 | 0.18 | SW pole yard |
| 121 | Secondary cremation | 57 | East | 0.74 | 0.25 | 0.20 | SW pole yard |
| 122 | Pit, large | 41 | East | 0.50 | 1.92 | 0.35 | SE pole yard |
| 123 | Extramural surface | 41 | West | 0.48 | 0.90 | 0.14 | SE pole yard |
| 124 | Pit, small | 54 | Both | 0.37 | 0.49 | 0.17 | NE pole yard |

* Feature extends beyond the end of the trench.

# EXHIBIT F
# RECREATIONAL PURPOSES AND ASPECTS

# EXHIBIT F
# RECREATIONAL PURPOSES AND ASPECTS

As stipulated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*"State the extent, if any, the proposed site or route will be available to the public for recreational purposes, consistent with safety considerations and regulations, and attach any plans the applicant may have concerning the development of the recreational aspects of the proposed site or route."*

While currently there is no recreation on the project site and there are no anticipated negative impacts to recreation in the study area from the proposed KEP, the CWG and the public identified opportunities for recreation enhancements on the KEP site that SRP will implement as a part of the overall project development. These opportunities are consistent with and will complement the Tempe General Plan 2020 that calls for expanding the network of bicycle and pedestrian circulation including the use of off-street locations such as canal banks, railroad right-of-way, and utility easements. These trails are intended to provide functional links to a regional network of recreational amenities including parks, schools, and neighborhoods as shown in Figure F-1.

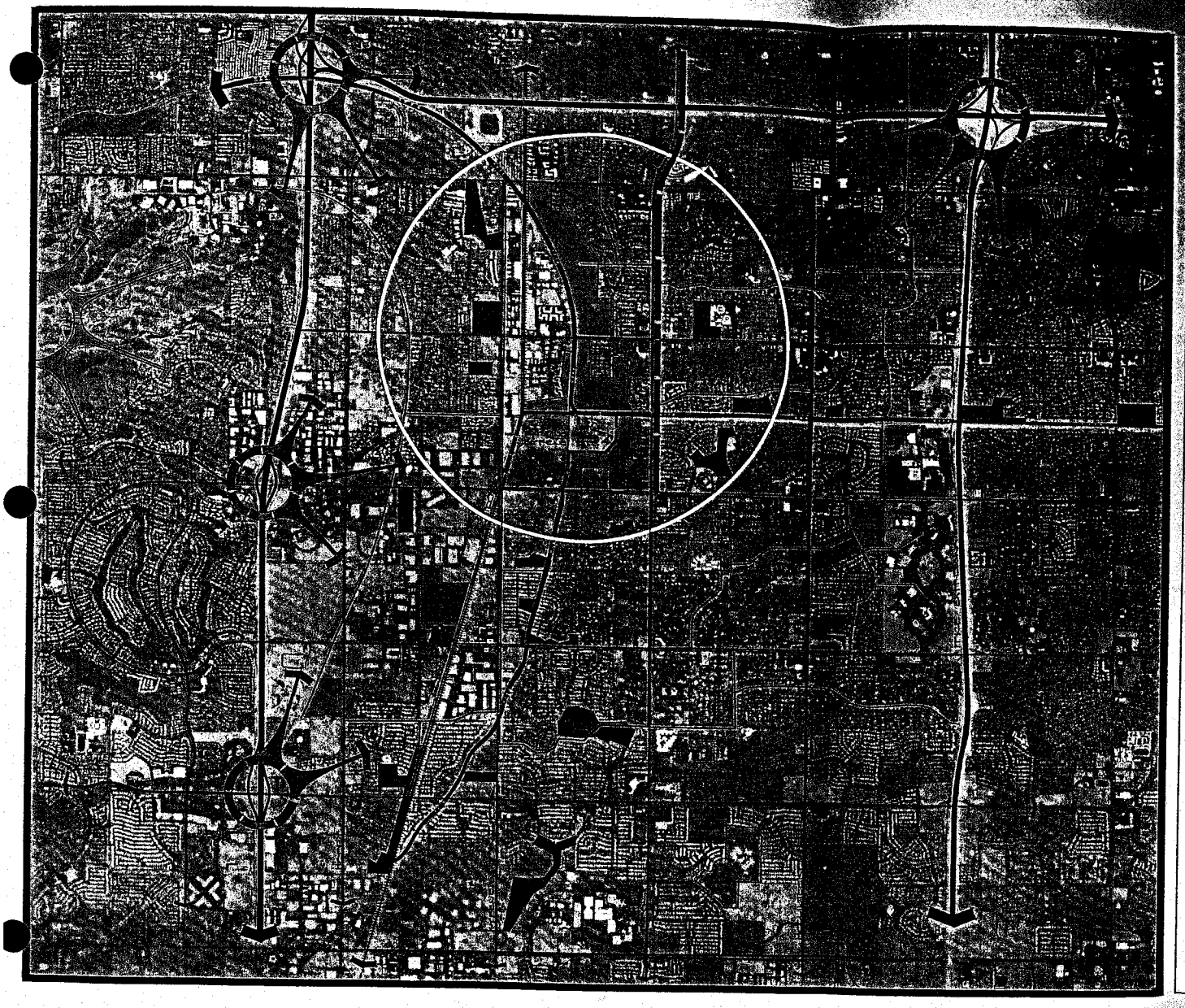
Two large recreational parks are located in the south-central portion of the city near the KEP. A trail system planned for the Union Pacific Railroad corridor runs along the west boundary of the KEP and continues to the northern portions of the city. A system of canals (providing pedestrian and bicycle access) passes through the southwestern portion of this area as well and bisects the KEP site. In addition, numerous other open space and recreational amenities are located within 2 miles from the KEP including (1) Ken McDonald Golf Course located along the north and east boundary of the KEP site, (2) Kiwanis Community Park extending between Baseline and Guadalupe roads and adjacent to the east bank of the Western Canal, (3) the Tempe Sports Complex located northwest of Kyrene and Warner roads, and (4) the YMCA located on Rural Road and Western Canal.

In maintaining consistency with the Bicycle Facilities Master Plan and Transportation Element of the City of Tempe General Plan 2020, SRP has proposed enhancements that would promote additional open space and recreation interconnections. The Bicycle Facilities Master Plan envisions a trail linkage between the Western Canal and Elliot Road. The proposed open space corridor and trail expansion enhancements would complete this connection along the eastern boundary of the site adjacent to the Ken McDonald Golf Course (Figures G-4a and G-4b).

The Transportation Element of the Tempe General Plan also promotes land development that integrates multiple modes of transportation, including pedestrians and bicycles. These transportation modes help reduce air pollution by encouraging mixed-use development and incorporating non-polluting modes of travel in context with urban design. In accordance with the new trail system, enhancements that will be considered include a parking lot/trailhead south of

the Western Canal and golf course clubhouse. This parking lot/trailhead would be located west of the YMCA with access from Rural Road (Figure G-4a). A trailhead, crosswalk, and interpretive signage on Elliot Road will also be considered as a part of the enhancements being considered on site. This enhancement will interconnect the canal trail system across Elliot Road and to the south through existing residential areas and smaller parks as shown in Figures F-1, G-3, and G-4a).

Figure F-1
Regional Area – Transportation, Open Space, and Recreation
11 x 17
color



# REGIONAL AREA - TRANSPORTATION, OPEN SPACE, AND RECREATION

Figure F-1

## Legend

- Highway/Expressway
- Major Arterial
- Proposed High Capacity Transit
- Transit Center Study Area
- Bicycle Facilities (Existing & Planned)
- Railroad
- Canal
- Regional/City Park
- Golf Course
- School/Park
- Neighborhood Park
- Regional Viewpoint

— SCALE IN FEET —

0 1000 2000 4000 8000

SOURCES: TEMPE GENERAL PLAN AND FIELD INTERPRETATION

Kyrene Expansion Project

DRAFT 6/02/00

# EXHIBIT G
# CONCEPTS OF TYPICAL FACILITIES

# EXHIBIT G
# CONCEPTS OF TYPICAL FACILITIES

As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

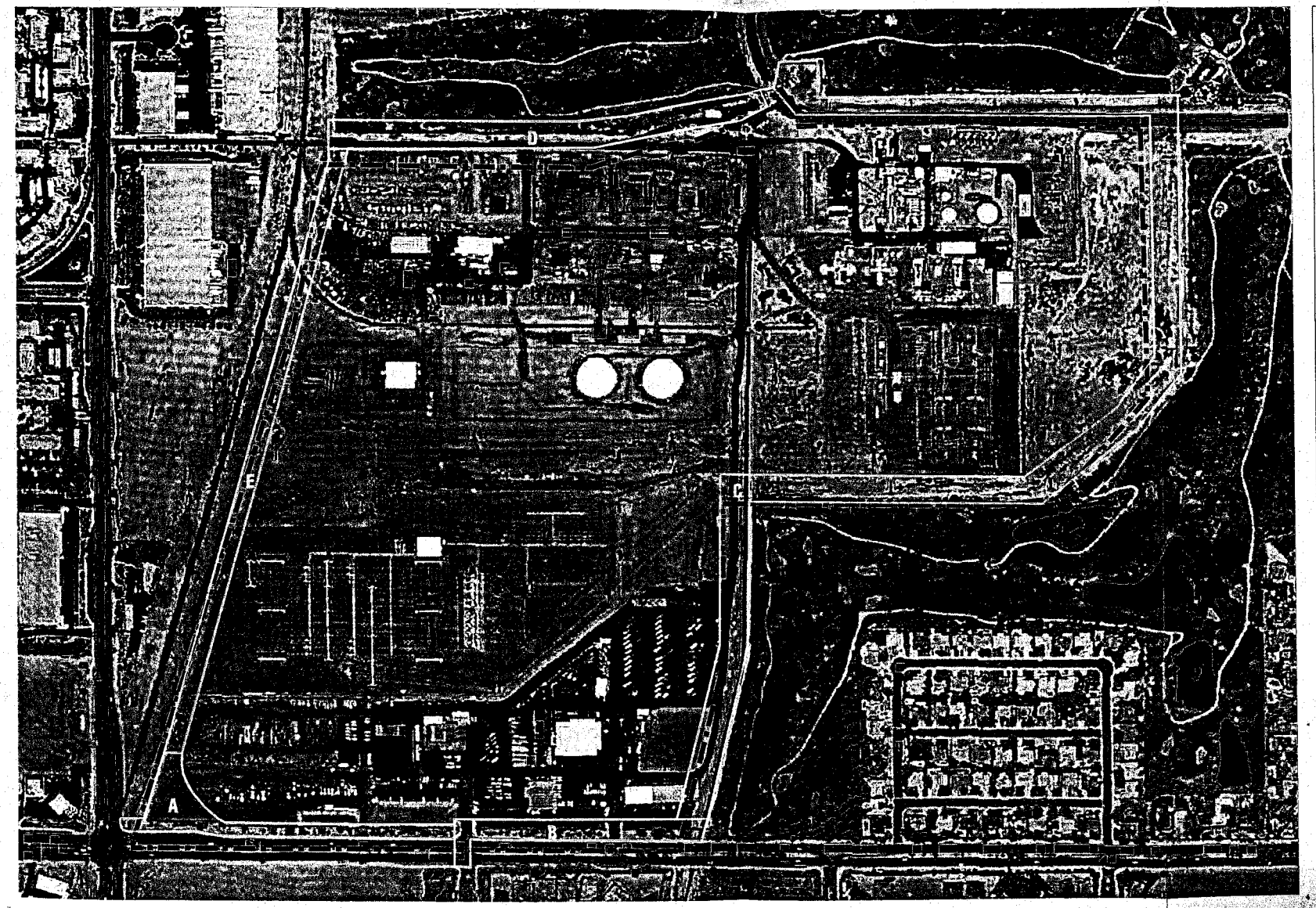
*"Attach any artist's or architect's conception of the proposed plant or transmission line structures and switchyards which applicant believes may be informative to the committee."*

## CONCEPTS OF TYPICAL FACILITIES

As discussed in Exhibit B, planning process overview, SRP continues to evaluate and explore design concepts for the KEP with the design focus group (an extension of the community working group described in Exhibit J). The concepts reveal potential designs to address the mitigation and enhancement measures that resulted from impact assessment as well as community and public issues and concerns. These preliminary concepts are contained in this exhibit.

| | |
|---|---|
| Figure G-1 | Preliminary Mitigation and Enhancement Zones |
| Figure G-2 | Area A - Mitigation and Enhancement Concepts |
| Figure G-3 | Area B - Mitigation and Enhancement Concepts |
| Figure G-4a | Area C - Mitigation and Enhancement Concepts |
| Figure G-4b | Area C - Mitigation and Enhancement Concepts |
| Figure G-5 | Area D - Mitigation and Enhancement Concepts |
| Figure G-6 | Area E - Mitigation and Enhancement Concepts |
| Figure G-7 | Community Integration Concept |

# EXHIBIT G-1
# PRELIMINARY MITIGATION AND ENHANCEMENT ZONES




# PRELIMINARY MITIGATION & ENHANCEMENT ZONES

## Figure G-1

### Legend

- Project Site
- Preliminary Project Location
- Issue Areas

0 100 200 400 600

Scale In Feet

DRAFT

Kyrene Expansion Project

# EXHIBIT G-2
# AREA A – MITIGATION AND ENHANCEMENT CONCEPTS

# AREA A

**ISSUES**
- Transportation views to existing and planned facilities
- Rail and road traffic during construction

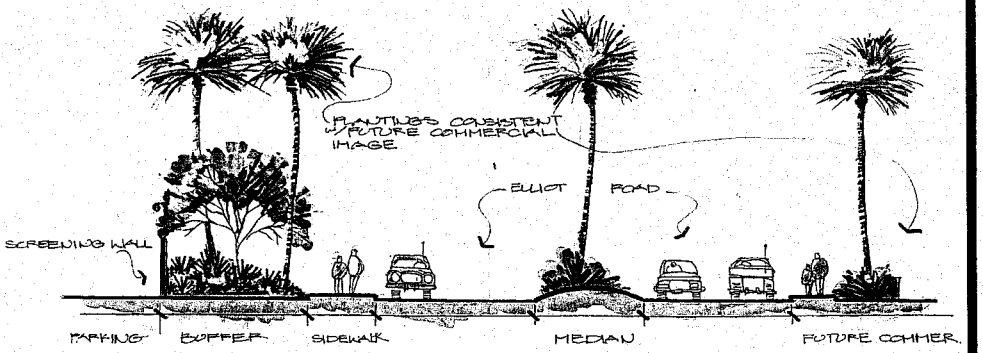
**IMPACTS**
- Filtered transportation views through existing facilities
- Temporary increase in traffic during construction

**MITIGATION MEASURES**
(in progress)

**ENHANCEMENTS**
(in progress)

**KEY TEMPE GENERAL PLAN ELEMENTS**
- This concept addresses traffic and visual issues while promoting a "gateway" and boulevard concept into the community that is consistent with existing and planned land use(s) near the corner of Kyrene and Elliot roads. See General Plan 2020 Elements under Land Use, Transportation, Urban Design, and Neighborhoods.

elevation a – a




section b – b

plan view

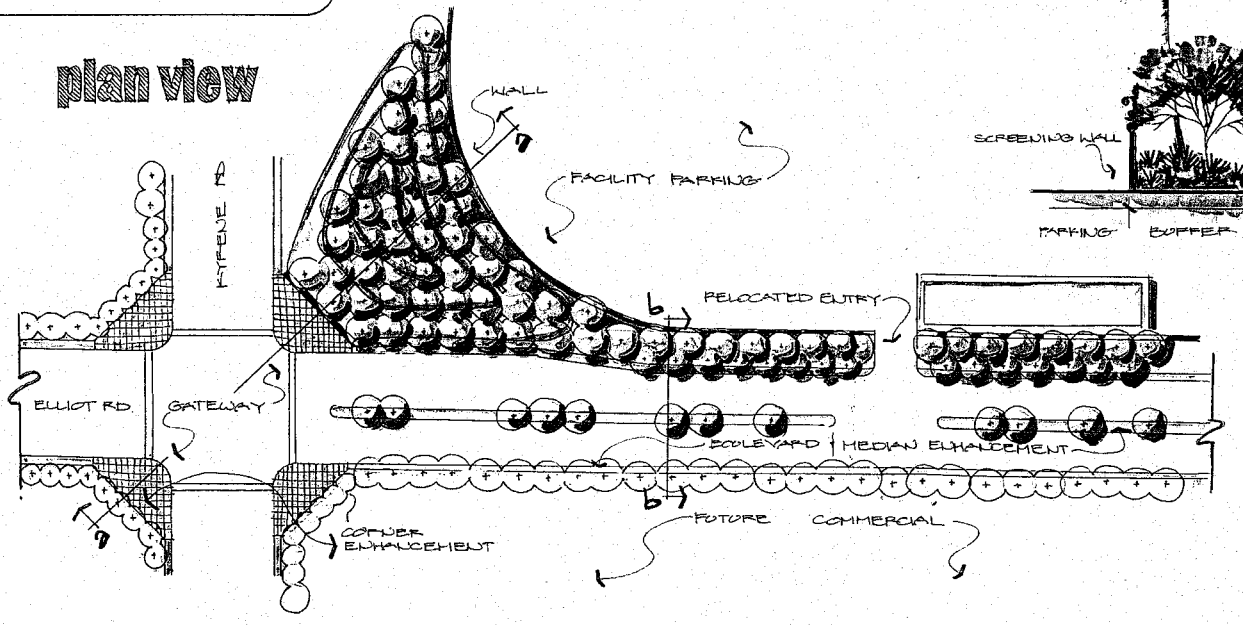



**Figure G-2**

## Mitigation and Enhancement Concepts

**Kyrene Expansion Project**

Draft 1/20/00

# EXHIBIT G-3
# AREA B – MITIGATION AND ENHANCEMENT CONCEPTS

# AREA B

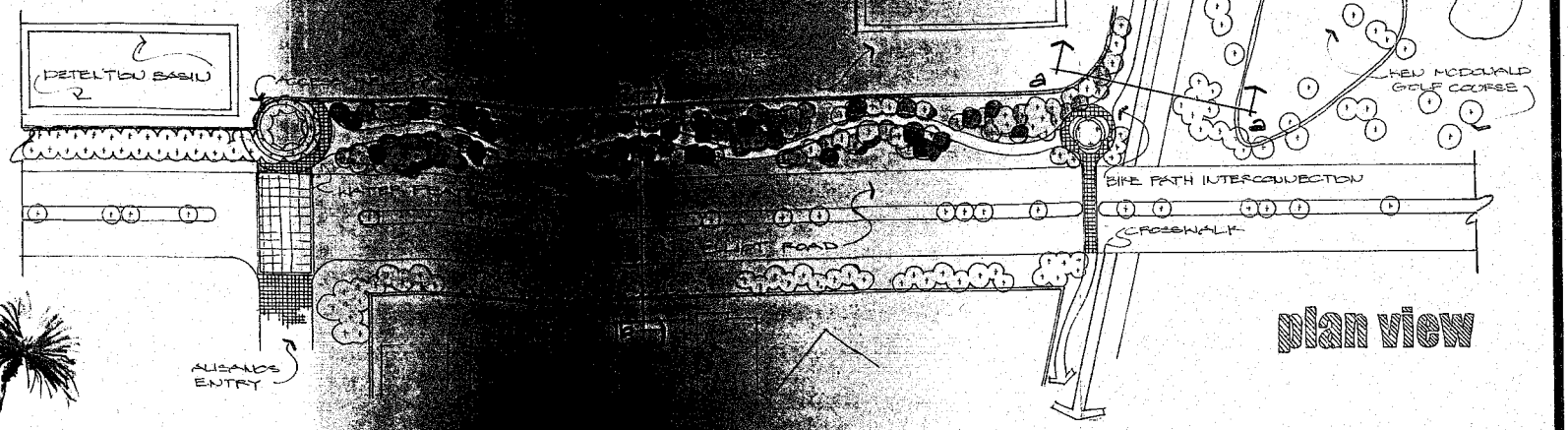
**ISSUES**
- Short-and long-term access, and noise
- Residential and transportation views
- Existing trails interconnection

**IMPACTS**
- Increase in construction traffic
- Filtered residential views through existing facilities

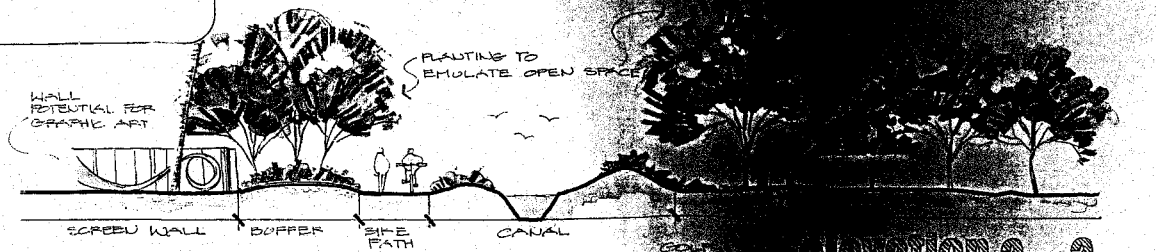
**MITIGATION MEASURES**
(in progress)

**ENHANCEMENTS**
(in progress)

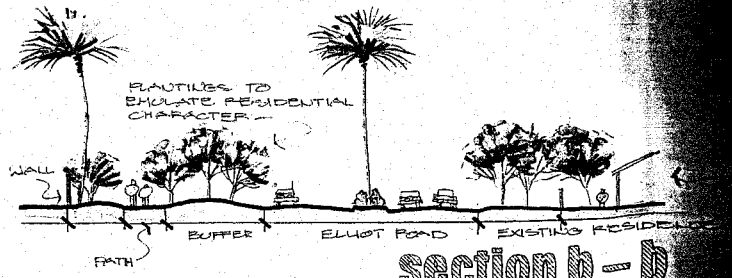
**KEY TEMPE GENERAL PLAN ELEMENTS**
- This concept addresses transition into the neighborhood and existing traffic and visual issues. Consistent with the Plan, this concept promotes landscape and "reverse frontage areas along Elliot Road that complement the neighborhood. Also included are a small plaza and transit stop (mimics the existing design treatment at Alisanos to the south) and a southern trailhead that provides access to the existing regional system along the canal. See General Plan Elements under Neighborhoods, Land Use, Urban Design, Transportation, Recreation, and Art in the City.




plan view




elevation a – a




section b – b

plant materials

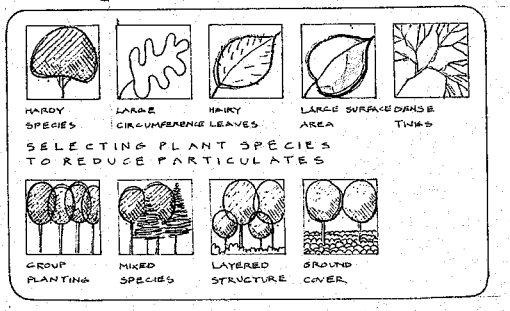



**Figure G-3**

## Mitigation and Enhancement Concepts

Kyrene Expansion Project

Draft 1/20/00

# EXHIBIT G-4a
# AREA C – MITIGATION AND ENHANCEMENT CONCEPTS

# AREA C

**ISSUES**
- Residential and recreational views
- Existing trails interconnection
- Construction and operation noise
- Lighting from existing and proposed plant

**IMPACTS**
- Filtered views through existing facilities from the golf course and surrounding residences
- Short-term noise impacts

**MITIGATION MEASURES**
(in progress)

**ENHANCEMENTS**
(in progress)

**KEY TEMPE GENERAL PLAN ELEMENTS**
- This concept promotes additional open space and recreation interconnection in concert with Ken McDonald Golf Course, the YMCA, neighborhood and regional plans. This portion of the site has been specifically "blended" into the golf course, within interconnecting trails system and interpretation facilities that could depict the history and culture of the Salt River Region and development of Tempe, and on-site cultural resources. See General Plan Elements under Recreation, Conservation of the Natural Environment, Neighborhoods, Land Use, Urban Design, Transportation, and Art in the City.

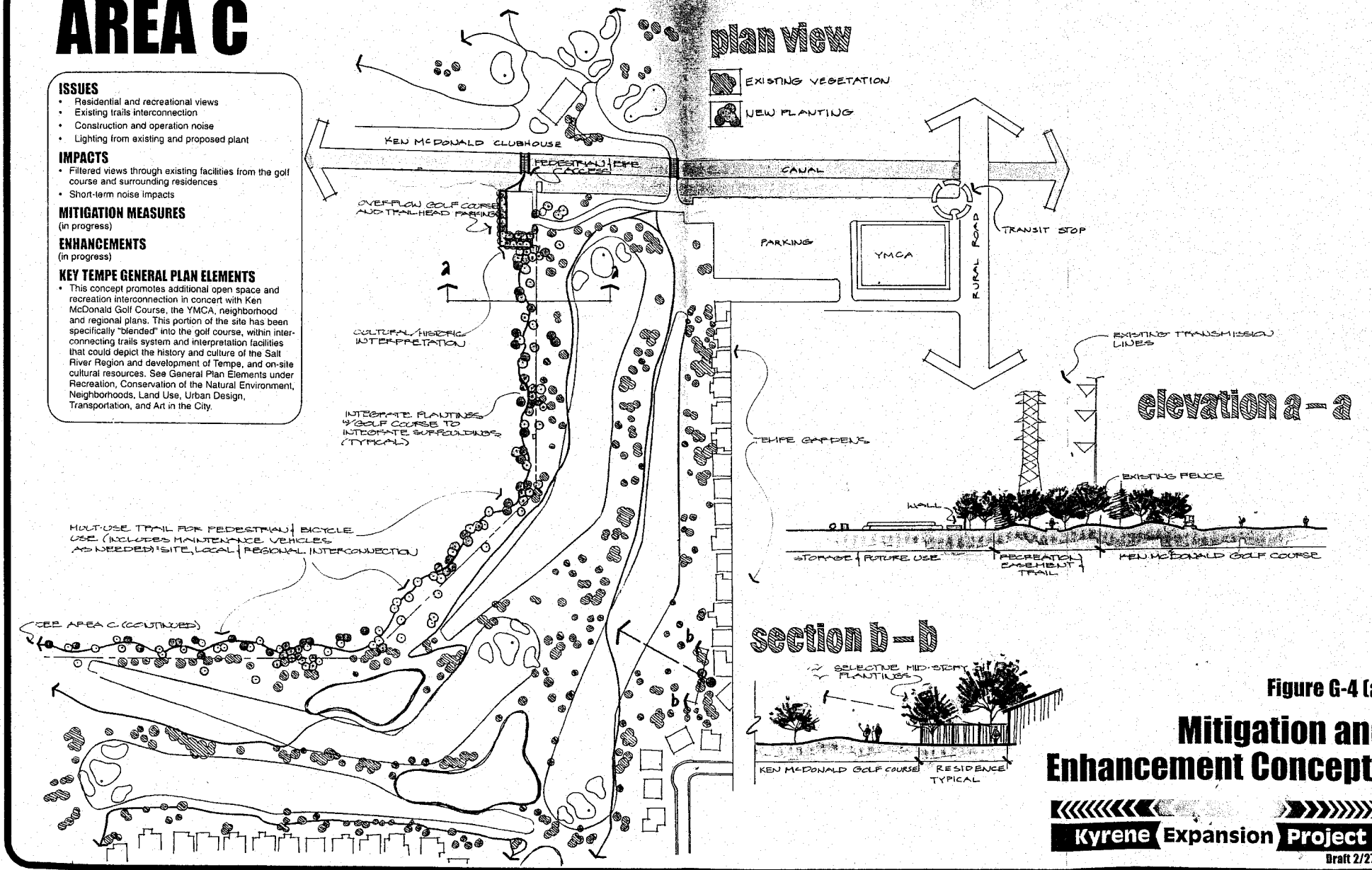



**Figure G-4 (a)**

## Mitigation and Enhancement Concepts

Kyrene Expansion Project

Draft 2/27/00

# EXHIBIT G-4b
# AREA C – MITIGATION AND ENHANCEMENT CONCEPTS

# AREA C

**ISSUES**
- Residential and recreational views
- Existing trails interconnection
- Construction and operation noise
- Lighting from existing and proposed plant

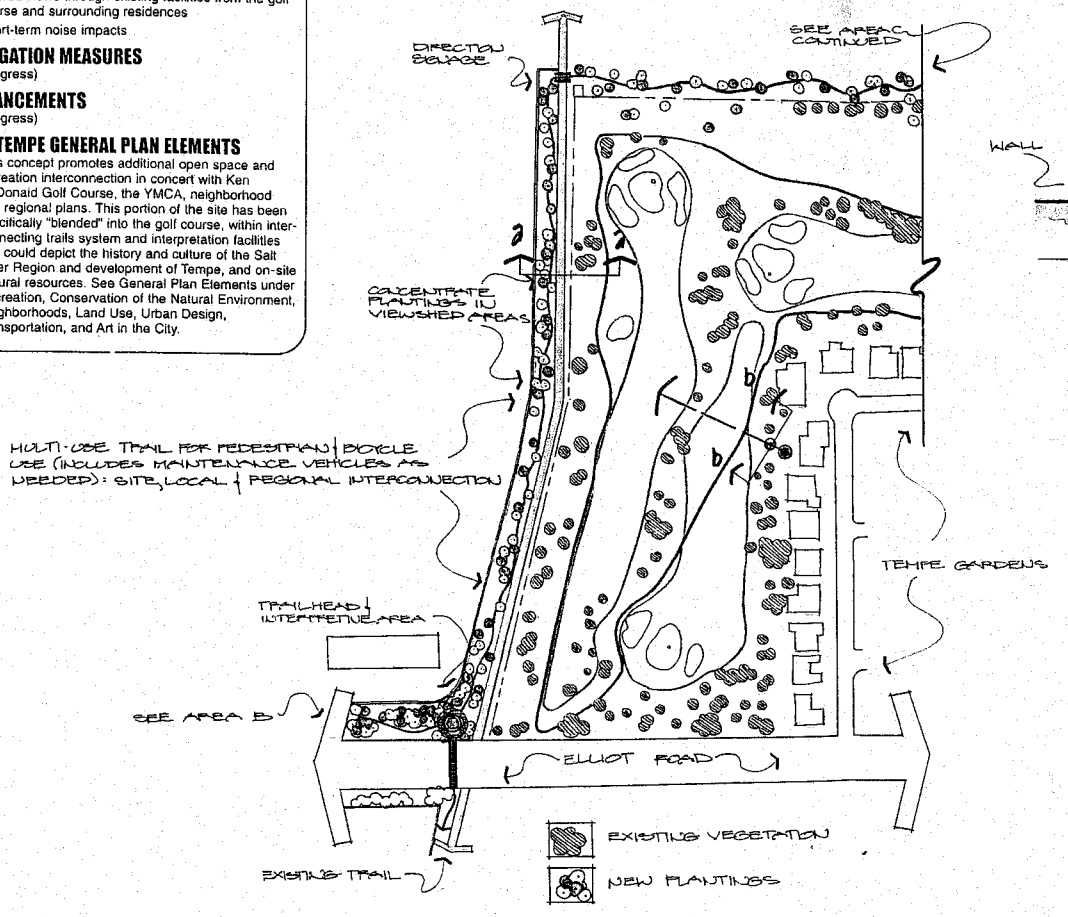
**IMPACTS**
- Filtered views through existing facilities from the golf course and surrounding residences
- Short-term noise impacts

**MITIGATION MEASURES**
(in progress)

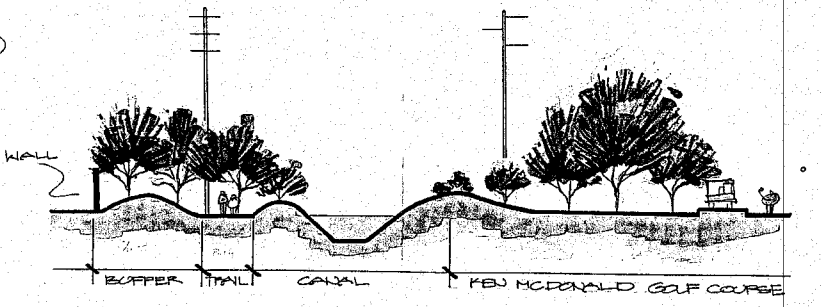
**ENHANCEMENTS**
(in progress)

**KEY TEMPE GENERAL PLAN ELEMENTS**
- This concept promotes additional open space and recreation interconnection in concert with Ken McDonald Golf Course, the YMCA, neighborhood and regional plans. This portion of the site has been specifically "blended" into the golf course, within interconnecting trails system and interpretation facilities that could depict the history and culture of the Salt River Region and development of Tempe, and on-site cultural resources. See General Plan Elements under Recreation, Conservation of the Natural Environment, Neighborhoods, Land Use, Urban Design, Transportation, and Art in the City.

## plan view




## elevation a – a




## section b – b

**Figure G-4 (b)**

# Mitigation and Enhancement Concepts

**Kyrene Expansion Project**

Draft 2/27/00

# EXHIBIT G-5
# AREA D – MITIGATION AND ENHANCEMENT CONCEPTS

# AREA D

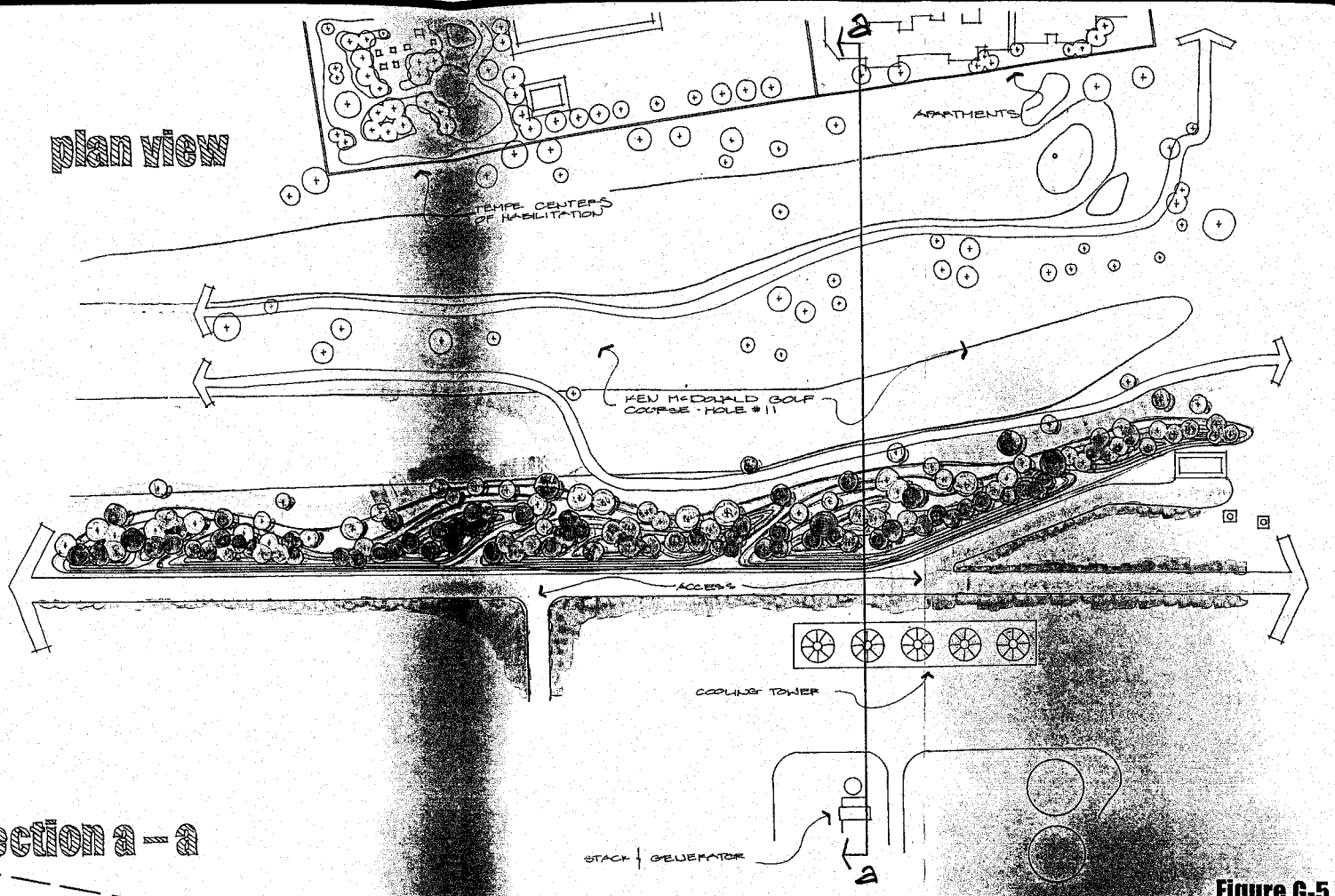
**ISSUES**
- Residential and recreational views
- Construction and operations noise

**IMPACTS**
- Direct foreground views from Ken McDonald Golf Course, Center for Habilitation, and apartment complex
- Short- and long-term noise impacts

**MITIGATION MEASURES**
(in progress)

**ENHANCEMENTS**
(in progress)

**KEY TEMPE GENERAL PLAN ELEMENTS**
- This concept promotes integration with Ken McDonald Golf Course, including landscaping and mural walls to buffer views and noise. In addition, selective off-site tree planting will occur to address specific residential concerns. An enhanced recycling center could also be provided on site near this area. See General Plan Elements under Recreation, Neighborhoods, Conservation of the Natural Environment, Land Use, Urban Design, and Art in the City.



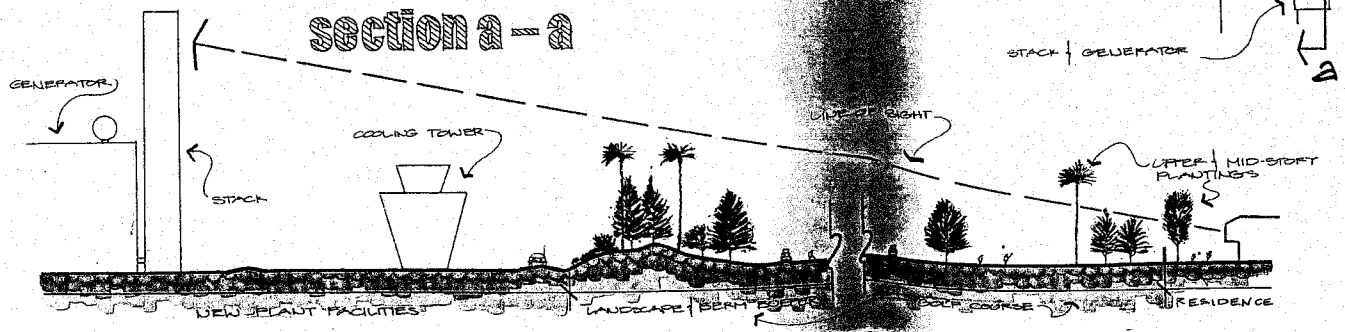




**Figure G-5**
**Mitigation and Enhancement Concepts**

Kyrene Expansion Project
Draft 1/20/00

# EXHIBIT G-6
# AREA E – MITIGATION AND ENHANCEMENT CONCEPTS

# AREA E

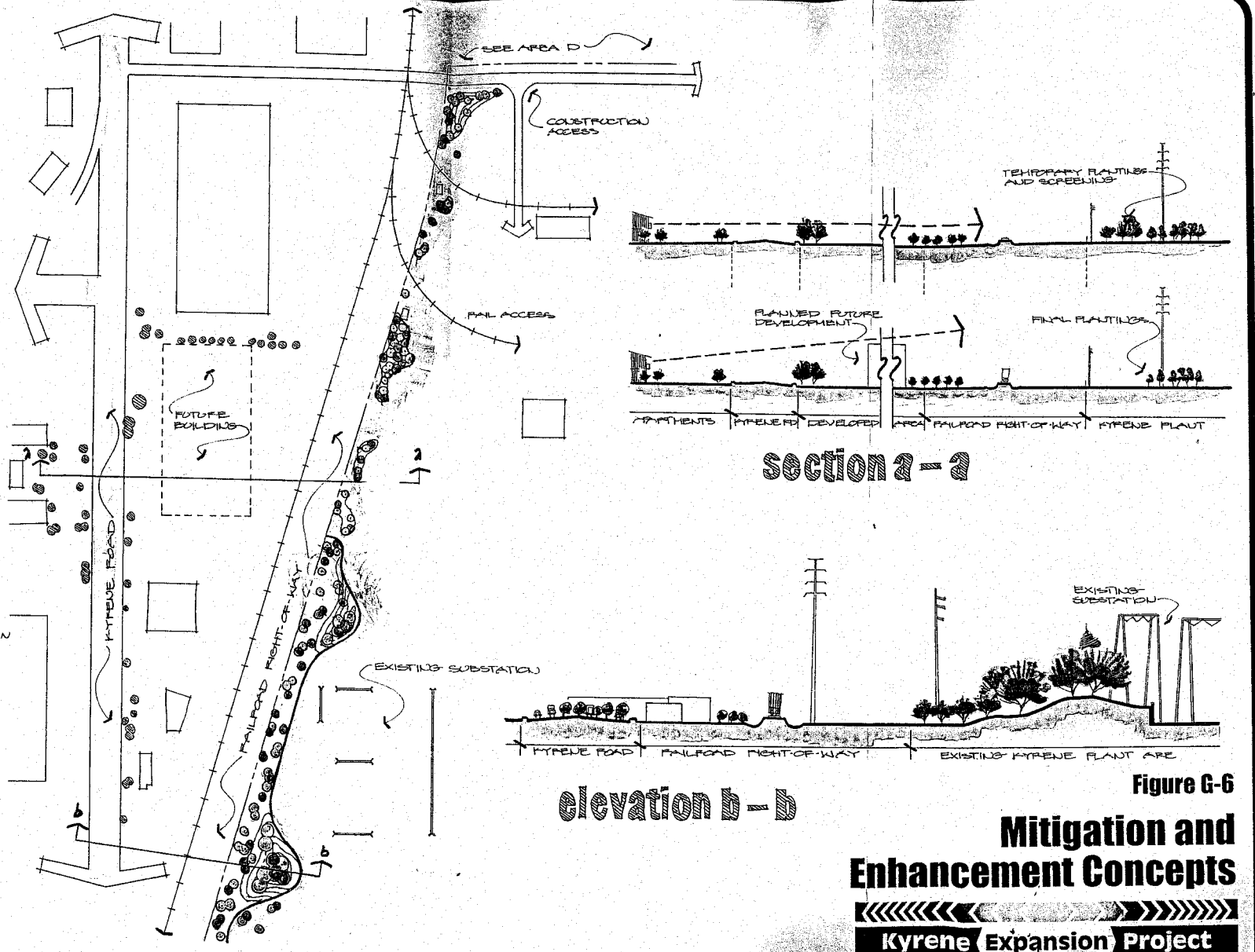
**ISSUES**
- Residential and transporation views
- Construction noise

**IMPACTS**
- Filtered views through industrial and commercial development from apartments and Kyrene Road
- Short-term noise impacts

**MITIGATION MEASURES**
(in progress)

**ENHANCEMENTS**
(in progress)

**KEY TEMPE GENERAL PLAN ELEMENTS**
- This concept integrates the site with the railroad corridor and views from Kyrene Road. Mitigation measures and enhancements focus on short- and long-term visual effects.




plan view

EXISTING VEGETATION

NEW PLANTING

section a – a

elevation b – b

**Figure G-6**

## Mitigation and Enhancement Concepts

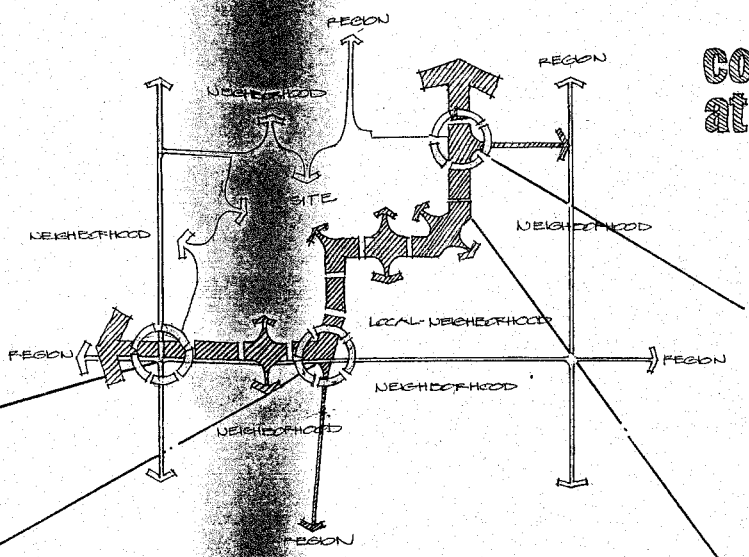
Kyrene Expansion Project

Draft 2/27/00

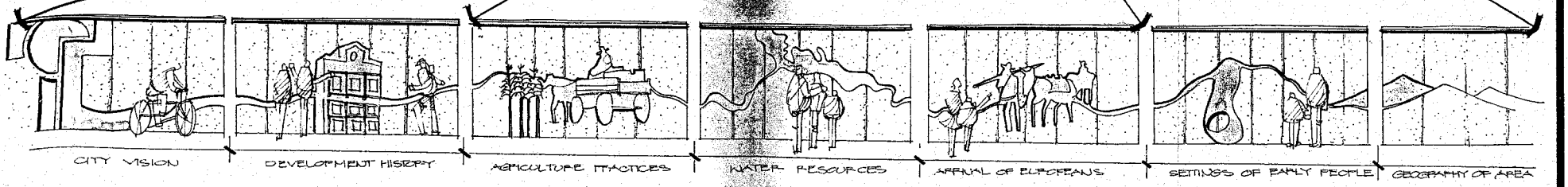
# EXHIBIT G-7
# COMMUNITY INTEGRATION CONCEPT

**KYRENE EXPANSION PROJECT**
**VISION 2020: GENERAL PLAN ELEMENTS**
**Integration into the Tempe Community**

- LAND USE
- TRANSPORTATION
- ECONOMY OF THE CITY
- URBAN DESIGN
- ART IN THE CITY
- NEIGHBORHOODS/SPECIFIC AREA PLANNING
- CONSERVATION OF THE MAN-MADE ENVIRONMENT
- CONSERVATION OF THE NATURAL ENVIRONMENT
- RECREATION
- PUBLIC SERVICES
- SAFETY




**community integration at all levels** SITE · LOCAL · REGIONAL




**future** ← **change** — **past**

**... and over time** HUMAN · NATURAL · CULTURAL ENVIRONMENTS

**Figure G-7**
# Mitigation and Enhancement Concepts

**Kyrene Expansion Project**

Draft 1/20/00

# EXHIBIT H
# EXISTING PLANS

# EXHIBIT H
# EXISTING PLANS

As stated in Arizona Corporation Commission Rules of Practice R-14-3-219:

*"To the extent applicant is able to determine, state the existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site or route."*

The Tempe General Plan 2020 has designated the existing Kyrene site as continued industrial use. As described in the General Plan the industrial category accommodates industrial as well as office business park/warehouses and limited commercial activity directly related to the primary use.

The Tempe General Plan 2020 also contains a Bicycle Master Plan that includes a proposed bicycle trail aligned along the Western Canal and an SRP lateral canal crossing the Kyrene plant site adjacent to the golf course.

SRP and the City of Tempe are currently discussing mitigation and enhancement measures integrating the plant with the existing Tempe General Plan (see Exhibit F).

# EXHIBIT I
# ANTICIPATED NOISE LEVELS AND INTERFERENCE WITH COMMUNICATION SIGNALS

# EXHIBIT I
# ANTICIPATED NOISE LEVELS AND INTERFERENCE WITH COMMUNICATION SIGNALS

As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*"Describe the anticipated noise emission levels and any interference with communication signals which will emanate from the proposed facilities."*

## ANTICIPATED NOISE

An acoustical engineering consultant evaluated the noise levels associated with full-load operation of the proposed KEP. The consultant evaluated the ambient noise levels prevalent at the site today and set acoustical design criteria for the proposed project. The design criteria will ensure that the noise from the proposed project will comply with all municipal noise regulations.

There are approximately 18 apartments across a golf course fairway immediately north of the proposed project. These apartments are approximately 600 feet distant from the project site. The next closest single-family dwellings are 1,400 feet from the corner of the site of the proposed project, and are generally southeast of the site. See Exhibit A, Figure A-3 for an illustration of these residential sites in comparison to the property on which the proposed project will be located.

Analysis of the ambient noise levels in the area, predicted noise levels from the proposed plant and incorporation of a number of noise suppression techniques resulted in the following anticipated noise levels at nearby residences.

| Receptor Point | Anticipated Noise Levels in Decibels (dBA) |
|---|---|
| Apartments approximately 600 feet north | 50 |
| Parking lot for YMCA and golf course | 49 |
| Single-family residence at Forest and East McNair approximately 1,400 feet southeast | 50 |

The anticipated noise levels cited above describe the contribution from the proposed plant. The Kyrene site is located in an urban setting with major thoroughfares on a 1-mile grid. Existing generating units at the Kyrene site also contribute to ambient conditions. However, those units are only expected to operate 1 percent of the time after the new units are operational and will thus have little impact on ambient conditions.

To meet the anticipated noise levels cited above SRP plans to utilize one or more of the following options to ensure minimal noise emissions:

- low noise fans and splash mats for the cooling tower
- inlet silencing for the combustion turbine
- exhaust silencing in the HRSG outlet stack
- mufflers on steam vents
- barrier walls

The anticipated noise levels attributed to the proposed project will be within the allowable code limits for the City of Tempe.

The noise modeling and survey work was conducted by Hessler Associates, Inc. of Haymarket, Virginia. The survey work on ambient conditions was performed in September 1999 and for at least some of the hours of the survey all five existing generating units at the Kyrene site were operating. The modeling incorporated an analysis of individual equipment components and the predicted noise levels from each of such components. The model incorporates acoustical screening associated with the backyard block walls predominant in the area as well as the losses associated with distance from the proposed plant to the receptor points.

This type of noise modeling has been verified on numerous occasions via comparison of predicted and actual results. Given the information available for the type of generating station equipment, which will be employed, it is anticipated that the planned facility will not have any adverse noise impact on the local environment.

The electrical effects of SRP transmission lines are those related to electric fields, magnetic fields, and corona. Possible radio noise (RI) or television interference (TVI) are consequences of transmission line corona discharges. Corona is a function of the conductor voltage gradient, controlled by the line voltage, conductor diameter, height of conductors above ground, phase spacing, geometry, and meteorological conditions. The Applicant proposes no design changes to the Kyrene transmission lines and the parameters, which impact the conductor voltage gradient, thus SRP expects no changes in existing RI or TVI performance.

# EXHIBIT J
# SPECIAL FACTORS: PUBLIC INVOLVEMENT

# EXHIBIT J
# SPECIAL FACTORS: PUBLIC INVOLVEMENT

## PUBLIC INVOLVEMENT PROCESS

Public involvement is an integral part of the environmental planning process. Public involvement activities began at the earliest stages of the KEP, offering the community an opportunity to obtain information and provide input at the first stage of the project. Through these activities, the community became instrumental in the planning process.

This section will address the following topics:

- purpose of the public involvement plan
- issues identified through the public planning process
- methods used
- materials

### Purpose of the Public Involvement Plan

The primary objective of the public involvement plan is to integrate public input into the planning process. In addition, it is designed to establish and maintain communication; inform and educate; accurately identify and consider the issues and concerns of the community through the gathering of public comment; and ensure that public input is considered in the overall decision-making process.

In each step of the planning process, the public was presented an opportunity to review and comment on new and updated project information. The public process allowed the project team to be responsive to comments and concerns expressed. The plan includes various methods of communication and public interaction that are explained in detail below.

### Issues Identification

The first step of the public involvement plan was to conduct interviews of community representatives to identify initial potential concerns and issues as well as potential members for the project CWG. People who were contacted shared information about the history and character of the study area, community issues and concerns, and offered suggestions on effective means of communication with local residents. Input received from these interviews allowed the project team to refine the public involvement plan to best meet the needs of the community.

At the early stages of the project, it became apparent that community issues could be classified into three main categories: general, existing plant, and proposed plant. The general issues encompassed topics such as project need, alternatives, description, proponents/owners, economics, and the planning process. There were also many comments received on both the

existing and proposed facilities concerning air quality, water use, noise levels, visual impact, land use, recreation, and health and safety. Property value concerns related to the proposed facility.

A project log of all public comments was maintained throughout the project. As of June 8, 2000, 510 contacts to SRP or EPG had been made. Of those, 196 were telephone calls; 194 were comment forms; 109 were e-mail messages; and 11 were letters.

## Methods Used

A variety of public involvement methods were utilized to provide information and address the concerns of all parties as well as those seeking involvement. Prior to initiating any public contact, a study area was established extending an approximate 2½-mile radius from the project site. Within this study area project members identified groups, businesses, homeowner and neighborhood associations, and individuals active in the community who would likely be interested in, or perceived to be impacted by, the proposed project. Initial project meetings were held with these groups and individuals to help determine what public involvement methods and contacts would be most effectively used for the duration of the project.

The project team used a combination of printed materials, electronic materials, and numerous meeting formats to disseminate information and gather comment. The primary methods utilized were newsletters, SRP billing inserts, telephone information line, website, public open houses, small group meetings, briefings, and CWG meetings.

## Materials

Printed and electronic materials were distributed or made available to the public to relay project information and to gather public comment.

*Project Mailing Lists:* The general mailing list of approximately 37,500 names was generated through a title company contracted to search county records for property ownership within the project study area. An additional project mailing list was developed and maintained throughout the project consisting of CWG members, elected officials, City of Tempe homeowners/neighborhood association contact lists, and others who expressed interest in the project. Requests to be added to this second mailing list were received from open house and newsletter comment forms, e-mails, telephone line messages, and open house sign-in sheets. At filing, this second list consisted of 538 contacts. Those on this mailing list received project mailings including newsletters, fact sheets, and meeting announcements from the time they contacted project representatives.

*Newsletters*: Two newsletters, two fact sheets, and an open house announcement postcard were distributed to the project mailing lists described above. Each newsletter provided general information on the project description, schedule, planning process, participants, and

opportunities for public participation. Each newsletter contained information on how to contact the project team (telephone number and website address), as well as a comment form to submit written comments. In addition, SRP distributed four fact sheets to local business customers detailing general information on the project. Copies of these mailings can be found in Exhibit J-1.

*SRP Billing Insert:* Another method to inform the public about the project was the use of the SRP billing insert, "Contact" (found in Exhibit J-1), which is distributed to approximately 710,000 SRP customers. In September 1999, the insert contained an article about east valley growth and new generation projects. In November 1999, April 2000, and May 2000, the articles highlighted the need for additional power in the southeast valley, SRP plans to build local generation, and the benefits of local generation to SRP customers.

*Telephone Information Line:* A telephone voice message information line was established and maintained to regularly include project information and upcoming meeting dates. Callers had the option to leave their name and address for inclusion on the project mailing list, or to leave their number for a call back from a project team member to discuss any questions or concerns they might have.

*Project Website and E-mail Address:* A project website, www.kyrenefacts.org, was established and maintained to provide the public with an opportunity to review written materials on the project, request to be added to the project mailing list, submit e-mail questions or comments, or request to be contacted by a project team member.

*Media Relations:* These efforts provided external communication support for the project. Information on significant developments was communicated to relevant news organizations as a means to help educate regulators, community leaders, and the general public about the need for a new urban generation resource. News releases were sent on August 10, 1999, October 13, 1999, and May 8, 2000. These announced the need for additional generation, SRP's alliance with Dynegy and NRG, and eventually provided information regarding the identification of the Kyrene site as the best suited for a new generation facility. Copies of these releases can be found in Exhibit J-2.

*Community Working Group:* A CWG composed of 17 members was established to provide a diverse range of opinions and community perspective to the project team. Members were chosen based on their professional knowledge, neighborhood representation, availability to participate, and knowledge of the community. Potential members were initially identified through community and agency contact and then interviewed by project team members. As needed, additional members were added throughout the process based on their ability to provide additional key input. See the table on the following page for a listing of CWG membership.

| CWG MEMBERS | |
|---|---|
| **Name** | **Affiliation** |
| **City/Town Representation** | |
| Laurel Arndt | City of Phoenix, Ahwatukee Foothills Village Planning Committee |
| Bill Coughlin, Environmental Engineer | City of Tempe |
| Mike Shimkus, Building Official | Town of Guadalupe |
| **School Districts/Education** | |
| Damian Nichols | Kyrene Elementary School District |
| Representative | Tempe Union High School District |
| **Business** | |
| Mary Ann Miller | Tempe Chamber of Commerce |
| **Organizations Bordering SRP Facility** | |
| David Cutty, President/CEO | The Centers for Habilitation |
| Steve Schyberg, Manager | Ken McDonald Golf Course |
| Duane Washkowiak | YMCA Board Member and Golf Course Advisory Committee Member |
| **Neighborhood/Area Representation** | |
| Randy Courtney | Alisanos |
| Lauren Ifflander | Optimist Park Northwest |
| Tom Lovell | Alisanos |
| Alan Matheson | Pecan Groves Estates |
| Jim Murphy | Tempe Gardens |
| Ted Pawlikowski | Coventry Tempe |
| Dean Purdy | Duskfire II |
| Steven Smith | Festiva Tempe Homeowners Association |

To date, the CWG has met a total of 10 times. The discussion has included aspects of the project such as need, description, resources, impacts, and mitigation. CWG meeting content was determined by both the planning process and member request. Each meeting is summarized below.

**Meeting 1**—The purpose of the first CWG meeting was to provide information about the need for the proposed expansion. In addition, a general overview of the proposed project, existing site, and planning process were provided. The roles and responsibilities of each participating member of the planning process were explained, and group members were encouraged to openly share their views.

**Meeting 2**—Statistics on public comments received, including the source (e-mail, telephone, CWG, etc.) and subject, were presented. The planning process was also described in detail, specifically the impact assessment and mitigation planning process.

**Meeting 3**—The third meeting expanded the previous presentation on project need, alternatives, description, and ownership. Specific data regarding future growth projections, the existing transmission grid, existing site infrastructure, and the structure of a deregulated electric market was presented.

**Meeting 4**—At the fourth meeting, the group continued the presentation and discussion of Meeting 3 materials.

**Meeting 5**—The CWG was provided with a tour of the existing Kyrene plant for the fifth meeting. The purpose was to provide group members with an understanding of existing conditions and infrastructure and to establish a foundation for future discussions on areas of impact and relevant mitigation measures. Following the tour, members reviewed the planning process and were presented with a preliminary discussion on site mitigation and enhancement concepts.

**Meeting 6**—The purpose of this meeting was to present information on air quality. Members were provided with EPA air quality standards for pollutants, as well as information regarding expected levels of pollutants from the proposed facility.

**Meeting 7**—The seventh CWG meeting focused on noise considerations. Common sounds and their decibel levels were described and compared to noise measurements taken from different points of the existing site. City of Tempe noise ordinances were discussed, as well as the expected combined noise levels of the existing and proposed facilities.

**Meeting 8**—The eighth CWG meeting consisted of group discussion on various aspects of the project including increased public awareness and involvement. Members shared their knowledge of neighborhood concerns.

**Meeting 9**—The ninth meeting consisted of a presentation on water supply and wastewater discharge. An update on public involvement activities and recent in-home mitigation workshops was provided. The group was also given basic information on the National Pollution Discharge Elimination System permitting process and the recently held EPA scoping meeting.

**Meeting 10**—This meeting was held to inform the CWG of the agreement made between SRP and members of the STOP opposition group. Details of the agreement and membership of the mediation group were provided. SRP representatives who attended the mediations were available to answer questions raised by CWG members about the agreement and the new project description.

Following Meeting 10, the CWG transitioned into a "Focus Group" where members would participate in and review mitigation and enhancement concepts and plans. The membership was expanded to include owners/managers of apartment complexes in close proximity to the Kyrene site. It is expected that the Focus Group will continue to meet over the next several months.

*Public Open Houses:* The project team hosted two sets of two public open houses, held in October 1999 and February 2000. The meetings were held in local Tempe schools and advertised through mailings and paid newspaper advertisements (Exhibit J-2), the telephone information line, and website, and letters to 40 homeowners association contacts within the study area. Over 130 community members attended the open house meetings in October; 219 attended the meetings in February.

Information presented at the open house meetings included project need, alternatives, site description, participants, economics, and the environmental and public planning processes. Facility information presented covered topics such as air quality, water quality, noise considerations, visual resources, impact assessment, mitigation planning, and land use.

The majority of the information was relayed through informational displays and graphics at stations staffed by the appropriate project personnel. Attendees were encouraged to ask questions and relay their thoughts and comments. Comment forms were provided that offered attendees the choice of completing the form at the open house or mailing at a later time. In an effort to be responsive to the public's request for a different format, the project team modified the format of the second open house to include a brief presentation on air quality. This presentation was offered approximately every half-hour throughout the three-hour open house.

*Neighborhood Workshops:* In response to public request and comment, the project team held neighborhood workshops at residential homes or in local facilities, primarily to focus on mitigation and enhancement concepts. Interest in the workshops was initially gauged with sign-up sheets provided at the second open house. They were then advertised with flyers provided by either the neighborhood contact or the project team. Examples of these flyers can be found in Exhibit J-3.

*Small Group Meetings/Local Official Briefings:* During the planning process, informal, informational small group meetings and briefings were held in the community and with local officials. At the request of individuals or homeowners associations, project team representatives met to provide information and discuss concerns, ideas, or questions. See the listing of these meetings held by SRP at the end of this section.

To provide project information to city officials, SRP's government relations representative arranged and attended project briefings and sent information letters to key City of Tempe officials (Exhibit J-4). As requested, additional information was provided throughout the planning process to maintain open communication.

## Mediation with Kyrene Neighbors

Because of neighborhood opposition to the planned expansion, in March 2000, Tempe mayor Neil Giuliano suggested that the neighborhood group opposing the expansion, other neighborhood representatives, and SRP engage in a mediation effort to examine SRP's

expansion plans and resolve differences in a manner which would be acceptable to the neighbors. All parties agreed to participate in a mediation process.

The mediation participants held mediation sessions on April 11, April 20, April 24, and May 4, 2000. The mediator was former Arizona Attorney General and Tempe resident Grant Woods. On May 4, 2000 the parties to the mediation reached agreement on the major issues involving the expansion of the Kyrene facility, the operation of the current facilities, and mitigation and enhancement requirements.

The points of the agreements reached during the mediation process, which are reflected in this application, as appropriate, are:

a. SRP's proposed expansion of the Kyrene facility will be scaled back from 825 MW to 250 MW. With the existing units, this will create an overall site limit of 505 MW.
b. SRP will operate the existing units at no greater than a one percent capacity factor, calculated on a rolling two-year average.
c. Units one and two of the existing units will be retrofitted with NOX reduction technology.
d. SRP will implement mitigation and enhancement measures as identified by the CWG.
e. SRP will diligently pursue obtaining required air emissions offsets in the immediate area of the Kyrene facility.
f. SRP will comply with applicable Tempe noise ordinances.

The document upon which the parties agreed during the mediation is shown in Exhibit J-5.

| SMALL GROUP MEETINGS/LOCAL OFFICIAL BRIEFINGS | | | |
|---|---|---|---|
| **Date** | **Name/Organization** | **Project Team Attendees** | **Discussion** |
| 08/05/99 | John Ward | Janeen Rohovit, SRP; Dick Hayslip, SRP | Location of facility on property, why site chosen, screening, current community cable replacement issues, how SRP will execute public process. |
| 08/10/99 | Ahwatukee Village Planning Committee (John McCormish) | Janeen Rohovit, SRP; Dick Hayslip, SRP | Why decline in existing resources, source of offsets, why site chosen, partners, bonds, effluent. |
| 08/16/99 | Stephanie Rae | Janeen Rohovit, SRP; Dick Hayslip, SRP | Generation, capacity at Kyrene, operation of current plant, more transmission lines, payment for expansion, rise in customer rates, access to existing plant, impact of new construction, location of new plant on site, ownership, solar panels of plant on University and McClintock, other neighborhoods meeting with SRP about project, lighting design of current plant. |
| 08/19/99 | Alisanos Sales Office | Janeen Rohovit, SRP; Dick Hayslip, SRP | Location of existing and new facilities, revegetation effort, improvements along Elliot/Fulton development, water use, use of reclaimed wastewater, noise, EMF levels, construction and equipment, increase of traffic, Kyrene vs. Santan, timeframe for public process and project, methods of information. |
| 09/01/99 | 33 residents from Alisansos | Janeen Rohovit, SRP; Dick Hayslip, SRP | City zoning at SRP property, property values, disclosure by realtors/developers, some neighbors didn't know about project, why SRP didn't accept Fulton landscaping proposal, EMF and health, what is at site now, access to plant, increased traffic, movement of 230kV and 500kV transformers, general generation questions, water use, noise, stacks, razing existing plant, Santan, aesthetics, visible steam, mitigation. |
| 09/14/00 | Rep. Mike Gardner | Janeen Rohovit, SRP; Dick Hayslip, SRP | Existing and future facilities, air quality, noise, permitting (city and state process), mitigation measures, construction traffic, other groups meeting with SRP. |
| 09/24/99 | Tempe Center for Habilitation (TCH) | Janeen Rohovit, SRP; Barbara Hoffnagle, SRP | Air quality, impact on center consumers, relocation of SRP recycling center to East Valley, interest in serving on CWG. |

| SMALL GROUP MEETINGS/LOCAL OFFICIAL BRIEFINGS | | | |
|---|---|---|---|
| **Date** | **Name/Organization** | **Project Team Attendees** | **Discussion** |
| 12/02/99 | George Bedewi | Janeen Rohovit, SRP; Randy Dietrich, SRP | Project information was presented; primary issue with group was outcome of air modeling. Group promised to follow our process and remain open-minded. |
| 01/03/00 | Mary Althemus | Janeen Rohovit, SRP | New plant, view of existing facility. Ms. Althemus may purchase home in Galleria. |
| 01/12/00 | Wendy Hanson, La Estancia Apartments | Janeen Rohovit, SRP | Concerned about information she has heard on project. After discussion seems favorable to the project and referred Ms. Rohovit to two friends who live near facility. |
| 01/13/00 | Katie and Scott James | Janeen Rohovit, SRP; Randy Dietrich, SRP | Live north of YMCA, backyard borders canal access road. Very active in STOP group. |
| 01/17/00 | Doug Seward | Janeen Rohovit, SRP; Randy Dietrich, SRP | Homes back up to golf course. Mr. Seward wants a mitigation meeting if plant is sited. |
| 01/17/00 | Mary Marin, Manager, La Estancia Apartments | Janeen Rohovit, SRP; Randy Dietrich, SRP | After reviewing the project, she requested a briefing for the apartment owner. |
| 01/18/00 | Dave and Liz Helfand | Janeen Rohovit, SRP | Live on east side of golf course. Opposed to project but impressed by property tax reduction estimates. |
| 01/18/00 | Former Councilwoman Carol Smith | Kathie Lee, SRP; Dick Hayslip, SRP; Nelson Ross, SRP; Randy Dietrich, SRP | Gave general project overview. |
| 01/20/00 | Kiwanis Club of Tempe | Randy Dietrich, SRP; Janeen Rohovit, SRP | Approximately 45 members attended, reviewed general project information. |
| 01/21/00 | Jeff Tessitorie | Janeen Rohovit, SRP | Mr. Tessitorie is realtor, may purchase in Alisanos. Convinced project will not devalue property. Thinks value will increase because of mitigation. Concerned about 69kV line located on canal east of Alisanos. EMF read taken. |
| 01/25/00 | City of Tempe City Council candidate G. Fritz Tuffli | Kathie Lee, SRP; Randy Dietrich, SRP; Nelson Ross, SRP | Gave general project overview. |
| 01/26/00 | City of Tempe City Council candidate Mark Mitchell | Kathie Lee, SRP; Randy Dietrich, SRP; Nelson Ross, SRP | Gave general project overview. |

| SMALL GROUP MEETINGS/LOCAL OFFICIAL BRIEFINGS | | | |
|---|---|---|---|
| **Date** | **Name/Organization** | **Project Team Attendees** | **Discussion** |
| 01/26/00 | Kathryn Motil, Tempe Multiple Listing Service | Janeen Rohovit, SRP; Randy Dietrich, SRP | Approximately 50 people attended, Overview of project was presented. Questions on air, noise, stack height, need. |
| 01/27/00 | City of Tempe City Council candidate Dr. Fred Wood | Kathie Lee, SRP; Janeen Rohovit, SRP; Nelson Ross, SRP | Gave general project overview. |
| 01/27/00 | Jim Briggs | Janeen Rohovit, SRP | Mr. Briggs is a SRP employee, discussed project in general. |
| 01/27/00 | Joseph Yousem, owner La Estancia Apartments | Janeen Rohovit, SRP; Randy Dietrich, SRP | Presented overview of project. |
| 01/30/00 | John Ward | Janeen Rohovit, SRP; Randy Dietrich, SRP | Discussed project. |
| 01/31/00 | City of Tempe City Council candidate Richard Bank | Kathie Lee, SRP; Dick Hayslip, SRP; Janeen Rohovit, SRP | Gave general project overview. |
| 01/31/00 | City of Tempe City Council candidate Gretchen Wolfe | Kathie Lee, SRP; Janeen Rohovit, SRP; Randy Dietrich, SRP; Dick Hayslip, SRP | Gave general project overview. |
| 02/01/00 | Former City of Tempe Councilman Don Cassano | Kathie Lee, SRP; Nelson Ross, SRP; Randy Dietrich, SRP | Gave general project overview. |
| 02/01/00 | City of Tempe City Council candidate Kolby Granville | Kathie Lee, SRP; Nelson Ross, SRP; Randy Dietrich, SRP | Gave general project overview. |
| 02/01/00 | Chuck Hosey | Janeen Rohovit, SRP; Randy Dietrich, SRP | Met with Mr. Hosey, Carter Rogers, and Chuck's brother. Chuck thinks project will have negative impact on real estate and is opposed. |
| 02/03/00 | City of Tempe City Council candidate Barbara Carter | Kathie Lee, SRP; Nelson Ross, SRP; Dick Hayslip, SRP | Gave general project overview. |
| 02/03/00 | City of Tempe City Council candidate Richard Erdmann | Kathie Lee, SRP; Nelson Ross, SRP; Randy Dietrich, SRP | Gave general project overview. |
| 02/07/00 | Former City of Tempe Councilwoman Linda Spears | Kathie Lee, SRP; Nelson Ross, SRP; Randy Dietrich, SRP | Gave general project overview. |

| SMALL GROUP MEETINGS/LOCAL OFFICIAL BRIEFINGS | | | |
|---|---|---|---|
| **Date** | **Name/Organization** | **Project Team Attendees** | **Discussion** |
| 02/07/00 | City of Tempe City Council candidate Peter Graves | Kathie Lee, SRP; Nelson Ross, SRP; Randy Dietrich, SRP | Gave general project overview. |
| 02/07/00 | City of Tempe Councilman Dennis Cahill | Kathie Lee, SRP; Nelson Ross, SRP; Randy Dietrich, SRP | Gave general project overview. |
| 02/07/00 | Joseph Yousem, owner of La Estancia Apartments | Janeen Rohovit, SRP; Duane Bledsoe, SRP | Toured existing facility. |
| 02/08/00 | City of Tempe Councilman Ben Arredondo | Kathie Lee, SRP; Kevin Wanttaja, SRP | Gave general project overview. |
| 02/09/00 | City of Tempe Councilman Hugh Hallman | Kathie Lee, SRP; Kevin Wanttaja, SRP | Gave general project overview. |
| 02/09/00 | City of Tempe Councilman Joseph Spracale | Kathie Lee, SRP; Kevin Wanttaja, SRP | Gave general project overview. |
| 02/10/00 | Don Strauss | Janeen Rohovit, SRP | Mr. & Mrs. Strauss purchased home in Alisanos. Concerned about EMF on 69kV line located along the canal east of Alisanos. EMF read taken. |
| 02/11/00 | Tempe Chamber of Commerce Executive Board | Dick Hayslip | Gave general project overview. |
| 02/14/00 | Norma Owens | Janeen Rohovit, SRP; Randy Dietrich, SRP | Discussed project. Ms. Owens concerned with air quality. |
| 02/14/00 | East Valley Chamber of Commerce Alliance | Nelson Ross | Gave general project overview. |
| 02/15/00 | Former City of Tempe Councilwoman Barbara Sherman | Kathie Lee, SRP; Janeen Rohovit, SRP | Gave general project overview. |
| 02/15/00 | Kyrene Middle School PTO | Janeen Rohovit, SRP; Randy Dietrich, SRP | Powerpoint presentation with project information. |

| SMALL GROUP MEETINGS/LOCAL OFFICIAL BRIEFINGS | | | |
|---|---|---|---|
| **Date** | **Name/Organization** | **Project Team Attendees** | **Discussion** |
| 02/18/00 | Tempe Gardens residents:<br>Beverly Van Dorp<br>Mary Bennett<br>Steve Hennis<br>Lynn Martellotti<br>Bonnie Pritchett<br>David Tanton<br>Cherie Herrara<br>David & Diana Abel<br>Lee Burge<br>Chuck & Martha Hoopes<br>Carlos Matiella<br>Carter Rogers<br>John & Dana Ward<br>Tom & Gail Smith<br>Gary Bennett<br>William & Phyllis Lymen | Randy Dietrich, SRP; Randy Palmer, EPG; Victoria Komadina, EPG | Discussed proposed facility, existing facility issues such as lighting. |
| 02/23/00 | Anna & Ruben Montalbo | Janeen Rohovit, SRP; Garlyn Bergdale, EPG | Live north of golf course in La Estancia. Both are teachers, receptive to tax benefit information. Ms. Montalbo agreed to host in-home meeting, tentative date 3/6/00. |
| 02/23/00 | Tempe Union High School Board | Nelson Ross, Randy Dietrich | Gave general project overview. |
| 02/24/00 | Kevin Moran (for Sen. Jon Kyl) | Janeen Rohovit, SRP; Renee Eastman, SRP | Discussed project points by conference call to Washington D.C. |
| 02/24/00 | Joe Yousem, owner of La Estancia apartments; Brent Bebout | Janeen Rohovit, SRP; Randy Dietrich, SRP; Randy Palmer, EPG | Overview of air modeling and discussion of possible mitigation. |
| 02/24/00 | Dan and Karen Pellouchoud And 18 attendees from neighborhood. | Janeen Rohovit, SRP; Randy Dietrich, SRP | Presentation initiated 3-hour discussion on proposed expansion project, positive response from group. |
| 02/27/00 | Jane Alfano | Janeen Rohovit, SRP; Randy Dietrich, SRP; Randy Palmer, EPG | Mitigation information was presented. Questions focused on air quality, property value, mitigation, noise, partners. |
| 02/29/00 | Honeywell | Randy Dietrich | Gave general project overview. |
| 02/29/00 | Microchip Technology | Brian Bednar | Customer was concerned about reliability of future power supply. Offered to talk positively about the project with key City of Tempe officials encountered during the course of conducting its business. The company was in the early stage of a significant plant expansion. |

| SMALL GROUP MEETINGS/LOCAL OFFICIAL BRIEFINGS | | | |
|---|---|---|---|
| **Date** | **Name/Organization** | **Project Team Attendees** | **Discussion** |
| 03/01/00 | Tempe Chamber of Commerce Government Affairs | Nelson Ross | Gave general project overview. |
| 03/01/00 | Tosco | Sharon Kausal | Customer was very supportive of the project and authored letters to key City of Tempe officials in favor of the project. |
| 03/02/00 | ON Semiconductor | Brian Bednar | Generally sympathetic to SRP's challenge. |
| 03/02/00 | Doug Seward | Janeen Rohovit, SRP; Randy Dietrich, SRP; Randy Palmer, EPG | Mr. Seward doesn't support project but is willing to consider mitigation that will shield his view of existing and proposed facilities. Anxious to landscape and may not wait to see if project is sited. |
| 03/02/00 | Rover Elementary School/PTO Group | Janeen Rohovit, SRP; Mike Hitt, SRP | Questioned air quality and need. Project information well received. |
| 03/02/00 | Bank One | Lori Jones | Customer was very supportive of the project. Referred SRP to the Bank One public relations director to work on a letter to the editor in support of the project. |
| 03/03/00 | Coca-Cola | Janeen Rohovit, SRP; Scott Trout, SRP; Jim Rea, SRP | Key account briefing on project proposal. |
| 03/03/00 | Intel | Bill Carroll | Customer was sympathetic to the challenges SRP faced with the project. Offered to consider making a project fact sheet available to employees. Also offered to talk positively about the project with key City of Tempe officials encountered during the course of conducting its business. Also considered allowing SRP to make a presentation to its citizens environmental group, but it was determined to not be appropriate. |
| 03/03/00 | Arizona Mills | Lori Jones | Customer was generally supportive of the project and offered to talk positively about the project with key City of Tempe officials encountered during the course of conducting its business. |

| SMALL GROUP MEETINGS/LOCAL OFFICIAL BRIEFINGS | | | |
|---|---|---|---|
| **Date** | **Name/Organization** | **Project Team Attendees** | **Discussion** |
| 03/04/00 | The TechGroup | Paul Barela | Customer was very supportive of the effort to build a plant at Kyrene. Offered to distribute a fact sheet on the plant to its employees and possibly have director of operations testify at public meetings in support of the project. |
| 03/21/00 | Tempe Gardens residents: Phyllis Lymer, Bill Lymer, David Abel, Diana Abil, Sherri Lange, Beverly VanDorp, Mary Bennett, Derick Abel, Charles and Martha (no last name given), plus 2 other residents | Randy Dietrich, SRP; Randy Palmer, EPG; Garlyn Bergdale, EPG; Victoria Komadina, EPG | The purpose was to hold a mitigation and enhancement neighborhood workshop for Tempe Gardens residents. These concepts were discussed as well as issues that had been raised during the first in-home meeting at Beverly Van Dorp's home on 2/18/00. |
| 03/21/00 | Steve Lucking | Janeen Rohovit, SRP; Kevin Wanttaja, SRP | Wants to know if acoustic survey could be compiled. Questioned partnership. Concern over air quality. |
| 03/23/00 | Warner Ranch Homeowners Association | Janeen Rohovit, SRP | Questions on if information could be provided on Valley air quality. |
| 03/30/00 | Southeast Valley Realtors 21 people attended. | Janeen Rohovit, SRP; Randy Dietrich, SRP | Keith Beauchamp of STOP presented opposing view of Kyrene project. SRP gave outreach presentation. Reviewed transmission vs. local generation, alternatives to Kyrene site, partnership, sale of power outside area. |
| 03/31/00 | Tempe South Rotary 35 attended. | Janeen Rohovit, SRP; Kara Young, SRP | Brief presentation and Q&A. Questions on permitting process, Tempe use of power, project need. |
| 04/06/00 | Tempe Sunrise Kiwanis 20 people attended. | Janeen Rohovit, SRP | Only half of presentation complete, will return later in month to complete discussion on noise and mitigation. |
| 04/08/00 | Area residents | Janeen Rohovit, SRP; Randy Dietrich, SRP; Duane Gray, SRP | Plant tour given at request of south Tempe church group. |
| 04/20/00 | George Bedewi and Ed Johnson | Janeen Rohovit, SRP; Randy Dietrich, SRP | Mr. Bedewi is small business owner (second meeting). Reviewed project development. |
| 04/24/00 | Anna and Ruben Montalbo 13 people attended. | Janeen Rohovit, SRP; Randy Dietrich, SRP | Discussed noise, visual improvements, air quality. |
| 05/16/00 | Area residents | Janeen Rohovit, SRP; R. Landato, SRP | Tour for project supporters. |

| SMALL GROUP MEETINGS/LOCAL OFFICIAL BRIEFINGS | | | |
|---|---|---|---|
| **Date** | **Name/Organization** | **Project Team Attendees** | **Discussion** |
| 05/18/00 | Lakes Community Homeowners Association | Janeen Rohovit, SRP; Randy Dietrich, SRP | Questions on how needed generation will be obtained after changes to Kyrene project description. Will new lines be needed, will old plant run more. |
| 05/23/00 | Joe Yousem, owner of La Estancia apartments | Janeen Rohovit, SRP | Mr. Yousem has been concerned about mitigation now that plant will be downsized. Invited him to participate in mitigation focus group; he accepted. |
| 05/23/00 | Beverly VanDorp, Tempe Gardens | Janeen Rohovit, SRP; Randy Dietrich, SRP | Follow-up meeting to discuss lights from existing facility. Also discussed noise, dust, and location of new facility. Randy Dietrich is working to resolve lighting issue. |

# EXHIBIT J-1
# NEWSLETTERS, BILLING INSERTS, COMMENT FORMS

# Kyrene Expansion Project

Number 1 October 1999

## Introduction

A group of companies, including SRP (Salt River Project), has begun a formal process to obtain permits to build an additional power generating facility at SRP's Kyrene Generating Station in south Tempe. This venture, known as the Kyrene Expansion Project, will be located at the northeast corner of Kyrene and Elliot roads. The generating facility, commonly known as a "power plant," is being built as the most cost-efficient and prudent solution to meet the future power needs of the Southeast Valley.

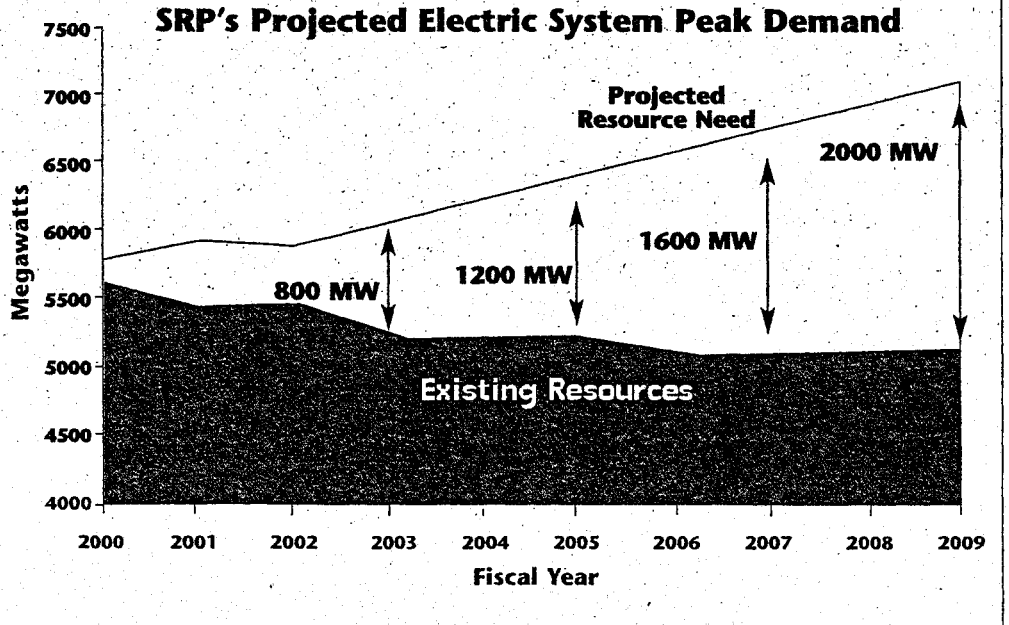
Environmental Planning Group, Inc. (EPG) has been retained to conduct the public planning process for the Kyrene Expansion Project. This newsletter is the first in a series designed to inform and communicate to the community key facts about the project.

## Growth Spurs Need

Metropolitan Phoenix is one of the nation's fastest-growing urban areas. For example, the number of SRP electric customers has increased about 21 percent during the past five years. Last fiscal year alone, SRP welcomed more than 27,000 new customers to its service territory - a record. SRP's customer growth rate is anticipated to continue; since May 1, SRP has added more than 14,000 new customers in the Valley.

Recent studies by SRP show a growing discrepancy between projected resource needs and existing resources to meet the system peak for electric customer demand (see graphic). For example, peak demand by 2003 is expected to be 6,100 megawatts (MW), while available resources could be only 5,300 MW. This 800-megawatt disparity is expected to double just four years later, in the year 2007. (During this time, some of SRP's existing power contracts will expire.) By 2009, there could be a 2,000 MW gap between projected resource need and available resources.

SRP's challenge, then, is to ensure that its electric system requirements do not outgrow its existing generation resources. This is especially true in the Southeast Valley, where a majority of the growth is occurring. SRP anticipates that the greatest power usage during the next 10 years in SRP territory will include Tempe, Mesa, Chandler, Gilbert and Ahwatukee/Phoenix.




## Kyrene Expansion Project

The Kyrene Expansion Project will consist of a generating facility that will provide electricity for 150,000 to 200,000 homes. Plans call for an 825-MW natural gas-fired generating facility using the most efficient fossil-fuel technology available. It will occupy about 40 acres of land on the existing Kyrene Generating Station property near Kyrene and Elliot roads.

Pending approvals, the new facility would be the first major generating station built in SRP's service area in 20 years. Project construction should create about 300 jobs; when it is operational, the facility is expected to employ about 25 individuals. The plant will operate round-the-clock, 7 days a week.

Permitting activities, including the public involvement process, are expected to continue into late 2000. Construction is planned to start next year and to last until the plant begins commercial operations in 2002.

# SRP Forms Alliance

In August 1999, SRP formed an alliance with Dynegy Inc. and NRG Energy, Inc, to develop the Kyrene Expansion Project. The alliance partners plan to form a limited liability company (LLC) that will oversee the project's development.

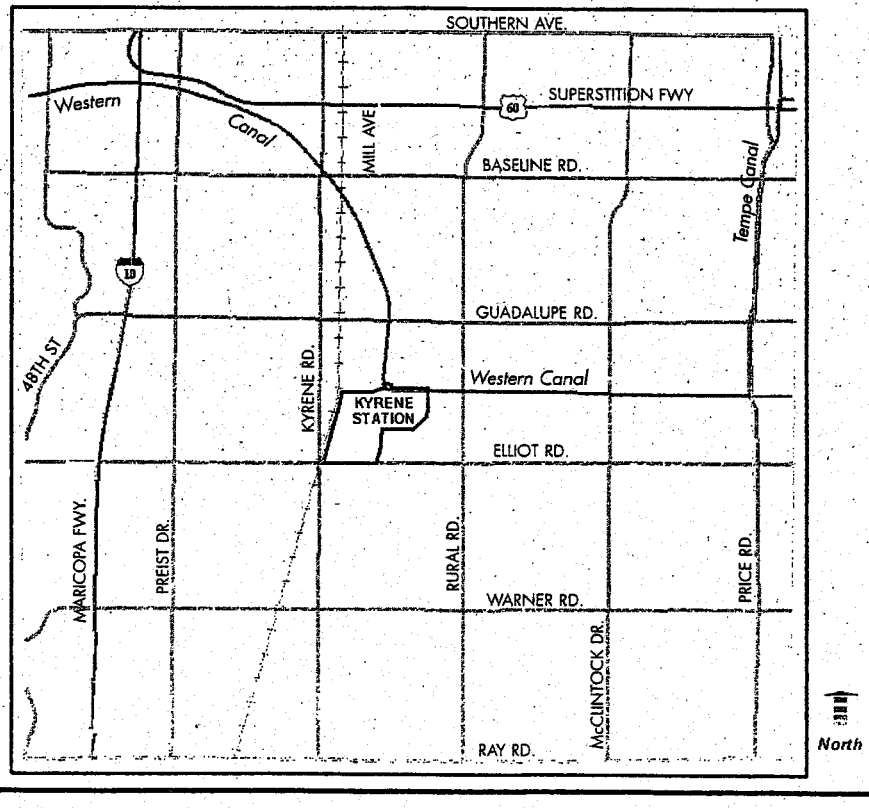
SRP, which is spearheading this effort, is the nation's third-largest public power utility, serving more than 700,000 electric customers in metropolitan Phoenix and is one of the state's largest water suppliers. Dynegy Inc. is one of the country's leading marketers of energy products and services. NRG Energy, Inc., is one of the world's leading independent power producers, specializing in the development, construction, operation, maintenance and ownership of low-cost, environmentally sensitive power plants.

SRP has conducted informational meetings about the project with relevant federal, state, county and municipal officials, as well as the Arizona Corporation Commission. An extensive public process, now being facilitated by EPG, also has been initiated.

## Who Is EPG?

The staff of Environmental Planning Group, Inc. (EPG), has provided environmental and public planning services in the Phoenix area for more than 25 years. In the western United States, EPG's professional staff has participated in numerous energy-related projects. An important objective of EPG's approach is to integrate environmental studies and public input into the planning process. One of EPG's goals is to accurately reflect the community's comments and concerns throughout the process.

**Kyrene Expansion Project Location**




## How Will The Community Be Heard?

Involving the public throughout the project is a key element of the planning process. Community members will have the opportunity through many methods to gain information and provide comments and questions.

Tools to inform the public and receive information include newsletters, a telephone voice message information line, a project Web site, comment forms and SRP billing inserts.

- **Newsletters:** Periodic newsletters will be distributed to provide updated project information as the planning process continues. A mailing list will be maintained and updated during the project.
- **Telephone voice message information line:** If you have any questions, would like to submit a comment or want to be added to the mailing list, please call (602)-840-3650. Upon request, a project team member will return your call.
- **Web site:** A Web site has been developed that contains pertinent project information. The site can be found at www.kyrenefacts.org. This site provides a link that enables the public to e-mail the project team comments, questions or requests to be added to the mailing list.
- **Comment forms:** These forms will be available at all public open house meetings and distributed through newsletters and by request. The forms provide an opportunity for the public to document and relay comments to the project team.
- **SRP Billing Inserts:** Periodically, SRP customers will receive updated project information in their monthly billing newsletter.

In addition to the public involvement activities outlined above, a community working group or CWG has been formed to serve as a "sounding board" during the project. The CWG is composed of a cross-section of individuals who are familiar with local issues and who represent a diverse range of views.

Municipalities, school districts, homeowner associations and adjacent property owners are examples of the CWG membership. While this group is not a decision-making body, its members will provide information regarding the community attitudes, issues and comments on the public involvement process.

## What Is The Planning Process?

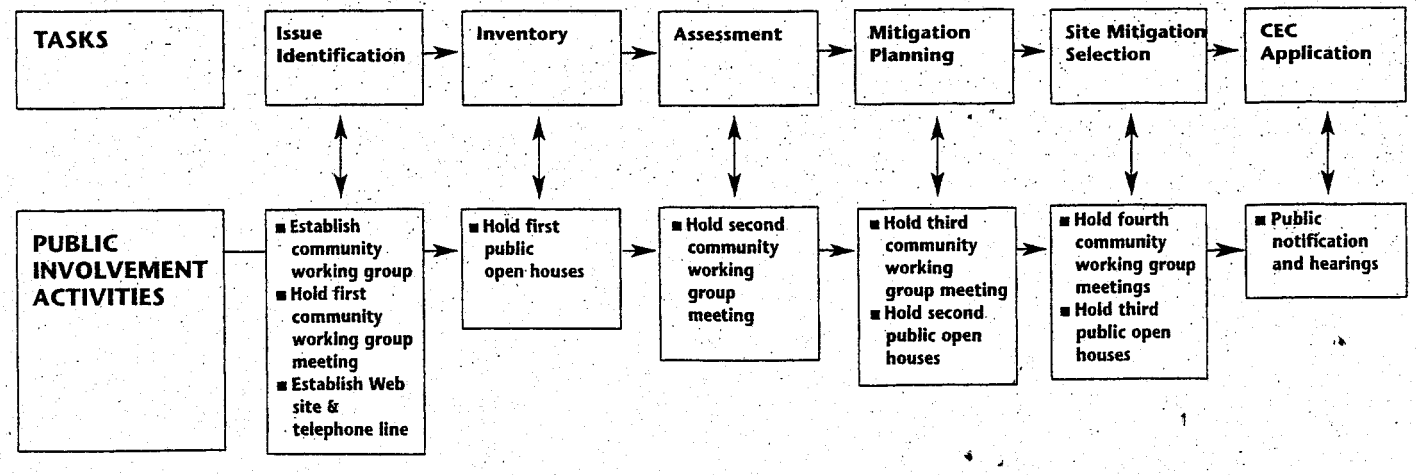
There are six major steps in the environmental and public planning process. The flow diagram illustrates the sequence and key element of each task. These steps focus on the identification of issues, inventory and assessment of relevant information, mitigation planning and selection, and an application for a Certificate of Environmental Compatibility to the Arizona Corporation Commission. The schedule for this process is anticipated to last four to six months.

## First Public Open Houses Are Oct. 21 and Oct. 23

Please attend one of the two public open houses being held to introduce the project to the community:

- **Thursday, Oct. 21, 1999**
  5-8 p.m.,
  Fees Middle School,
  1600 E. Watson Dr, Tempe
  (just west of McClintock Drive, between Baseline and Guadalupe roads)
- **Saturday, Oct. 23, 1999**
  10 a.m - noon,
  Kyrene Middle School,
  1050 E. Carver Rd., Tempe
  (east of Rural Road, between Elliot and Warner roads) For more information, please phone the Kyrene Expansion Project voice message information line, (602)-840-3650.

# The Kyrene Expansion Project
## Public Process Activities & Schedule



Environmental Planning Group, Inc.
4350 E. Camelback Road, Suite G-200
Phoenix, AZ 85018

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**Kyrene Expansion Project**

# Comment Form

Environmental Planning Group, Inc.
4350 E. Camelback Road, Suite G-200
Phoenix, AZ 85018

If you or someone you know would like to be added to the project mailing list to receive information about the Kyrene Expansion Project, please complete this form and mail it back to the address listed above. If you have any input about the Kyrene Expansion Project, please send it to us as soon as possible to ensure that we can include it in the public process.

Name_____ Name_____

Address _____ Address _____

City, ZIP _____ City, ZIP _____

Comments: _____

_____

_____

Kyrene Expansion Project

Number 2 January 2000

## Introduction

This second edition of the Kyrene Expansion Project newsletter is being mailed to area residents to keep them informed about proposed plans to build an 825-megawatt (MW) electric generating facility in the area. The proposed facility would be built at the existing Kyrene Generating Station on SRP (Salt River Project) property, located at the northeast corner of Kyrene and Elliot roads.

In July 1999, SRP agreed to form Oasis Energy, a limited liability corporation, with Dynegy Inc. and NRG Energy Inc., in order to develop, construct, and operate an electric generating facility in the Southeast Valley. Oasis Energy has begun the process to obtain all of the approvals necessary to build a state-of-the-art, natural-gas-fired, combined-cycle electric generating facility, known as the Kyrene Expansion Project. The project is considered to be the most cost-efficient and prudent solution to help meet the Southeast Valley's future power needs.

The initial newsletter was sent to area residents in mid-October. If you would like a copy of the first newsletter, please call the Kyrene Expansion Project voice message information line at (602) 840-3650.

# About the Kyrene Expansion Project

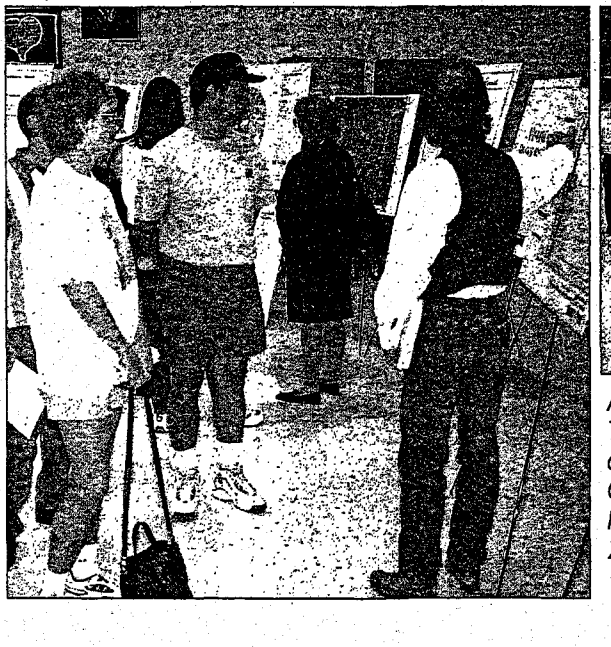
Oasis Energy's Kyrene Expansion Project will consist of an 825-MW, natural gas-fired electric generating facility (the average amount consumed by 200,000 homes). The proposed facility will utilize the most efficient and environmentally friendly fossil-fuel technology available.

More power is needed in the Southeast Valley because of the area's rapid growth. The facility would be a load-serving power plant that is available around-the-clock, seven days a week. This proposed facility would ensure local electric system reliability, including voltage control, and maintain power during regional system outages. The benefits of load-serving generation accrue to the Southeast Valley grid as a whole, regardless of a customer's choice of generation supplier, and would improve power delivery and power quality.

The proposed Kyrene Expansion Project will be located on a 21-acre site within SRP's existing 160-acre Kyrene property. The project site is closely surrounded by industry to the west, a golf course to the north and east, and SRP's 500-kilovolt switchyard and Tempe Service Center to the south.

Permitting activities, including the planning process, are expected to continue through mid-2000. Construction, which is contingent on securing all of the necessary permits, is scheduled to begin in late 2000 and end in early 2002. The new facility would begin commercial operations in the spring of 2002 to meet SRP's summer peak loads.

Project construction should take about one and one-half years and should create about 300 construction jobs. When commercial operations begin, the facility is expected to employ about 25 individuals.



*About 130 members of the south Tempe community attended two open houses on Oct. 21 and Oct. 23 to learn more about the Kyrene Expansion Project. See Page 2 for more details.*

# First Open Houses Draw About 130 Participants

As part of the planning process, Oasis Energy conducted two public open houses on Oct. 21 and Oct. 23, at which about 130 citizens attended.

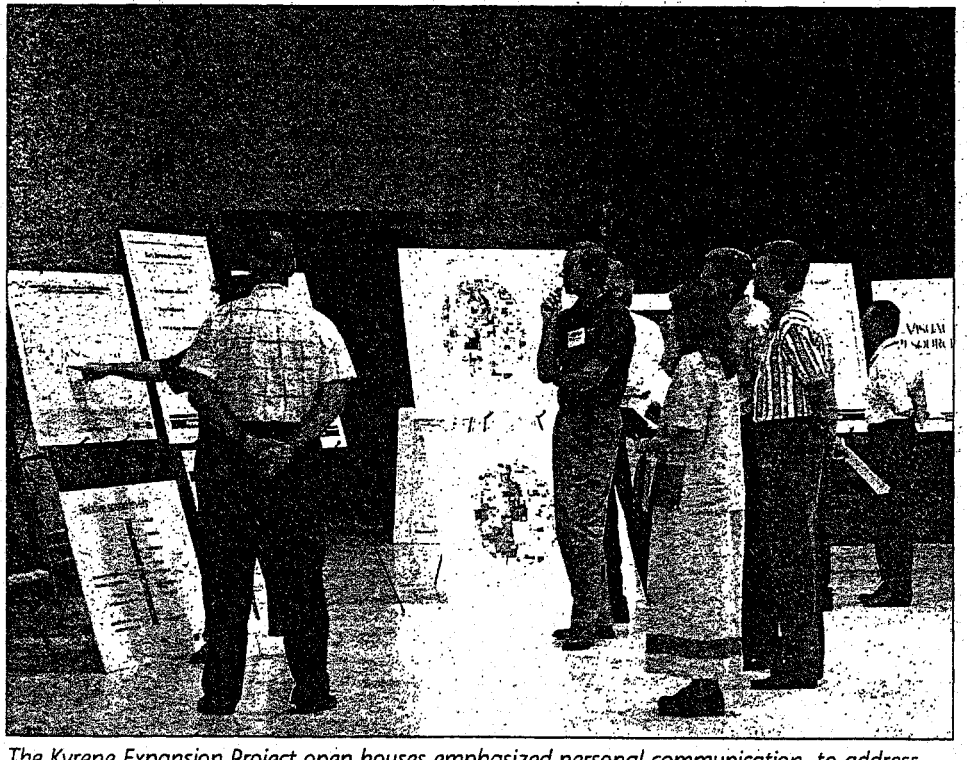
Individuals attending the open houses were given the opportunity to learn more about a number of elements pertaining to the project through informative displays as well as discussions with project team members. Information about the project available at the open house included the following:

- SRP's need for additional power in the Southeast Valley
- Participation/partnerships
- Planning and public process
- Facility operations
- Water use
- Air quality
- Visual resources
- Noise.

The format for these and other open house meetings is an informal, "one-on-one" style gathering, with an emphasis on personal communication so that Oasis Energy representatives can address individual issues and questions from those who attend the event. The open house format allows the public to attend at their convenience.

Involving the public throughout the project is a key element of the planning process. Through a variety of methods, community members will have the chance to gain information, provide suggestions, and ask questions. In addition to the open houses, the following means are being used to inform the public and secure feedback:

- **Newsletters:** Periodic newsletters will be distributed to provide updated project information as the planning process continues. A mailing list will be maintained and updated during the project.
- **Telephone voice message information line:** If you have any questions, would like to submit a comment, or want to be added to the mailing list, please call (602) 840-3650. Upon request, a project team member will return your call as soon as possible.
- **Web site:** A Web site has been developed that contains pertinent project information. The site can be found at **www.kyrenefacts.org**. This site provides a link that enables the public to e-mail the project team comments, questions or requests to be added to the mailing list. It also provides links to the Oasis Energy partners' Web sites.
- **Comment forms:** These forms will be available at all public open house meetings and distributed through newsletters and by request. The forms provide an opportunity for the public to document and relay comments to the project team.
- **SRP Billing Inserts:** Periodically, SRP customers may receive updated project information in their monthly billing newsletter.



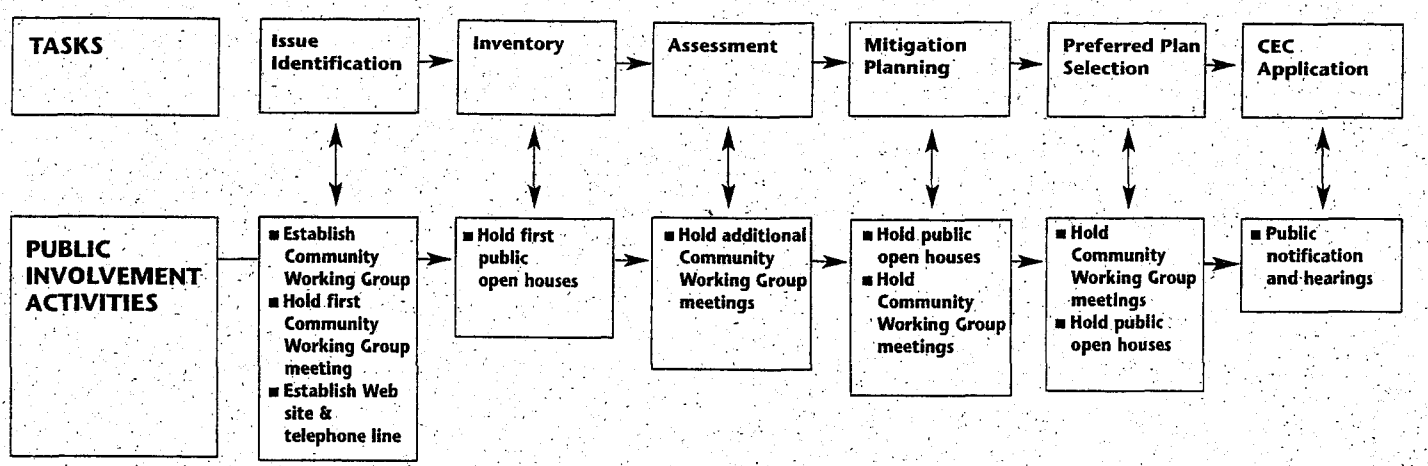
*The Kyrene Expansion Project open houses emphasized personal communication, to address individual questions and suggestions. The open house format allows the public to attend at their convenience.*

# The Environmental and Planning Process - A Vital Component

There are six major tasks in the environmental and planning process. The flow diagram illustrates the sequence and key element of each task. These tasks focus on the identification of issues, inventory and assessment of relevant information, mitigation planning, preferred plan selection, and an application for a Certificate of Environmental Compatibility (CEC) to the Arizona Corporation Commission. To support Oasis Energy, the Environmental Planning Group (EPG) has been retained to conduct this process.

This newsletter is part of the planning process and is intended to inform and to communicate to the community key facts about the proposed project. One of the goals is to accurately reflect the community's comments and issues throughout the process. Consideration of public comments obtained during the public meetings and throughout the planning process is very important to the Kyrene Expansion Project.

# The Kyrene Expansion Project
## Planning Process Activities and Schedule




# Community Working Group Plays An Important Role

A key component of the planning process is the Community Working Group (CWG). The CWG has been formed to serve as a "sounding board" during the development of the project. The group is a cross-section of individuals who are familiar with local issues and who represent a diverse range of views.

CWG members include representatives from the community, such as the city of Tempe and the town of Guadalupe, as well as individuals from local businesses and educational communities, and residential neighborhoods.

The first CWG meeting was held in October. Members met with representatives from Oasis Energy and EPG to become familiar with the proposed Project and to define the roles and responsibilities of all project participants.

In a second meeting, held in November, CWG members reviewed the environmental and public process and environmental evaluation criteria for discussion at future meetings and during future public open houses. The third and fourth meetings focused on project need, alternatives, and project description.

Throughout the development process, the CWG will be presented with detailed information and updates and asked for input. Then, the community at large will be presented with similar information at public open houses and asked for comments. Results of studies and analyses will be provided for review during each CWG meeting and open house, as well.

# Why Oasis Energy?

Power facilities require significant capital investments. SRP has partnered with other entities to build new generation capacity. Examples of facilities in Arizona in which SRP has an ownership interest are the Navajo Generating Station and the Palo Verde Nuclear Generating Station. Facilities outside of Arizona in which SRP is partial owner include the Mohave Generating Station in Nevada, the Craig and Hayden generating stations in Colorado, and the Four Corners Generating Station in New Mexico.

In the past, SRP has partnered on large generation projects in order to reduce risk, to benefit from economies of scale, and to draw on the partners' experience and expertise. By including partners on the proposed Kyrene Expansion Project, SRP will be able to obtain the generation it needs early on at a lower cost. SRP's Oasis Energy partners, Dynegy and NRG, would receive the benefit of their investment by obtaining "exchange power" delivered by SRP to the Palo Verde Switchyard, west of the Valley.

For the Kyrene Expansion Project, the Oasis Energy partners bring together a complementary blend of expertise, physical assets, and capital. By working together, the three parties are able to develop a state-of-the-art generating facility that will help SRP meet its rapidly growing demand for electricity in a cost-effective and reliable fashion.

# Who is Oasis Energy?

SRP, Dynegy Inc., and NRG Energy Inc., agreed to form Oasis Energy to oversee the project's development.

SRP is one of Arizona's largest electric utilities and water providers and serves more than 700,000 residential, business, and industrial customers with electric power throughout a 2,900-square-mile area in central Arizona. SRP operates or participates in seven major power plants and numerous other generating stations in four states, including fossil fuel, nuclear, and hydroelectric sources. With generating capacity of more than 5,000 MW, SRP is the nation's third-largest public power utility.

Dynegy Inc. (NYSE: DYN) is one of the country's leading marketers of energy products and services. Through its leadership position in gathering, processing, transportation, power generation, and marketing of energy, the company provides energy solutions to its customers primarily in North America and the United Kingdom.

Dynegy's primary business segments are wholesale gas and power and natural gas liquids. Dynegy Marketing and Trade, the company's power generation and natural gas and power marketing and trading subsidiary, focuses on energy convergence — the marketing and trading opportunities that exist among natural gas, power, and coal that can be enhanced by the control and optimization of related physical assets.

Dynegy's natural gas liquids subsidiary, Dynegy Midstream Services, Limited Partnership, includes North American midstream liquids operations, global natural gas liquids transportation and marketing operations, as well as North American crude oil marketing operations.

The capacity of Dynegy's 34 natural-gas-fired U.S. generation assets currently operating or under development is nearly 7,000 gross MW. This includes the recently announced Calcasieu Generation Project, a 155-MW natural gas-fired peaking facility currently under development in southwest Louisiana.

NRG Energy Inc. (NRG) is one of the world's leading independent power companies. Founded in 1989, NRG develops, operates, owns and acquires a variety of energy-related operations worldwide, including independent power production and co-generation facilities, district heating and cooling production, thermal energy production and transmission facilities, and resource recovery facilities.

NRG has built a global portfolio of projects in North America, Europe, Asia-Pacific and Latin America. As of September 1999, NRG's portfolio consists of nearly 170 facilities in operation, under construction or under signed acquisition representing approximately 21,165 MW of installed generating capacity.

The projects use such diverse fuel sources as fossil fuels (natural gas, oil, coal and coal seam methane) and green power renewable fuels (biomass, landfill gas, hydro, and wind) as well as refuse-derived fuels and geothermal energy.

NRG, headquartered in Minneapolis, is a wholly owned subsidiary of Northern States Power Company (NSP). NSP is among the top 20 electric and natural gas companies in the United States with approximately 7,000 MW of generating capacity.

# Questions and Answers About the Kyrene Expansion Project

Southeast Valley residents are interested in the efforts to plan and build a new generating facility in south Tempe. The following collection of frequently asked questions about the Kyrene Expansion Project has come from open houses, phone calls, and letters.

- ***Why does SRP need the power?***

Metropolitan Phoenix has been among the two or three fastest-growing areas in the nation for several years. Much of this growth has occurred in SRP's service territory, especially in the Southeast Valley. In fiscal year 1998-99, for example, a record 27,000 new customers came into SRP's territory. The pace of SRP's customer growth is anticipated to continue, particularly in the Southeast Valley.

Projections indicate that by 2009 RP will need an additional 2,000 MW of capacity to meet its customers' peak demand. Additional generating capacity is critical to ensure SRP's ability to meet forecasted demand and to maintain a dependable supply of power over the next decade. Also, there is a critical need for local generation capacity to meet the Southeast Valley's reliability needs.

- ***What alternatives have been considered? Can SRP buy power from other utilities and bring it to the Valley?***

Given its future need for more electric power, SRP management studied two possible solutions. The first was to increase transmission of energy from outside the Valley into the metropolitan area. The second was to increase local generation; that is, to build new generation resources.

To employ the first solution would place an added burden on existing transmission facilities in and around the Greater Phoenix area. The transmission lines bringing in power — from power plants in other parts of the state and beyond — already are approaching their capacity limit.

As a result, to increase transmission of energy into metropolitan Phoenix would mean expanding the area's power line system. As suggested by several recently announced power plant development projects in Arizona, it is possible to build a generation project outside of the urban communities served by SRP. However, the objectives of many of these other "merchant" plant developers and SRP are distinct. Merchant plant developers are concerned with the proximity and access to the Southwest's foremost electricity trading market at the Palo Verde Nuclear Generating Station Switchyard. That's why these proposed facilities are located primarily in the West Valley, with access to the Palo Verde Switchyard.

Meanwhile, SRP is focused on the continued provision of reliable, low-cost electric service to ensure the vitality of the communities it serves. The Kyrene Expansion Project is located within the heart of SRP's Southeast Valley service territory — where electric demand is growing almost exponentially. From this location the Kyrene Expansion Project would help minimize the increasing risk of service interruptions that can accompany increased dependence on electricity imported from remote or rural sources.

The proposed Kyrene Expansion Project will be a cost-effective means of meeting longer-term power demand, securing electric power system reliability, and helping reduce the need for new transmission lines. If the Southeast Valley is to receive the full benefit of local generation, a local site is the most desirable option. The Kyrene site offers adequate land already used for power generation purposes and also provides access to the necessary natural gas, water, and electric transmission interconnections.

- ***How many sites is SRP considering for new generating facilities?***

The greatest power usage during the next five years in SRP territory is projected to occur in the Southeast Valley. The Kyrene Generating Station property — the site for the Oasis Energy Kyrene Expansion Project — lies near the geographic core of this area. SRP also is considering the Santan Generating Station site for developing a second project. Santan is located in Gilbert at Warner Road and Val Vista Drive. SRP also anticipates that additional generation (beyond these two sites) will be required, so other sites could be evaluated in the future. The existing transmission connection, land use, and water and fuel supplies at Kyrene and Santan make them superior candidates for new generating facilities to meet customers' most immediate needs.

- ***Who would actually own the new Kyrene facility? How much power would be available for Valley residents?***

SRP's objective in building the Kyrene Expansion Project is to obtain additional generation supplies to meet its customer load growth. Since the generating facility will be located inside metropolitan Phoenix, the facility's entire output will go into SRP's electrical system for the benefit of its customers. While SRP will own 30 percent of the facility's assets, the important point is how much energy SRP can use from the Kyrene Expansion Project. Essentially all of the power output from the facility will be used by SRP's customers. As part of the business transaction, SRP will exchange energy with Oasis Energy at a delivery point outside of metropolitan Phoenix.

This relationship allows SRP customers to benefit from the location of the Kyrene Expansion Project by providing reliable electrical energy, improving electrical system performance, and realizing the economic benefits of the new technology to obtain the lowest possible cost for all of its customers.

# Questions and Answers about the Kyrene Expansion Project (continued)

- ***How will air quality be affected? What about health concerns?***

The expansion at Kyrene will result in additional emissions; however, the types and amount of emissions from the existing and new facilities during plant operations will not threaten any health-based ambient air quality standards. Changes in plant air emissions — including carbon monoxide, particulate matter, sulfur dioxide, and nitrogen dioxide — all are being studied, and will meet the regulatory requirements as specified in the Federal Clean Air Act, State Implementation Plan, and Maricopa County Air Quality Regulations.

- ***What will be done about emissions from the proposed facility?***

The Kyrene Expansion Project will utilize state-of-the-art combustion and control technology. The project will be fueled by natural gas, the cleanest-burning available fossil fuel. In addition, it will be required to reduce specific emissions (nitrogen oxide and carbon monoxide) by 120 percent of the facility's projected emission rates. The net result is that 20 percent of these emissions will be permanently retired in the region.

In Maricopa County, ozone is the principal air quality issue for a natural-gas-fired generating station such as the proposed Kyrene Expansion Project. Ozone is created when nitrogen oxides combine with other volatile organic compounds in the atmosphere and are exposed to sunlight. The proposed Kyrene facility will emit nitrogen oxide, a precursor to ozone. In order to obtain an air quality permit from the Maricopa County Air Pollution Control District, Oasis Energy must first demonstrate the ability to offset the amount of estimated nitrogen oxide emission from the new facility by 120 percent. SRP, as part of its role in Oasis Energy, is investigating several sources to meet this mandate.

The process of burning natural gas also produces carbon monoxide; however, today's turbine technology has resulted in an extremely efficient process resulting in minimal carbon monoxide emissions. The Maricopa County air quality rules and regulations require Oasis Energy to provide emission offsets at 120 percent of its carbon monoxide emissions. The regulations also require carbon monoxide offsets to be obtained from within the impacted area. The Kyrene Expansion Project actually will help improve existing air quality because 20 percent of the emissions will be permanently retired.

- ***When I bought a house in this area, I didn't anticipate a power plant being built here. Will the aesthetics of the area be changed?***

The old Kyrene Generating Station was built in the early 1950s, when south Tempe was a rural area. The newer residential areas near Kyrene were developed long after the original plant was completed. So much of the area around the Kyrene Generating Station property is zoned for a mixture of uses, including industrial and commercial. The new facility would be located about one-half mile north of Elliot Road in an area of the site zoned by the city of Tempe as heavy industrial (I-3).

The facility's ultimate design and appearance will depend upon Oasis Energy's analysis and the input obtained during the environmental and public planning process. The partners have every intention of carefully integrating the new generating facilities with the surrounding environment.

Visual mitigation measures depend upon the suggestions and ideas from the Community Working Group and from the public input during the open houses and comment period. Some of the ideas received include removal of existing facilities, installing visual buffers including trees and high walls in select locations, removing old signage, and repainting selected existing facilities.

- ***Will the new facility be louder than the facilities that already exist on the site?***

Current noise studies for the project are ongoing. Oasis Energy will meet or better the minimum requirements established by the city of Tempe noise ordinances. In addition to the use of the best technologies in the facility's design, Oasis Energy will consider a variety of noise abatement measures, including additional buffering through the use of walls and landscaping.

- ***What about the safety of natural gas use? What will you do to ensure public safety?***

There is no measurable incremental increase of the chance for a natural gas incident. In fact, the proposed facility will require a new gas line; this line will be built to new, higher/better safety standards. As a result, safety relating to natural gas use actually should improve.

- ***When the new facility becomes operational, from where will the water needed for various processes be obtained? How much will be needed?***

The facility will require about 5,000 acre-feet of water per year. Much of the water will be transported through the Western Canal, which runs adjacent to the Kyrene site. Oasis Energy is considering a variety of water resources to be used for the new facility, including reclaimed water or effluent. Other potential water supplies may include groundwater, potable water, and/or Central Arizona Project water exchange. Because SRP also is a major supplier of water to the Valley and is well aware of water supply issues, groundwater use for the Kyrene Expansion Project will be kept to a minimum.

# Comment Form

We want to hear your views about the Kyrene Expansion Project. Your comments are important to help with identifying ideas and issues for the project.

## My comments are:

_____

_____

_____

_____

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_____

_____

_____

(Tear along perforation to ...ach comment form)

## Mailing List

The project mailing list will be supplemented as needed throughout the project. If you would like to be added to the project mailing list you may either call (602) 840-3650 or provide your name and address below. If you know of additional people you believe should be included in the mailing list, please provide their names and addresses below.

Name: _____

Address: _____

City, State, Zip: _____

Neighborhood: _____

E-mail: _____ Phone: _____

Name: _____

Address: _____

City, State, Zip: _____

Neighborhood: _____

E-mail: _____ Phone: _____

Name: _____

Address: _____

City, State, Zip: _____

Neighborhood: _____

E-mail: _____ Phone: _____

Name: _____

Address: _____

City, State, Zip: _____

Neighborhood: _____

E-mail: _____ Phone: _____

Please fold this form (leaving the address and postage exposed) and seal the open end with tape before mailing.

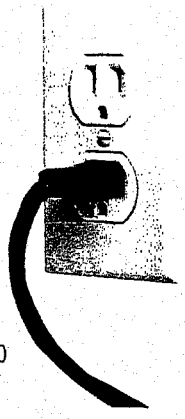
**Thank You For Your Comments!**

# Kyrene

SRP
Delivering More Than Power.®

*March 10, 2000 No. 1* **Air Quality and Plant Appearance** *News from* SRP *about the Kyrene Expansion Project*


## The Proposal At-A-Glance



An 825-megawatt, natural-gas-fired generating plant that can serve up to 200,000 homes is proposed for the existing Kyrene Generating Station site. The new facility would occupy about 21 acres on the northcentral area of the 160-acre property at the northeast corner of Elliot and Kyrene roads.

Demand for electricity due to growth in the Southeast Valley is the reason for the proposal. SRP generation sources are near capacity during the hottest summer days, and transmission constraints limit electricity imports into the Valley. These two reasons combine to make local generation expansion a necessity. Locating a new plant near the geographic area where most growth is occurring - the Southeast Valley - means lower development costs, less need for transmission structures, and a stable and reliable supply of electricity.

As a political subdivision of the state of Arizona, SRP does not make "profits" and we do not have stockholders. Rather, our prices are set according to our costs. When costs are contained, so too are our prices. This business approach is why SRP is able to offer among the lowest electricity prices in the West.

◆

**Would you like to host a small-group meeting to learn more about the Kyrene proposal? Contact Janeen Rohovit at SRP, (602) 236-2679.**

◆

# Three Reasons Why The Plant *Will Not* Harm Air Quality

## Technology, standards and offsets

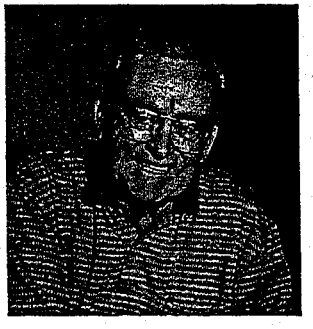
There are three major reasons for SRP to confidently state that the Kyrene proposal is environmentally sound. They are:

**1. The plant will use state-of-the-art technology.**

The plant design is based on combined-cycle, natural-gas-fired turbine technology. This type of power plant is recognized as the most efficient and environmentally friendly fossil-fuel generation technology available. In addition, the plant will be equipped with the best emission controls.

**2. The plant must meet all standards and regulations.**

The Environmental Protection Agency (EPA) establishes air quality standards to protect the most sensitive populations (such as the elderly, children, and people with asthma). EPA regulations ensure that facilities such as power plants do not negatively impact air quality for these most sensitive people.



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***"The data from the study shows conclusively that there will be no hazardous pollutants escaping into even the closest neighborhoods."***

**Jim H. Murphy**
Tempe resident and member of the Kyrene Community Working Group

**Letter to the Editor, *The Tribune*, Feb. 10, 2000**

◆

SRP and its partners in the proposed facility retained the firm of Dames & Moore to conduct the air modeling study based upon EPA methodology. Results indicate EPA-defined "insignificant impacts" in the vicinity of the plant site and in the Valley. The study results will be contained in the air quality permit application and will be subject to review and approval by Maricopa County and EPA.

**3. The plant must provide a net air-quality benefit.**

EPA and Maricopa County require such projects to offset emissions by removing more from existing sources than the new source will emit.

***(Continued on back)***

## Four Key Facts

- 100 percent of the power will be available to serve Southeast Valley electric customers.
- The plant will meet all air quality standards to protect public health.
- Improvements to the Kyrene property will ensure compatibility with the surrounding community.
- The plant will meet Tempe noise ordinance requirements.

# Kyrene

SRP
Delivering More Than Power®

*March 31, 2000 No. 2* **Benefits and Noise Findings** *News from* **SRP** *about the Kyrene Expansion Project*

## New Plant Will Offer Important Benefits

New electricity sources in the Southeast Valley will bring many real benefits to local communities, businesses and homeowners. SRP expects more than 50 percent of electricity demand growth to occur in Tempe, Chandler, Mesa and Gilbert in the years ahead. SRP's Kyrene proposal would establish a new, state-of-the-art generating station to serve this growing need.

### The benefits of local generation

**1. Continued supply of reliable electric power.**

SRP has a strong power reliability record, and our customers tell us reliability is an important issue to them. Increasing demands upon available electricity resources mean we must either build new local generation or import more power from outside sources. Importing energy from remote plants carries greater reliability-related risks associated with disturbances on the electric grid. On the other hand, local generation helps maintain voltage levels required by customer equipment and appliances. In other words, local generation is much more effective in providing such voltage support than remote generation sources.

**2. Continued supply of low-priced power.**

SRP offers among the lowest electricity prices in the Southwest. As a political subdivision of the state, we do not make "profits" and we do not have stockholders. Rather, our prices are set according to our costs. Local generation offers a cost-benefit to SRP and in turn, the opportunity for continued low prices for customers. We evaluated many sites, and the Kyrene location offers development costs that are substantially less than other options. We are committed to maintaining low prices for our customers.

*(Continued on back)*

# Mayor and Council Broker Agreement

Tempe Mayor Neil Giuliano and members of the City Council have brokered an agreement to foster discussions between SRP and STOP, a group opposed to the Kyrene Expansion Project.

At the March 16, Tempe City Council Issues Review Session, Giuliano said former state attorney general Grant Woods had volunteered to facilitate working sessions between the parties. The mayor and Councilman Hugh Hallman agreed to attend the sessions as observers. Woods resides within two miles of the plant site.

The sessions will comprise representatives of SRP and the neighborhood STOP group, as well as other representatives from the Kyrene area. STOP stands for Stop Tempe Oasis Project.

Differences of opinion about the plant's impacts include air quality, visual appearance and property values.

Woods, who has not voiced his preference about the plant proposal, said he believes "SRP doesn't want to do anything to endanger the people of Tempe." However, he also said the STOP group has legitimate concerns.

A STOP spokesman was quoted in *The Arizona Republic* as saying he believes Woods will conduct a fair discussion between the groups.

The first meeting is expected to occur in about two weeks. Woods has said he is willing to mediate as many meetings as necessary.

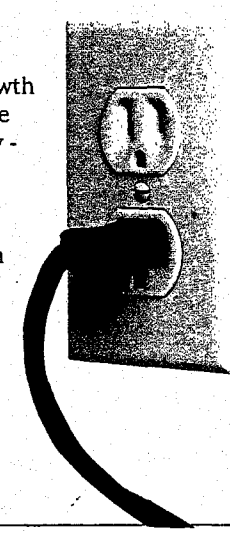
SRP and its partners are pleased with the outcome of the meeting and look forward to productive dialogue with the community members.

**Would you like to host a small-group meeting to learn more about the Kyrene proposal? Contact Janeen Rohovit at SRP, (602) 236-2679.**

# The Proposal At-A-Glance

The Kyrene Expansion Project is a proposal for a new, 825-megawatt, natural-gas-fired generating plant. The new facility would occupy about 21 acres on the north-central area of the 160-acre property at the northeast corner of Elliot and Kyrene roads.

Demand for electricity due to growth in the Southeast Valley is the reason for the proposal. SRP generation sources are near capacity during the summer, and transmission constraints limit electricity imports into the Valley. These two reasons combine to make local generation expansion a necessity. Locating a new plant near the geographic area where most growth is occurring - the Southeast Valley - means lower development costs, less need for transmission structures, and a stable and reliable supply of electricity.



# Kyrene Expansion Project

## SRP Invites Public to Open Houses

Please join SRP and representatives from Oasis Energy and the Environmental Planning Group for two open houses regarding the proposed Kyrene Expansion Project. The project would be a 825-megawatt, state-of-the-art, natural gas-fired combined cycle electric generation facility, located on SRP's existing Kyrene property at the northeast corner of Kyrene and Elliot roads.

Information to be shared at the open houses will include details on the noise, air quality and visual impact studies recently completed. In addition, attendees can learn more about the project, which is designed to help SRP meet the growing demand for electricity in the Southeast Valley.

The format for these meetings is informal, emphasizing "one-on-one" communications so individuals can have their concerns addressed. The public is free to attend at their convenience during the sessions.

Mark your calendars to attend one of these two informational sessions:

- **Thursday, Feb. 3, 2000**
  5 to 8 p.m.
  Sam Fees Middle School
  1600 E. Watson Dr., Tempe
  *(Just west of McClintock Drive, between Baseline and Guadalupe roads)*

- **Saturday, Feb. 5, 2000**
  9 a.m. to 12:00 noon
  Kyrene Middle School
  1050 E. Carver Rd., Tempe
  *(East of Rural Road, between Elliot and Warner roads)*

# Contact

September 1999

News for SRP Residential Customers

## We're Y2k Ready

SRP has verified that its electric supply and delivery system are "Y2k Ready." This verification includes:

- All SRP operated generating stations
- All SRP operated substations
- All other equipment used to deliver power, such as meters and communications networks
- Written contingency plans for all critical functions, which will be tested before the end of the year.

We are continuing to make sure that any newly purchased equipment is Y2k ready before

*Continued on page 2*

## In This Issue

New Power Project 2
Managed Payment Plan 3
Energy Saving Advice 4

# SRP Ranked Highest In Customer Satisfaction

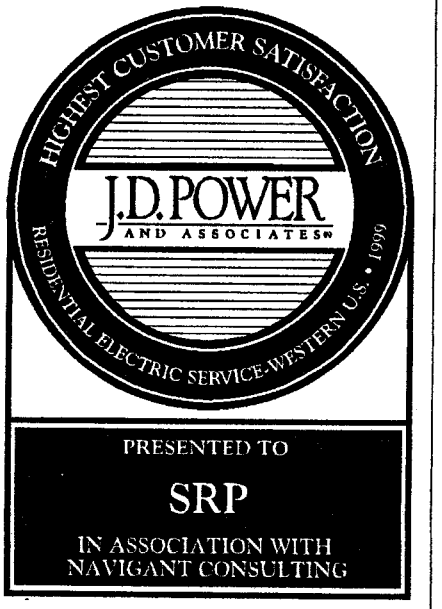
In a study issued by J.D. Power and Associates and Navigant Consulting, SRP has been ranked highest among electric utilities in the western United States for residential customer satisfaction in a tie.

SRP and Idaho Power Company tied for the highest ranking, with an overall customer satisfaction index of 111. SRP was cited for a strong company image and reliability.

The inaugural 1999 Electric Utility Residential Customer Satisfaction Study was based on more than 26,000 responses from residential electric customers throughout the continental U.S. These responses were collected through telephone interviews.

We're pleased our customers rank SRP so highly, but we won't rest on our laurels. We'll continue to offer the low prices and quality services our customers expect.

According to J.D. Power and Associates and Navigant Consulting Inc., which jointly designed and independently financed the study, the key determinant of satisfaction in the electric utility industry is a provider's image. Image includes 14 specific attributes, including reputation, honesty, effort to become more efficient and ability to communicate changes.




*Continued on page 2*

## SRP Tops Study

*Continued from page 1*

Other determinants of overall satisfaction are price and value, power quality and reliability, billing and call center. These attributes are consistent among all customers and regions.

With an overall customer satisfaction index of 111, SRP was ranked among the highest utilities in the nation. Only LG&E Energy, the parent company of Kentucky Utilities Co. and Louisville Gas and Electric Co., had a higher index of 115.

**J.D. Power and Associates/ Navigant Consulting, Inc. 1999 Electric Utility Residential Customer Satisfaction Study (www.jdpower.com) ranked the top 19 largest electric companies in the western U.S. and was based on 26,096 consumer responses.**

# Team Proposes New Power Project

SRP, Dynegy Inc. and NRG Energy, Inc. are working together on a new power project. The team has begun the process of obtaining the necessary siting permits for a natural gas-fired electricity generating facility in the greater Phoenix area and is considering multiple sites in the East Valley.

The number of electric customers SRP serves has skyrocketed to more than 700,000, which includes last year's record total of 27,000 new customers. The pace of customer growth is expected to continue, particularly in the East Valley. The new power project will help us meet customers' increasing energy needs over the next decade.

SRP selected Dynegy, one of the country's leading marketers of energy products and services, and NRG, a world leader in independent power production, to participate in the project.

The three companies are conducting informational meetings with federal, state, county and municipal officials and will soon launch an extensive public process related to facility siting. Pending approval from local authorities and state regulators, project construction would begin in late 2000.

## Save With Home Energy Manager

The answer to managing home energy costs is right at your fingertips. Using a computer with Internet service, you can access SRP's Home Energy Manager™.

The Home Energy Manager will help you examine your energy use over the past year and learn energy-efficiency techniques. There's no better time to start saving than right now. Go to **www.srpnet.com** and click on the **Online Services** icon. Then, select **Home Energy Manager** from the Product and services section.

## We're Y2k Ready

*Continued from page 1*

it is installed. And, we're working with other major western utilities to verify regional readiness.

For more information, visit **www.srpnet.com** and click on the **Y2k** link on the front page.

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**SRP Year 2000 Readiness Disclosure**

# Contact

November 1999

News for SRP Residential Customers

## With Your Bill

In our envelope this month, you'll find a brochure that lists **SRP PayCenter™** (automated payment terminal) locations and hours of operation.

We have placed PayCenters throughout the Valley for your convenience. SRP PayCenters, similar to automated teller machines, accept electric bill payments and are located in SRP offices, inside grocery stores and in convenience stores. Some PayCenters are open 24 hours a day.

## In This Issue

Advantage Billing 2

Economy Price Plan 3

Energy Saving Advice 4

# Growth Spurs Need For New Generation

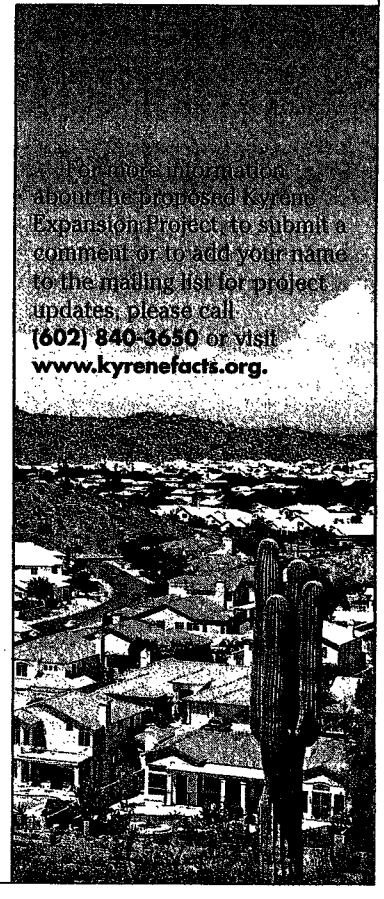
Metropolitan Phoenix is one of the nation's fastest-growing urban areas. As a result, the number of SRP electric customers has increased about 21% during the past five years.

Recent studies by SRP show a growing gap between projected peak demand for electricity and existing generation. By 2009, there could be a 2,000-megawatt gap between customer energy needs and generating capacity.

To address the projected gap, a group of companies, including SRP, has begun a formal process to obtain permits to build an additional power plant at SRP's Kyrene Generating Station in Tempe. This proposed project, called the Kyrene Expansion Project, will help meet the future energy needs of the Southeast Valley. SRP is conducting a separate process to obtain permits for additional generating capacity at the Santan station in Gilbert.

The Kyrene Expansion Project will consist of an environmentally-friendly, natural gas-fired facility that would generate enough energy to power 150,000 to 200,000 homes. Pending approvals, the new facility would be the first major power plant built in SRP's service area in 20 years.

Permitting activities, including the public involvement process, are expected to continue into late 2000. Construction is planned to start next year and to last until the plant begins commercial operations in 2002.

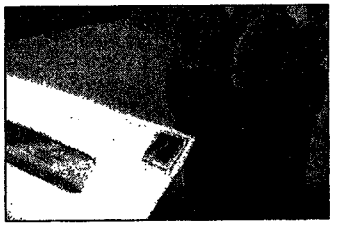


# Contact

April 2000

News for SRP Residential Customers


## With Your Bill



In our envelope this month, you'll find a voucher for two free tickets to the SRP Kick Off Party at Country Thunder USA on Thursday, April 27. The festival, held in Queen Creek, will feature music, food, a rodeo and other activities. For details, call **(480) 966-9920**.

### In This Issue


Advantage Billing 2

Cooling Tips 3

Summer Prices 4


# SRP Continues To Offer Among The Lowest Prices In The Southwest

SRP management has proposed to reduce prices by $9.8 million, or approximately 1%. Under the proposal, nearly 99% of SRP electric customers will either benefit or experience no change to their monthly bills.

We continue to offer among the lowest energy prices in the Southwest. If approved by SRP's Board of Directors, this adjustment will be the fourth decrease in six years and will make SRP's overall electricity prices more than 10% lower than in 1991. With this adjustment, SRP will exceed the 10% price decrease required by the Electric Power Competition Act.

The SRP Board of Directors will decide on a proposed electric price reduction on April 10. New prices could take effect as early as May 1, 2000 if the proposal is approved.

The proposed adjustment will realign prices to better reflect costs of providing service and to further facilitate electric utility

*Continued on Page 4*

### ◆ Price Plan Comparison ◆

**Basic Price Plan (E-23)**

| | Current | Proposed |
|---|---|---|
| **Summer** | | |
| Monthly Service Charge | $2.69 | $7.67 |
| Delivery Charge | $0.0480/kWh | $0.0430/kWh |
| Energy Charge | $0.0326/kWh | $0.0376/kWh |
| **Winter** | | |
| Monthly Service Charge | $12.65 | $7.67 |
| **First 400 kWh** | | |
| Delivery Charge | $0.0478/kWh | $0.0438/kWh |
| Energy Charge | $0.0228/kWh | $0.0268/kWh |
| **All Additional kWh** | | |
| Delivery Charge | $0.0203/kWh | $0.0163/kWh |
| Energy Charge | $0.0228/kWh | $0.0268/kWh |

# Three Options That Are Good Together

For truly effortless bill-paying, try the combination of our Managed Payment Plan, Customer Selected Due Date and 10-Day SurePay. With this trio of options (known as the **Advantage Billing** package), each month your electric payment will be automatically deducted from your financial account on the date you select for a pre-determined amount and you will receive a 1% discount on the cost of SRP's energy and delivery services.

Managed Payment Plan (MPP) allows you to balance the seasonal highs and lows of your electric bills so you can have predictable electric bills each month. Your annual energy cost is divided into equal monthly payments, making it easier to budget each month.

SRP's Customer-Selected Due Date enables you to pick almost any monthly due date for your SRP bill that works with your household budget. Our customer service representatives will help you select a due date that works best for you.

With 10-Day SurePay, the amount of your monthly electric bill is automatically withdrawn from your bank or other financial institution 10 days after the statement date. Since this payment option provides savings to SRP, we pass on a 1% discount on SRP services to customers who use 10-Day SurePay.

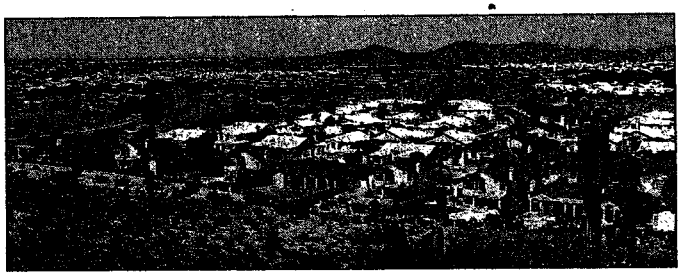
◆

**Remember, when you combine 10-Day SurePay with Customer-Selected Due Date and the Managed Payment Plan, you:**

- **receive a discount**
- **choose a due date that fits with your household's budget**
- **know the amount of your monthly bill in advance.**

**You can enroll in one, two or all three of these options of our Advantage Billing package. Call us at (602) 236-8888 for sign-up information.**

◆



# A Reasonable Plan For Growing Energy Needs

Demand for electricity is increasing due to growth in the Southeast Valley. We, at SRP, believe our plan to expand our existing Kyrene and Santan generating stations (in Tempe and Gilbert, respectively) is a reasonable and responsible approach to address our customers' energy needs.

SRP generation sources are near capacity during the hottest summer days, and transmission line constraints limit electricity imports into the Valley. These two conditions make local generation a necessity.

Locating new plants near the geographic area where most growth is occurring—the Southeast Valley—means lower development costs, less need for additional transmission structures, and a more stable and reliable supply of electricity.

As a political subdivision of the state of Arizona, SRP does not make "profits" and we do not have stockholders. Rather our prices are set according to costs. When costs are contained, so too are our prices. We offer among the lowest electricity prices in the Southwest.

Through efficient natural gas technology and emission offsets, these new power plants will result in a net improvement to the Valley's air quality. These plants will also increase property tax revenue by a combined $200 million over their life and will include property enhancements such as landscaping.

# Contact

May 2000

News for SRP Residential Customers

## Don't Drive On Canal Banks

Please do not drive along SRP canal banks. Motor vehicle use of canal roads is restricted to SRP and other authorized users.

If you observe unauthorized vehicles, excessive dust stirred by a vehicle, or unsafe driving practices on a canal road, please call us at **(602) 236-5305** to report these violations.

### In This Issue

New Plant Benefits ..... 2
Two Period Plan ..... 3
Mowing Down Pollution ..... 4

# Electric Prices Decrease By $13.7 Million

SRP's Board of Directors approved a measure that will raise the "shopping credit" portion of customer bills and reduce overall electric prices by approximately $13.7 million (about 1%). In addition, all SRP electric customers will be eligible to choose their own generation supplier after May 31, 2000.

We are realigning prices to better reflect the cost of providing service and to further facilitate electric utility competition. The shopping credit is the energy charge part of the bill and can be used in comparing SRP's prices with those of alternative energy suppliers.

With this Board decision, SRP will become the first electric utility in Arizona and the first public power entity in the nation to open its entire service area to generation competition. This action is seven months earlier than required by Arizona's Electric Power Competition Act.

Under competition, we will continue to deliver our customers' electricity. Customers will be able to buy their supply of electricity from SRP or other energy service providers (ESPs) that are authorized to serve in SRP's service area. Supply represents about a third of a typical residential monthly bill. The current list of SRP-authorized ESPs is available through the "Utility Competition" link at **www.srpnet.com,** at **www.electricfacts.org,** or by calling us at **(602) 236-8888.**

SRP will not release customer names, consumption data or other confidential information to ESPs, unless we have written permission from customers. Please call SRP at **(602) 236-8888,** if you are interested in selecting an alternate ESP and would like to release your account information.

The price reduction is the fourth decrease in six years. Since 1991, overall prices have fallen more than 10%. This adjustment is anticipated to take effect May 15, 2000. Additional pricing details will be mailed to customers prior to the effective date of the change.

# New Plants Will Offer Important Benefits

New electricity sources in the Southeast Valley will bring many real benefits to local communities.. SRP expects more than 50% of future energy demand growth to occur in the Southeast Valley. SRP's Kyrene and Santan expansion proposals would establish new, state-of-the-art generating stations to serve this growing need. Here are four benefits of the local generation projects.

**1. Continued supply of reliable electric power**

Increasing demands upon available electricity resources mean we must either build new local generation or import more power from outside sources. Importing energy from remote plants carries greater reliability-related risks associated with disturbances on the electric grid. However, local generation helps maintain voltage levels required by customer equipment and appliances.

**2. Continued supply of low-priced power**

Local generation offers a cost-benefit to SRP and in turn, the opportunity for continued low prices for customers. We evaluated alternative sites, and the Kyrene and Santan locations offer development costs that are much less than other options.

**3. Increased tax revenues to local education and cities**

The new plants would represent significant increases in local property tax revenues for Kyrene Elementary, Tempe Union High School and Gilbert Unified districts.

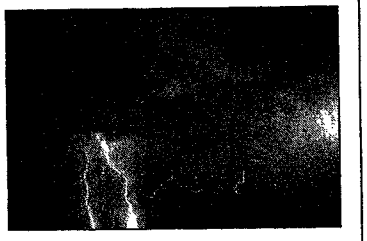
**4. Reduced need for new transmission lines into this area in the future**

There is no new transmission development required for the new plants. By comparison, a remote plant would require new transmission structures through communities to get the electricity to customers.

For more information about the Kyrene and Santan projects, visit **www.kyrenfacts.org** and **www.santanfacts.org.**

# Preparing For Summer Storms

SRP has been taking steps to improve its electric system to reduce the possibility of service interruptions from summer storm-related damage.



**Inspecting Wood Poles**

SRP is in the fifth year of a comprehensive program to inspect and maintain wood poles, which carry its transmission and distribution lines. Poles that are identified as deficient are treated, reinforced or replaced.

Ongoing visual inspections of our substation equipment and transformers are also helping to avoid potential outages.

**Tree Pruning**

Power outages can occur during monsoon storms when trees come in contact with overhead electricity lines. To help prevent these incidents, SRP prunes and removes trees that are too close to its power lines on a regular basis.

**Weather Forecasting**

Because weather plays a significant role in creating power outages, SRP has improved its ability to predict storm activity. SRP uses weather satellite image loops, the Lightning Detection Network and Doppler weather radar displays to forecast potentially damaging weather. This information allows SRP to respond quickly to storm damage by placing its restoration crews on alert during heavy storm activity.

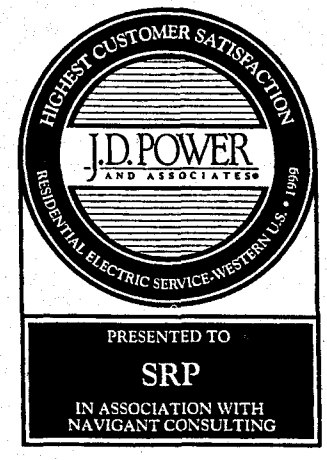
**Quick Response**

In addition to storms, car accidents sometimes knock down poles and cause power outages. While we cannot prevent these incidents from occurring, we are committed to restoring power quickly. Please call SRP at **(602) 236-8811** to report outages. This phone line is open 24 hours a day. Tell us if other homes in your area are out or if it's just your home. We will provide you with as much information as possible about the outage.

# Customer Choice

*August - September 1999 Vol. 2 No. 4* *SRP's Report on Electric Power Competition*

## SRP Ranked Highest In Customer Satisfaction




In a study issued by J.D. Power and Associates and Navigant Consulting, SRP has been ranked highest (in a tie) among electric utilities in the western United States for residential customer satisfaction.

SRP and Idaho Power Company tied for the highest ranking, with an overall customer satisfaction index of 111. SRP was cited for a strong company image and reliability.

The inaugural 1999 Electric Utility Residential Customer Satisfaction Study was based on more than 26,000 responses from residential electric customers throughout the continental U.S. These responses were collected through telephone interviews.

We're pleased our customers rank SRP so highly, but we won't rest on our laurels. We'll continue to offer the low prices and quality services our customers expect.

According to J.D. Power and Associates and Navigant Consulting Inc., which jointly designed and independently financed the study, the key determinant of satisfaction in electric utility industry is a provider's image. Image includes 14 specific attributes, including reputation, honesty, effort to become more efficient and ability to communicate changes.

Other determinants of overall satisfaction are price and value, power quality and reliability, billing and call center. These attributes are consistent among all customers and regions.

With an overall customer satisfaction index of 111, SRP was ranked among the highest utilities in the nation.

**J.D. Power and Associates/Navigant Consulting, Inc. 1999 Electric Utility Residential Customer Satisfaction Study (www.jdpower.com) ranked the top 19 largest electric companies in the western U.S. and was based on a total of 26,096 consumer responses.**

## We Are Y2k Ready

SRP has verified that its electric supply and delivery system are "Y2k Ready." This verification includes:

- All SRP operated generating stations
- All SRP operated substations
- All other equipment (hardware and software) used to deliver power, such as meters, information and energy management systems and communications networks
- Written contingency plans for all critical functions, which will be tested before the end of the year.

We are continuing to make sure that any newly purchased equipment is Y2k ready before it is installed. And, we are working with other major Western utilities to verify regional readiness.

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**SRP Year 2000 Readiness Disclosure**

**For more information, visit www.srpnet.com and click on the Y2k link on the front page.**

Y2K

# Customer Choice

*November 1999 Vol. 2 No. 5* *SRP's Report on Electric Power Competition*

# Electricity Market Warms

## New Plants Planned in Arizona

About a year after Arizona's Electric Power Competition Act of 1998 took effect, the state's electricity market is warming up. In just a few months, 11 different power plant construction projects have been announced to take advantage of electricity supply deregulation.

Industry analysts say it is unclear whether Arizona regulators or the regional power market will support all these proposed plants, most with remote sites far away from consumers and requiring miles of new transmission lines across the state. However, demand for energy in the Phoenix area—where the majority of the state's population resides—is rising.

Metropolitan Phoenix is one of the nation's fastest-growing urban areas. As a result, the number of SRP electric customers has increased about 21% during the past five years.

Recent studies by SRP show a growing gap between projected peak demand for electricity and existing generation.

SRP's Kyrene Generating Station in Tempe and the Santan Generating Station in Gilbert have been chosen as potential sites for new environmentally friendly, natural gas-fired generating facilities required to help meet the rapidly growing need for energy in the East Valley.

The Kyrene and Santan sites are well suited for new generating capacity. Their proximity to existing transmission facilities and access to natural gas fuel and water will reduce the costs and the environmental impact of the projects.

SRP, Dynegy Inc. and NRG Energy, Inc. will form Oasis Energy, a limited liability corporation to develop, construct and operate a generating facility at the Kyrene site. A process also is underway to obtain permits for generating capacity at the Santan location.

Environmental Planning Group, Inc. (EPG) will facilitate the public planning process for the Kyrene Expansion Project and Santan site, including consumer working groups and a series of open houses.

The working groups are composed of a cross-section of individuals who are familiar with local issues and who represent a diverse range of views. Its members will provide information regarding the community attitudes, issues and comments on the public involvement process.

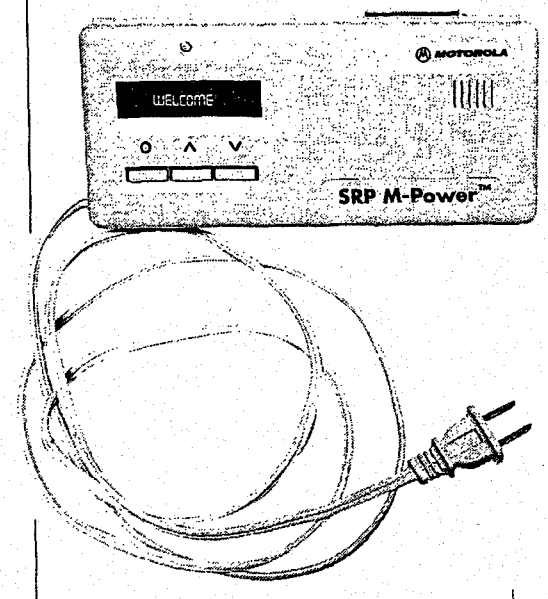
The open houses provide opportunities for the public to review information and discuss the projects with project team members.

Pending approval from local and state authorities and regulatory officials, construction on the Kyrene Expansion Project would begin in late 2000.

# SRP, Motorola Develop Electric Prepay Product

Through an agreement with Motorola, SRP will purchase 20,000 of Motorola's new PowerCom™ prepayment systems during the next two years.

The SRP-Motorola agreement will give SRP residential electric customers more options and flexibility in controlling and managing their electric usage. It also will position SRP as a prepayment leader among electric utilities in the U.S. Currently, only about 20,000 prepayment units are being used nationally—nearly 2,000 by SRP customers in the greater Phoenix area.




SRP first offered some electric customers the opportunity to voluntarily participate in its Pay As You Go prepayment program in 1993. SRP will begin offering the new program called **SRP M-Power™** to residential customers later this year.

# Customer Choice

*January 2000 Vol. 3 No. 1* **SRP's** *Report on Electric Power Competition*

## Plan For Competition And Growing Energy Needs

One of the challenges SRP faces in a competitive electricity market is determining the most effective solution to meet the growing energy needs. We've considered several approaches, including:

1. Build remote power plants (in less populated areas, miles away from electricity consumers) and new high-voltage power lines (also known as transmission) to deliver the electricity where it's needed.
2. Build local generation (close to consumers) and deliver electricity over existing transmission facilities.

Approach #1 would involve greater costs and more extensive power line impacts in the Valley than would local generation.

The second approach offers many advantages, including:

- Reduced overall costs
- Increased system reliability
- A reduced need for more power line construction
- Tax benefits to local communities.

To meet future needs, a mix of approach one and two provides the best solution. Local generation clearly is the best alternative in meeting short-term energy needs (within the next five to ten years). In previous issues of Customer Choice, we reported that SRP is pursuing permits for expanded generating facilities at our Kyrene station in Tempe and Santan station in Gilbert. These locations were selected because they are on existing generation sites, at the heart of SRP's existing delivery system and can directly serve the Southeast Valley.

In the long term, we believe expanding our high-voltage transmission system into and inside the Valley, will be necessary to fuel commerce and continued growth in our service area.

**We plan to meet future energy needs, by combining our local generation expansion proposals with efforts to increase major transmission to the Valley.**

That is why we are combining our local generation expansion proposals with efforts to increase major transmission to the Valley. More local generation will help us meet near-future growth demands, while new major transmission will address long-term growth.

## SRP Named Best Public Power Company

PHB Hagler Baily, a firm that offers strategic advice and analysis to the energy, telecommunications and transportation industries, named SRP the "best public power entity" in its recent Energy Industry Outlook 2000.

The Outlook cited SRP's "deep and positive relationships with its customers" as an important consideration in selecting us as a top performer.

In addition to recognizing outstanding performances by SRP and other companies, the report provides information about industry trends.

## SRP Sponsors Fuel Cell Project

At SRP, we're studying new technologies that will enable us to bring innovative service to customers.

That's why we have joined forces with Dana Corporation, Texaco and Southern Company to fund a fuel cell demonstration and evaluation project at the Houston Advanced Research Center (HARC). The three-year, $7 million project will determine if fuel cells can serve as clean, reliable and affordable energy sources.

**Fuel cells may be an environmentally friendly alternative to conventional power plants.**

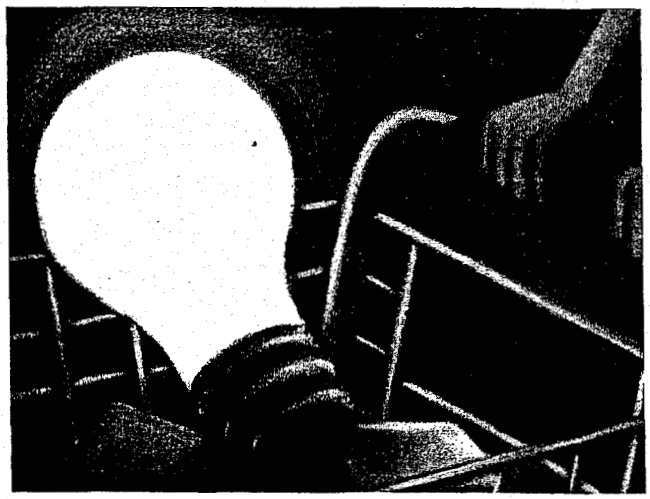
A fuel cell is a device that uses hydrogen from natural gas, gasoline, methanol or ethanol, to create a chemical reaction that produces electricity, heat and water. Because fuel cells use an electrochemical reaction rather than combustion to generate electricity, emissions are minimal, making them an environmentally friendly alternative to conventional power plants.

# Customer Choice

*May 2000 Vol. 3 No. 2* **SRP's** *Report on Electric Power Competition*

# Board Sets Shopping Credit

## Electric Prices Decrease By $13.7 Million



SRP's Board of Directors approved a measure that will raise the "shopping credit" portion of customer bills and reduce overall electric prices by $13.7 million (about 1%). In addition, all SRP electric customers will be eligible to choose their own generation beginning June 2000.

We are realigning prices to better reflect the cost of providing service and to further facilitate electric utility competition. The shopping credit is the energy charge part of the bill and can be used in comparing SRP's prices with those of alternative energy suppliers. We are decreasing the delivery charge so that most customers will receive lower bills or will not be impacted by the increase in the shopping credit.

With this Board decision, SRP will become the first electric utility in Arizona and the largest public power entity in the nation to open its entire service area to generation competition. This Board action is seven months earlier than the date required by Arizona's Electric Power Competition Act. Under the act, we will continue to deliver our customers' electricity.

Customers will be able to buy their supply of electricity from SRP or other energy service providers (ESPs) that are authorized to serve in SRP's service area. Supply represents about a third of a typical residential monthly bill (supply is an even larger portion of a business customer's bill).

The price reduction is the fourth decrease in six years. Since 1991, overall prices have fallen more than 10%. This adjustment, which may take effect as early May 15, 2000, includes a new price plan for towns, cities and other organizations that will ensure affordable public area lighting for streets, parks, playgrounds, schools, parking lots and common areas. Our new public lighting plan reflects our concern for safety and commitment to Valley communities.

## EPA Honors SRP Program

SRP's "Mowing Down Pollution" earned an Earth Day Award from the U.S. Environmental Protection Agency.

The EPA selected 46 groups and individuals from more than 160 nominees, seven of which were from Arizona. U.S. EPA Regional Administrator Felicia Marcus presented the award to SRP at Valley Forward EarthFest 2000 on April 11. Mowing Down Pollution, allows residents to trade in their gas-powered lawn mowers and hand-held gas-powered lawn equipment for discounts on electric models.

# Generation Update

SRP and representatives of several Tempe neighborhood groups reached agreement on a new proposal for power generation at the Kyrene Generating Station in Tempe.

The agreement proposes that SRP construct a, state-of-the-art, 250-megawatt natural gas generating station at Kyrene. SRP and the neighborhood groups agreed that new generation resources are needed at the site to meet local energy needs. This new facility will result in the reduced operation of the existing 250-megawatt Kyrene plant.

Some Tempe residents initially were concerned that increased emissions from a larger project could not be readily offset in the area. By installing a smaller, highly efficient plant and limiting the use of the current facility, total emissions will be less than the project output without any new generating capacity at this site. The agreement maintains the current site characteristics while providing additional local power generation capacity, which SRP and community groups consider to be a "win-win" proposal.

**Efforts to meet future East Valley needs advanced through a tentative agreement on a new proposal for power generation at the Kyrene Generating Station and an Intergovernmental Agreement with the Town of Gilbert regarding expansion of the Santan Generating Station.**

Efforts to meet future East Valley energy needs also advanced with an Intergovernmental Agreement (IGA) being signed between SRP and the Town of Gilbert regarding expansion of the **Santan Generating Station** at Val Vista and Warner roads.

Through the IGA, SRP will develop several municipal improvements in Gilbert, including: widening a portion of Warner Road

*continued on back page*

Kyrene Expansion Project

# Comment Form

OCTOBER 1999

*Thank you for attending this first public open house!* We want to hear your views on the project. Your comments are important to help us identify issues for the Kyrene Expansion Project. Please take a few minutes to consider the information provided in the newsletter and the open house displays, and complete and return this form to us.

**My concerns or comments are:** _____

_____

_____

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_____

## Mailing list

The project mailing list will be supplemented as needed throughout the project. If your name is not on the list (that is, if you did not receive a newsletter in the mail) and you want to be added, you may either call **(602) 840-3650** or provide your name and address below. If you know of additional people you believe should be included on the mailing list, please provide the names and addresses below.

Name: _____

Address: _____ Neighborhood: _____

City, State _____ Zip Code: _____

E-mail address: _____ Phone (optional): _____

Please fold this form (leaving the address and postage exposed) and tape or staple before mailing.

## Thank You For Your Comments!

Kyrene Expansion Project

# COMMENT FORM

FEBRUARY 2000

*Thank you for attending this second public open house!* We want to hear your views on the project. Your comments are important to help us identify issues for the Kyrene Expansion Project. Please take a few minutes to consider the information provided in the newsletter and the open house displays, and complete and return this form to us.

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Name: _____ Name: _____

Address: _____ Address: _____

City, State, Zip _____ City, State, Zip _____

E-mail: _____ E-mail: _____

Please fold this form (leaving the address and postage exposed) and seal the open end with tape before mailing.

*Thank You For Your Comments!*

# Kyrene Expansion Project

## Mitigation/Enhancement Comment Form

Community input is vital to the Kyrene Expansion Project. Please take a few minutes to consider the information provided at the Mitigation Station and other displays. If you believe that a particular issue needs to be addressed (i.e. noise considerations or visual resources, etc.), please list it and any mitigation or enhancements you feel would benefit the project. For example, we have heard that the views to the site from specific areas (i.e. corner of Kyrene and Elliot) are issues. Community members have suggested the use of trees or walls to screen these views as a way to address the concern.

Issue: _____

Suggested Mitigation/Enhancement for this issue: _____

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Issue: _____

Suggested Mitigation/Enhancement for this issue: _____

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Name: _____

Address: _____

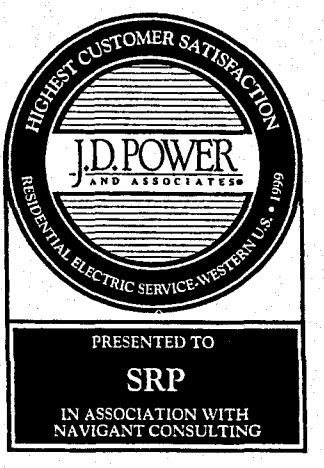
City, State, Zip: _____

Neighborhood: _____ Phone: _____

# Customer Choice

*August - September 1999 Vol. 2 No. 4* *SRP's Report on Electric Power Competition*


## SRP Ranked Highest In Customer Satisfaction

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With an overall customer satisfaction index of 111, SRP was ranked among the highest utilities in the nation.

**J.D. Power and Associates/Navigant Consulting, Inc. 1999 Electric Utility Residential Customer Satisfaction Study (www.jdpower.com) ranked the top 19 largest electric companies in the western U.S. and was based on a total of 26,096 consumer responses.**

## We Are Y2k Ready

SRP has verified that its electric supply and delivery system are "Y2k Ready." This verification includes:

- All SRP operated generating stations
- All SRP operated substations
- All other equipment (hardware and software) used to deliver power, such as meters, information and energy management systems and communications networks
- Written contingency plans for all critical functions, which will be tested before the end of the year.

We are continuing to make sure that any newly purchased equipment is Y2k ready before it is installed. And, we are working with other major Western utilities to verify regional readiness.

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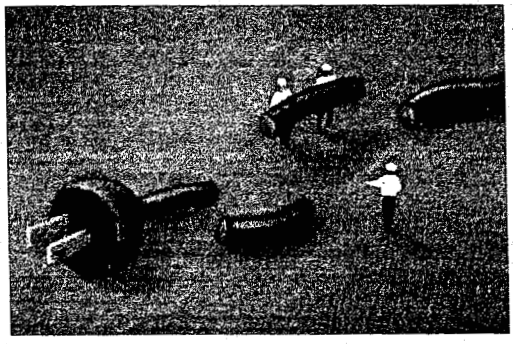
**SRP Year 2000 Readiness Disclosure**

**For more information, visit www.srpnet.com and click on the Y2k link on the front page.**

# New Power Project Proposed

SRP, Dynegy Inc. and NRG Energy, Inc. are working together on a new power project and have begun the process for obtaining the necessary siting permits for a natural gas-fired electricity generating facility in the greater Phoenix area. Multiple sites in the East Valley are being considered for the generating facility.



The number of electric customers SRP serves has skyrocketed to more than 700,000, which includes last year's record 27,000 new customers. The pace of customer growth is expected to continue, particularly in the East Valley. The new power project will help us meet customers' increasing energy needs over the next decade.

SRP selected Dynegy, one of the country's leading marketers of energy products and services, and NRG, a wholly-owned subsidiary of Northern States Power and world leader in independent power production, to participate in the project.

The three companies are meeting with federal, state, county and municipal officials and are launching an extensive public involvement process related to facility siting. Pending approval from local authorities and state regulators, project construction would begin in late 2000.

## ACC Decision Expected In Sept.

The Arizona Corporation Commission (ACC) held a hearing in July to consider New West Energy's request for certification as an energy service provider in Arizona. New West Energy, SRP's power marketing affiliate, will serve electric consumers outside SRP's traditional service territory. The ACC's final decision on the affiliate's request is expected sometime in the fall.

New West Energy will market energy in Arizona that becomes surplus in a competitive market. That surplus power, for example, will come from excess SRP generating capacity made available by the loss, through competition, of any current SRP customers.

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**Customer Choice**

SRP's Report On
Electric Power Competition

◆

**Correspondence**

SRP Customer Choice Editor
PO Box 52025 PAB 340
Phoenix AZ 85072-2025

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Visit our Web site **www.srpnet.com.,**
**or choice@srpnet.com**

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**Visit www.srpnet.com for more information about competition and customer choice.**

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# Customer Choice

*November 1999 Vol. 2 No. 5* *SRP's Report on Electric Power Competition*

# Electricity Market Warms

## New Plants Planned in Arizona

About a year after Arizona's Electric Power Competition Act of 1998 took effect, the state's electricity market is warming up. In just a few months, 11 different power plant construction projects have been announced to take advantage of electricity supply deregulation.

Industry analysts say it is unclear whether Arizona regulators or the regional power market will support all these proposed plants, most with remote sites far away from consumers and requiring miles of new transmission lines across the state. However, demand for energy in the Phoenix area—where the majority of the state's population resides—is rising.

Metropolitan Phoenix is one of the nation's fastest-growing urban areas. As a result, the number of SRP electric customers has increased about 21% during the past five years.

Recent studies by SRP show a growing gap between projected peak demand for electricity and existing generation.

SRP's Kyrene Generating Station in Tempe and the Santan Generating Station in Gilbert have been chosen as potential sites for new environmentally friendly, natural gas-fired generating facilities required to help meet the rapidly growing need for energy in the East Valley.

The Kyrene and Santan sites are well suited for new generating capacity. Their proximity to existing transmission facilities and access to natural gas fuel and water will reduce the costs and the environmental impact of the projects.

SRP, Dynegy Inc. and NRG Energy, Inc. will form Oasis Energy, a limited liability corporation to develop, construct and operate a generating facility at the Kyrene site. A process also is underway to obtain permits for generating capacity at the Santan location.

Environmental Planning Group, Inc. (EPG) will facilitate the public planning process for the Kyrene Expansion Project and Santan site, including consumer working groups and a series of open houses.

The working groups are composed of a cross-section of individuals who are familiar with local issues and who represent a diverse range of views. Its members will provide information regarding the community attitudes, issues and comments on the public involvement process.

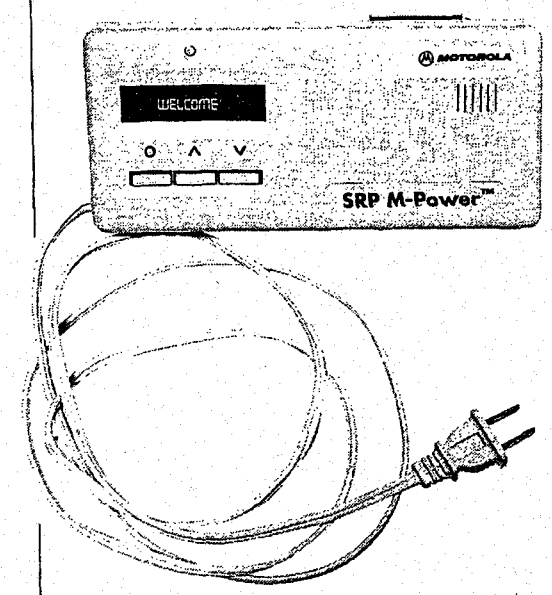
The open houses provide opportunities for the public to review information and discuss the projects with project team members.

Pending approval from local and state authorities and regulatory officials, construction on the Kyrene Expansion Project would begin in late 2000.

# SRP, Motorola Develop Electric Prepay Product

Through an agreement with Motorola, SRP will purchase 20,000 of Motorola's new PowerCom™ prepayment systems during the next two years.

The SRP-Motorola agreement will give SRP residential electric customers more options and flexibility in controlling and managing their electric usage. It also will position SRP as a prepayment leader among electric utilities in the U.S. Currently, only about 20,000 prepayment units are being used nationally—nearly 2,000 by SRP customers in the greater Phoenix area.




SRP first offered some electric customers the opportunity to voluntarily participate in its Pay As You Go prepayment program in 1993. SRP will begin offering the new program called **SRP M-Power™** to residential customers later this year.

# Energy Providers Await Statewide Competition

Arizona's electric utility industry has moved closer to customer choice. In late September, the Arizona Corporation Commission (ACC) adopted statewide competition rules for public service corporations. During the past year, the ACC has approved several energy service providers (ESPs) to compete for customers throughout the state.

New West Energy Corporation, an affiliate of SRP, is among the companies that are certified to provide energy and related services to Arizona consumers. Other certified providers include:

- **APS Energy Services**
- **Eastern Competitive Solutions**
- **Enron Energy Services**
- **Illinova Energy Partners**
- **New Energy Ventures Southwest**
- **PG&E Energy Services**
- **Sempra Energy Trading**
- **Sierra Southwest Electric Power Cooperative Services.**

Agreements between these ESPs and existing Arizona electric utility distribution companies still need to occur before full competition occurs.

The SRP affiliate will offer competitive electric services statewide once competition begins. New West Energy will market power outside SRP's distribution service territory and compete for customers with Arizona's existing electric utilities and other certified ESPs.

New West Energy plans to approach consumers in phases, starting with Valley business customers and a limited number of residential customers in 2000.

New West Energy supplies power to California businesses and residents from San Diego to San Francisco. New West Energy's experience in California has given the affiliate insight into how to build value for its customers in a competitive energy market.

## Choice Benefits

Since SRP opened its service area to competition on January 1, 1999, we have reduced prices by 5.4% (on average) and earned top ranking in a national electric utility residential satisfaction study. We believe competition will continue to bring lower prices and better service to our customers. In addition, SRP is working to develop innovative products and services.

**See the article in the front right column to learn about a new SRP program.**

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## Customer Choice

SRP's Report On
Electric Power Competition

◆

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# Customer Choice

*January 2000 Vol. 3 No. 1* **SRP's** *Report on Electric Power Competition*

## Plan For Competition And Growing Energy Needs

One of the challenges SRP faces in a competitive electricity market is determining the most effective solution to meet the growing energy needs. We've considered several approaches, including:

1. Build remote power plants (in less populated areas, miles away from electricity consumers) and new high-voltage power lines (also known as transmission) to deliver the electricity where it's needed.
2. Build local generation (close to consumers) and deliver electricity over existing transmission facilities.

Approach #1 would involve greater costs and more extensive power line impacts in the Valley than would local generation.

The second approach offers many advantages, including:

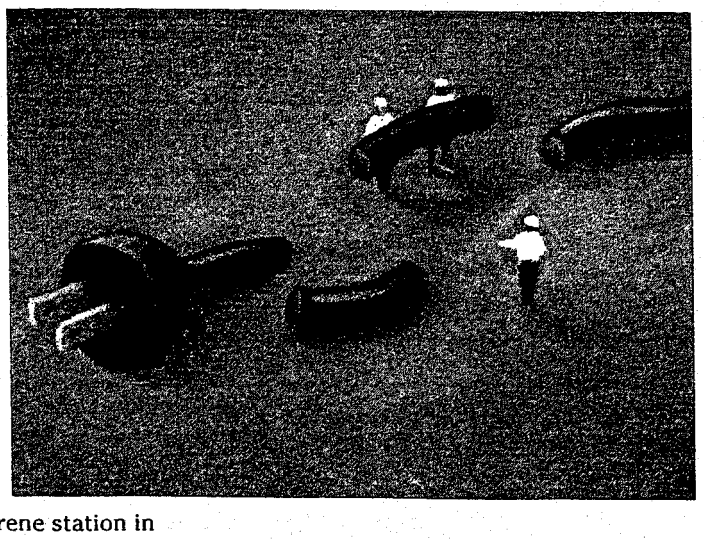
- Reduced overall costs
- Increased system reliability
- A reduced need for more power line construction
- Tax benefits to local communities.

To meet future needs, a mix of approach one and two provides the best solution. Local generation clearly is the best alternative in meeting short-term energy needs (within the next five to ten years). In previous issues of Customer Choice, we reported that SRP is pursuing permits for expanded generating facilities at our Kyrene station in Tempe and Santan station in Gilbert. These locations were selected because they are on existing generation sites, at the heart of SRP's existing delivery system and can directly serve the Southeast Valley.

In the long term, we believe expanding our high-voltage transmission system into and inside the Valley, will be necessary to fuel commerce and continued growth in our service area.

**We plan to meet future energy needs, by combining our local generation expansion proposals with efforts to increase major transmission to the Valley.**

That is why we are combining our local generation expansion proposals with efforts to increase major transmission to the Valley. More local generation will help us meet near-future growth demands, while new major transmission will address long-term growth.



## SRP Named Best Public Power Company

PHB Hagler Baily, a firm that offers strategic advice and analysis to the energy, telecommunications and transportation industries, named SRP the "best public power entity" in its recent Energy Industry Outlook 2000.

The Outlook cited SRP's "deep and positive relationships with its customers" as an important consideration in selecting us as a top performer.

In addition to recognizing outstanding performances by SRP and other companies, the report provides information about industry trends.

## SRP Sponsors Fuel Cell Project

At SRP, we're studying new technologies that will enable us to bring innovative service to customers.

That's why we have joined forces with Dana Corporation, Texaco and Southern Company to fund a fuel cell demonstration and evaluation project at the Houston Advanced Research Center (HARC). The three-year, $7 million project will determine if fuel cells can serve as clean, reliable and affordable energy sources.

**Fuel cells may be an environmentally friendly alternative to conventional power plants.**

A fuel cell is a device that uses hydrogen from natural gas, gasoline, methanol or ethanol, to create a chemical reaction that produces electricity, heat and water. Because fuel cells use an electrochemical reaction rather than combustion to generate electricity, emissions are minimal, making them an environmentally friendly alternative to conventional power plants.

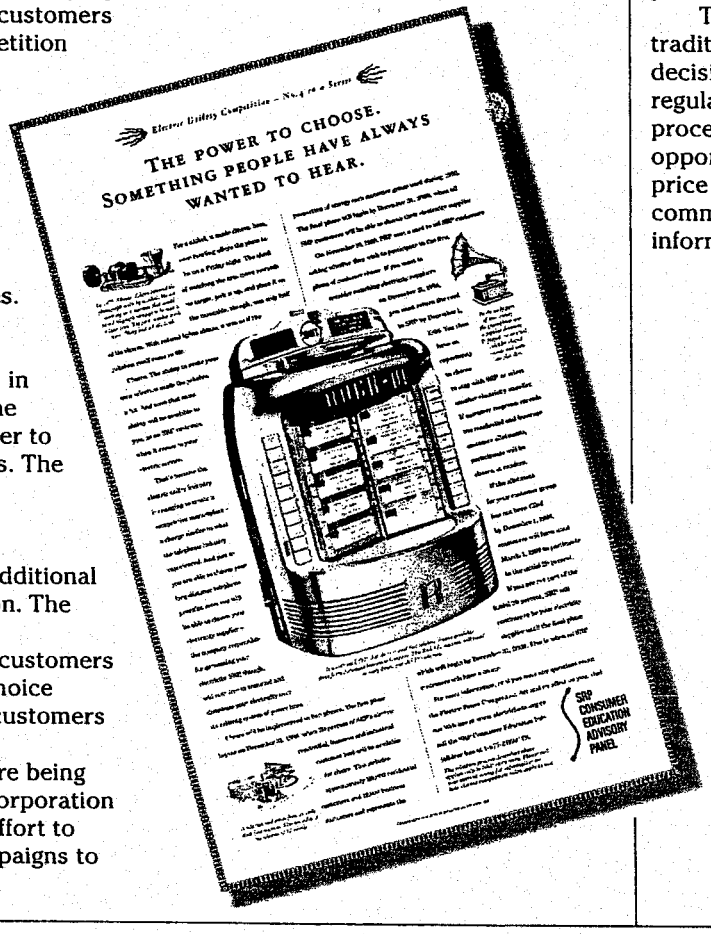
# Panel Continues Education Efforts

SRP's Consumer Education Advisory Panel (CEAP), consisting of diverse community group representatives, has been developing a program to educate SRP customers about electric utility competition since 1998.

The current program consists of a Web site **(www.electricfacts.org)**, a toll-free telephone line **(1-877-23FACTS)**, public presentations and a series of seven brochures about different competition issues.

The panel is now working on a "Shopper's Guide" to assist customers in making a decision about the best energy service provider to meet their individual needs. The guide will contain a comprehensive section on criteria to consider when selecting a supplier, plus additional information on deregulation. The guide will be mailed to the approximately 80,000 SRP customers who are now eligible for choice and available to all other customers by request.

CEAP materials also are being shared with the Arizona Corporation Commission (ACC) in an effort to coordinate education campaigns to reduce confusion to the public. An ACC representative also is invited to CEAP meetings to further its understanding of our campaign.


THE POWER TO CHOOSE.
SOMETHING PEOPLE HAVE ALWAYS WANTED TO HEAR.

SRP CONSUMER EDUCATION ADVISORY PANEL

# SRP Begins Public Process

In February, SRP will conduct a public process to receive input on a proposed price adjustment. While the details of the proposal are still being developed, the adjustment is designed to better align prices with the cost of providing service.

The public process reflects SRP's tradition of involving customers in decisions that will affect them and is a regular part of our price setting process. Customers will have several opportunities to learn more about the price change proposal and to submit comments, including a series of informational meetings in February.

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## Customer Choice

SRP's Report On
Electric Power Competition

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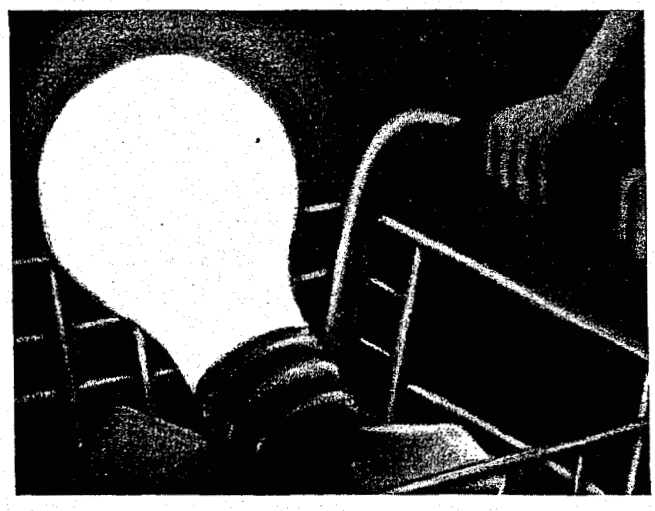
# Customer Choice

*May 2000 Vol. 3 No. 2* **SRP's** *Report on Electric Power Competition*

# Board Sets Shopping Credit

## Electric Prices Decrease By $13.7 Million



SRP's Board of Directors approved a measure that will raise the "shopping credit" portion of customer bills and reduce overall electric prices by $13.7 million (about 1%). In addition, all SRP electric customers will be eligible to choose their own generation beginning June 2000.

We are realigning prices to better reflect the cost of providing service and to further facilitate electric utility competition. The shopping credit is the energy charge part of the bill and can be used in comparing SRP's prices with those of alternative energy suppliers. We are decreasing the delivery charge so that most customers will receive lower bills or will not be impacted by the increase in the shopping credit.

With this Board decision, SRP will become the first electric utility in Arizona and the largest public power entity in the nation to open its entire service area to generation competition. This Board action is seven months earlier than the date required by Arizona's Electric Power Competition Act. Under the act, we will continue to deliver our customers' electricity.

Customers will be able to buy their supply of electricity from SRP or other energy service providers (ESPs) that are authorized to serve in SRP's service area. Supply represents about a third of a typical residential monthly bill (supply is an even larger portion of a business customer's bill).

The price reduction is the fourth decrease in six years. Since 1991, overall prices have fallen more than 10%. This adjustment, which may take effect as early May 15, 2000, includes a new price plan for towns, cities and other organizations that will ensure affordable public area lighting for streets, parks, playgrounds, schools, parking lots and common areas. Our new public lighting plan reflects our concern for safety and commitment to Valley communities.

## EPA Honors SRP Program

SRP's "Mowing Down Pollution" earned an Earth Day Award from the U.S. Environmental Protection Agency.

The EPA selected 46 groups and individuals from more than 160 nominees, seven of which were from Arizona. U.S. EPA Regional Administrator Felicia Marcus presented the award to SRP at Valley Forward EarthFest 2000 on April 11. Mowing Down Pollution, allows residents to trade in their gas-powered lawn mowers and hand-held gas-powered lawn equipment for discounts on electric models.

# Generation Update

SRP and representatives of several Tempe neighborhood groups reached agreement on a new proposal for power generation at the Kyrene Generating Station in Tempe.

The agreement proposes that SRP construct a, state-of-the-art, 250-megawatt natural gas generating station at Kyrene. SRP and the neighborhood groups agreed that new generation resources are needed at the site to meet local energy needs. This new facility will result in the reduced operation of the existing 250-megawatt Kyrene plant.

Some Tempe residents initially were concerned that increased emissions from a larger project could not be readily offset in the area. By installing a smaller, highly efficient plant and limiting the use of the current facility, total emissions will be less than the project output without any new generating capacity at this site. The agreement maintains the current site characteristics while providing additional local power generation capacity, which SRP and community groups consider to be a "win-win" proposal.

**Efforts to meet future East Valley needs advanced through a tentative agreement on a new proposal for power generation at the Kyrene Generating Station and an Intergovernmental Agreement with the Town of Gilbert regarding expansion of the Santan Generating Station.**

Efforts to meet future East Valley energy needs also advanced with an Intergovernmental Agreement (IGA) being signed between SRP and the Town of Gilbert regarding expansion of the **Santan Generating Station** at Val Vista and Warner roads.

Through the IGA, SRP will develop several municipal improvements in Gilbert, including: widening a portion of Warner Road

*continued on back page*

# New Plants Will Offer Important Benefits

New electricity sources in the Southeast Valley will bring many real benefits to local communities. SRP expects more than 50 percent of electricity demand growth to occur in Southeast Valley in the years ahead. SRP's Kyrene and Santan expansion proposals would establish new, state-of-the-art generating stations to serve this growing need. Here are four benefits of the local generation projects proposed by SRP.

### 1. Continued supply of reliable electric power

SRP has a strong power reliability record, and our customers tell us reliability is an important issue to them. Increasing demands upon available electricity resources mean we must either build new local generation or import more power from outside sources. Importing energy from remote plants carries greater reliability-related risks associated with disturbances on the electric grid. On the other hand, local generation helps maintain voltage levels required by customer equipment and appliances.

### 2. Continued supply of low-priced power

SRP offers among the lowest electricity prices in the Southwest. As a political subdivision of the state, we do not make "profits" and we do not have stockholders. Rather, our prices are set according to our costs. Local generation offers a cost-benefit to SRP and in turn, the opportunity for continued low prices for customers. We evaluated alternative sites, and the Kyrene and Santan locations offer development costs that are substantially less than other options.

### 3. Increased tax revenues to local education and cities

The new plants would represent increases in local property tax revenues for Kyrene Elementary, Tempe Union High School and Gilbert Unified districts. The new plants' estimated present-value tax payments over 20 years would total approximately $75 million.

### 4. Reduced need for new transmission lines into this area in the future

There is no new transmission development required for the new plants. By comparison, a remote plant would require new transmission structures through communities to deliver the electricity to customers.

For more information about the Kyrene and Santan projects, visit **www.kyrenfacts.org** and **www.santanfacts.org**.

**Generation Update** *continued from front*

near the existing plant site; realigning a portion of the Western Canal; completing an extension of a horseback and hiking trail on the eastern edge of the plant site; and screening of the existing facilities using trees, plants and berms.

SRP is proposing a natural gas, combined-cycle generating facility at Santan to help serve the growing demand for electricity. Natural gas generating units are an efficient and environmentally friendly way to generate electricity.

SRP will hold an open house to update the public about the siting process in June. The open house provides an opportunity for the public to review informational displays and discuss the project with project team members.

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## Customer Choice

SRP's Report On
Electric Power Competition

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Kyrene Expansion Project

# Comment Form

OCTOBER 1999

*Thank you for attending this first public open house!* We want to hear your views on the project. Your comments are important to help us identify issues for the Kyrene Expansion Project. Please take a few minutes to consider the information provided in the newsletter and the open house displays, and complete and return this form to us.

**My concerns or comments are:** _____

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## Mailing list

The project mailing list will be supplemented as needed throughout the project. If your name is not on the list (that is, if you did not receive a newsletter in the mail) and you want to be added, you may either call **(602) 840-3650** or provide your name and address below. If you know of additional people you believe should be included on the mailing list, please provide the names and addresses below.

Name: _____

Address: _____ Neighborhood: _____

City, State _____ Zip Code: _____

E-mail address: _____ Phone (optional): _____

Please fold this form (leaving the address and postage exposed) and tape or staple before mailing.

## Thank You For Your Comments!

Kyrene Expansion Project

Place Postage Here

EPG
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Suite G-200
Phoenix, Arizona 85018

Kyrene Expansion Project

# COMMENT FORM

FEBRUARY 2000

*Thank you for attending this second public open house!* We want to hear your views on the project. Your comments are important to help us identify issues for the Kyrene Expansion Project. Please take a few minutes to consider the information provided in the newsletter and the open house displays, and complete and return this form to us.

**My concerns or comments are:** _____

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Name: _____ Name: _____

Address: _____ Address: _____

City, State, Zip _____ City, State, Zip _____

E-mail: _____ E-mail: _____

Please fold this form (leaving the address and postage exposed) and seal the open end with tape before mailing.

*Thank You For Your Comments!*

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Kyrene Expansion Project

EPG, Inc.
4350 East Camelback Road
Suite G-200
Phoenix, Arizona 85018

# Kyrene Expansion Project

## Mitigation/Enhancement Comment Form

Community input is vital to the Kyrene Expansion Project. Please take a few minutes to consider the information provided at the Mitigation Station and other displays. If you believe that a particular issue needs to be addressed (i.e. noise considerations or visual resources, etc.), please list it and any mitigation or enhancements you feel would benefit the project. For example, we have heard that the views to the site from specific areas (i.e. corner of Kyrene and Elliot) are issues. Community members have suggested the use of trees or walls to screen these views as a way to address the concern.

Issue: _____

Suggested Mitigation/Enhancement for this issue: _____

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Issue: _____

Suggested Mitigation/Enhancement for this issue: _____

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Name: _____

Address: _____

City, State, Zip: _____

Neighborhood: _____ Phone: _____

Kyrene Expansion Project

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# EXHIBIT J-2
# NEWSPAPER ADS, NEWS RELEASES

THE ARIZONA REPUBLIC

October 20, 1999
Page EV9

## Southeast Valley residents, you're invited to an open house

Come learn about the **Kyrene Expansion Project.** The proposed project consists of an additional generating facility at SRP's Kyrene Generating Station in Tempe to help meet the future energy needs of the Southeast Valley.

The Environmental Planning Group Inc. will conduct two public open houses to introduce the project to the community.

- **Thursday, October 21, 1999,** from 5 p.m. to 8 p.m.
  Fees Middle School, 1600 E. Watson Drive, Tempe
  (west of McClintock Drive, between Baseline & Guadalupe roads)
- **Saturday, October 23, 1999,** from 10 a.m. to noon
  Kyrene Middle School, 1350 E. Carver Road, Tempe
  (east of Rural Road, between Elliot and Warner roads)

For more information, to submit a comment or to add your name to the mailing list for project updates, please call **(602) 840-3650** or visit **www.kyrenefacts.org.**

Tribune

October 20, 1999
Page F3

## Se abre al público por los residentes del Sureste del Valle

A todos los residentes del Sureste del Valle, se les invita a conocer el proyecto **"Kyrene Expansion Project."** Se trata de una facilidad adicional en la Estación de Generación Kyrene de SRP, al sur de Tempe, y tiene el propósito de garantizar las necesidades futuras de energía en el Sureste del Valle.

El grupo Environmental Planning Group, Inc. conducirá dos exposiciones públicas para presentar el proyecto a la comunidad.

- **Jueves, 21 de octubre, 1999,** de 5 p.m. a 8 p.m.
  En la escuela Fees Middle School, 1600 E. Watson Drive, Tempe
  (al oeste de McClintock, entre las calles Baseline y Guadalupe).
- **Sábado, 23 de octubre, 1999,** de 10 a.m. a mediodía
  En la escuela Kyrene Middle School, 1050 E. Carver Road, Tempe
  (al este de Rural, entre las calles Elliot y Warner).

Para mayor información, enviar un comentario o incluir su nombre en la lista de correo para actualización de fechas, favor de llamar al **(602) 840-3650.**

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# East Valley residents, you're invited to an open house

Come learn about the **Kyrene Expansion Project.** The proposed project consists of an additional generating facility at SRP's Kyrene Generating Station in Tempe to help meet the future energy needs of the East Valley.

The Environmental Planning Group Inc. will conduct two public open houses to discuss details of project impact studies.

- **Thursday, February 3, 2000,** from 5 p.m. to 8 p.m.
  Sam Fees Middle School, 1600 E. Watson Dr., Tempe (just west of McClintock Drive, between Baseline & Guadalupe roads)
- **Saturday, February 5, 2000,** from 9 a.m. to 12:00 noon
  Kyrene Middle School, 1050 E. Carver Rd., Tempe (east of Rural Road, between Elliot and Warner roads)

For more information, to submit a comment or to add your name to the mailing list for project updates, please call **(602) 840-3650** or visit **www.kyrenefacts.org.**

SRP®

4.25" x 5"

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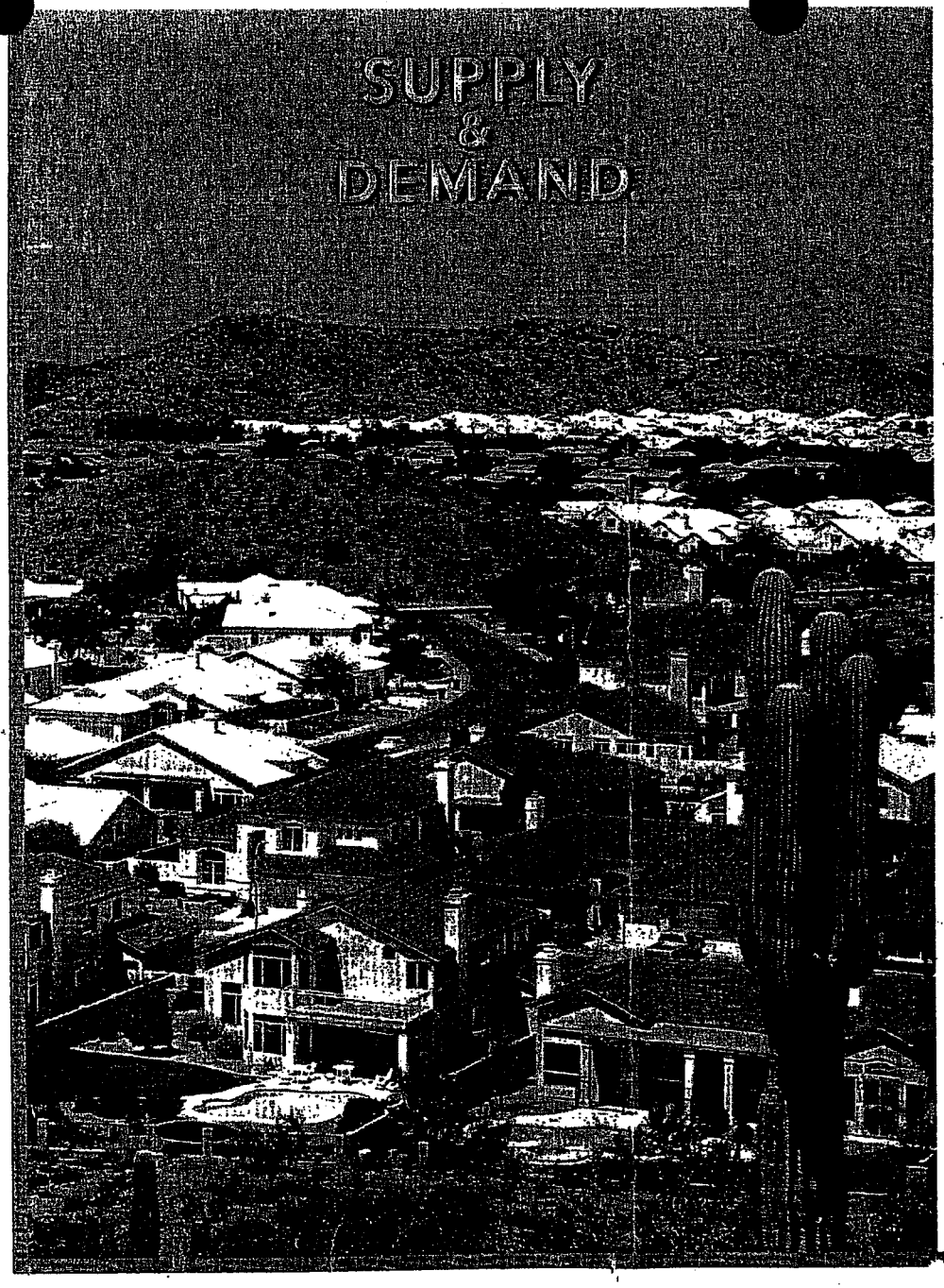
SRP

3" x 5"




# AS THE EAST VALLEY CONTINUES TO GROW, SO TOO DOES OUR NEED FOR MORE ELECTRICITY.

From new homes spreading as far as the eye can see, to the increased traffic on our freeways, it's not hard to understand why metropolitan Phoenix is one of the nation's fastest-growing urban areas, with the majority of growth occurring in East Valley cities within SRP's service territory. These circumstances provide many challenges. One that we at SRP take seriously is making sure the same reliable electric service our customers enjoy now will be there for them in the future.

## WHEN DEMAND IS GREATER THAN SUPPLY.

When demand exceeds supply, shortage occurs. In order to understand how a resource like electricity runs in short supply, think about water pressure. When a dishwasher runs at the same time as a shower, water pressure is reduced. In the same way, voltage is decreased when more load is added to SRP's existing electric system which could cause your lights to dim or go out.

Currently, SRP supplies much of the needed electricity to the Valley from generating facilities located outside the metropolitan area. Energy is transported to the Valley over high-voltage transmission lines. But transmission lines can carry just so much electricity – and they are already close to reaching their maximum capacity.

## GROWTH AND THE EAST VALLEY.

Much of the growth is occurring in the East Valley, where four of Arizona's fastest-growing cities – Tempe, Mesa, Gilbert and Chandler – are located. In fact, during the past five years, the number of SRP customers has increased more than 15 percent, which means there are more households, more businesses, more appliances, more air conditioners – more load on our electric system. But perhaps more important, SRP anticipates even greater power usage in the East Valley during the next ten years. And current studies indicate that by 2003, peak demand (the maximum amount of electricity required at any one time during the year) is expected to exceed available resources.

## OUR CHALLENGE.

For the past few years, SRP has been committed to finding a solution to this very serious problem – a problem that directly affects the lives of our residential customers and the economic growth of East Valley businesses. As SRP works towards meeting increased electric system requirements, we will at the same time keep the best interests of our customers foremost in our minds. And because we believe in keeping our customers informed, we will continue to provide you with the facts, the options and possible solutions this challenge holds for all of us.

SRP
Delivering More Than Power.®

For more information on the East Valley Power Project, call (602) 236-2679.

332739

# News Release

Delivering More Than Power.®

Media Relations • P. O. Box 52025, Phoenix AZ 85072-2025 • (602) 236-2500 • www.srpnet.com

Media:

Scott Harelson, SRP
(602) 236-2500

John Sousa, Dynegy Inc.
(713) 507-3936

Frank Rapley, NRG Energy, Inc.
(612) 373-8892

Analyst:

Margaret Nollen, Dynegy Inc.
(713) 767-8707

FOR IMMEDIATE RELEASE August 10, 1999

## SRP, Dynegy and NRG Energy Form Alliance:
### Propose Power Generation Project in the Phoenix Area

Phoenix (August 10, 1999) – SRP, Dynegy Inc. and NRG Energy, Inc. today announced the creation of an alliance to develop a 500 to 750-megawatt (MW) natural gas-fired, combined-cycle generating facility to serve the growing demand for electricity in the greater Phoenix area. The three companies are initiating the process to obtain the necessary siting permits and are considering multiple sites in Phoenix's East Valley.

SRP, which provides electricity to more than 700,000 customers in the greater Phoenix metropolitan area, has experienced a tremendous growth in customers the past few years, including a record 27,000 new customers last fiscal year. The pace of SRP's customer growth is anticipated to continue, particularly in the East Valley. The companies believe that the project is critical to ensure SRP's ability to meet forecasted demand and to maintain a dependable supply of power over the next decade.

"Our projections show that without new generation resources in Phoenix's East Valley, we could have difficulties meeting our growing customer load in three years," said SRP General Manager Richard Silverman. "A new natural gas-fired generating facility in the area would alleviate some of the transmission challenges in our service territory and help SRP to continue to provide the reliable service our customers expect."

- MORE -

SRP selected Dynegy and NRG to participate in the project after issuing a request for proposals in April, 1998. Dynegy is a national energy merchant headquartered in Houston; NRG is a wholly-owned subsidiary of Northern States Power, which is located in Minneapolis.

The group plans to construct a new 500 to 750-megawatt (MW) natural gas-fired generating facility in the Phoenix area. The site of the project has not been finalized, although existing SRP properties at the Kyrene Generating Station in Tempe and the Santan Generating Station in Gilbert are among the sites under consideration. Both Kyrene and Santan offer existing transmission facilities, natural gas connections and convenient water supplies and thus would reduce the environmental footprint required to install the additional generating capacity.

The three companies are conducting informational meetings about the project with relevant federal, state, county and municipal officials as well as the Arizona Corporation Commission. The participants will soon launch an extensive public process to facilitate the permitting procedure. The public process will culminate with a request for a certificate of environmental compatibility from the state of Arizona Power Plant and Transmission Siting Committee. Pending approval from local and state authorities and regulatory officials, construction on the project would begin in late 2000.

"Because of the tremendous growth in demand for power and ancillary products in the greater Phoenix area, Dynegy is pleased to join with SRP and NRG in seeking solutions to the growing demand for electricity in the region," said Steve Bergstrom, president and chief operating officer of Dynegy Inc. "Each of the participants is committed to high standards for commercial development and environmental performance. As a group, we are dedicated to receiving input from the community and keeping citizens informed as we move through the approval and construction phases of the project."

"Our three organizations and the experience and expertise we possess are well-suited to develop new power generation facilities that utilize natural gas," said David Peterson, chairman, president and chief executive officer of NRG Energy. "As the operator of more than 11,000 megawatts of generation worldwide, we have demonstrated our ability to operate safe and efficient power plants."

- MORE -

Dynegy Inc. (NYSE: DYN) is one of the country's leading marketers of energy products and services. Through its leadership position in gathering, processing, transportation, power generation, and marketing of energy, the company provides energy solutions to its customers primarily in North America and the United Kingdom. Dynegy's primary business segments are wholesale gas and power and natural gas liquids.

NRG Energy, Inc. is one of the world's leading independent power producers, specializing in the development, construction, operation, maintenance and ownership of low-cost, environmentally sensitive power plants. Established in 1989, NRG has a high quality portfolio of projects in the United States, Europe, the Pacific Rim, and Latin America.

SRP is the third largest public power utility in the U.S. serving more than 700,000 electric customers in the greater Phoenix metropolitan area and has been ranked the top-performing electric utility in the western U.S. for residential customer satisfaction by J.D. Power and Associates.

- 30 -

# News Release

Delivering More Than Power.™

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Analyst:

Margaret Nollen, Dynegy Inc.
(713) 767-8707

FOR IMMEDIATE RELEASE October 13, 1999

## SRP Identifies Two Sites for New Generating Facilities
### Focus on Kyrene and Santan Locations

PHOENIX (Oct. 13, 1999) – The Kyrene Generating Station in Tempe and the Santan Generating Station in Gilbert have been chosen as potential sites for new natural gas-fired, combined-cycle generating facilities required to help meet the rapidly growing need for energy in the East Valley.

Salt River Project (SRP), Dynegy Inc. and NRG Energy, Inc. will form a limited liability corporation to pursue the installation of additional generating capacity at the Kyrene site. SRP is conducting a separate process to obtain permits for additional generating capacity at the Santan location.

The Kyrene and Santan sites are best suited for new generating capacity because they have existing transmission facilities and access to natural gas fuel and water, which will reduce the costs and the environmental impact required to install the additional generating capacity.

SRP has experienced a tremendous growth in customers the past few years, including a record 27,000 new customers over the last fiscal year. The pace of SRP's customer growth is anticipated to continue, particularly in the East Valley. Additional generating capacity is critical to ensure SRP's ability to meet forecasted demand and to maintain a dependable supply of power over the next decade.

- MORE -

The capacity of Dynegy's 34 U.S. Generation assets currently operating or under construction is more than 7,000 gross megawatts.

NRG Energy Inc., a wholly owned subsidiary of Northern States Power (NTSE: NSP), is one of the world's largest independent power producers, specializing in the development, construction, operation, maintenance and ownership of low-cost, environmentally responsible power plants.

Established in 1989, NRG has a high-quality portfolio of projects in the United States, Europe, the Pacific Rim, and Latin America. NRG is involved in projects totaling more than 21,000 MW of generating capacity, utilizing diverse fuel types including natural and landfill gas, hydro, and solid fuels such as coal, lignite, biomass and refuse-derived fuel.

SRP is the third-largest public power utility in the U.S., serving more than 700,000 electric customers in the greater Phoenix metropolitan area.

**For more information about the Kyrene Expansion Project, visit the project web site at www.kyrenefacts.org.**

- 30 -

# NEWS RELEASE

FOR IMMEDIATE RELEASE May 8, 2000

## SRP and Tempe Neighborhood Groups Reach Agreement on Tentative New Proposal for Power Generation at Kyrene Facility

SRP and representatives of several Tempe neighborhood groups, including the "Stop Tempe Oasis Project" (STOP) community coalition, have reached a tentative agreement on a new proposal for power generation at the SRP Kyrene Generating Station in Tempe.

The agreement was reached following a series of meetings proposed by the City of Tempe and facilitated by former state Attorney General and Grant Woods, a Tempe resident.

The agreement proposes that SRP seek permits to construct a new, state-of-the-art 250-megawatt natural gas generating station at Kyrene. SRP and the neighborhood groups agreed that some new generation resource is needed at the Kyrene site to meet the future needs of the surrounding community. This new facility will result in the reduced operation of the existing 250-megawatt Kyrene plant.

Tempe residents initially opposed the SRP expansion because of the increase in emissions that would have resulted from a much larger 825-megawatt expansion project. By limiting the size of the new, highly efficient facility and reducing the use of the current facility, total emissions will be limited to about the same as currently produced at Kyrene and will be much less than the projected output without any new generating capacity at this site. This proposal essentially maintains the current site characteristics while providing additional local power generation capacity, which SRP and community groups consider to be a "win-win" proposition.

- MORE -

The highlights of the agreement include:

- The capacity of the new generating facility will be 250 megawatts.
- All of the existing units at Kyrene will be limited, in aggregate, to a 1 percent capacity factor.
- SRP will invest approximately $2.4 million to install equipment to reduce emissions from Units 1 and 2 at the existing Kyrene facility. This is expected to reduce current emissions by an estimated 60 percent and will be done as soon as SRP receives permits to construct the new facility.
- The Kyrene facility will comply with the City of Tempe's applicable noise ordinance.
- SRP will implement a series of environmental mitigation efforts upon receiving necessary approvals to proceed with the project. These include extensive landscaping and tree planting, construction of a bike and pedestrian path, repainting of the switchyard structures and the installation of noise-suppression equipment.
- SRP will comply with all Maricopa County clean-air standards and obtain air-quality offsets for the new *and* existing facilities.

"I want to thank the members of STOP and the representatives of the homeowner groups who participated in these discussions for their willingness to consider opposing viewpoints in an effort to reach this win-win agreement we are announcing today," said Richard Hayslip, SRP manager of Environmental, Land & Risk Management. "With the assistance of Mayor Neil Giuliano, Councilman Hugh Hallman and Grant Woods, we were able to sit down with members of the community, hear their concerns and respond appropriately."

Todd Taylor, STOP public affairs director, said, "Sitting down for face-to-face meetings with SRP is the most important thing our organization has done. It allowed us to work together with SRP for the betterment of our community. What we have accomplished here is the best solution for pollution reduction and to fulfill the power needs for our community. The City of Tempe and Grant Woods are to be commended for the role they played in making this agreement possible."

The tentative agreement is subject to approval of the SRP Board of Directors. The STOP community coalition will hold a community forum tonight at 7 at the Kyrene Middle School, 1050 E. Carver Road in Tempe, to seek input and support for this proposal from its members.

-30-

**For more information, contact:**

**Todd Taylor, STOP Public Affairs Director**
**(480) 731-4665**

**Mark Moorehead**
**Pecan Grove Homeowners Association**
**(480) 456-6754**

**Scott Harelson, SRP Media Relations**
**(602) 236-2500**

**Grant Woods**
**(602) 258-5749**

# EXHIBIT J-3
# NEIGHBORHOOD MEETING FLYER AND SIGN-UP FORM

# To: **Tempe Gardens Residents**

## IMPORTANT MEETING INFORMATION ABOUT THE PROPOSED EXPANSION OF THE SRP KYRENE GENERATING FACILITY

On February 18, Salt River Project (SRP) and EPG, Inc., an environmental planning consulting firm, held a neighborhood workshop at the home of Tempe Gardens resident Beverly Van Dorp. Approximately 30 residents had the opportunity to ask any questions they had regarding the proposed project and express their views. Many requested a second meeting to focus primarily on suggestions and comments regarding mitigation and enhancement concepts for the project.

As a follow up, SRP and EPG, along with your neighbors, Beverly Van Dorp and Mary Bennett, have planned another meeting for Tempe Gardens residents:

**Tuesday, March 21, 2000**
**6:00 p.m. – 8:30 p.m.**
**Tempe Police Substation Community Room**
**8201 S. Hardy**
(north of Warner Road, west of Kyrene Road, near the Cardinals training center)

Please contact Lyndy Morgan at EPG (602) 956-4370, ext. 120, or Mary Bennett at (480) 456-4653, if you are interested in attending. If you have any questions regarding the project or future neighborhood workshops, please call Lyndy at the number above.

# Kyrene Expansion Project

## Neighborhood Workshop

To encourage neighborhood planning and offer residents a further voice in the planning process, SRP will hold neighborhood workshops. During these workshops, individuals can learn more about the project, express concerns and ideas, and interact with the project team. Input from these workshops will be a valuable tool in gathering ideas for developing mitigation and enhancement concepts and options as we move forward in the development of plan alternatives.

YES! I am interested in a neighborhood workshop. Please contact me for availability.

Name: _____

Address: _____

City: _____, AZ Zip Code: _____

Neighborhood: _____ Phone Number: _____

# EXHIBIT J-4
# CITY OF TEMPE – SRP INFORMATION LETTERS TO OFFICIALS

Tempe Candidates

March 22, 2000

«Title» «fname» «lname»
«office»
«street»
«citystatezip»

Dear «salutation»:

Thank you for meeting with us for a briefing on the Kyrene Expansion Project (KEP). I know how busy you must be at this time and I appreciate your willingness to learn more about KEP. I hope you left with an understanding of the need for the plant and that many of your questions were answered. There are a few questions that have arisen from all of the briefings in which I think you would be interested. I have listed the questions along with the answers on a separate attachment.

I made sure you are on the mailing list for the KEP newsletters and, in case your copy of the Community Working Group roster is not complete with names, I've enclosed one for you. Finally, enclosed is an updated version of the overview, including air quality report information and simulated mitigation ideas.

If you have any further questions or concerns about KEP, please give me a call at 602-236-2467, or e-mail me at kplee@srpnet.com and I will get you an answer.

Sincerely,

Kathie Lee

KPL/jz

Enclosures

| title | fname | salutation | lname | City | street | Office | citystatezip |
|---|---|---|---|---|---|---|---|
| | Tom | Tom | Head | | 4505 S Hardy Dr., #1104 | | Tempe, AZ 85282 |
| | G. Fritz | Fritz | Tuffli | | 1440 E Broadway Rd., #1119 | | Tempe AZ 85282 |
| | Mark | Mark | Mitchell | | 1624 E Diamond Dr. | | Tempe AZ 85283 |
| | Richard | Richard | Bank | | 1131 W 10th St. | | Tempe AZ 85281 |
| | Gretchen | Gretchen | Wolfe | | 1402 E Guadalupe Rd., #159 | | Tempe AZ 85283 |
| | Kolby | Kolby | Granville | | 1827-D E Kirkland Ln. | | Tempe AZ 85281 |
| | Barbara | Barbara | Carter | | 1933 E Redfield | | Tempe AZ 85283 |
| | Richard J. | Richard | Erdmann | | 513 E Libra Dr. | | Tempe AZ 85283 |
| | Dr. Fred | Dr. Wood | Wood | | 6438 S Clark Dr. | | Tempe AZ 85283 |
| | Peter | Peter | Graves | | 1016 E Verde Ln | | Tempe AZ 85284 |
| | Scott | Scott | Burge | | 8869 S Myrtle | | Tempe AZ 85284 |

3/16/00

Former Council members

March 22, 2000

«Name»
«address»
«citystatezip»

Dear «salutation»:

Thank you for meeting with us for a briefing on the OASIS project (Kyrene). I know you are very busy and can hardly take the time. We respect your position in the community and we understand that it is important for you to be informed on this issue. I hope you left with an understanding of the need for the plant and that many of your questions were answered. There are a few questions that have arisen during our briefings that I think you would want the answers to. I have listed them on a separate attachment.

I made sure you are on the mailing list for the project newsletters and I have also enclosed a listing of the Community Working Group members, complete with names. Finally, enclosed is an updated version of the overview, including air quality report information and simulated mitigation ideas.

If you have any further questions or concerns about the project, please give me a call at 602-236-2467, or e-mail me at kplee@srpnet.com and I will get you an answer.

Sincerely,

Kathie Lee

| fName | salutation | Lname | address | citystatezip | |
|---|---|---|---|---|---|
| Linda | Linda | Spears | 127 E Santa Cruz | Tempe AZ | 85282 |
| Don | Don | Cassano | 1514 E Westwind Way | Tempe AZ | 85283 |
| Barbara | Barbara | Sherman | 120 E McKellips | Tempe AZ | 85281 |
| Carol | Carol | Smith | 6411 S River Dr., #60 | Tempe AZ | 85283 |

March 22, 2000

Honorable Neil Giuliano
Mayor
City of Tempe
PO Box 5002
Tempe AZ 85280

Dear Mayor Giuliano:

During the last month, we have briefed Tempe council candidates and re-briefed some of the council members on the Kyrene Expansion Project (KEP). Since we have not had the opportunity to meet with you, I am forwarding you the information that I have gathered as a result of those meetings.

I am enclosing a copy of the Community Working Group roster; an updated version of the overview, including air quality report information and simulated mitigation ideas; and a Q&A listing of some of the questions that arose during the briefings.

As you continue to have questions about the KEP, please give me a call at 602-236-2467, or e-mail me at kplee@srpnet.com

Sincerely,

Kathie Lee

KPL/jz

Enclosures

cc: Gary Brown
Patrick Flynn
Bill Coughlin

March 22, 2000

Honorable Len Copple
Councilmember
City of Tempe
PO Box 5002
Tempe AZ 85280

Dear Len:

During the last month, we have briefed Tempe council candidates and re-briefed some of the council members on the Kyrene Expansion Project (KEP). Since we have not had the opportunity to meet with you, I am forwarding you the information that I have gathered as a result of those meetings.

I am enclosing a copy of the Community Working Group roster; an updated version of the overview, including air quality report information and simulated mitigation ideas; and a Q&A listing of some of the questions that arose during the briefings.

As you continue to have questions about the KEP, please give me a call at 602-236-2467, or e-mail me at kplee@srpnet.com

Sincerely,

Kathie Lee

KPL/jz

Enclosures

March 22, 2000

Honorable Joseph Lewis
Councilmember
City of Tempe
PO Box 5002
Tempe AZ 85280

Dear Joseph:

During the last month, we have briefed Tempe council candidates and re-briefed some of the council members on the Kyrene Expansion Project (KEP). Since we have not had the opportunity to meet with you, I am forwarding you the information that I have gathered as a result of those meetings.

I am enclosing a copy of the Community Working Group roster; an updated version of the overview, including air quality report information and simulated mitigation ideas; and a Q&A listing of some of the questions that arose during the briefings.

As you continue to have questions about the KEP, please give me a call at 602-236-2467, or e-mail me at kplee@srpnet.com

Sincerely,

Kathie Lee

KPL/jz

Enclosures

March 2, 2000

Honorable Joseph Spracale
Councilmember
City of Tempe
PO Box 5002
Phoenix AZ 85280

Dear Joe:

Thanks for meeting with us for an update on the OASIS project (Kyrene). I know you are very busy and I appreciate your willingness to learn more about the project. There are a few more questions that have arisen that I think you would want the answers to. I have listed them on a separate sheet.

I made sure you are on the mailing list for the project newsletters and I have enclosed a copy of the Community working Group roster, complete with names. Finally, enclosed is an updated version of the overview, including air quality report information and simulated mitigation ideas.

As you continue to have questions about the project, please give me a call at 602-236-2467, or e-mail me at kplee@srpnet.com.

Sincerely,

Kathie Lee

KPL/jz

Enclosures

March 2, 2000

Honorable Ben Arredondo
Councilmember
City of Tempe
PO Box 5002
Phoenix AZ 85280

Dear Ben:

Thanks for meeting with us for an update on the OASIS project (Kyrene). I know you are very busy and I appreciate your willingness to learn more about the project. There are a few more questions that have arisen that I think you would want the answers to. I have listed them on a separate sheet.

I made sure you are on the mailing list for the project newsletters and I have enclosed a copy of the Community working Group roster, complete with names. Finally, enclosed is an updated version of the overview, including air quality report information and simulated mitigation ideas.

As you continue to have questions about the project, please give me a call at 602-236-2467, or e-mail me at kplee@srpnet.com.

Sincerely,

Kathie Lee

KPL/jz

Enclosures

March 2, 2000

Honorable Hugh Hallman
Councilmember
City of Tempe
PO Box 5002
Phoenix AZ 85280

Dear Hugh:

Thanks for meeting with us for an update on the OASIS project (Kyrene). I know you are very busy and I appreciate your willingness to learn more about the project. There are a few more questions that have arisen that I think you would want the answers to. I have listed them on a separate sheet.

I made sure you are on the mailing list for the project newsletters and I have enclosed a copy of the Community working Group roster, complete with names. Finally, enclosed is an updated version of the overview, including air quality report information and simulated mitigation ideas.

As you continue to have questions about the project, please give me a call at 602-236-2467, or e-mail me at kplee@srpnet.com.

Sincerely,

Kathie Lee

KPL/jz

Enclosures

March 2, 2000

Honorable Dennis Cahill
Councilmember
City of Tempe
PO Box 5002
Tempe AZ 85280

Dear Dennis:

Thanks for meeting with us for a re-briefing on the OASIS project (Kyrene). I know you are very busy right now with the campaign, city council work and trying to have a life, and I appreciate your willingness to learn more about the project. There are a few questions that have arisen from all of the briefings that I think you would want the answers to. I have listed them on a separate attachment.

I made sure you are on the mailing list for the project newsletters and in case your copy of the Community Working Group roster is not complete with names, I've enclosed one for you. Finally, enclosed is an updated version of the overview, including air quality report information and simulated mitigation ideas.

As you have further questions about the project, please give me a call at 602-236-2467, or e-mail me at kplee@srpnet.com.

Sincerely,

Kathie Lee

KPL/jz

Enclosures

| Title | fname | salutation | lname | office | street | citystatezip |
|---|---|---|---|---|---|---|
| Honorable | Neil | Neil | Giuliano | Mayor | PO Box 5002 | Tempe AZ 85280 |
| Honorable | Dennis | Dennis | Cahill | Councilman | PO Box 5002 | Tempe AZ 85280 |
| Honorable | Ben | Ben | Arredondo | Councilman | PO Box 5002 | Tempe AZ 85280 |
| Honorable | Leonard | Len | Copple | Councilman | PO Box 5002 | Tempe AZ 85280 |
| Honorable | Hugh | Hugh | Hallman | Councilman | PO Box 5002 | Tempe AZ 85280 |
| Honorable | Joseph | Joe | Lewis | Councilman | PO Box 5002 | Tempe AZ 85280 |
| Honorable | Joe | Joe | Spracale | Councilman | PO Box 5002 | Tempe AZ 85280 |

# EXHIBIT J-5
# AGREEMENT

## AGREEMENT

The key points of the agreement are as follows:

1. SRP will significantly reduce the size of the proposed new capacity at Kyrene to 250 MWs of combined cycle generation.
2. Units 1 and 2 of the existing facility at Kyrene will be retrofitted with low $NO_X$ burner technology. Although not required by regulation, SRP is willing to invest $2.4 million to reduce $NO_X$ emission rates from these two units. Pending approval of the SRP Board of Directors and the STOP organization, SRP will initiate work immediately on this aspect of the agreement and in the absence of equipment availability limitations will commit to an in-service date for the new technology of the summer of 2001.
3. All of the existing units at Kyrene will be limited, in aggregate, to a one percent capacity factor. The one percent capacity factor will be subject to a rolling two-year average.
4. SRP will implement the following environmental mitigation measures identified by the CWG immediately upon receipt of approvals to proceed with the project. These measures include:

a) relocation of entrance to SRP's Tempe Service Center off Elliot Road
b) construction of a bike and pedestrian path along the eastern edge of the SRP property
c) repainting of the 500kV switchyard structures
d) installing noise suppression equipment on the steam vents for Kyrene Units 1 and 2
e) berming and trees along the southern boundary of the SRP property
f) berming and trees at the corner of Elliot and Kyrene
g) trees along the eastern edge of the SRP property
h) trees and a berm along a portion of the northern edge of the property (directly north of the proposed generating units)

i) individual tree planting for homes along the golf course that would have a view of the proposed generating units

5. SRP will obtain offsets as required by the County Permitting Authority for the new capacity. In addition, SRP will diligently pursue offsets in the immediate area to accommodate the CO and PM emissions associated with the continued operation of the existing units.
6. SRP's offer is subject to approval by its Board of Directors and review by the Community Working Group.
7. SRP agrees to comply with City of Tempe's applicable noise ordinance.

As consideration for this proposal, the parties will agree to jointly support SRP's expansion project at Kyrene as proposed in this agreement and the STOP organization will remain uninvolved in other SRP expansion plans outside the City of Tempe.