ORIGINAL

0000076307

BEFORE THE ARIZONA POWER PLANT AND TRA... COMMITTEE

IN THE MATTER OF THE APPLICATION OF NORTHERN ARIZONA ENERGY, LLC, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES 40-360.03 AND 40-360.06, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF A 175 MW NATURAL GAS-FIRED, SIMPLE CYCLE GENERATING FACILITY AND ASSOCIATED TRANSMISSION LINE INTERCONNECTING THE GENERATING FACILITY TO THE ADJACENT WESTERN AREA POWER ADMINISTRATION GRIFFITH SWITCHYARD, ALL LOCATED IN MOHAVE COUNTY APPROXIMATELY 9 MILES SOUTHWEST OF KINGMAN, ARIZONA.

DOCKET NO. L-00000FF-07-0134-00133

NOTICE OF FILING

Arizona Corporation Commission
DOCKETED
SEP 20 2007
DOCKETED BY

Applicant, Northern Arizona Energy, LLC, hereby provides notice that it is filing herewith the Draft Environmental Assessment for Pre-Approval Review.

RESPECTFULLY SUBMITTED this 20th day of September, 2007.

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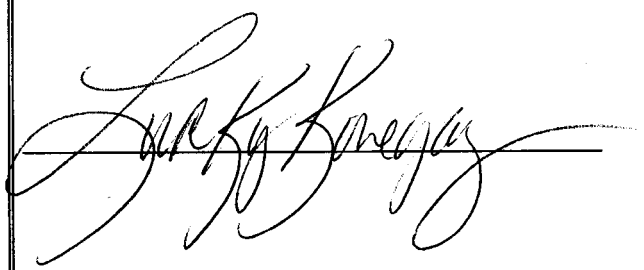
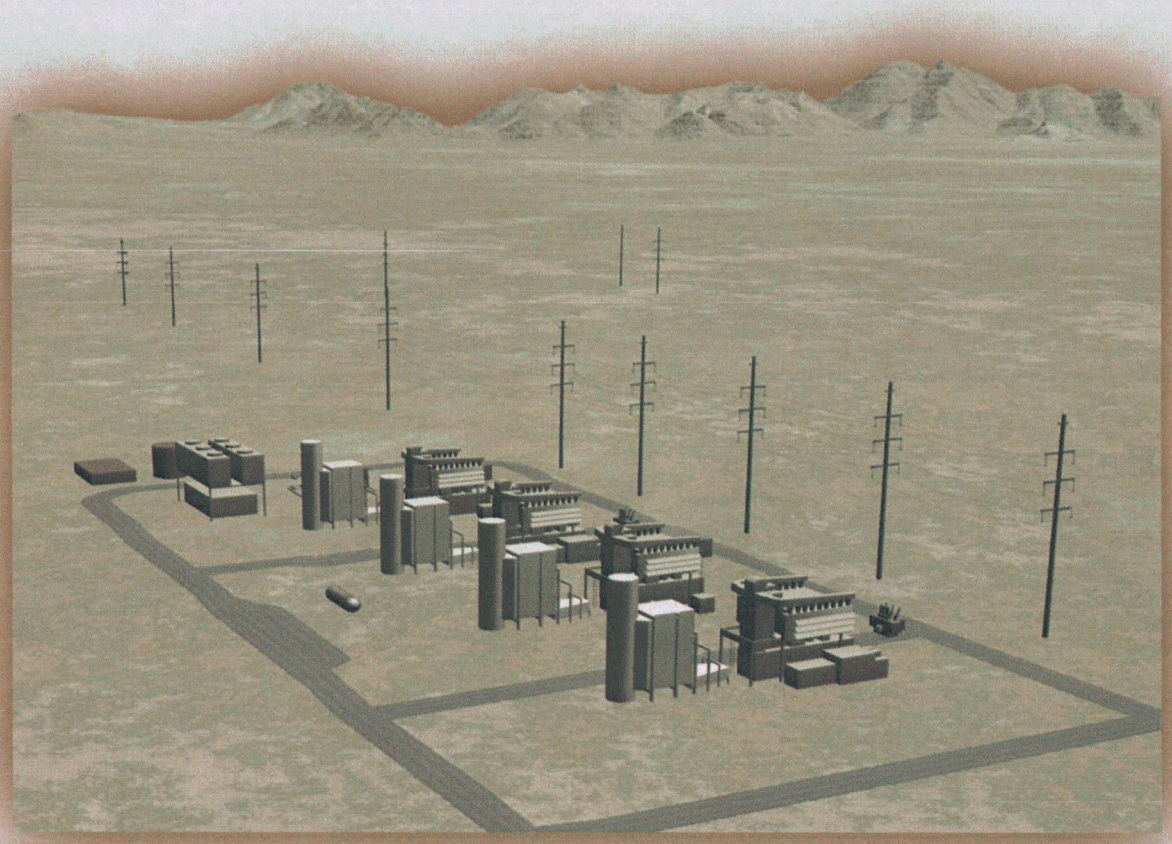


DOE/EA-1587

Draft Environmental Assessment for Pre-Approval Review

for the Northern Arizona Energy Project

Mohave County, Arizona
September 2007



Prepared for:

Western AREA POWER ADMINISTRATION

Lead Agency:
Western Area Power Administration

Cooperating Agency:
Arizona Department of Water Resources

Docket Number
L-00000FF-07-0134-00133

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ACRONYMS AND ABBREVIATIONS

The following is a list of acronyms used in this Environmental Assessment (EA). For the reader's convenience, they are redefined in each chapter the first time they are used. This section also includes a list of metric prefixes and a measurement conversion chart.

ACRONYMS and ABBREVIATIONS	
AAAQG	Arizona Ambient Air Quality Guidelines
AAC	Arizona Administrative Code
AADT	average annual daily traffic
AASHTO	American Association of State Highway and Transportation Officials
ACC	Arizona Corporation Commission
ADEQ	Arizona Department of Environmental Quality
ADOSH	Arizona Division of Safety and Health
ADOT	Arizona Department of Transportation
ADT	Average Daily Traffic
ADWR	Arizona Department of Water Resources
afy	acre feet per year
AGFD	Arizona Game and Fish Department
APP	Aquifer Protection Permit
Applicant	Northern Arizona Energy, LLC
ASM	Arizona State Museum
ATSF	Atchison Topeka and Santa Fe
bcf	billion cubic feet
bcf/yr	billion cubic feet per year
bgs	below ground surface
BLM	Bureau of Land Management
BMP	best management practice
BNSF	Burlington Northern Santa Fe
BTU	British thermal unit
CAA	Clean Air Act
CEMS	continuous emissions monitor system
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide

ACRONYMS and ABBREVIATIONS

CO_2	carbon dioxide
CTG	combustion turbine generator
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DCS	distributed control system
DOE	Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
El Paso	El Paso Natural Gas Company
EPC	engineering, procurement, and construction
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FONSI	Finding of No Significant Impact
FR	Federal Register
GE	General Electric
gpd	gallons per day
gpd/ft	gallons per day per foot
gpm	gallons per minute
Griffith Energy	Griffith Energy Project
GSU	generator step-up
GVID	Golden Valley Irrigation District
HAP	Hazardous Air Pollutant
HHV	high heating value
HPS	high-pressure sodium
I-40	Interstate Highway 40
IES	Illuminating Engineering Society
KOP	Key Observation Point
KRMC	Kingman Regional Medical Center
kV	kilovolt
kWh	kilowatt hours

ACRONYMS and ABBREVIATIONS

lb/hr	Pounds per hour
LGIP	Large Generator Interconnection Procedures
LNG	liquefied natural gas
LOS	level of service
MACT	maximum achievable control technology
MCC	motor control center
MCEDA	Mohave County Economic Development Authority
MMBtu	Million British Thermal Units
mph	miles per hour
MSDS	Material Safety Data Sheet
msl	mean sea level
MW	megawatt
MWh	megawatt hours
MX	heavy industrial / manufacturing zone
NAAQS	National Ambient Air Quality Standards
NAEP	Northern Arizona Energy Project
NEPA	National Environmental Policy Act
NESHAP	national emission standards for hazardous air pollutant
NFPA	National Fire Protection Association
NH_3	aqueous ammonia
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_X	nitrogen oxide
NRCS	Natural Resources Conservation Service
NSPS	new source performance standards
NSR	New Source Review
NWP	Nationwide Permit
O_2	oxygen
O_3	ozone
O&M	operations and maintenance
ORV	off-road vehicle
OSHA	Occupational Safety and Health Administration
Pb	lead
PGA	Peak Ground Acceleration

ACRONYMS and ABBREVIATIONS

PM_{10} and $PM_{2.5}$	particulate matter less than 10 or 2.5 micrometers in diameter
ppm	parts per million
ppmdv	parts per million dry volume
Project	Northern Arizona Energy Project
PSD	Prevention of Significant Deterioration
psig	pounds per square inch guage
PWL	power level
Questar	Questar Corporation
RCRA	Resource Conservation and Recovery Act
RO	reverse osmosis
ROD	Record of Decision
ROI	Region of Influence
SARA	Superfund Amendments and Reauthorization Act
SCR	Selective Catalytic Reduction
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Office
SF_6	Sulfer hexafluoride
SLM	sound level meter
SO_2	sulfur dioxide
SOPs	standard operating procedures
SPCC	Spill Prevention Control and Countermeasure
SPRINT	SPRay INTer-cooling
TAP	toxic air pollutant
TCP	Traditional Cultural Property
TDS	total dissolve solids
tpy	tons per year
Transwestern	Transwestern Pipeline Company
UES	UniSource Energy Services
UPS	uninterrupted power supply
USACE	U.S. Army Corp of Engineers
USDA	U.S. Department of Agriculture
USDC	U.S. Department of Commerce
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
V	volt

ACRONYMS and ABBREVIATIONS

VOC	volatile organic compound
VR	Visual Range
Western	Western Area Power Administration
$\mu g/m^3$	micrograms per cubic meter
YOS	Years of Service

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1.0 PROJECT OVERVIEW

Northern Arizona Energy, LLC (Applicant) proposes to construct and operate the Northern Arizona Energy Project (NAEP; Proposed Action), a natural gas-fired, simple cycle power plant, on private lands south of Kingman, Arizona. **Figure 1-1** shows the general project location of the Proposed Action within the State of Arizona. The Proposed Action would be located adjacent to the existing Griffith Energy Project (Griffith Energy) and would interconnect to Western Area Power Administration's (Western) system at the existing Griffith 230-kilovolt (kV) switchyard (Griffith Switchyard). **Figure 1-2** provides a more detailed view of the Proposed Action, which would consist of four General Electric (GE) LM6000 combustion turbine generators (CTGs) with a net generation capacity of 175 megawatts (MW) at design conditions. Power purchases by customers would be voluntary wholesale purchases, and all construction costs would be borne by the Applicant.

The Applicant applied to interconnect its proposed power plant with the Western transmission system at its Griffith Switchyard. Western, as a major transmission system owner, needs to evaluate the interconnection request and provide access to its transmission system if the request complies with existing policies, regulations, and laws. The proposed interconnection would integrate the power generated by the Proposed Action into the regional transmission grid and would allow the Applicant to supply power to the competitive electric wholesale market. Based on the application, Western's Proposed Action is to enter into an interconnection and construction agreement with the Applicant for the requested interconnections (the Federal Action), including modifying its Griffith Switchyard to accommodate the interconnection request.

1.1 ENVIRONMENTAL ASSESSMENT OVERVIEW

Before Western can agree to the interconnection, the National Environmental Policy Act (NEPA) the Council on Environmental Quality (CEQ) regulations and Department of Energy (DOE) NEPA Implementing Procedures must be satisfied. Western invited agencies with permitting responsibilities and special expertise to participate in this Environmental Assessment (EA) as cooperating agencies. Mohave County and the Arizona Department of Water Resources (ADWR) agreed to be cooperating agencies.

Western has prepared this EA to analyze the Proposed Action's expected impact on the human environment. The EA process provides the public and other interested parties an opportunity to review and provide input into the Proposed Action. After a comment period, the EA would be finalized and used to make Western's determination on whether or not to prepare and Environmental Impact Statement (EIS). Should Western determine that an EIS is necessary at any time in the course of preparing the EA, Western will use the issues and alternatives identified during scoping process in preparing the EIS, including all input and comments received during any public workshops or meetings held for the Proposed Action. If it is decided that an EIS will be prepared, Western would publish a Notice of Intent (NOI) in the Federal Register (FR).

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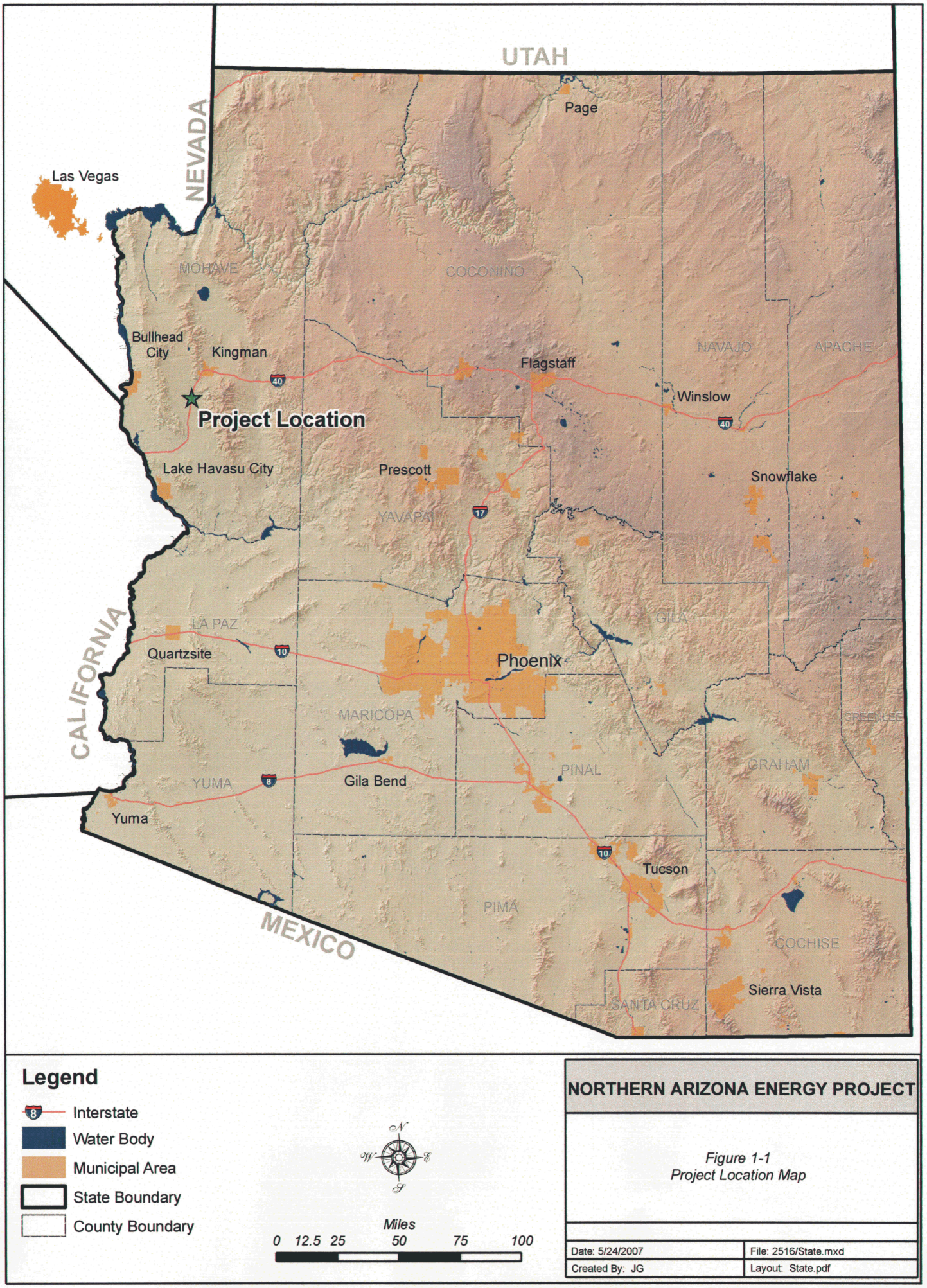
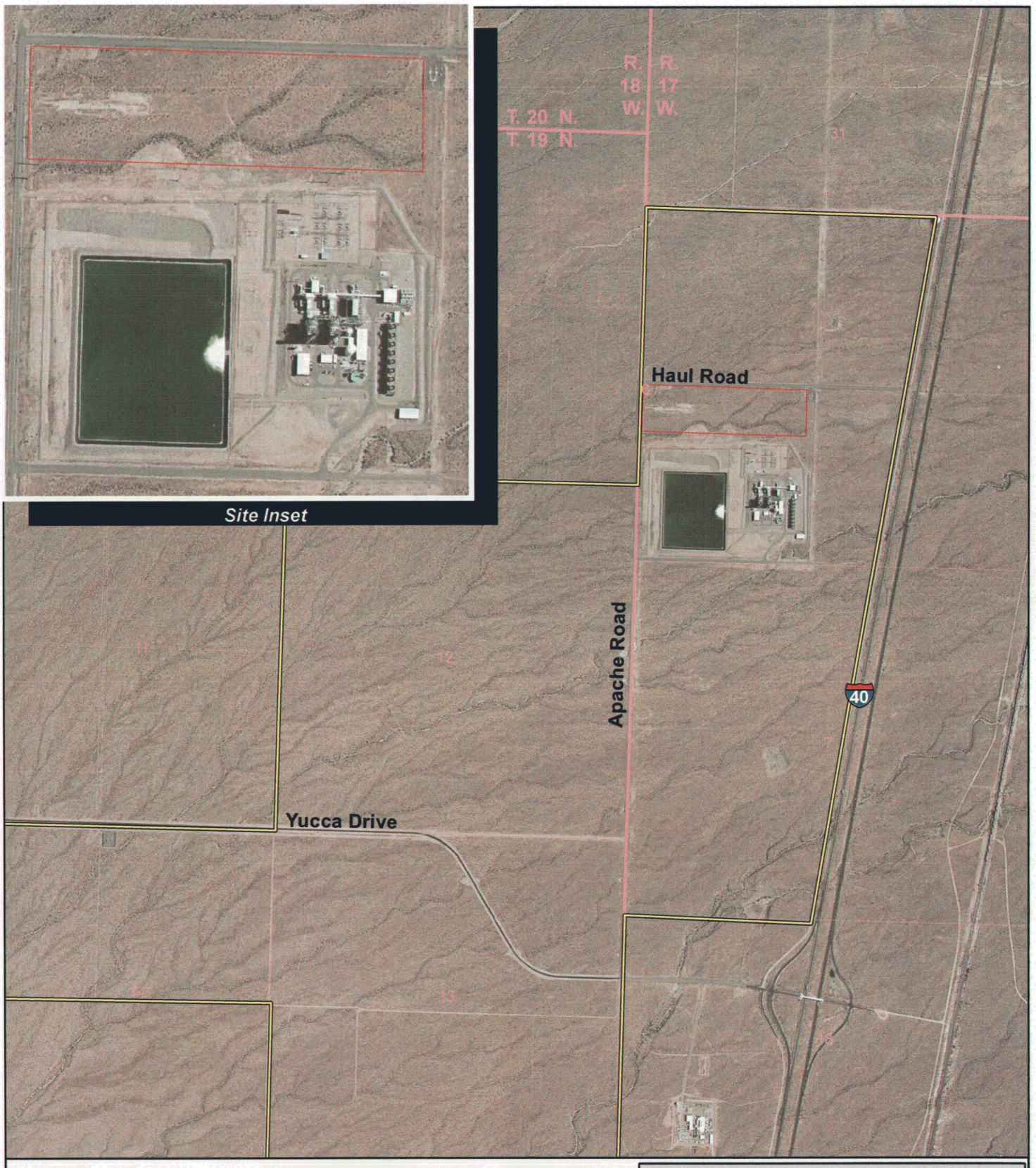

UTAH
NEVADA
Las Vegas
Page
MOHAVE
COCONINO
Bullhead City
Kingman
Flagstaff
NAVAJO
APACHE
Winslow
Project Location
Lake Havasu City
Prescott
Snowflake
YAVAPAI
CALIFORNIA
LA PAZ
Quartzsite
GILA
Phoenix
MARICOPA
GREENLEE
PINAL
GRAHAM
YUMA
Gila Bend
Yuma
Tucson
PIMA
COCHISE
MEXICO
Sierra Vista
SANTA CRUZ
Legend
Interstate
Water Body
Municipal Area
State Boundary
County Boundary
N
W
E
S
Miles
0 12.5 25 50 75 100
NORTHERN ARIZONA ENERGY PROJECT
Figure 1-1
Project Location Map
Date: 5/24/2007
File: 2516/State.mxd
Created By: JG
Layout: State.pdf



Legend

- Northern Arizona Energy Project Boundary
- I 40 Industrial Corridor Boundary

0 250 500 1,000 Meters

0 500 1,000 2,000 3,000 4,000 Feet

NORTHERN ARIZONA ENERGY PROJECT

Figure 1-2
Site Location

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 02/28/2007	File: 2516/Site_EA.mxd
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DOE's NEPA implementing procedures require an EIS to be prepared for the addition of new generation resources greater than 50 average MW. Although the Proposed Action would be capable of producing 175 MW, its purpose is to provide electricity in time of peak demand, and would therefore operate intermittlently. Western based a determination to prepare an EA for the NAEP based on the Applicant's expectation that resource demand will be no more than the expected 2,500 hours per year and Applicant's willingness to limit the yearly electrical output of the proposed power plant to less than 50 average MW, or 437,991 megawatt hours (MWh). If this annual production threshold is exceeded, Western would open the breaker and take the units off-line until the start of the next annual period. The proposed power plant would then be operated within the stated production limits. Additionally, the Applicant may, at any time, pursue completion of an EIS to evaluate operation of the Proposed Action above the 50 average MW limit.

1.2 PURPOSE AND NEED

Western is a Federal power marketing agency under DOE that operates and maintains high-voltage transmission lines and associated facilities throughout the west. Western's mission is to market and trasmit power generated from Federal hydroelectric plants. Western's Open Access Transmission Service Tariff provides open access to Western's transmission service for entities such as the Applicant to supply power to their customer load areas.

Western provides these services through an interconnection if there is available capacity on the transmission line. The Applicant has requested an interconnection of the Proposed Action to Western's transmission system at the existing Griffith Switchyard.

When responding to the Need for Agency Action, Western must abide by the following:

- *Providing Transmission Service.* Western offers capacity on its transmission system to deliver electricity when such capacity is available under Western's Tariff. The Tariff complies with the Federal Energy Regulatory Commission's (FERC's) Final Order Nos. 888, 888A, 888B, and 888C, which are intended to ensure non-discriminatory transmission system access. Following FERC's Order Nos. 2003, 2003-A and 2003-B, Western submitted revisions to its non-jurisdictional Tariff on January 25, 2005 to FERC. The purpose of the filing was to revise certain terms of Western's original Tariff and to incorporate the Large Generator Interconnection Procedures (LGIP) and a Large Generator Interconnection Agreement. Western needs to respond to the interconnection and transmission service requests under the provisions of its revised Tariff.
- *Protect Transmission System Reliability and Service to Existing Customers.* Western's purpose is to ensure that existing transmission system reliability and service is not degraded. Western's LGIP provides for transmission and system studies to ensure that system reliability and service to existing customers is not adversely affected by new interconnections.
- *Consideration of the Applicant's Objectives.* Because the Statement of Purpose and Need affects the extent to which alternatives are considered reasonable, it is important to understand both Western's Purpose and Need and that of the Applicant.

More information about these requirements is available on Western's website, located at www.wapa.gov.

1.2.1 Purpose of the Proposed Action

The NAEP would supply power to load serving entities in Arizona and surrounding regions for the purpose of serving customers during periods of peak electricity demand. Currently, there are no generation units in operation dedicated to serving the peak demand of the Mohave County loads. The proposed power plant is capable of a rapid startup and can respond to fluctuations in electric demand within 10 minutes.

1.3 DECISIONS TO BE MADE

Western will use the information in this EA to support Federal decisions for the Proposed Action. Western will decide whether to enter into an interconnection agreement with the Applicant, and the best way to interconnect the Proposed Action into the Western transmission system, to provide the transmission service needed. When making its decision, Western will ensure consistency with its statutory responsibilities governing interconnections, will consider the environmental impacts of the Proposed Action, will ensure Western's ability to meet its current contractual obligations and customer needs, and will ensure that regional system reliability is maintained or improved.

1.4 PUBLIC PARTICIPATION

Western notified Federal, state, and local agencies; tribes; and affected landowners of its determination to prepare an EA and requested information on issues and concerns related to the Proposed Action. Informal consultation was completed with the U.S. Fish and Wildlife Service (USFWS) for endangered species compliance. Consultation was also undertaken with the Arizona State Historic Preservation Office (SHPO) and all tribes that might have interest in the area. A Class III Cultural Resource inventory was conducted with a monitor from the Hualapai Tribe, and the resulting Report was provided to the SHPO and those tribes that requested it.

Chapter 5.0. Persons and Agencies Consulted. provides a brief summary of scoping activities and a listing of the entities contacted during scoping.

1.5 AUTHORIZING ACTIONS

In addition to the Federal decisions by Western, several permits and approvals need to be obtained from other entities to construct and operate the NAEP. **Table 1-1** summarizes the primary approvals that would be required.

Table 1-1 Project List of Permits/Approvals

Agency	Permit/Approval
Arizona Corporation Commission (ACC)	Certificate of Environmental Compatibility (CEC)
Arizona Department of Agriculture	Native Plant Permit
Arizona Department of Environmental Quality (ADEQ)	Air Quality Permits
ADEQ	Hazardous Waste Permit
ADEQ	Stormwater Permits
Arizona State Historic Preservation Office	Concurrence or Agreement Document
Mohave County	Excavation/Grading Permit Septic Permit Permit for Temporary Construction Facilities Permit for Temporary Power Building Permits and Site Plan Water Service Agreement
US Army Corps of Engineers (USACE)	Nationwide 404 Permit, if required
US Environmental Protection Agency (EPA)	Air Quality Permits
EPA	Stormwater Permits
USFWS	Concurrence or Biological Opinion

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2.0 PROPOSED ACTION AND ALTERNATIVES

The Applicant is proposing to finance and construct a power plant on private lands south of Kingman, Arizona. This Proposed Action is known as the NAEP.

The proposed power plant would be a natural gas-fired, simple cycle power plant that would supply power to load-serving entities in Arizona and surrounding regions for the purpose of serving their customers during periods of peak electricity demand. The proposed power plant would be designed to produce 175 MW of net electrical output with a heat rate of 9,975 British Thermal Units/kilowatt hour (Btu/kWh) high heating value (HHV) based on the design condition ambient temperature of 90 degrees Fahrenheit (°F). The CTGs are capable of rapid startup, allowing the proposed power plant to respond to fluctuations in electric demand within ten minutes. The Applicant would limit the output of the proposed power plant to 50 average MW or less, or 437,991 MWh per year.

The proposed power plant would interconnect with the Western 230-kV system at the neighboring existing Griffith Switchyard via 2,745 feet of overhead double circuit transmission line that would be owned, operated, and maintained by the Applicant. There would be one generator step-up (GSU) transformer per CTG pair. Natural gas would be supplied to the proposed power plant through the existing UniSource Energy Services (UES) gas distribution facilities currently serving the Interstate 40 (I-40) Industrial Corridor. More detail on the gas interconnection is found in section 2.1.5.

2.1 PROPOSED ACTION DESCRIPTION

2.1.1 Power Plant Location and Description

The Proposed Action would be located in Mohave County Arizona, just west of I-40, approximately 1.7 miles north of the Griffith interchange, about 9 miles south of Kingman. It is approximately 110 miles southeast of Las Vegas, Nevada via Arizona Highway 93 and 200 miles northwest of Phoenix, Arizona. **Figure 1-1** shows the general project location of the Proposed Action within the State of Arizona. The Proposed Action would be located within the existing I-40 Industrial Corridor just north of the existing Griffith Energy facilities on a parcel of undeveloped land comprising essentially the north 700 feet of the north one-half of the southwest quarter of section 6, Township 19 North, Range 17 West, Gila & Salt River Base & Meridian, Mohave County, Arizona, as shown on **figure 1-2**.

The Proposed Action would be located on a 40-acre parcel of land (NAEP property) that is controlled by the Applicant. The NAEP property occupies the northernmost 700 feet of the original 160-acre parcel of land owned by Griffith Energy (Original Griffith Property). Within the NAEP property, approximately eight acres would be utilized to site the power plant equipment, stormwater retention basin, and interconnection facilities (proposed power plant).

The NAEP property is zoned heavy industrial/manufacturing (MX) by Mohave County. This zoning designation permits the siting of industrial facilities including electric generation facilities. No local land use permits, such as conditional use permits or special use permits, are

required by Mohave County, given the MX zoning of the NAEP property. The Applicant would be required to obtain approval of a site plan and building permits from Mohave County.

2.1.2 Site Layout and Arrangement

The overall site layout is shown on **figure 2-1**, which shows the locations and sizes of the equipment and improvements including access roads, the gas pipeline and meter station, the 230-kV transmission line, the Griffith Switchyard expansion area, the construction lay down area, and a retention basin for storm water management. A more detailed general arrangement of the proposed power plant is shown on **figure 2-2**.

A network of roads would surround the 8-acre power plant site for fire equipment and maintenance access. The area required for the Griffith Switchyard expansion would be one acre. The temporary construction area for contractor facilities, construction parking, and equipment and material lay down (temporary construction area) would be located in two designated areas, one west and one east of the proposed power plant. If the entire designated temporary construction area is utilized, a total of 6 acres would be used by the construction contractors. The remaining 32 acres of the NAEP property would be left undeveloped.

The proposed power plant equipment and facilities would be arranged for optimum use of the power plant site as well as to ensure operability and maintainability. Conceptual engineering has been conducted to define the specific equipment requirements and to confirm the suitability of the site.

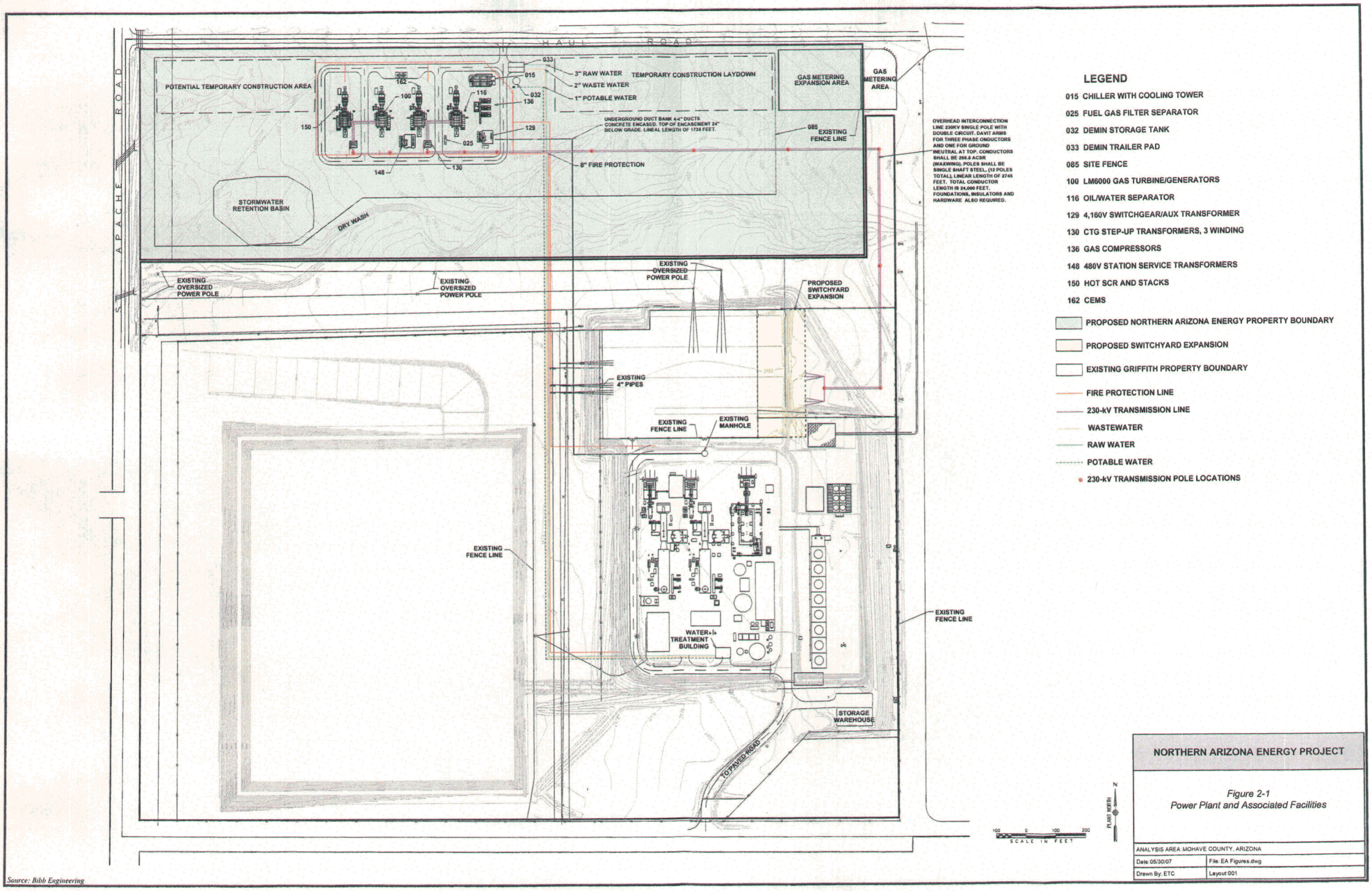
2.1.2.1 Site Access

Access to the proposed power plant would be via the Griffith interchange on I-40, which travels north-south near the Proposed Action. From the Griffith interchange, access to the proposed power plant would be west on Griffith Road, then approximately 1.7 miles north on South Apache Road, then east on Haul Road to the proposed power plant entrance. Access to the NAEP property would be controlled through a security gate at the proposed power plant entrance off of Haul Road.

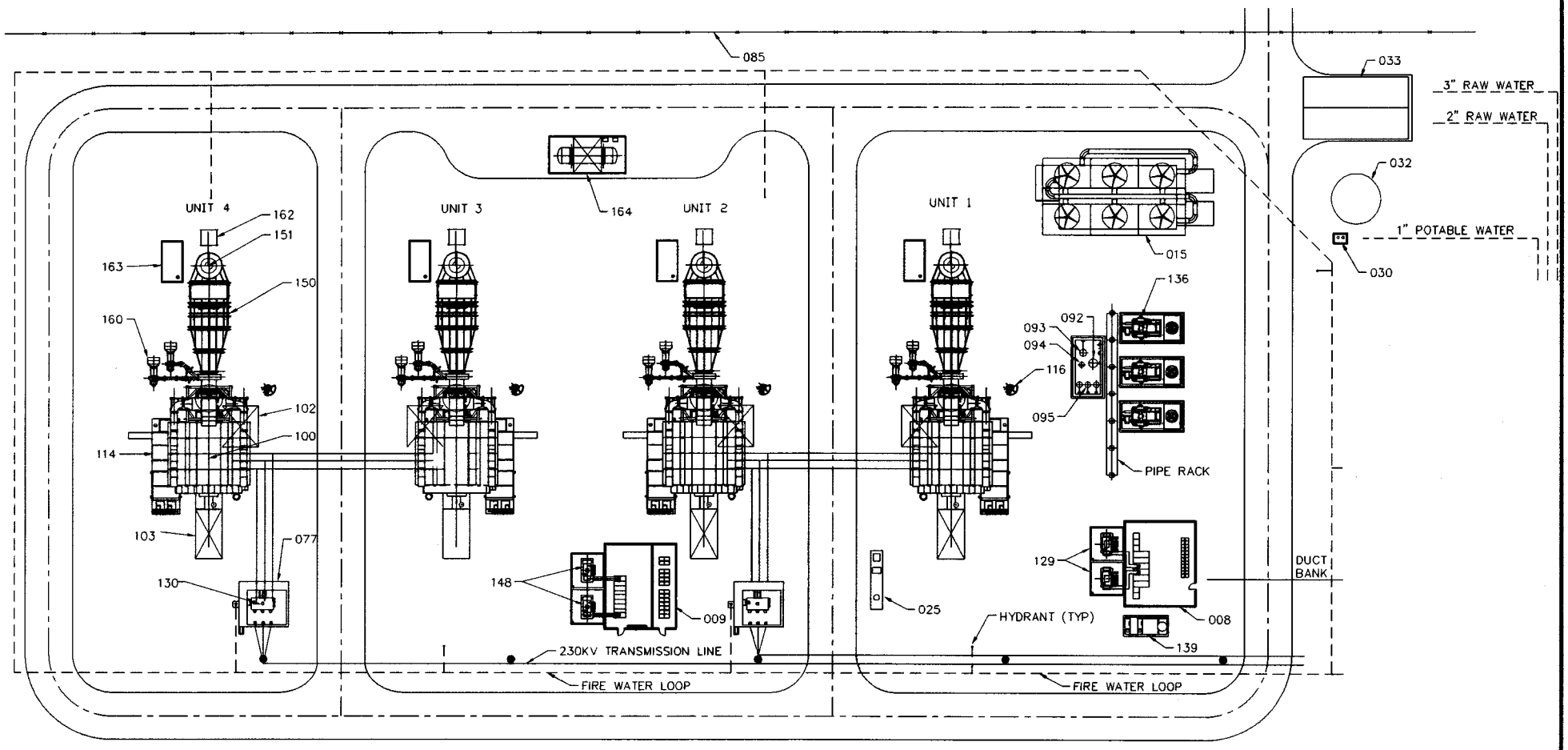
A separate entrance from Haul Road would be utilized for construction access to the temporary construction area. A separate gate for construction personnel and equipment/material deliveries would allow access to the temporary construction area during the construction of the Proposed Action.

2.1.2.2 Interior Roads and Fencing

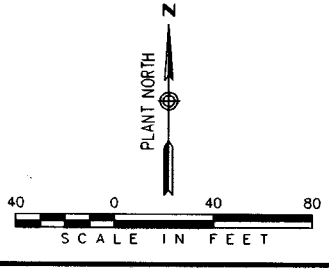
The finish surface on roadways and parking areas located within the proposed power plant would be gravel or as determined by section 26 of the Mohave County Zoning ordinance. Unpaved ground surfaces in and around the main equipment area would be covered with crushed stone or gravel. An eight-foot-tall, metal fabric security fence with barbed wire or razor wire on top would enclose the entire proposed power plant and temporary construction area.



Source: Bibb Engineering



008 4160V SWITCHGEAR AND MCC BUILDING
009 480V SWITCHGEAR AND MCC BUILDING
015 CHILLER WITH COOLING TOWER
025 OIL/WATER SEPARATOR
030 DEMIN WATER FORWARDING PUMPS
032 DEMIN STORAGE TANK
033 DEMIN TRAILER PAD
077 FIRE WALL
085 SITE FENCE
092 FUEL GAS ACCUMULATOR
093 NATURAL GAS INLET SCRUBBER
094 HYDROCARBON DRAIN TANK
095 DISCHARGE FILTER SCRUBBER
100 LM6000 GAS TURBINE/GENERATORS
102 TURBINE REMOVAL/MAINTENANCE AREA
103 GENERATOR ROTOR REMOVAL AREA
114 POWER CONTROL MODULE129
116 FUEL GAS FILTER SEPARATOR
129 AUXILIARY TRANSFORMER
130 CTG STEP-UP TRANSFORMER, 3 WINDING
136 GAS COMPRESSORS
139 AIR COMPRESSOR SKID
148 480V STATION SERVICE TRANSFORMERS
150 HOT SCR AND STACKS
151 STACK
160 SCR PURGE AIR/DILUTION AIR FANS
162 CEMS
163 AMMONIA VAPORIZATION SKID
164 AMMONIA STORAGE TANK AND UNLOADING AREA



NORTHERN ARIZONA ENERGY PROJECT

Figure 2-2
Site Layout of the Proposed Power Plant

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 08/06/07	File: EA-Figure 2-2.dwg
Drawn By: ETC	Layout: 001

Source: Bibb Engineering

2.1.2.3 Grading and Drainage

The proposed power plant slopes downgradient from northeast to southwest. The entire proposed power plant footprint containing the equipment would be raised to provide adequate drainage away from equipment and buildings to the stormwater retention basin as shown on **figure 2-3**. Excavated material from the stormwater retention basin may be used for structural fill depending on the suitability of the excavated material. Approved soil materials for structural fill would be imported, if required. Additionally, specialized granular material may need to be imported for road base and possible use below foundations. If so, this material would be purchased from a local supplier.

2.1.3 Power Plant Type and Processes

The proposed power plant would use four GE LM6000 PC SPRINT NxGen CTGs with inlet air chiller modules. Auxiliary equipment would include inlet air filters with chiller coils, mechanical chiller with cooling module, circulating water pumps, water treatment equipment, natural gas compressors, GSU and auxiliary transformers, and water storage tanks. The technical details of the proposed power plant components are described below.

2.1.3.1 Combustion Turbine Generator Equipment

The LM6000 combustion turbines are two-shaft gas turbine engines. These turbines are essentially the same as the CF6-80C2 engine, which is GE's high-thrust, high-efficiency aircraft engine. The CTGs would be housed in a metal enclosure to protect the units from the elements and reduce noise.

The CTGs would use state-of-the-art technology to efficiently burn clean natural gas with reduced nitrogen oxide (NO_x) and carbon monoxide (CO) emissions. Each CTG would be equipped with water injection to the combustors for reducing the production of NO_x. In addition, Selective Catalytic Reduction (SCR) systems would further reduce NO_x and CO with a combination of catalysts and injection of 19 percent aqueous ammonia.

Each CTG would also be provided with a SPRINT system, which enhances the efficiency and output of the gas turbine engine by spraying micro-droplets of atomized water into the inter-stage air stream between the low-pressure and high-pressure compressors. The water would be atomized to a droplet diameter of less than 20 microns by using interstage bleed air and special nozzles. As the droplets evaporate, the air temperature would be reduced and the mass flow increased. This would result in greater power output and better fuel efficiency.

2.1.3.2 Air Intake System

The air intake system would provide filtered air to the combustion turbine compressors. Mounted above each combustion turbine, the intake system would be equipped with a self-cleaning filter system to clean particulates from the air. The system would be provided with access for inspection and maintenance. Inlet air chilling would enhance gas turbine performance during times of high ambient air temperatures. The inlet chilling system would consist of heat exchanger coils located in the inlet air stream. Chilled water from a mechanical chiller would flow through the coils to cool the incoming air. This would result in increased electrical output and improved fuel efficiency for the units.

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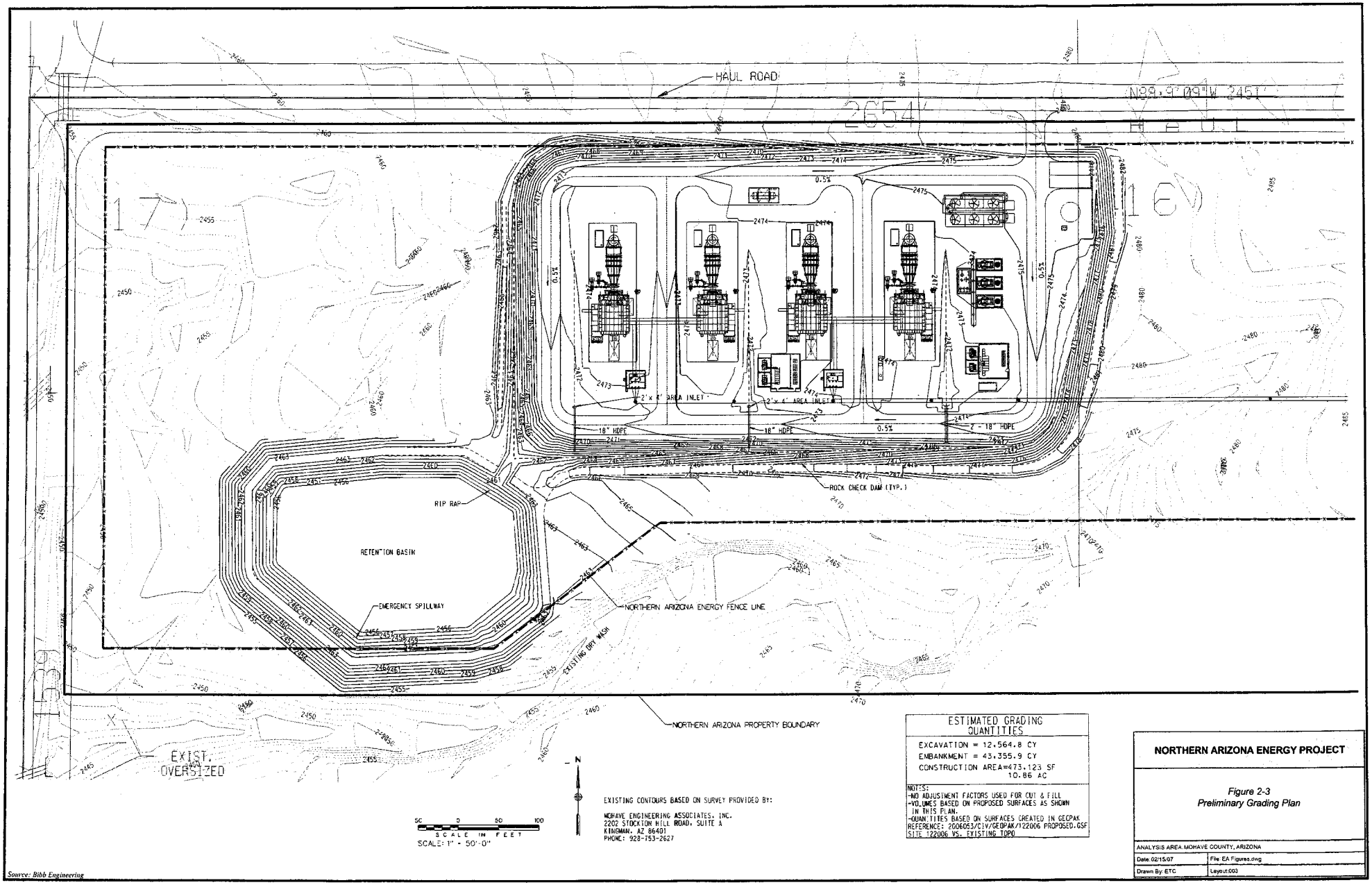

Source: Bibb Engineering

2.1.3.3 Emissions Control Equipment

The combustion gases would exit the turbine at approximately 830 °F and then pass through the SCR system for NO_x emission control and an oxidization catalyst for control of CO and volatile organic compound (VOC) emissions. The SCR system would be used in conjunction with ammonia injection for the control of NO_x emissions. A 19 percent aqueous ammonia (NH_3) solution would be injected into the CTG exhaust gas stream, which would pass over a catalyst bed to reduce the oxides of nitrogen to inert nitrogen. Diluted ammonia vapor would be injected into the exhaust gas stream via a grid of nozzles located upstream of the catalyst module. The subsequent chemical reaction on the catalyst would reduce NO_x to nitrogen and water. The SCR equipment would include a reactor chamber, catalyst modules, ammonia storage system, ammonia vaporization and injection system, and monitoring equipment and sensors.

After passing through the SCR system, the exhaust gases would exit through the attached stack. Each of the four exhaust stacks would be 85 feet tall and 10 feet in diameter. The stacks would be equipped with continuous emissions monitor system (CEMS) and test connections for performance monitoring.

2.1.3.4 Instrumentation and Controls

GE would provide their standard digital process control system for each CTG. The balance of plant systems would be controlled by a distributed control system (DCS).

The DCS would interface with the control systems furnished by the CTG supplier to provide supervisory remote control capabilities as well as data acquisition, annunciation, and historical storage of CTG operating information. A fiber optic connection would be made between the NAEP and the control room at Griffith Energy from which the NAEP would be operated. The fiber line would be collocated with the water and wastewater lines.

2.1.3.5 Fuel System

High-pressure natural gas would be supplied to the proposed power plant from the existing UES gas distribution system located adjacent to the NAEP property. A metering station would be located east of the proposed power plant. From the metering station, gas would be piped to the gas conditioning and compressor equipment skids. The gas conditioning skids would filter gas particulates and drop out any moisture contained in the gas. The gas pipeline will be approximately 1,200 feet long and located entirely within the NAEP property.

2.1.3.6 CTG Cooling

The generators would be air-cooled. The lube oil for the CTGs would be cooled by a closed-loop water-glycol system with water-to-air (fin fan) coolers.

2.1.3.7 Inlet Air Chiller

The four CTG units would be served by one shared inlet air chiller system providing 6,500 nominal refrigeration tons of chilled water. The chiller system would be composed of two chillers arranged in a series configuration. Cooling for the chiller would be provided by a

cooling module located above the chiller skid. Refrigerant utilized for the chiller would be R-123.

2.1.3.8 Water Treatment

The water treatment facilities for the proposed power plant would be permanently provided by leased reverse osmosis (RO) and demineralization trailers to supply demineralized water to the CTGs.

The leased demineralizer trailers would be taken off site for regeneration, and all waste product contained in the trailer would be disposed of at off-site facilities by the vendor, in accordance with applicable regulations.

2.1.3.9 Interfaces and Shared Services

The Proposed Action would be integrated with several existing Griffith Energy systems. The integration between the two facilities is described in the following paragraphs.

2.1.3.9.1 Firewater

The existing firewater loop at Griffith Energy consists of an electric firewater pump with a diesel backup firewater pump. The firewater pumps discharge into an underground firewater loop that circles Griffith Energy and provides water to fire hydrants and the fire suppression systems. The existing firewater pumps are capable of supplying up to 1,500 gallons per minute (gpm) at 100 pounds per square inch gauge (psig) of water to the Griffith Energy firewater loop. Based on National Fire Protection Association (NFPA) standards, the proposed power plant firewater requirement is 500 gpm. This firewater flow requirement is significantly lower than the capability of the Griffith Energy firewater system. Therefore, the proposed power plant would be connected into the Griffith Energy firewater system by extending the firewater loop around the proposed power plant. Additional fire pumps and storage tanks would not required for the proposed power plant. The NFPA standards do not require protection for coincident events at the proposed power plant and at Griffith Energy.

The proposed power plant would not be located within a designated Fire District. A private company, Inland Valley Fire, serves Griffith Energy and the Arizona State Prison in Kingman 24 hours a day. The Inland Valley Fire equipment, which includes a fire truck, ambulance, and staff, is located in the vicinity. It is anticipated that NAEP would contract with Inland Valley Fire Company to provide fire protection.

2.1.3.9.2 Supply Water

The raw water supply to the proposed power plant would be pretreated by Griffith Energy. The process water interconnection would be located near the Griffith Energy cooling tower and would consist of a new pipe connection to existing Griffith Energy water supply piping. This water supply pipeline would be approximately 2,500 feet long and would be located entirely on NAEP and Griffith Energy property within the same corridor as the other interconnections with Griffith Energy. The water would be pumped from this location to the proposed power plant, as shown on **figure 2-1**.

2.1.3.9.3 Wastewater

Wastewater from the proposed power plant would be piped to the existing Griffith Energy wastewater recycling and treatment system to maximize water reuse and minimize the overall amount of wastewater produced. The final wastewater effluent would then be directed to the existing Griffith Energy brine disposal pond using existing equipment. The Griffith Energy brine disposal pond has sufficient storage and evaporating capacity. No additional environmental permits for the brine disposal pond are needed to accommodate both the proposed power plant's and Griffith Energy's wastewater over the design life of both projects. The proposed routing of the wastewater piping from the proposed power plant to Griffith Energy is shown on **figure 2-1**.

2.1.3.9.4 Electrical Grounding Systems

The existing grounding system at Griffith Energy and at the Griffith Switchyard is presently electrically interconnected as shown on **figure 2-4**. To minimize personnel hazards at the proposed power plant, a new buried ground grid in the proposed power plant area would be electrically interconnected with the existing Western and Griffith Energy grounding systems. The electrical interconnection is shown on **figure 2-5**.

2.1.4 Operations

2.1.4.1 Operations Management

The Proposed Action would provide electric power to the grid when other base load generation cannot meet system demands. This typically occurs during periods of peak system electrical load. As a peaking facility, the proposed power plant would have the ability to dispatch any combination of the four independent CTGs in an hourly and/or daily start-stop mode. Unit start times are short, with each CTG typically achieving full load output within 10 minutes of a unit start. Each CTG would be independently controlled from approximately 50 to 100 percent of full load.

The Applicant would contract with Griffith Energy for operations and maintenance (O&M) services. It is anticipated that existing Griffith O&M personnel would be increased by two to four individuals to support the proposed power plant operations and maintenance. Minor maintenance would be provided by existing Griffith O&M personnel, and major maintenance activities would be supported by contracted labor services or original equipment manufacturers' personnel.

The proposed power plant would be operated from the existing Griffith Energy control room. The combustion turbines and plant systems would incorporate state-of-the-art monitoring and control systems. The Proposed Action would be designed to operate independently of the operational status of Griffith Energy, although, to optimize operations efficiency, certain plant equipment (e.g., make-up water/wastewater processes and fire water systems) would be integrated with existing Griffith Energy systems and operations.

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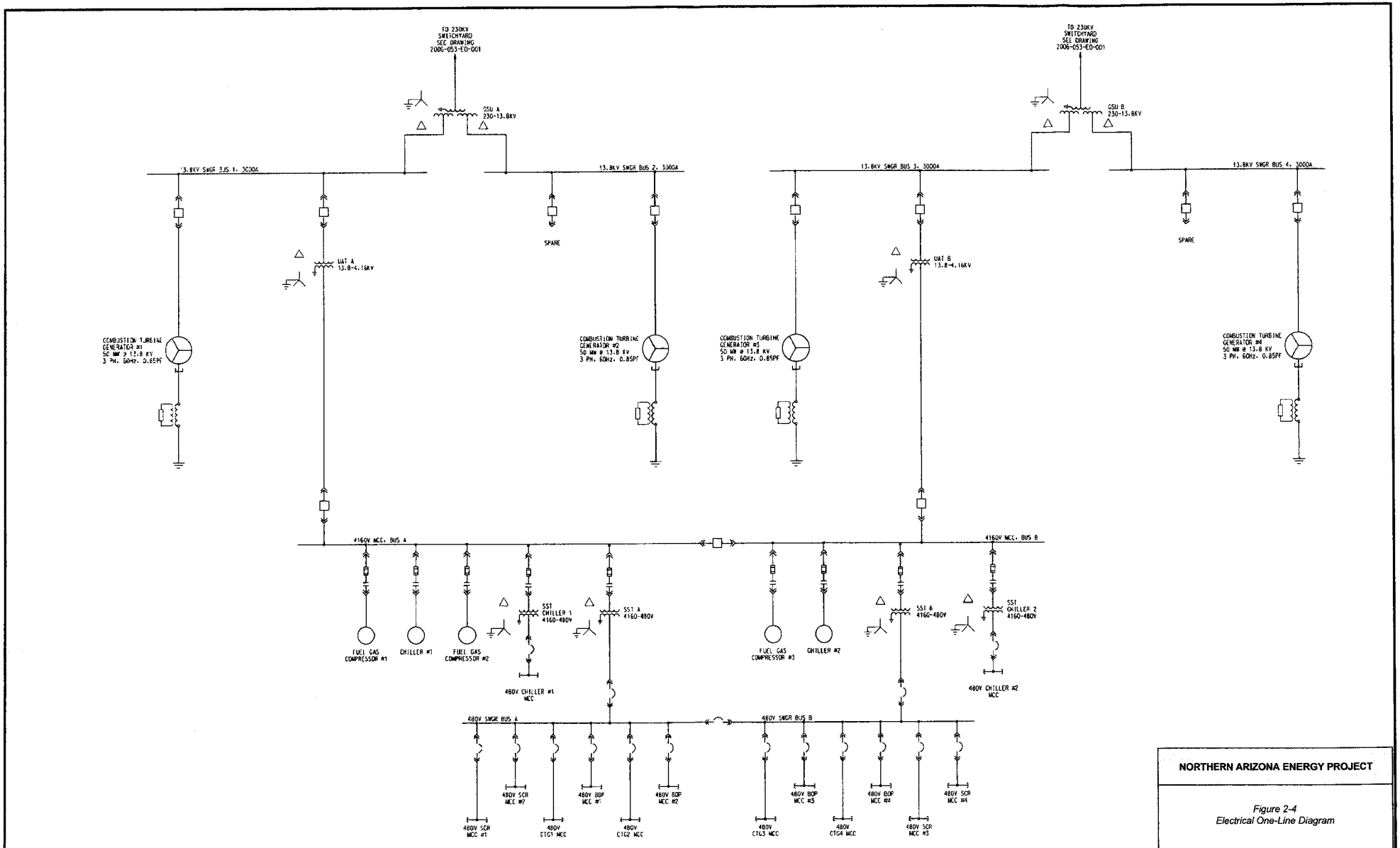
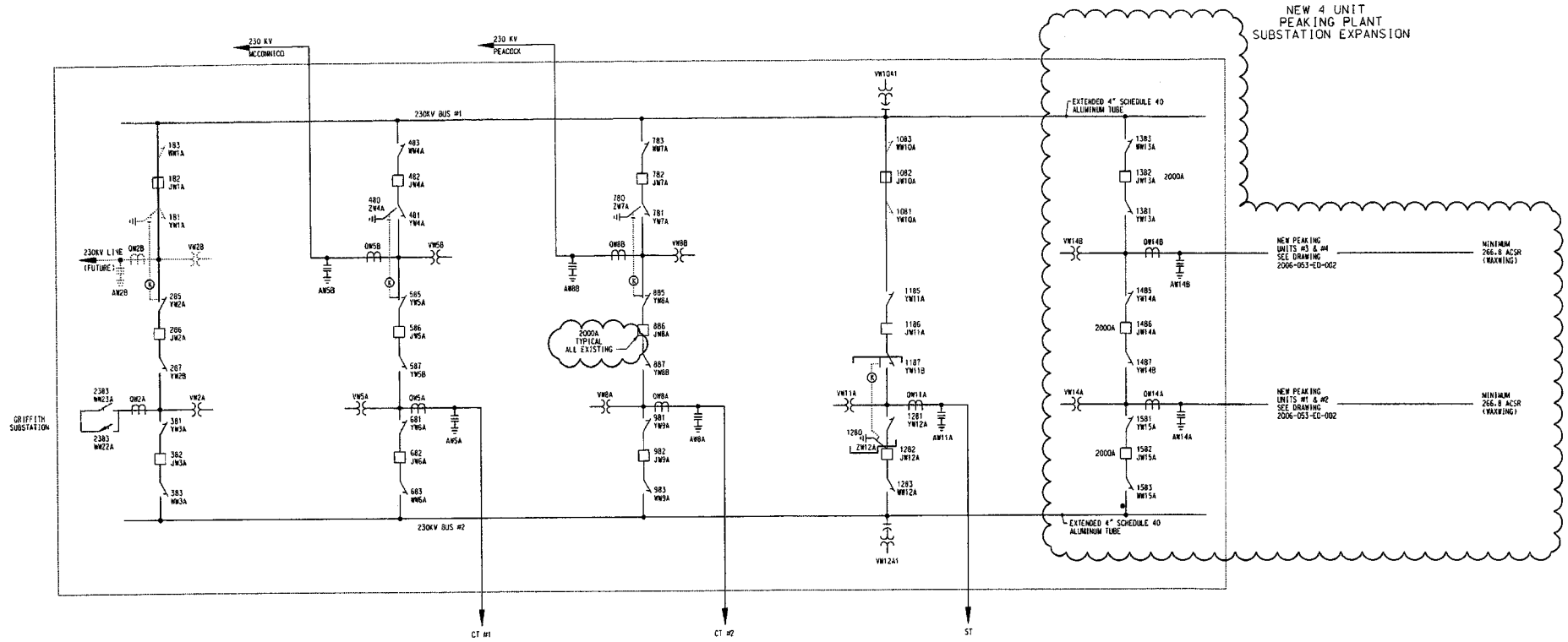


NORTHERN ARIZONA ENERGY PROJECT

Figure 2-4
Electrical One-Line Diagram

ANALYSIS AREA MOHAVE COUNTY, ARIZONA	
Date: 02/15/07	File: EA Figures.dwg
Drawn By: ETC	Layout: 006

Source: Bibb Engineering



NORTHERN ARIZONA ENERGY PROJECT

Figure 2-5
Griffith Switchyard Interconnection
Electrical One-Line Diagram

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 02/15/07	File: EA Figures.dwg
Drawn By: ETC	Layout: 005

Source: Bibb Engineering

2.1.4.2 Operations

The Proposed Action could serve the peak load requirements of customers in Mohave County, other Arizona loads, and surrounding regional load centers. The proposed power plant's design performance is presented in **table 2-1**.

Table 2-1 Project Design Performance

Condition	Temperature (°F)	Net Plant Output (MW)	Net Plant Heat Rate (Btu/kWh) (HHV)
Design Basis	90	175.2	9,975
High Temperature Day	113	174.3	10,029
Average Ambient Conditions for Maximum 5,000 Annual Operating Hours	80	176.7	9,892

The amount of operating hours and startups for any individual simple cycle unit depends on (i) the location, (ii) the load profiles of the customer, (iii) fuel prices, and (iv) the general power market supply and demand conditions. A typical operating profile for a simple cycle turbine would be 1,500 to 3,000 operating hours and 150 to 250 startups per year. The actual annual operating hours and startups of the Proposed Action would be determined by the economic dispatch of each unit as determined by customer needs. To present a realistic worst-case estimate of environmental impacts given the simple cycle gas-fired technology proposed for this proposed power plant, nominal annual hours of 5,000 and 300 starts for each of the four units were evaluated.

2.1.4.3 Emissions Profile

The Applicant filed an application for an air permit with the ADEQ in March 2007. ADEQ issued proposed Air Quality Permit No. 43801 on June 19, 2007. The information contained in the proposed permit is summarized below.

The maximum allowable emission limits for the Proposed Action pursuant to ADEQ's permit are as follows:

- NO_x 25.0 parts per million dry volume (ppmdv) @ 15 percent oxygen (O_2)
- SO_2 0.060 lb/ Million British Thermal Units (MMBtu) heat input
- Ammonia slip 10.0 ppmdv @ 15 percent O_2

As discussed in section 2.1.3.3, the Proposed Action would control NO_x through water injection into the CTG and through the use of an SCR system. CO and VOC emissions would be controlled through the use of an oxidation catalyst. SO_2 and particulate matter with a diameter less than ten microns (PM_{10}) emissions would be controlled through the use of pipeline quality gas.

The Proposed Action would be operated within the annual emission limits required by ADEQ. The annual emission limits are summarized in section 4.3 – Air Quality, **table 4-2** of this document. In addition, the run-hours for the Proposed Action would also be limited by the 50 MW annual average required by Western and described in section 1.1.

2.1.5 Fuel System

High-pressure natural gas would be supplied to the proposed power plant from any combination of the El Paso Natural Gas Company (El Paso), Questar Corporation (Questar), and Transwestern Pipeline Company (Transwestern) natural gas interstate pipelines to the UES local gas distribution system located adjacent to the NAEP property. A new UES-owned metering station would be constructed adjacent to the existing UES metering station serving Griffith Energy, as shown on **figure 2-1**. From this new metering station, gas would be piped to the gas compressor and conditioning equipment skids. The gas conditioning skids would filter very small amounts of gas particulates and drop out moisture contained in the gas. The filters would be replaced periodically and disposed of appropriately. The natural gas system line pressure is expected to be 600 psig at the proposed power plant boundary. Gas compressors would increase the natural gas supply pressure for the CTGs to approximately 675 psig. Pressure reduction and control valves would be used to feed gas to the CTGs.

2.1.5.1 Fuel Gas Requirements

The Proposed Action would utilize an average of approximately 1,750 MMBtu HHV of gas per hour, 28,000 MMBtu per 16-hour day, and 42,000 MMBtu per 24-hour day. Assuming an expected 2,500 annual operating hours for each unit, the Proposed Action would utilize 4,375,000 MMBtu of gas per year.

2.1.5.2 Fuel Supply and Transportation

Natural gas would be delivered to the Proposed Action via two existing UES-owned and operated gas pipelines that interconnect with the El Paso, Questar, and Transwestern interstate pipelines and transport natural gas to the I-40 Industrial Corridor. Both pipelines terminate at an existing gas regulating/metering station located at the northeast corner of the Original Griffith Property.

The Proposed Action would interconnect with both UES laterals just upstream of the existing UES gas regulating/metering station. The two pipelines would be tied to a new gas metering station and would be routed to the Proposed Action via an approximate 1,000-foot gas pipeline shown on **figure 2-1**. The pipelines would be placed in an excavated trench located on the NAEP property. The trench would be backfilled after construction.

Fuel gas compressors would boost the pressure to 675 psig, and a fuel gas conditioning system would assure adequate gas quality prior to the gas being fed to the CTGs. The representative natural gas analysis, provided by El Paso and Transwestern, is shown on **table 2-2**. All gas interconnection facilities would be contained within the boundaries of the proposed power plant.

Each UES pipeline lateral would have a gas transportation capacity of a minimum of 6,250 MMBtu per hour or 150,000 MMBtu per day for a total UES system capacity of more than 12,500 MMBtu per hour or 242,000 MMBtu per day.

Table 2-2 Project Natural Gas Analysis	
Higher Heating Value	1,016.0 Btu/scf 22,667 Btu/lb
Lower Heating Value	915.5 Btu/scf 20,425 Btu/lb
Specific Gravity	0.5857
H-C Molar Ratio	3.9449
Inerts-HC Mass Ratio	0.0503
Molecular Weight	16.934
Spec. Heat (Cp), Btu/lb-F	0.5180
Water Vapor, lb/MMscf	< 7
Sulfur (total), grains/100scf	< 5
Hydrocarbon Dew Point, F	< 20
Temperature °F	40 to 120
Chemical Compounds	**Composition, Percent by Volume**
Methane	96.07
Ethane	1.49
Propane	0.33
Iso Butane	0.06
Norm Butane	0.06
Iso Pentane	0.02
Norm Pentane	0.01
Hexanes plus	0.03
Carbon Dioxide	1.69
Nitrogen	0.24
Hydrogen	0.00
Helium	0.00
Oxygen	0.00

2.1.6 Electrical Interconnection8

2.1.6.1 Electrical Systems

The Proposed Action would be designed to interconnect with the Western 230-kV transmission system at the neighboring existing Griffith Switchyard. The electrical one-line diagram for the Proposed Action is shown on **figure 2-4**.

2.1.6.1.1 Generator Output

Each CTG would have an associated 13.8-kV generator switchgear module. Each switchgear bus would have a generator circuit breaker, an auxiliary circuit breaker, and a direct connection to a three-winding GSU transformer. The Proposed Action would have two 230/13.8-kV three-winding GSUs, which would each be connected directly to two CTG switchgear buses. The high-voltage side of the GSU transformers would connect to the 230-kV Griffith Switchyard via overhead double circuit transmission lines.

2.1.6.1.2 Auxiliary Electric System

A 4,160-volt (V) electrical enclosure would house the 4,160V motor control center (MCC) along with two 480V MCCs. The 4,160V electrical enclosure would have two associated 13.8 to 4.16-

kV unit auxiliary transformers feeding the double-ended 4,160V MCC and two associated 4,160-480V station service transformers to feed the two 480V MCCs.

A 480V electrical enclosure would house the 480V switchgear DCS, battery, and uninterrupted power supply (UPS) system. The 480V electrical enclosure would have two associated 4,160-480V station service transformers to feed the double-ended 480V switchgear.

Power for starting the CTGs would be provided to the 480V level by back-feeding power from the Griffith Switchyard via the Proposed Action's GSUs and auxiliary transformers.

2.1.6.2 Electrical Interconnection Systems

The Proposed Action would connect to the Western 230-kV transmission system at the existing Griffith Switchyard. The Griffith Switchyard is owned and operated by Western. The electrical output of each generator would connect to the low-voltage winding of a GSU transformer used to convert generator output voltage of 13.8-kV to the transmission system voltage of 230-kV. The high-voltage side of the GSU transformers is connected to the 230-kV Griffith Switchyard via overhead double circuit transmission lines. The electrical one-line diagram of the Griffith Switchyard expansion to accommodate the Proposed Action is shown on **figure 2-5**.

2.1.6.2.1 Electric Interconnection Arrangement

The Applicant would construct an overhead 230-kV double circuit transmission line from the proposed power plant to Western's existing Griffith Switchyard, as shown on **figure 2-1**. The entire electric interconnection with the Western system occurs within the Original Griffith Property. Western would contract for all construction within the switchyard. The work would consist of expanding the existing switchyard by about 1 acre as shown on **figure 2-5**. The switchyard expansion would be deeded to Western ownership. The switchyard expansion would be designed in compliance with Federal, state, and local regulations and applicable industry standards and would be compatible with Western's interconnection standards and requirements.

Switchyard construction would involve site grading, installing gravel material, excavating for foundations and cable trenches, constructing foundations, installing switchyard equipment, and extending the chain-link security fence to enclose the expanded area.

The Griffith Switchyard consists of twelve 230-kV circuit breakers arranged in a breaker-and-a-half configuration. The interconnection of the new double circuit transmission line associated with the Proposed Action would require the addition of a new breaker-and-a-half bay consisting of three new 230-kV circuit breakers with associated isolation switches.

The construction sequence would begin with grading and installation of a copper ground mat, followed by foundations, and conduit and cable trenches using graders, backhoes, drill rigs, front end loaders, concrete trucks, boom trucks or cranes, and tractor trailer trucks for delivery of switchyard components. The final phase would involve installation of the electrical equipment graveling and fencing.

The switchyard would comply with Federal and state regulations for spill prevention, control, and countermeasures under the Resource Conservation and Recovery Act (RCRA). Sulfur

hexafluoride (SF_6) gas is considered one of the best insulating gases available for electric equipment. However, it is a potent greenhouse gas, and prevention of leaks is very important. There are no regulations established for SF_6 gas. Western recognizes this concern and is a voluntary participant in EPA's SF_6 Emission Reduction Partnership. As a participant, it is Western's goal to maintain SF_6 emission levels at less than 2 percent of system capacity.

2.1.6.2.2 Electric Interconnection Facilities

The Proposed Action's electric transmission lines, constructed on the NAEP property, would be constructed with double circuits on tubular steel poles, as shown on **figure 2-6**. The poles would be 100 to 120 feet tall with three arms on each side, approximately 17 feet apart to support the conductors and a smaller arm on each side above the conductor arms to support the overhead ground wires used for lightning protection.

2.1.7 Water Supply and Use

2.1.7.1 Water Use Requirements

The Proposed Action would minimize water consumption and wastewater generation by integrating with the water treatment and wastewater treatment equipment of Griffith Energy. Water uses would include pretreated water for makeup to the chiller cooling module, service water, and demineralized water for NO_x control and SPRINT power augmentation.

One design approach to minimize water use is to capture and recycle the condensate created by the CTG inlet air chillers. Depending on temperature and humidity, the condensate flow available from the inlet coils can be up to 25 gpm as shown on **figure 2-7**. This condensate is captured and utilized for the Proposed Action.

At design conditions, assuming that no chiller condensate is recovered, the maximum total raw water requirement would be 370 gpm, or 355,200 gallons per day (gpd), based on 16 hours of operation. With consideration of condensate recovery, the maximum total raw water requirement is 345 gpm, or 331,200 gpd, based on 16 hours of operation.

The Proposed Action water balance is presented in **figure 2-7** and indicates the various process water flow streams for an average operating day. **Table 2-3** lists the water and wastewater flows for several design conditions.

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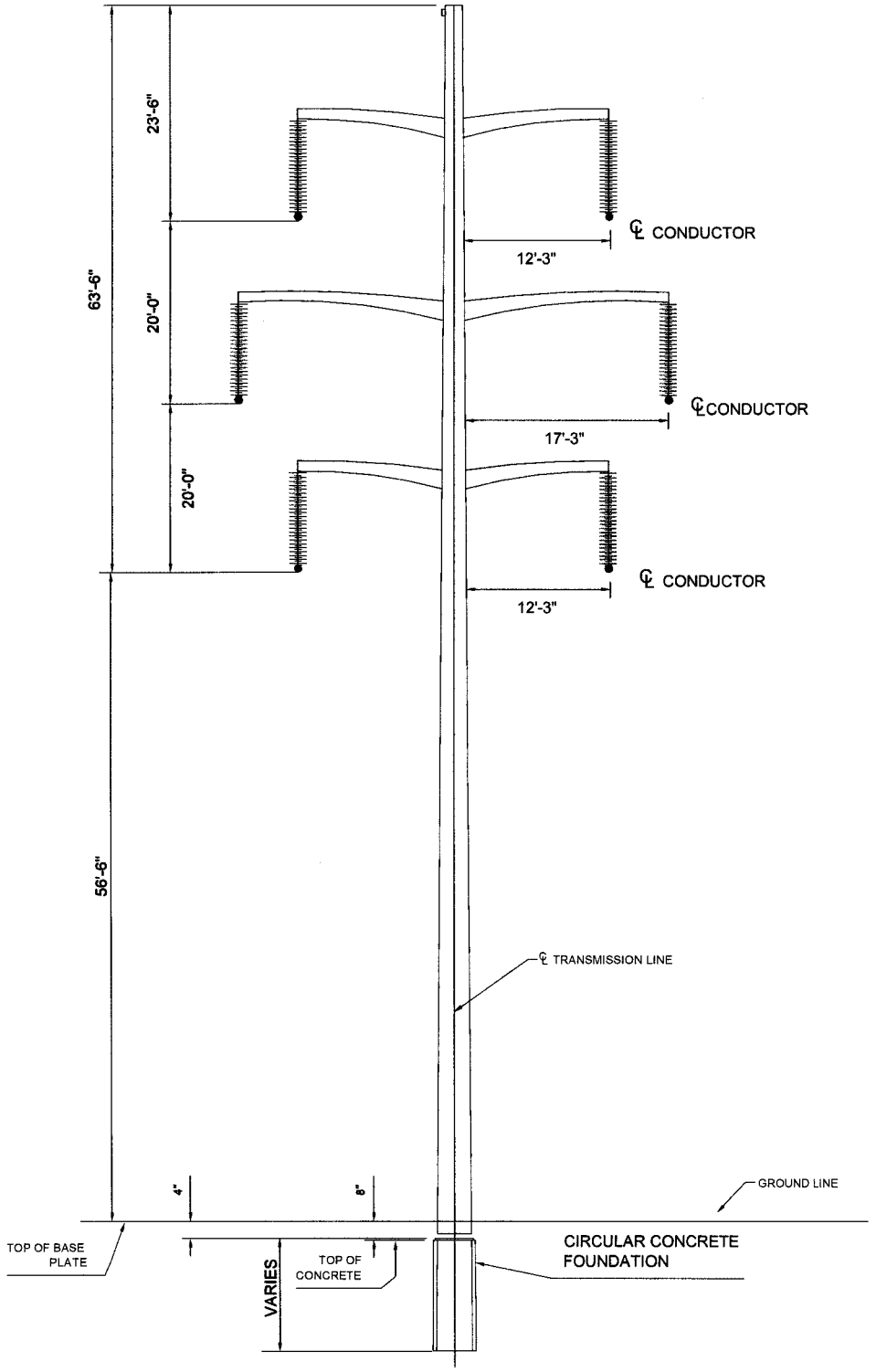

NORTHERN ARIZONA ENERGY PROJECT

Figure 2-6
Typical Transmission Structure

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 02/19/07	File: EA-Proposed Trans Structure.dwg
Drawn By: ETC	Layout: 001

Source: Griffith 1998a

Table 2-3 Daily and Annual Water Flows[1]

	Peak Day[2] 1,000 gpd	Summer Day[3] 1,000 gpd	Expected Year[4] Acre-ft/yr	Max Year[5] Acre-ft/yr
Raw Water Use				
Cooling Module Makeup	227	145	70	81
Demineralizer System	389	260	125	250
Service Water	4	3	1	3
Recovered Wastewater	(116)	(77)	(37)	(66)
Net Water Use	**504**	**331**	**159**	**268**
Wastewater Flows				
Cooling Module Blowdown	44	28	13	17
RO System Rejects	97	65	31	63
Plant Drains	4	3	1	3
Recovered Wastewater	(116)	(77)	(37)	(66)
Net Wastewater to Pond	**29**	**19**	**8**	**17**

Notes:
1) All flows are for four units operating at base load.
2) Peak Day is 24-hour operation with 12 hours at the peak temperature (113°F) and 12 hours at the design condition temperature (90°F).
3) Summer Day is 16 hours at the design condition temperature (90°F).
4) Expected year is based on 2,500 hours of operation per CTG at the design operating temperature (90°F).
5) Max Year is based on 5,000 hours of operation per CTG at the average operating temperature (80°F).

2.1.7.2 Source of Water

The existing I-40 Industrial Corridor Water System owned by Mohave County is capable of supplying a minimum of 5,000 gpm of water from the Sacramento Valley aquifer. The system consists of six groundwater wells approximately 1,200 to 1,400 feet in depth, a water pipeline collection and distribution system and a 1.3 million gallon storage tank located north of the Proposed Action.

At the design ambient temperature of 90 °F, about 345 gpm of raw water would be required for process water supply for the proposed power plant. Process water requirements would include makeup water to the chiller cooling module and water supply to the mobile water treatment equipment that would be used to make demineralized water for turbine injection for both NO_x control and SPRINT power augmentation.

To be conservative and to cover water needs for the proposed power plant during peak demand and high temperature days (plus design margin), the Applicant would contract for approximately 450 gpm (peak flow) of water.

Given the estimated 2,500 operating hours each year, NAEP would require approximately 160 acre-feet of groundwater each year. The Applicant would also include, for analysis purposes, a theoretical maximum operating hour case for a peaking facility of 5,000 hours per year. Under this theoretical maximum case, the proposed power plant would use approximately 268 acre-feet of water. Both annual use volumes are evaluated in the impact analysis in chapter 4.

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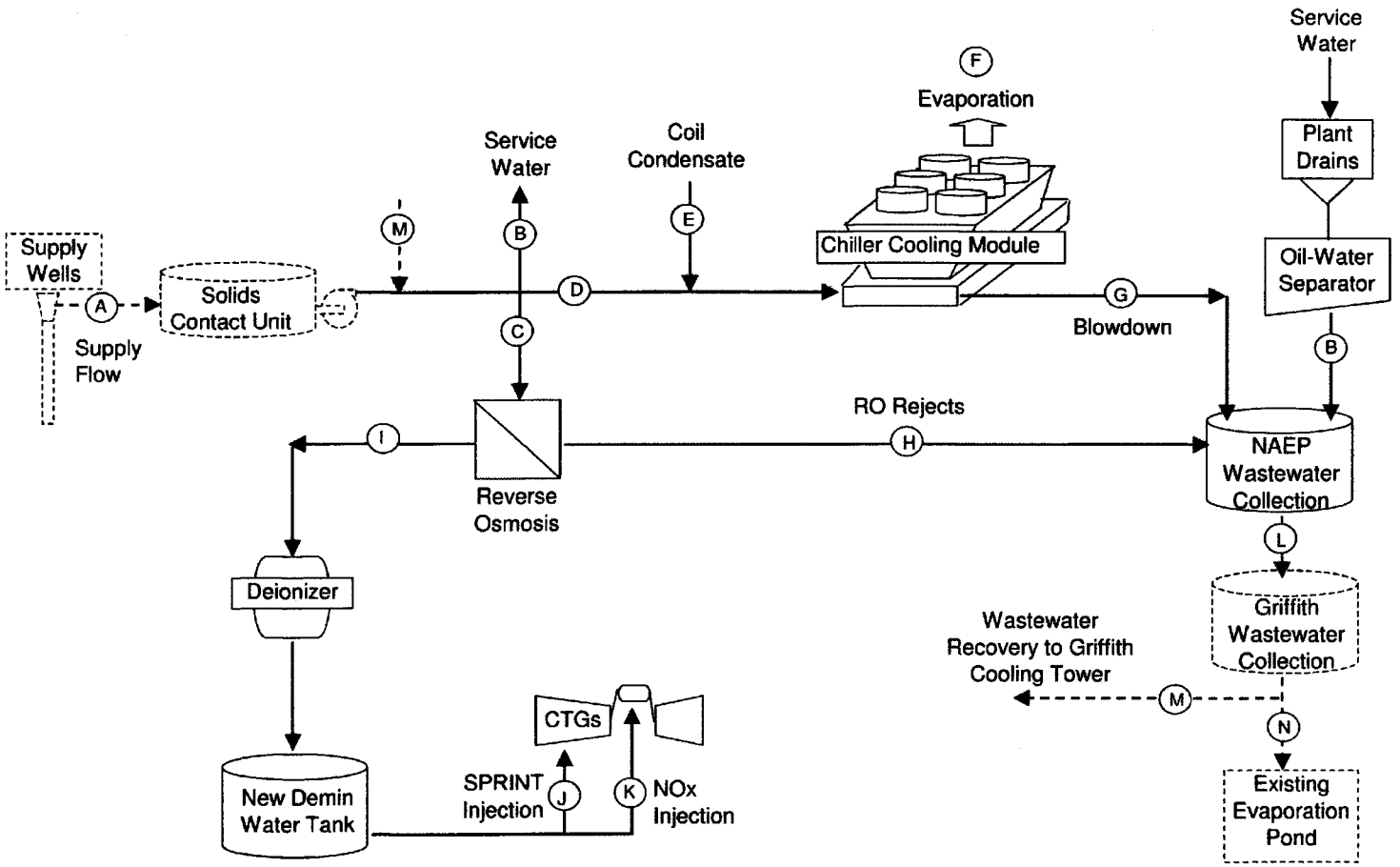

Notes:

1) Based on 4 x LM6000 PC Sprint
2) Using Griffith service water and Griffith waste water treatment
3) All Flows are displayed in GPM
4) NOx and Sprint Injection flows from GE performance estimates
5) Reverse Osmosis recovery rate 75%
6) Wastewater recovery rate 80%
7) Cooling Tower cycles of conc. 6.0

Temperatures:

Peak	113
Average Summer (Jun-Aug)	90
Average Operating (Apr-Oct)	80
Coldest Temperature:	25

Stream	Description	TEMPERATURE, F			
		113	90	80	25
A	Flow from the supply wells	380	345	290	179
B	Service water to NAEP wash-down hoses	3	3	3	3
C	Softened water to NAEP RO Trailer	271	271	271	223
D	Softened water to NAEP cooling module makeup	192	151	88	0
E	Inlet air coil condensate	25	25	25	0
F	NAEP cooling module evaporation	181	147	94	0
G	NAEP cooling module blowdown	36	29	19	0
H	NAEP RO system reject stream	68	68	68	56
I	Demineralizer trailer water flow	203	203	203	167
J	Demin water for SPRINT injection	63	63	63	0
K	Demin water for NOx injection	140	140	140	167
L	Wastewater flow to Griffith	107	100	90	59
M	Wastewater recovered by Griffith HERO ™	86	80	72	47
N	Wastewater flow to evaporation pond	21	20	18	12

NORTHERN ARIZONA ENERGY PROJECT

Figure 2-7
Water Balance Diagram

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA

Date: 02/15/07	File: EA Figures.dwg
Drawn By: ETC	Layout: 004

Source: Bibb Engineering

Groundwater would be pumped from the local Sacramento Valley aquifer and delivered to the Proposed Action. Mohave County and the Applicant have completed a new water interconnection and supply agreement for 450 gpm (peak flow). The water would be delivered to the proposed power plant through the existing Mohave County water system in the area. Through a revised water interconnection and supply agreement with Mohave County, Griffith has agreed to reduce its contracted peak flow quantity from 4,500 gpm to 3,900 gpm, making available 450 gpm for the proposed power plant and 150 gpm for other users. Griffith will hold the 600 gpm of water capacity as uncontracted reserve until such time as NAE has need for the water and the County requests the 150 gpm for other users.

2.1.7.3 Water Treatment

2.1.7.3.1 Inlet Air Chiller Module

The cooling module would provide heat rejection for the centrifugal chiller used to supply chilled water to the air inlet coils. Makeup water would be pre-treated water from Griffith Energy. The circulating water would be continuously treated and controlled in order to achieve approximately six cycles of concentration. The six-cycle limit is determined by the silica concentration of the water.

Makeup water would replace water lost from evaporation, drift, and blowdown. A chemical feed system would supply water-conditioning chemicals to the circulating water to minimize corrosion and control the formation of mineral scale and bio-fouling. Sulfuric acid would be fed into the circulating water system in proportion to makeup water flow for alkalinity reduction to control the scaling tendency of the circulating water. The acid feed equipment would consist of a bulk sulfuric acid storage tank and two full-capacity sulfuric acid metering pumps.

To further inhibit scale formation, an alkaline scale inhibitor solution would be fed into the circulating water system in an amount proportional to the circulating water blowdown flow. The scale inhibitor feed equipment would consist of a chemical solution bulk storage tank and two full-capacity scale inhibitor metering pumps.

To prevent bio-fouling in the circulating water system, a sodium hypochlorite solution would be fed into the system. The hypochlorite feed equipment would consist of a bulk storage tank and two full-capacity hypochlorite metering pumps, which would be provided for feeding either stabilized bromine or sodium bromide as supplemental biocides.

2.1.7.3.2 Demineralized Water

The water injected into the CTG for NO_x control and SPRINT power augmentation must be free of contaminants. Pretreated water from Griffith Energy would be filtered and further treated by RO trailers located on the proposed power plant. The product water from the RO trailers would be sent through demineralizer trailers and then to a demineralized water storage tank. The leased demineralizer trailers would be taken off site for regeneration, and all waste products would be disposed of off site by the trailer vendor at licensed commercial facilities in compliance with applicable regulations.

2.1.8 Wastewater and Stormwater

2.1.8.1 Process Wastewater

The Proposed Action process wastewater disposal would be integrated with the Griffith Energy wastewater system. The Proposed Action wastewater would be routed through the Griffith Energy wastewater recovery and treatment system via pipeline and process reject wastewater from that recycling system would be sent to the existing Griffith Energy brine disposal pond. This pipeline would be approximately 2,500 feet long and would be located entirely of NAEP and Griffith Energy property within the same corridor as the other interconnections with Griffith Energy.

There would be process wastewater streams from the Proposed Action's RO system and chiller module. The wastewater would be sent to the Griffith Energy wastewater treatment system where 80 percent of the water would be recovered and sent to the Griffith Energy cooling tower. This would leave 20 percent of the stream as the wastewater flow to the brine evaporation pond. As shown in **table 2-3**, the maximum daily peak flow to the pond while operating would be 29,000 gpd (20.1 gpm). However, the actual annual flow would average approximately 11 gpm based on the conservatively high operating assumptions presented above. Annual wastewater flows estimated for a typical expected year (based on 2,500 hours of operation) would be 8 acre-feet per year (afy), while the maximum annual flow (based on 5,000 operating hours) would be 17 afy. The Proposed Action would also generate a negligible waste stream from plant drains, consisting of equipment wash-down water and the minor condensation streams from the compressed air and CEMS. These drains would be directed to the oil/water separator and then discharged to the Griffith Energy wastewater system. Wastewater generated from CTG compressor washing would be collected in an underground tank before being trucked off site for disposal at a facility licensed to treat this type of wastewater.

2.1.8.2 Sanitary Waste

The Proposed Action personnel would utilize the existing Griffith Energy sanitary facilities with no increase in design capacity required for the additional personnel. During periodic major maintenance events, portable facilities would be provided to accommodate the additional maintenance workers.

2.1.8.3 Stormwater Management

The proposed power plant stormwater runoff would be routed to the west of the power generation equipment by means of swales, ditches, and sheet flow. However, where space restriction precludes the use of open ditches and channels, a series of pipes and inlets would be used. Culverts would be used to carry stormwater under on-site traffic areas. Stormwater runoff would discharge by gravity from the proposed power plant area to a 1-acre stormwater retention basin located to the west of the proposed power plant to prevent stormwater from leaving the NAEP property. The stormwater retention basin was designed to effectively handle a 100-year storm event. Off-site runoff would be routed around the proposed power plant using berms and ditches and into the stormwater retention basin. Stormwater runoff in the retention basin would be left to evaporate and/or infiltrate.

2.1.9 Project Auxiliaries

The Proposed Action auxiliary systems include fire protection, aqueous ammonia, compressed air, and lighting as described in the following paragraphs.

2.1.9.1 Fire Protection System

The Proposed Action includes an underground firewater loop interfaced with the Griffith Energy firewater system. There would be two connections to two different portions of the Griffith Energy firewater loop. The firewater supply network of pipelines would be approximately 5,700 feet long and would be located entirely on NAEP and Griffith Energy property with the same corridor as the other interconnections with Griffith Energy. The Proposed Action does not require on-site storage of firewater because it would be served from Griffith Energy.

The CTG enclosures would be protected by a carbon dioxide (CO_2)-based fire suppression system as supplied by the manufacturer, which includes heat and natural gas detection devices.

The oil-filled transformers would be isolated from adjacent equipment and structures using physical separation and/or firewalls. The auxiliary transformers would be supplied with dielectric fluids. Each transformer also would reside within a concrete containment area that serves to:

- Contain oil spills.
- Retain direct contact stormwater that could potentially come in contact with transformer oil.
- Retain firewater that could potentially come into contact with transformer oil.

The fire protection system would be designed per NFPA standards, utilizing equipment approved by Underwriter's Laboratories/Factory Mutual Research Corp.

2.1.9.2 Ammonia Receiving and Storage System

The aqueous ammonia system provides for the receipt, storage, and delivery of 19 percent aqueous ammonia to the SCRs to reduce NO_x emissions. Aqueous ammonia would be delivered to the proposed power plant via tanker trucks and deposited in an aboveground 10,000-gallon storage tank. Aqueous ammonia would then be pumped to each SCR, where it would be sprayed into the CTG exhaust flow upstream of the NO_x catalyst to reduce plant emissions. The Proposed Action's ammonia system would not be integrated with Griffith Energy.

2.1.9.3 Compressed Air

The compressed air system provides both service air and instrument air throughout the proposed power plant. Service air is used primarily for maintenance activities and the instrument air system is used for the operation of control systems, primarily pneumatic valves. Three compressors that can each provide 50 percent of the needed capacity (providing backup capacity if needed) would be provided for the Proposed Action. The existing compressed air system at Griffith Energy would not be integrated with the Proposed Action.

2.1.9.4 Lighting Systems

Outdoor area lighting for the Proposed Action would consist of efficient, high-pressure sodium (HPS) fixtures. They would be permanently mounted fixtures located throughout the facility; mounted on pendants, poles, stanchions, building columns, or walls; and providing access lighting for plant operations and maintenance. Outdoor lights would be automatically controlled by photocells with manual override capability.

The outdoor lighting system would be designed to provide nighttime lighting levels consistent with the Illuminating Engineering Society (IES) standards to allow basic operator movement throughout the proposed power plant. The Proposed Action would be located approximately 9 miles outside of any city limits. However, all outdoor lighting would conform to the regulations for the MX Zone in section 24 of the Mohave County Zoning Ordinance including all applicable provisions of sections 25, 26, and 27 of the Mohave County Outdoor Light Control (Dark Sky) Ordinance.

2.1.10 Construction

The proposed power plant would be constructed by a primary contractor who would perform the engineering, procurement, and construction (EPC) of the Proposed Action. The EPC contractor would typically be responsible for the complete detailed design of the Proposed Action; procurement of equipment and permanent materials; construction of all civil works, foundations and structures; and startup and checkout of the generation facility. Up to 6 acres of the Proposed Action would be dedicated as the temporary construction area and would serve as space for construction trailers and parking as well as a laydown and storage area for equipment and materials used by the EPC contractor.

The design and construction of the extension of the Griffith Switchyard would be performed by Western. The UES gas distribution system would be modified by UES to add a new gas metering facility for the Proposed Action. No modifications to the I-40 Industrial Corridor Water System would be required.

2.1.10.1 Project Cost

The cost of the Proposed Action is estimated to be in the range of $140 to $160 million. The cost includes the CTGs, gas compressors, transformers, chiller, gas, water and electric transmission interconnection facilities, and all ancillary balance of plant equipment as well as all civil works, construction labor, construction materials, and engineering. In addition, the Proposed Action cost includes the cost estimates for gas and electric interconnections performed by the interconnecting utilities and Applicant's costs for development, insurance, and financing.

2.1.10.2 Project Schedule

2.1.10.2.1 Engineering, Procurement and Construction Schedule

The field construction schedule from site mobilization to commercial operation for a four-unit simple cycle proposed power plant is typically 9 to 12 months. Depending on equipment fabrication and delivery durations, detailed engineering and procurement activities would be initiated up to 12 months in advance of site mobilization to assure that equipment deliveries

occur to support the construction schedule. Market conditions can impact both the equipment lead times and the construction labor availability and may extend EPC schedules. The key Proposed Action schedule milestones are presented in **table 2-4**.

Table 2-4 Anticipated Project Schedule

Action	Date
Submit Permit Applications	March 2007
All Permits Complete	October 2007
Onsite Construction Starts (earliest)*	Fourth Quarter 2007*
Commercial Operation (earliest)*	May 2008*

* Depending on market conditions

2.1.10.2.2 Potential Modified Construction Schedule

Depending on market conditions, the Proposed Action may be constructed in a two-phased construction sequence with two units being advanced to construction immediately upon the receipt of environmental approvals and completion of power purchase agreements and the second two units constructed when market conditions would support them.

2.1.10.3 Transportation

All equipment, permanent materials, and commodities for the Proposed Action would be transported to the site via state and interstate highways which are designed for an American Association of State Highway and Transportation Officials (AASHTO) truckload designation of HS20 (a national standardized truck that is intended to encompass most of the loads to which a bridge might be subjected). The roads and bridges can accommodate the heaviest anticipated equipment component for the Proposed Action. Heavy haul trucks with multiple axles would be employed to distribute loads, as required. All equipment and material deliveries would utilize the NAEP property construction or primary access from Haul Road.

2.1.10.3.1 Equipment and Materials

Truck deliveries of equipment and materials would occur from the initial construction notice to proceed through the entire duration of the Proposed Action. Initial truck deliveries would include haul trucks for importing engineered fill materials (such as gravel), as required, followed by concrete trucks for installation of major foundations, and deliveries of reinforcing steel. Piping materials for buried piping would be delivered to NAEP property early in the construction period corresponding to approximately the time frame for foundation installation. Deliveries of large major equipment would commence at about midpoint of the construction period.

2.1.10.4 Labor Force

The monthly construction labor force requirements for the Proposed Action are presented on **table 2-5**. This projection includes all personnel that would be required to complete construction of the Proposed Action including overall project and site management, laborers, skilled craft, and startup personnel. Skilled craft and laborers would be drawn from the local area with construction management and startup functions provided by relocated personnel from the EPC contracting firm.

After the construction only about two to four personnel would be needed for operations of the proposed power plant.

Table 2-5 Construction Workforce Project* Months After Construction Notice to Proceed

Month	1	2	3	4	5	6	7	8	9	10
Proposed Power Plant Workforce	34	80	115	132	138	138	132	115	80	34
Switchyard Expansion Workforce		10	30	30	10					
Total	**34**	**90**	**145**	**162**	**148**	**138**	**132**	**115**	**80**	**34**

* Includes construction management, laborers, skilled craft, and startup personnel.

2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED

2.2.1 Alternative Sites

A site for a project of this type needed to have a combination of factors present – natural gas, transmission, the ability to be zoned appropriately, and available land. Alternate sites in northern Arizona were considered by the Applicant, but were dismissed because no alternative sites were found that met the following criteria.

- location within a designated industrial development area
- proximity to gas, transmission, and water infrastructure to limit off-site laterals and thereby reduce environmental impacts and costs
- proximity to rail and highways for transportation of equipment and materials
- developed site access roads

This evaluation resulted in the Applicant selecting a preferred site, which is the Proposed Action identified in this EA. The prime advantage of the preferred site was its location within the I-40 Industrial Corridor and existing zoning designation of MX, along with all infrastructure being available for physical interconnection within the NAEP property or the adjacent Griffith Energy property including gas lines, electric transmission, water supply, and transportation. In addition, rail access and I-40 offer superior transportation advantages; thus, other alternatives were eliminated from consideration.

2.2.2 Alternative Energy Technologies

Alternative energy technologies, such as wind and solar thermal, were suggested for consideration by some respondents during scoping. The NAEP is proposed to provide peaking power – additional power during times of peak electrical demand as discussed in section 1.2 – Purpose and Need. This type of energy resource needs to be available when needed on very short notice. Solar and wind technologies provide intermittent power (when the wind is blowing or the sun is shining) and cannot be effectively made available during times of peak demand. Consequently, these alternative energy technologies were not considered viable options for the Proposed Action.

2.3 NO ACTION ALTERNATIVE

NEPA and DOE guidelines, which guide Western's project environmental assessments, require consideration of a "No Action" Alternative. Under the No Action Alternative, Western would not grant permission to the Applicant to interconnect with Western's transmission system. Without the ability to interconnect to Western's transmission system, the Proposed Action would not be feasible and would not be built. If the Proposed Action is not built, the impacts associated with the construction and operation of the facility would not occur, and the current environmental conditions and impacts would not change. Likewise, this additional peaking resource would not be available to serve the customers of load-serving entities in Arizona and the surrounding region. However, the need for peaking power would remain, and other peaking facilities might be approved and constructed.

2.4 MITIGATION

Standard mitigative practices applicable to construction of the Proposed Action are provided to minimize impacts. **Table 2-6** presents a list of committed mitigation measures for the Proposed Action.

Table 2-6 Mitigation

1.	During construction and operations, supervisory staff would ensure that all activities are conducted under all applicable regulations, laws, and permits. This applies to all regulated activities associated with air emissions, wastewater discharges, stormwater discharges, water use, solid waste disposal, and other applicable areas.
2.	The limits of construction activities normally would be predetermined, with activity restricted to and confined within those limits. All construction vehicle movement would be restricted to predesignated access, contractor acquired access, or public roads.
3.	In construction areas where recontouring is not required, vegetation would be left in place wherever possible, and original contour would be maintained to avoid excessive root damage and allow for resprouting.
4.	Applicant would prepare an erosion control plan for construction. All construction would be conducted in a manner that would minimize disturbance to vegetation and drainage features. In construction areas where substantial ground disturbance has occurred, surface restoration would occur as indicated by Best Management Practices. Anticipated restoration methods normally would consist of contouring to near natural conditions, elimination of ruts, reseeding with a regionally native seed mixture, placement of erosion control measures, and other measures evaluated on a case-by-case basis.
5.	Excavated material or other construction materials shall not be stockpiled or deposited near or within the drainage features where they can be wasted away by high water or storm runoff or can in any way encroach upon the actual watercourse itself.
6.	Applicant would file a NOI to obtain coverage under Arizona's General Stormwater Discharge Permit No. 2 for stormwater runoff during construction and operation. A pollution prevention plan shall be prepared consistent with the general permit requirements.
7.	The Applicant would include in its Site Grading Plan measures to ensure that any archaeological discoveries are property protected. All construction supervisors would be instructed on the protection of cultural and ecological resources. Construction supervisors shall be familiar with specific procedures outlined in the Site Grading Plan that would be followed in case of an archaeological discovery. Inadvertent discoveries of human remains would be immediately reported to the Director of the Arizona State Museum as required by Arizona Revised Statute 41-865.
8.	Consideration of cultural resources would continue during ground disturbance phases of implementation. In consultation with State Historic Preservation Officer, specific mitigation measures would be developed

Table 2-6 Mitigation

	and implemented to mitigate any identified adverse impacts. These may include modifications to avoid adverse impacts, monitoring of construction activities, and data recovery studies. Native American tribes would be involved in these consultations to determine whether there are effective or practical ways of addressing impacts on Traditional Cultural Properties.
9.	All requirements of those entities having jurisdiction over air quality matters would be adhered to, and any permits needed for construction activities would be obtained. Open burning of construction trash would not occur unless allowed by appropriate jurisdictional authorities.
10.	Fugitive dust emissions would be minimized by using water trucks to moisten soil areas and by limiting vehicle use in construction areas. Oil or other petroleum products would not be used for dust control. All construction vehicles would adhere to posted speed limits and any speed limits enforced on the project site.
11.	During operations, Applicant would operate the proposed power plant in compliance with all conditions of the Title V air permit issued by the ADEQ.
12.	All construction waste, including trash and litter, garbage, other solid waste, petroleum wastes (other than used oil, which would be colleted by a licensed waste oil handling contractor), and other potentially hazardous wastes, would be sent to a disposal facility authorized to accept such wastes. Where possible, wastes would be recycled or reused.
13.	No non-biodegradable debris would be deposited on site. Slash and other biodegradable debris would be left in place or disposed of in accordance with agency requirements.
14.	Regulated materials, hazardous liquids, or wastes would not intentionally be released onto the ground or into drainage areas. If an accidental spill of hazardous materials occurs, the construction contractor or operator would mitigate the spill per applicable cleanup regulations.
15.	R-123 refrigerant from the chillers would be reclaimed with certified equipment operated by certified technicians if the materials are to be recycled or disposed.
16.	The Applicant would prepare a Spill Prevention, Control and Countermeasures (SPCC) Plan. The plan would identify any hazardous materials that would be used, precautions to prevent spills, and employee awareness training.
17.	Construction activities shall be performed by methods that would prevent entrance or accidental spillage of solid matter contaminants, debris, any other objectionable pollutants and wastes into dry watercourses. Such pollutants and waste include, but are not restricted to, refuse, garbage, cement, concrete, sanitary waste, industrial waste, oil and other petroleum products, aggregate processing tailing, and mineral salts.
18.	Mitigation measures for biological resources developed in conjunction with Federal and state authorities would be adhered to.
19.	To mitigate visual impacts, fences would be maintained, entrances and roadways would be kept in good condition, and lighting impacts would be minimized by placing security lighting downward.
20.	All maintenance activities during operations would be conducted to minimize disturbance to vegetation and drainage features.
21.	Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments or other inefficient operating conditions shall not be operated until they are repaired or adjusted.
22.	The contractor shall make all necessary provisions in conformance with safety requirements for maintaining the flow of public traffic and shall conduct its construction operations to offer the least possible obstruction and inconvenience to public traffic.
23.	Upon completion of the work, including maintenance work and operation, all work areas except access roads shall be scarified or left in a condition which would facilitate natural revegetation, provide for proper drainage, and prevent erosion.

Sources: Griffith, 1998b; Exira, 2003; Western Construction Standard 13

3.0 AFFECTED ENVIRONMENT

This chapter describes the baseline condition of the general area that could be affected by the Proposed Action. Resources, ecosystems, and human communities are identified that could potentially be affected by implementation of Proposed Action described in chapter 2.

The study area used to describe the affected environment, or Region of Influence (ROI), varies depending on the resource being analyzed and the predicted locations of direct and indirect impacts from the Proposed Action. The ROI for some resources is the NAEP property and for other resources, a larger area may be analyzed (e.g., county or region). The baseline condition serves as a reference point for the evaluation of impacts presented in chapter 4. For ease of understanding the evaluation of impacts correlating chapters 3 and 4, this document has been prepared so that a resource described in chapter 3 has the same subsection number in chapter 4 (e.g., 3.2: Water Resources; 4.2: Water Resources).

3.1 GEOLOGY, SOILS AND SEISMICITY

This section describes the existing geologic, soil, and seismicity environment within the ROI. The regional geology is discussed to provide the reader with an understanding of the geologic setting of the area.

3.1.1 Geology

The Proposed Action is located within the Basin and Range physiographic province, which is characterized by north-south trending fault block mountain ranges separated by agraded desert plains (Thornbury, 1965). The Proposed Action lies within the northern portion of the Sacramento Valley, an agraded desert plain which drains to the south and is bordered by fault block mountains to the west (the Black Mountains) and east (the Hualapai Mountains). The elevation of the Sacramento Valley ranges from 3,500 feet above mean sea level (msl) on the north to 1,500 feet msl on the south end of the valley.

The Sacramento Valley is mantled by thick deposits of unconsolidated sand, gravel, cobbles, and boulders which date from late Pleistocene to recent times (Gillespie and Bentley, 1971). They have been deposited by ephemeral streams carrying weathered material from the Hualapai Mountains. These alluvial deposits are several hundred feet thick in the ROI and overlie Precambrian igneous and metamorphic bedrock.

The geology of the Proposed Action is characteristic of the gently sloping, alluvial outwash, valley sides of the Sacramento Valley. Elevations at the NAEP property range from 2,445 feet to about 2,506 feet, with a total site relief of approximately 60 feet and the land sloping to the southwest. The NAEP property is too flat to be affected by mass movements such as rockfall and landslides. Flash floods can occur in the numerous washes that cross the valley floor near the Proposed Action. A wash cuts across a portion of the southeastern corner of the NAEP property. Because the near-surface geology is made up of recent alluvial material, there is little or no potential for the presence of paleontological materials.

Numerous sand and gravel borrow pits, which are exploited for construction of roads and other projects, are present throughout the Sacramento Valley and near the Proposed Action. No active, inactive, or proposed mining operations would be affected by the Proposed Action. There are no significant coal, oil, or gas resources in the immediate area.

3.1.2 Soils

Soils at the NAEP property have been mapped by the Natural Resource Conservation Service (NRCS, 2006). Two soil mapping units have been identified at the NAEP property: Castaneda extremely gravelly loam and Mahon-Poachie complex, dry. Castaneda extremely gravelly loam covers 32 acres of the NAEP property, while the remaining 8 acres is made up of Mahon-Poachie complex, dry soil. Castaneda extremely gravelly loam formed on slopes of 1 to 7 percent from alluvium and/or colluvium derived from metamorphic rock. These are moderately deep soils which are not subject to flooding and have a moderate shrink-swell potential. These are well-drained soils with high runoff potential. The water erosion hazard is slight, and the wind erosion hazard is very slight (NRCS, 2006).

Mahon-Poachie complex, dry soils formed on slopes of 2 to 15 percent from alluvium derived from volcanic and mixed-rock sources. These are very deep soils that are not subject to flooding and have a low to moderate shrink-swell potential. These are well-drained soils with low to medium runoff potential. The wind and water erosion hazards are both low to moderate (NRCS, 2006).

3.1.3 Seismicity

The Proposed Action lies within seismic risk zone 2 (on a scale of 0 to 3, with 3 being the highest risk) (Algermissen, 1969). Earthquake intensities are discussed using the Modified Mercalli Intensity Scale which measures intensities from I to XII or more. Moderate damage occurs from earthquakes corresponding to an intensity of VII, which is the maximum impact that can be expected within the ROI.

Seismic hazard is commonly expressed in Peak Ground Acceleration (PGA) of percent gravity with 10 percent probability of exceedance in 50 years. The Proposed Action falls between 5 and 6 percent gravity, which represents very light potential for damages to structures from earthquake activity (USGS, 2002).

The National Earthquake Information Center database (USGS, 2006a) was searched to identify seismic events which have occurred within a 125-mile radius of the geographic center of the Proposed Action. Earthquake magnitudes are expressed on the Richtor Scale with magnitudes ranging from 1.0 to 12.0 or more. Earthquakes with magnitudes greater than 7.0 are considered to be major earthquakes. Between January 1, 1973, and December 31, 2006, 74 earthquakes of magnitude 3.5 to 9.9 occurred within the 125-mile radius.

Another database was searched for the same location for the period of record prior to 1972. The record for this period includes only events of magnitude 4.5 and greater. This search indicated that 17 earthquakes of magnitude 4.5 to 9.9 occurred within the 125-mile radius between 1916 and 1972 (USGS, 2006b).

The largest recorded earthquake in the area occurred in 1916. It had a magnitude of 6.1 and was centered about 109 miles to the west near Baker, California. The closest located recorded earthquake occurred in 1981, had a magnitude of 3.5, and was centered 56 miles northeast near Peach Springs, Arizona (USGS, 2006a, b).

3.2 WATER RESOURCES

3.2.1 Surface Water

The Sacramento Valley and adjacent uplands and mountains comprise an arid region without year-round streams. The Valley lies between the Hualapai Mountains to the east and the Black Mountains to the west. Elevations in the Sacramento Valley range from 3,500 feet msl (north) to 1,500 feet msl (south). Average annual precipitation ranges from approximately 7.65 inches per year in Yucca (located about 16 miles south of the proposed power plant) to approximately 10.9 inches per year in Kingman (located about 9 miles northeast of the proposed power plant). Consequently, water use in the Sacramento Valley is exclusively derived from groundwater sources.

Streams are ephemeral in the vicinity of the proposed power plant and flow only in response to storm events. There are two named washes, Griffith Wash and Black Rock Wash, and few unnamed washes in the vicinity of the proposed power plant. As the streams exit the mountain canyons, they flow southwest across highly dissected alluvial fans, which act as an infiltration sink. Stream channels diminish in size and dry up due to recharge of the alluvium and increased evaporation associated with higher temperatures at the lower elevations. The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) indicates that the lake evaporation rate in the ROI is 82 inches per year, 71 percent of which occurs between May and October (NOAA, 1979).

A waters of the U.S. determination was completed on January 18, 2007 (Avant, 2007). Waters of the U.S. may include streams, ponds, lakes, ephemeral washes, and wetlands. Three of the ephemeral washes within the NAEP property were determined to be waters of the U.S. Widths of these washes varied from 1 to 2 feet to 4 to 8 feet.

Floodplain boundaries are determined by the Federal Emergency Management Agency (FEMA). FEMA designated 100-year floodplains within the vicinity of the Proposed Action (FEMA, 1998), and they are mapped on **figure 3-1**. The Proposed Action does not fall within a designated 100-year floodplain.

3.2.2 Groundwater

There are two major unconnected aquifers serving the region: the Hualapai and the Sacramento Valley aquifers. The Hualapai aquifer, located north and east of the Proposed Action, underlies the City of Kingman and is the primary water source for the city. The Sacramento Valley aquifer, which is currently the source of water for the I-40 Industrial Corridor and Griffith Energy, underlies the sparsely populated Sacramento Valley to the west and south of Kingman.

Water supply for the Proposed Action would be obtained from the Sacramento Valley aquifer as described in detail in section 2.1.7.2.

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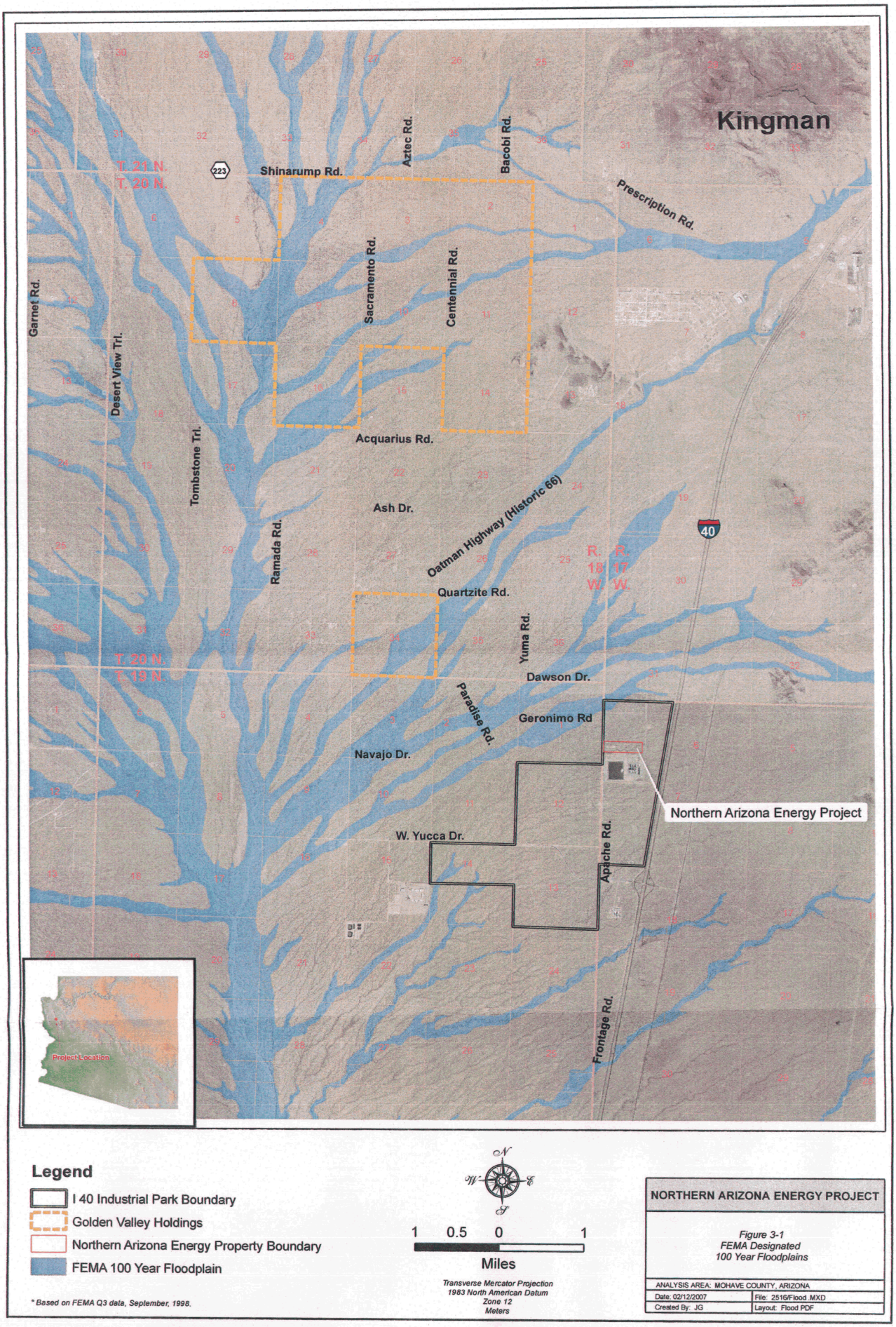

Kingman
T. 21 N.
T. 20 N.
223
Shinarump Rd.
Aztec Rd.
Bacobi Rd.
Prescription Rd.
Garnet Rd.
Desert View Trl.
Tombstone Trl.
Sacramento Rd.
Centennial Rd.
Acquarius Rd.
Ash Dr.
Oatman Highway (Historic 66)
Ramada Rd.
Quartzite Rd.
Yuma Rd.
Dawson Dr.
Paradise Rd.
Geronimo Rd
Navajo Dr.
W. Yucca Dr.
Apache Rd.
Frontage Rd.
40
R. 18 W.
R. 17 W.
T. 20 N.
T. 19 N.
Northern Arizona Energy Project
Project Location
Legend
I 40 Industrial Park Boundary
Golden Valley Holdings
Northern Arizona Energy Property Boundary
FEMA 100 Year Floodplain
* Based on FEMA Q3 data, September, 1998.
N
W
E
S
1 0.5 0 1
Miles
Transverse Mercator Projection
1983 North American Datum
Zone 12
Meters
NORTHERN ARIZONA ENERGY PROJECT
Figure 3-1
FEMA Designated
100 Year Floodplains
ANALYSIS AREA: MOHAVE COUNTY, ARIZONA
Date: 02/12/2007
File: 2516/Flood .MXD
Created By: JG
Layout: Flood PDF

The Sacramento Valley aquifer has an areal extent of approximately 310 square miles and is recharged by a surface drainage watershed of more than 1,500 square miles. The aquifer basin was formed by thrust block faulting which raised the Hualapai Mountains on the east and the Black Mountains on the west. The basin was subsequently filled with several thousand feet of Tertiary and Quaternary alluvial deposits, resulting in an unconfined aquifer of slightly consolidated sediments.

The Sacramento Valley aquifer is unconfined. Groundwater in the Sacramento Valley migrates from north to south along the axis of the valley and ultimately discharges into the Colorado River. The alluvial deposits range in thickness from zero feet along the basin margins to greater than 3,200 feet in the north-central portion of the basin. Depth to bedrock in the vicinity of the County Well Field is approximately 1,600 to 3,200 feet (SGC, 2007). The gradient ranges from 8 to 20 feet per mile, with gentler gradients to the north and steeper gradients to the south (Manera, 1998). The depth to groundwater ranges from 1,000 feet below the land surface on the north end of the Sacramento Valley to 300 feet below the land surface near Yucca. At the County Well Field, depth to groundwater ranges from approximately 530 to 630 feet below ground surface (bgs) (SGC, 2007).

Water levels at Sacramento Valley basin appear to be at equilibrium at present time (Manera, 2006). The fact that the water levels of 2006 are almost identical to those measured by Rascona (1991) and Pfaff and Clay (1981) and are similar to those reported by Gillespie and Bentley (1971), shows that few, if any, gross changes have occurred in the past 35 years.

SGC (2007) summarized and reviewed aquifer parameters including those from tests conducted by Manera Inc. at the County Well Field. Based on these tests, the transmissivity (the ability of the aquifer to transmit water) of the lower alluvial unit ranges from 17,000 to 200,000 gallons per day per foot (gpd/ft), and the specific yield (the amount of water a unit volume of saturated permeable rock will yield when drained by gravity) is approximately 0.07. The saturated thickness of the regional aquifer in the vicinity of the County Well Field was conservatively calculated to be 770 feet. Using a generally accepted rule that the practical recoverable volume (volume likely to be recovered from the aquifer) of groundwater is 66 percent of the total saturated thickness, a projected drawdown of 508 feet (770 feet x 66 percent), or recoverable depth to water of 1,142 feet bgs was estimated (SGC, 2007).

ADWR estimated an average transmissivity value of 33,750 gpd/ft, a specific yield of 0.07, and an average aquifer saturated thickness of only 435 feet in its review of the Golden Valley well field located 4 miles north of County Well Field (ADWR, 2006).

Groundwater in storage in the Sacramento Valley aquifer above 1,500 feet bgs has been estimated by Gillespie and Bentley (1971) to be in the range of 6.5 to 13 million acre-feet based on an average specific yield of 5 to 10 percent. ADWR estimated that there are 2.3 million acre-feet of water in storage in the Sacramento Valley aquifer above a depth of 1,200 feet bgs (ADWR, 1994).

Most of the recharge to the Sacramento Valley occurs as runoff of the Hualapai Mountains on the eastern side of the basin infiltrating into the alluvial deposits of the valley floor (Manera,

2006). Natural annual recharge of the aquifer has been estimated at 4,000 afy with discharge to the Colorado River west of Yucca equaling recharge (Gillespie and Bentley, 1971).

Estimates of annual groundwater outflow from the Sacramento Valley basin have ranged from less than 500 afy to as much as 10,000 afy (ADWR, 2007). In 1997, ADWR estimated groundwater outflow from the Sacramento Valley basin to be 1,200 afy based on water level data, aquifer test results, and geologic cross-sections across Sacramento Valley's groundwater outflow point near Topock, Arizona (ADWR, 2007).

Annual historic water use estimates have ranged from less than 500 afy to as much as 6,000 afy during the late 1960s and 1970s (Rascona, 1991; Tadayon, 2004). The high water use during 1960s and 1970s was due to withdrawals for mineral extraction and processing by the Cyprus Metals Company (Rascona, 1991). In 1989, the mine was placed on standby, and withdrawals for mining have decreased to about 300 afy (ADWR, 2007).

Current water use in Sacramento Valley is estimated at about 2,900 afy (Tadayon, 2004; SGC 2007). Water uses consist of about 1,500 afy for municipal/domestic use and about 1,400 afy of industrial pumpage (ADWR, 2007). Future pumpage in Sacramento Valley may exceed 30,000 afy if the planned developments reach full buildout, the mine becomes active again, and the Mohave County water system reaches its maximum capacity of 7,260 afy (ADWR, 2007).

Current and projected groundwater demand has been evaluated by SGC (2007) and adds up to 27,516 afy for the worst-case scenario. Details on groundwater demand are presented in SGC (2007) report. Study by SGC (2007) also evaluated pumping impacts of the Proposed Action on Sacramento Valley aquifer and the results of this study are presented in section 4.2.2.1.

The quality of the water in the Sacramento Valley aquifer is generally good. It is an alkaline, sodium to calcium-sodium bicarbonate water with high hardness, low sodium adsorption ratio, and low total dissolve solids (TDS) concentrations (Gillespie and Bentley, 1971). Concentrations of regulated constituents in the water do not exceed any drinking water standards.

3.3 CLIMATE AND AIR QUALITY

This section describes the affected environment for air resources. Factors that influence air quality include the local climate and meteorology and the types and magnitude of air pollutants.

3.3.1 Regional Climate and Meteorology

According to data from the Western Regional Climate Center (WRCC), the climate in the vicinity of the Proposed Action is moderate all year long with mild winter temperatures and cooler summers than other parts of the state (WRCC, 2007). Summer temperatures may go as high as 110 °F. In the winter, the lows may infrequently go down into the low 20s °F. The average daily temperature during winter (December through February) is 46 to 53 °F. The average annual low temperature is 54 °F, while the average annual high temperature is 81 °F. The average annual precipitation is 7.56 inches per year.

3.3.2 Existing Air Quality

The Clean Air Act (CAA) of 1970, 42 USC 7401 et seq., as amended in 1977 and 1990, and Title 40 of the Code of Federal Regulations (CFR) parts 50 through 99 are the basic Federal statutes and regulations governing air pollution in the United States. The CAA designates six criteria pollutants for which seven National Ambient Air Quality Standards (NAAQS) have been promulgated to protect human health and welfare. The criteria pollutants are:

- Sulfur oxides, measured as sulfur dioxide (SO_2);
- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10});
- Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$);
- Carbon monoxide (CO);
- Ozone (O_3);
- Nitrogen dioxide (NO_2); and
- Lead (Pb).

The NAAQS are codified in 40 CFR part 50 and summarized in **table 3-1**. The Arizona ambient air quality standards for criteria pollutants are the same as the Federal standards.

Table 3-1 National Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standard µg/m³	Secondary Standard µg/m³
SO_2	Annual[a]	80 (0.030 ppm)	-
	24-Hour[b]	365 (0.14 ppm)	-
	3-Hour[b]	-	1,300 (0.5 ppm)
PM_{10}	Annual[a]	-	-
	24-Hour[b]	150	
$PM_{2.5}$	Annual[a]	15	15
	24-Hour[b]	35	-
CO	8-Hour	10,000 (9 ppm)	None
	1-Hour[b]	40,000 (35 ppm)	None
Ozone	8- Hour[c]	157 (0.08 ppm)	157 (0.08 ppm)
NO_2	Annual[a]	100 (0.053 ppm)	100 (0.053 ppm)
Lead	Quarter[a]	1.5	1.5

µg/m³ = micrograms per cubic meter
ppm = parts per million
Notes:
[a] Arithmetic mean.
[b] Block average.
[c] Rolling average.
Source: National Ambient Air Quality Standards

Based on the NAAQS for each criteria pollutant, the EPA classifies airsheds throughout Mohave County as attainment areas and nonattainment areas. Attainment areas are airsheds that comply with NAAQS, while nonattainment areas are those that do not. A given area can be classified as both attainment and nonattainment because the NAAQS are pollutant-specific. Mohave County is currently classified as an attainment area for all criteria pollutants.

Arizona Department of Health Services established the Arizona Ambient Air Quality Guideline (AAAQG) values for various toxic air pollutants (TAPs) in 1992. New projects are required to compare modeled emission rates of potential TAPs to demonstrate compliance with the AAAQG values. **Table 3-2** lists the potential project TAPs and their respective AAAQG screening values.

Table 3-2 Arizona Ambient Air Quality Guideline Screening Values and Emission Thresholds

	Ambient Guidelines			Emission Thresholds	
Pollutant	1-Hour µg/m³	24-Hour µg/m³	Annual µg/m³	De Minimis (lb/hr)	De Minimis (lb/yr)
1,3-Butadiene	7.2	1.9	0.067	N/A	0.39
Acetaldehyde	2300	1400	0.5	N/A	5.3
Acrolein	6.7	2	-	0.013	0.129
Ammonia	-	140	-	N/A	N/A
Benzene	630	51	0.14	N/A	1.5
Ethylbenzene	4500	3500	-	14	6,442
Formaldehyde	20	12	0.08	N/A	0.9
Hexane	5300	1400	-	659	13,689
Naphthalene	630	400	-	N/A	0.35
POM[a]	-	-	-	N/A	0.013
Propylene Oxide	1500	400	2	N/A	N/A
Toluene	4700	3000	-	109	146,766
Xylene[b]	5500	3500	-	98	644

Key:
µg/m³ = micrograms per cubic meter
lb/yr = pounds per year
N/A = Not Applicable
[a] Polycyclic Organic Matter (selected compound: Benzo(a)pyrene)
[b] Mixed isomers

Source: Arizona Ambient Air Quality Guideline

ADEQ is the lead air permitting authority for the Proposed Action. ADEQ's air quality regulations are codified in Title 18 of the Arizona Administrative Code (AAC) chapter 2. They incorporate the Federal program requirements listed in 40 CFR parts 50 through 99 and establish permit review procedures for all facilities that can emit pollutants to the ambient air. Any new facility or modification to an existing facility is required to obtain an air quality permit prior to initiating construction. Facilities can trigger additional review by EPA if emissions exceed the major source thresholds listed in 40 CFR §52.21(b)(1)(i).

The pre-construction review process for new or modified major sources located in attainment areas is called New Source Review (NSR), which may include a Prevention of Significant Deterioration (PSD) review. This process is intended to keep new air emission sources from

causing existing air quality to deteriorate beyond acceptable levels. ADEQ has codified the NSR program and Federal PSD requirements in 18 AAC R18-2-401, et seq.

3.3.3 Other Applicable Requirements

40 CFR part 60 establishes new source performance standards (NSPS) for specific emission sources. ADEQ incorporates these emission standards by reference in 18 AAC R18-2-901, et seq. 40 CFR part 60 Subpart KKKK: Standards of Performance for Stationary Combustion Turbines.

40 CFR parts 61 and 63, as incorporated by reference in 18 AAC R18-2-1101, et seq., are the Federal emission standards that have been developed to address certain individual Hazardous Air Pollutants (HAPs) and HAP emissions from a variety of source categories. The individual HAP rules are found in 40 CFR part 61 and are typically referred to as the National Emission Standards for Hazardous Air Pollutants (NESHAPs).

The source category rules, commonly referred to as the maximum achievable control technology (MACT) standards (40 CFR part 63), apply to facilities that are classified as major sources of HAPs, and operate affected equipment as listed in each standard. A facility is a major source of HAPs if it emits any individual HAP in excess of 10 tons per year (tpy) or a combination of HAPs in excess of 25 tpy.

3.3.4 Visibility

Under the CAA, a "Federal Class I area" is defined as one in which visibility is protected more stringently than the NAAQS, including such areas as national parks, wilderness areas, and other areas of special significance. Arizona has 12 Federal Class I areas. The closest Class I area to the Proposed Action is the Grand Canyon National Park, which is about 200 miles to the northeast. The primary annual wind direction is to the southeast and northwest of the site. Two particulate samplers were located in the Grand Canyon and operated continuously between 1988 and 1998. The visibility indices for summer (visual range [VR] 75 miles) were higher than for the other seasons, followed by autumn (VR 90 miles), then spring (VR 95 miles), and finally winter (VR 100 miles). No significant seasonal trends were observed in any of the seasons over the period between 1988 and 1998.

3.4 BIOLOGICAL RESOURCES

The ROI varies depending on the resource being analyzed. In the case of biological resources, it is defined as the area of disturbance of the proposed action, as well as adjacent infrastructure. The existing infrastructure adjacent to the proposed action creates a baseline condition of disturbance to biological resources in the area. The resources described include vegetation, wildlife, and special status wildlife and vegetation. Surveys were previously conducted for Griffith Energy to determine the occurrence of wildlife and vegetation species in the ROI of the proposed power plant (Griffith, 1998b). Special status species were analyzed for occurrence in the ROI of the Proposed Action. Special status species include threatened, endangered, proposed, and candidate species (USFWS), Bureau of Land Management (BLM) sensitive species, and State of Arizona sensitive species.

3.4.1 Vegetation

The area surrounding the Proposed Action is located within a boundary area of five biological provinces (the Great Basin, Interior, Mojave, Semidesert, and Sonoran), each represented by one or more vegetation series. The distribution of these provinces is driven by biotic responses to precipitation, elevation, topography, exposure, soil type, and land use. Information regarding the existing vegetation was obtained from previous surveys for Griffith Energy adjacent to the Proposed Action (Griffith, 1998b).

The Proposed Action is within the Mojave Province, which is typically desert scrub community situated on west-facing alluvial fans. Except for a small portion of the northeast corner of the site that is disturbed, bard ground, the ROI is occupied by Sonoran creosote bush-bursage (Mac et al. 1998). **Table 3-3** shows a complete list of vegetation species that occur within the ROI of the Proposed Action (Griffith, 1998b).

Table 3-3 Checklist of Plants that May Occur Within ROI of the Proposed Action

Semi-Desert Grasslands	
Trees	
one-seed juniper	*Juniperus monosperma*
mesquite	*Prosopis juliflora*
Shrubs	
acacia	*Acacia spp*
desert hackberry	*Celtis pallida*
hopbush	*Dodonaea viscosa*
joint-fir	*Ephedra sp*
ocotillo	*Fouquieria splendens*
broom snakeweed	*Guierrezia sarothrae*
creosotebush	*Larrea tridentata*
groundsel	*Senecio spp.*
soaptree yucca	*Yucca elata*
Grasses and Forbs	
poverty three-awn	*Aristida divaricata*
sprucetop grama	*Bouteloua chondrosioides*
sideoats grama	*B. curtipendula*
black grama	*B. eriopoda*
blue grama	*B. gracilis*
hairy grama	*B. hirsuta*
broom grasses	*Bromus spp.*
buffalo grass	*Buchloe dactyloides*
cryptanth	*Cryptantha spp.*
plains lovegrass	*Eragrostis intermedia*
tanglehead	*Heteropogon contortus*
tobosa	*Hilaria mutica*
lupine	*Lupinus sp.*
wolftail	*Lycurus phleiodes*
bush muhly	*Muhlenbergia porteri*
vine mesquite grass	*Panicum obtussum*
little bluestem	*Schizachyrium scoparium*
bristlegrass	*Setaria sp.*
mallows	*Sphaeralcea spp.*
Wright sacaton	*Sporobolus wrightii*
buffalo grass	*Buchloe dactyloides*
Cactus	
hedgehog cactus	*Echinocereus sp.*

Table 3-3 Checklist of Plants that May Occur Within ROI of the Proposed Action	
Wright pincushion	*Mammillaria wrightii*
prickly pears/chollas	*Opuntia spp.*
tree cholla	*O. imbricata*
Engelman prickly pear	*O. phaeacantha*
XERORIPARIAN HABITAT	
Trees	
crucifixion thorn	*Canotia holacantha*
blue Paloverde	*Cercidium floridum*
smoketree	*Psorothamnus spinosus*
mesquite	*Prosopis spp.*
Shrubs	
white-thorn acacia	*Acacia consticta*
catclaw	*A. greggii*
desert broom	*Buccharis sarothroides*
anderson thornbush	*Lycium andersonii*
cheesebush or burrobush	*Hymenoclea salsola*
Grasses and Forbs	
sand verbena	*Abronia spp.*
milk vetch	*Astragalus spp.*
spiderling	*Boerhaavia spp.*
bromegrass	*Bromus rubens*
desert senna	*Cassia armata*
spurges	*Euphorbia spp.*
MOJAVE DESERTSCRUB	
Trees	
Joshua tree	*Yucca brevifolia*
Shrubs	
saltbush	*Atriplex spp.*
agave	*Agave spp.*
white bursage	*Ambrosia dumosa*
white brittlebush	*Encella farinosa*
joint-fir	*Ephedra funerea*
rough joint-fir	*E. nevadensis*
desert buckwheat	*Eriogonum deserticola*
desert trumpet	*E. inflatum*
hopsage	*Grayia spinosa*
snakeweed	*Gutierrezia microcephala*
burrobush	*Hymenoclea salsola*
little-leaved ratany	*Krameria parviflora*
creosotebush	*Larrea tridentata*
Anderson thornbush	*Lycium andersonnii*
spiny mendora	*Menodora spinescens*
trixis	*Trixis californica*
Mojave yucca	*Yucca schidigera*
Cactus	
desert coryphantha	*Coryphantha vivipera var. desertii*
Engelman hedgehog	*Echinocereus engelmanii*
mammillaria	*Mammillaria spp.*
chollas, prickly pears	*Opuntia spp.*
buckhorn cholla	*O. acanthocarpa*
silver cholla	*O. echinocarpa*
Mojave prickly pear	*O. erinacea*
Grasses and Forbs	
sand verbena	*Abronia spp.*
milk vetch	*Astragalus spp.*
three-awn	*Aristida spp.*

Table 3-3 Checklist of Plants that May Occur Within ROI of the Proposed Action	
spiderling	*Boerhaavia spp.*
bromegrass	*Bromus rubens*
desert senna	*Cassia armata*
spurges	*Euphorbia spp.*
sixweeks fescue	*Festucca octoflora*
big galleta	*Hilaria rigida*
bush muhly	*Muhlenbergia porteri*
Source: Griffith, 1998a	

3.4.1.1 Wetlands and Riparian

No wetlands occur within the ROI of the Proposed Action. Wetlands in this part of Mohave County are limited to relatively rare springs. As water issuing from springs most often evaporates, or is quickly absorbed into the subsurface or in the surrounding surface soil, the establishment of wetland vegetation is generally precluded (Avant, 2007).

There are dry washes in the ROI of the Proposed Action (**figure 1-2**) which flow only as high-energy runoff, but there are no riparian areas. Although the additional soil moisture during these brief periods is enough to allow the growth of drought-tolerant species like mesquite, the lack of residual soil moisture, the scouring of the high-energy flow of these ephemeral streams, and the sediment deposition on existing vegetation as waters recede prohibit the growth of most wetland and riparian plants (Griffith, 1998b).

3.4.2 Wildlife

Wildlife expected to occur in the ROI of the Proposed Action include big game, predators, small mammals, songbirds, raptors, and reptiles. Due to the limited amount of permanent water resources within the area, aquatic and amphibian species are not expected to be present. Several big game mammals occur in the area. Mule deer (*Odocoileus hemionus*) are the most widely distributed and abundant big game species within Arizona. Most of the ROI is within mule deer habitat. However, it is not a high-quality habitat because the existing infrastructure adjacent to the area of the proposed action discourages migration in the ROI (Griffith, 1998b).

Desert bighorn sheep (*Ovis canadensis nelsoni*) inhabit dry, desert mountain ranges within the Great Basin, Mojave, Sonora, and Chihuahuan Deserts. These sheep prefer foothills near rocky cliffs and when water is seasonally available. Generally, sheep inhabit a summer range near available water sources and a winter range that has good grazing habitat. Sheep are active during the day, with minimal activity during extreme temperatures, and inhabit the rough terrain associated with the canyons and cliffs within the Black Mountains west of the Sacramento Valley. They could occur in the ROI of the Proposed Action (Griffith, 1998b).

Antelope (*Antilocapra americana*) occur from the deserts to the grasslands of the high plateaus. They prefer areas of grasses and scattered shrubs with rolling hills and dissected hills and mesas (Hoffmeister 1986). Antelope are not anticipated to occur within the Proposed Action because the existing infrastructure adjacent to the area of the Proposed Action discourages migration in the ROI, although they do occur nearby at Goodwin Mesa, Hualapai Valley, Truxton and Dutch Flats, and Round Valley (Griffith, 1998b).

Predators in the region include kit fox (*Vulpes macrotis*), bobcat (*Felis rufus*), badger (*Taxidea taxus*), and coyote (*Canis latrans*). Mountain lions (*Felis concolor*) may also occur near the Proposed Action in areas where mule deer are abundant (Hoffmeister, 1986).

Numerous small and medium-sized mammal species occur in the ROI of the Proposed Action including desert shrew (*Notiosorex crawfordi*), antelope jackrabbit, (*Lepus alleni*), hooded skunk (*Mephitis macroura*), striped skunk (*Mephitis mephitis*), Harris' antelope squirrel (*Ammospermophilus harrisii*), and mesquite mouse (*Peromyscus merriami*). The following species may occur within ROI: Arizona pocket mouse (*Perognathus amplus*), desert kangaroo rat (*Dipodomys deserti*), and desert woodrat (*Neotoma lepida*) (Hoffmeister,1986).

Five bat species may occur in the ROI of the Proposed Action. These include the greater western mastiff bat (*Eumops perotis*), Mexican free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), Yuma myotis (*Myotis yumanensis*), and spotted bat (*Euderma maculata*). Their occurrence, however, is unlikely because it is not ideal habitat for bat species due to the existing adjacent infrastructure and lack of available water sources within the ROI (Griffith, 1998b).

Density and diversity of songbird species within the ROI of the Proposed Action vary by season. Typical species include rock doves (*Columba livia*), mourning doves (*Zenaida macroura*), lesser nighthawk (*Chordeiles acutipennis*), common poorwill (*Phalaenoptilus nuttallii*), yellow-shafted flicker (*Colaptes auratus*), ash-throated flycatcher (*Myiarchus cinerascens*), western kingbird (*Tyrannus verticalis*), common raven (*Corvus corax*), verdin (*Auriparus flaviceps*), cactus wren (*Campylorhynchus brunneicapillus*), black-tailed gnatcatcher (*Polioptila melanura*), phainopepla (*Phainopepla nitens*), and white-crowned sparrow (*Zonotrichia leucophrys*) (Griffith, 1998b).

Several raptor species are known to occur seasonally in the general area. Species include turkey vulture (*Cathartes aura*), golden eagle (*Aguila chrysactos*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and Harris' hawk (*Parabuteo unicinctus*). All of these species may breed in the ROI of the Proposed Action (Griffith, 1998b).

Reptile species known or expected to occur near the Proposed Action include desert iguana (*Dispsosaurus dorsali*), zebra-tailed lizard (*Callisaurus draconoides*), desert collared lizard (*Crotaphytus insularis*), western whiptail (*Cnemidophorus tigris*), gopher snake (*Pituophis melanoleucus*), common kingsnake (*Lampropeltis getulus*), speckled rattlesnake (*Crotalus mitchellii*), and Mojave rattlesnake (*Crotalus scutulatus*) (Griffith, 1998b). **Table 3-4** lists wildlife species that may be found in the area.

Table 3-4 List of Wildlife Which May Occur in the ROI of the Proposed Action

Birds	
eared grebe	*Podiceps nigricollis*
turkey vulture	*Cathartes aura*
Harris' hawk	*Parabuteo unicinctus*
red-tailed hawk	*Buteo jamaicensis*
American kestrel	*Falco sparverius*
Gambel's quail	*Callipepla gambelii*
killdeer	*Charadrius vociferus*
rock dove	*Columba livia*
white-winged dove	*Zenaida asiatica*

Table 3-4 List of Wildlife Which May Occur in the ROI of the Proposed Action	
mourning dove	*Z. macroura*
Inca dove	*Scardafella inca*
greater roadrunner	*Geococcyx californicus*
barn owl	*Tyto alba*
western screech-owl	*Otus kennicottii*
great horned owl	*Bubo virginianus*
lesser nighthawk	*Chordeiles acutipennis*
common poorwill	*Phalaenoptilus nuttallii*
white-throated swift	*Aeronautes saxatilis*
black-chinned hummingbird	*Archilochus alexandri*
Anna's hummingbird	*Calypte anna*
Costa's hummingbird	*Calypte costae*
Gila woodpecker	*Melanerpes uropygialis*
ladder-backed woodpecker	*Dendrocopos scalaris*
northern flicker	*Colaptes cafer*
gilded flicker	*C. auratus*
black phoebe	*Sayornis nigricans*
Say's phoebe	*S. saya*
ash-throated flycatcher	*Myiarchus cinerascens*
brown-crested flycatcher	*M. tyrannulus*
western kingbird	*Tyrannus verticalis*
horned lark	*Eremophila alpestris*
northern rough-winged swallow	*Stelgidopteryx serripennis*
common raven	*Corvus corax*
verdin	*Auriparus flaviceps*
cactus wren	*Campylorhynchus brunneicapillus*
rock wren	*Salpinctes obsoletus*
canyon wren	*Catherpes mexicanus*
Bewick's wren	*Troglodytes bewickii*
ruby-crowned kinglet	*Regulus calendula*
black-tailed gnatcatcher	*Polioptila melanura*
northern mockingbird	*Mimus polyglottos*
curve-billed thrasher	*Toxostoma curvirostre*
Leconte's thrasher	*T. lecontei*
phainopepla	*Phainopepla nitens*
loggerhead shrike	*Lanius ludovicianus*
European starling	*Sturnus vulgaris*
Bell's vireo	*Vireo bellii*
solitary vireo	*Vireo solitarius*
Wilson's warbler	*Wilsonia pusilla*
northern cardinal	*Cardinalis cardinalis*
pyrrhuloxia	*Cardinalis sinuatus*
green-tailed towhee	*Pipilo chlorurus*
canyon towhee	*Pipilo fuscus*
Brewer's sparrow	*Spizella breweri*
black-throated sparrow	*Aimophila bilineata*
white-crowned sparrow	*Zonotrichia leucophrys*
brown-headed cowbird	*Molothrus ater*
hooded oriole	*Icterus cucullatus*
Scott's oriole	*Icterus parisorum*
house finch	*Carpodacus mexicanus*
house sparrow	*Passer domesticus*

Table 3-4 List of Wildlife Which May Occur in the ROI of the Proposed Action	
Mammals	
desert shrew	*Notiosorex crawfordi*
California leaf-nosed bat	*Macrotus californicus*
lesser long-nosed bat	*Leptonycteris curosae yerbabuena*
Yuma myotis	*Myotis yumanensis*
cave myotis	*M. velifer*
California myotis	*M. californicus*
western pipistrelle	*Pipistrellus hesperus*
big brown bat	*Eptesicus fuscus*
southern yellow bat	*Lasiurus ega*
pallid bat	*Antrozous pallidus*
American free-tailed bat	*Tadarida brasiliensis*
pocketed free-tailed bat	*T. femorosacca*
desert cottontail	*Sylvilagus audubonii*
black-tailed jack rabbit	*Lepus californicus*
Harris' antelope squirrel	*Ammospermophilus harrisii*
rock squirrel	*Spermophilus variegatus*
round-tailed ground squirrel	*S. tereticaudus*
Botta's pocket gopher	*Thomomys bottae*
Arizona pocket mouse	*Perognathus amplus*
Bailey's pocket mouse	*P. baileyi*
rock pocket mouse	*P. intermedius*
desert pocket mouse	*P. penicillatus*
banner-tailed kangaroo rat	*Dipodomys spectabilis*
Merriam's kangaroo rat	*D. merriami*
desert kangaroo rat	*D. deserti*
western harvest mouse	*Reithrodontomys megalotis*
cactus mouse	*Peromyscus eremicus*
deer mouse	*P. maniculatus*
southern grasshopper mouse	*Onychomys torridus*
Arizona cotton rat	*Sigmodon arizonae*
white-throated wood rat	*Neotoma albigula*
desert wood rat	*N. lepida*
house mouse	*Mus musculus*
coyote	*Canis latrans*
kit fox	*Vulpes macrotis*
gray fox	*Urocyon cinereoargenteus*
badger	*Taxidea taxus*
western spotted skunk	*Spilogale gracilis*
mountain lion	*Felis concolor*
bobcat	*F. rufus*
collared peccary	*Tayassu tajacu*
mule deer	*Odocoileus hemionus*
Reptiles and amphibians	
Toads	
Couch's spadefoot toad	*Scaphiopus couchi*
southern spadefoot toad	*S. multipicatus*
Sonoran desert toad	*Bufo alvarius*
great plains toad	*B. cognatus*
Sonoran green toad	*B. debilis*
red-spotted toad	*B. punctatus*
Tortoises/turtles	

Table 3-4 List of Wildlife Which May Occur in the ROI of the Proposed Action	
desert tortoise	*Gopherus agassizi*
Lizards	
desert banded gecko	*Coleonyx variegatus*
chuckwalla	*Sauromalus obesus*
desert iguana	*Dipsosaurus dorsalis*
zebra-tailed lizard	*Callisaurus draconoides*
long-nosed leopard lizard	*Gambelia wislizenii*
desert spiny lizard	*Sceloporus magister*
side-blotched lizard	*Uta stansburiana*
desert horned lizard	*Phrynosoma platyrhinos*
regal horned lizard	*P. solare*
tree lizard	*Urosaurus ornatus*
long-tailed brush lizard	*U. graciosus*
collared lizard	*Crotaphytus collaris*
western whiptail	*Cnemidophorus tigris*
canyon spotted whiptail	*C. burti*
Gila monster	*Heloderma suspectum*
Snakes	
western blind snake	*Leptophlops humilis segregus*
spotted leaf-nosed snake	*Phyllorhynchus decurtatus*
saddled leaf-nosed snake	*P. brownii*
coachwhip sonoran whipsnake	*Masticophis flagellus M. bilineatus*
desert patch-nosed snake	*Salvadora hexalepis*
glossy snake	*Arizona elegans*
gopher snake	*Pituophis melanoleucus*
common kingsnake	*Lampropeltis getulus*
long-nosed snake	*Rhinocheilus lecontei marcianus*
ground snake	*Sonora semiannulate*
banded sand snake	*Chilomeniscus cinctus*
western shovel-nosed snake	*Chionactis occipitalis*
night snake	*Hypsiglena torquata*
southwestern black-headed snake	*Tantilla hobartsmithii*
Arizona coral snake	*Micruroides euryxanthus*
lyre snake	*Trimophodon biscutatus*
western diamondback rattlesnake	*Crotalus atrox*
speckled rattlesnake	*C. mitchelli*
Mojave rattlesnake	*C. scutulatus*
Source: Griffith, 1998a	

3.4.3 Special Status Plant Species

Nineteen special status plant species (those listed as endangered, threatened, proposed, or candidates for listing by the USFWS, or designated sensitive by Federal resource management agencies, as well as those of concern to the State of Arizona) may occur within the ROI of the Proposed Action. **Table 3-5** presents information regarding these special status species.

Table 3-5 Special Status Plant Species that May Occur within the ROI of the Proposed Action

Scientific name	Common name	Designation	Agency	Suitable Habitat in ROI of the Proposed Action
Astragalus holmgreniorum	Paradox milkvetch	sensitive	BLM	no
Astragalus newberryi var. *aquarii*	Aquarius (Newberry's) milkvetch	sensitive	BLM	yes
Cordylanthus nevinii	Nevin's birdsbeak	sensitive	BLM	yes
Cycladenia humilis ssp. jonesii	Jones' cycladenia	threatened	USFWS	no
Cynanchum utahense	Crownless (or Utah) milkweed vine	sensitive	BLM	yes
Fremontodendron californicum	California flannelbush	sensitive	BLM	yes
Mammillaria viridiflora	Varied fishhook cactus	salvage restricted	State of Arizona	no
Pediocactus peeblesianus var. fickeiseniae	Fickeisen plains cactus	Candidate and sensitive	USFWS and BLM	no
Pediocactus sileri	Siler pincushion cactus	threatened	USFWS	no
Penstemon albomarginatus	White-margined beardtongue	sensitive	BLM	yes
Penstemon bicolor ssp. *roseus*	Two-color beard-tongue	sensitive	BLM	yes
Petalonyx nitidus	Mojave sandpaper bush	sensitive	BLM	no
Phacelia parishii	Parish phacelia	sensitive	BLM	yes
Purshia glandulosa	Antelopebush	sensitive	BLM	no
Purshia subintegra	Arizona cliffrose	endangered	USFWS	no
Senna armata	Shrubby senna	sensitive	BLM	yes
Tetradymia argyraea	Striped horsebrush	sensitive	BLM	no
Tricardia watsonii	Three hearts	sensitive	BLM	yes

Source: Griffith, 1998b; USFWS, 2007

Species Potentially Occurring within the ROI

Suitable habitat for nine species is present within the ROI. These include white-margined beardtongue (*Penstemon albomarginatus*), two-color beard-tongue (*Penstemon bicolor* ssp. *roseus),* three hearts (*Tricardia watsonii*), Aquarius (Newberry's) milkvetch (*Astragalus newberryi* var. *aquarii*), Nevin's birdsbeak (*Cordylanthus nevinii*), California flannelbush (*Fremontodendron californicum*), crownless (or Utah) milkweed vine (*Cynanchum utahense*), Parish phacelia (*Phacelia parishii),* and shrubby senna (*Senna armata)* (Griffith, 1998b).

White-margined Beardtongue

This species is found at elevations ranging from 2,800 to 6,000 feet. The only known population of white-margined beardtongue in Arizona is located at Dutch Flat, approximately 25 miles southeast of the Proposed Action near Yucca, AZ. However, there is suitable habitat for this species to occur in the ROI of the Proposed Action (USDA, 2007).

Two-color Beardtongue

This species is found at elevations between 2,296 to 4,921 feet and is in the family Scrophulariaceae. This species is a perennial herb. There is suitable habitat for this species to occur in the ROI of the Proposed Action (USDA, 2007).

Three Hearts
This species is found in sandy or gravelly desert slopes and flats to elevations of 7,000 feet, often in creosotebush scrub, Joshua tree, and pinyon-juniper woodlands and deserts. This species has a blooming period from April to June. There is suitable habitat for this species to occur in the ROI of the Proposed Action (USDA, 2007).

Aquarius (Newberry's) Milkvetch
This species is a perennial found throughout the region at elevations of 2,000 to 7,000 feet. Flowers are pink-purple, sometimes pale, and 0.6 inch long. The pods are densely white-villous, spreading, sessile, ovoid, and incurved into a stiff, lateral compressed beak. The leathery valves are concealed by the dense, woolly coat. There is suitable habitat for this species to occur in the ROI of the Proposed Action (USDA, 2007).

Nevin's Birdsbeak
Nevin's birdsbeak grows on dry slopes at elevations from 5,000 to 8,000 feet and blooms from July to September. Nevin's birdsbeak is a slender, paniculately branched annual with bristly hairs on the stem and alternating leaves, the lower ones somewhat crowded and three-lobed, the upper linear and more segregated. There is suitable habitat for this species to occur in the ROI of the Proposed Action (USDA, 2007).

California Flannelbush
This species is found in chaparral, yellow pine forest, and pinyon-juniper woodland slopes at elevations between 1,312 and 6,561 feet. It has distinctive large yellow flowers. There is suitable habitat for this species to occur in the ROI of the Proposed Action (USDA, 2007).

Crownless (or Utah) Milkweed Vine
This species is found in creosotebush scrub habitat type and is in the family Asclepiadaceae. This species is a perennial herb confined to western North America. There is suitable habitat for this species to occur in the ROI of the Proposed Action (USDA, 2007).

Parish Phacelia
This species is often found in the western Mojave Desert. It is typically found in clay or alkaline soils and in dry lake margins at elevations of 2,700 to 4,000 feet. It has a flowering period from April to July. There is suitable habitat for this species to occur in the ROI of the Proposed Action (USDA, 2007).

Shrubby Senna
This species is found in sandy or gravelly washes at elevations of 650 to 3,250 feet. It has a flowering period from March to July (USDA, 2007). There is suitable habitat for this species to occur in the ROI of the Proposed Action.

Species Unlikely to Occur within the ROI

The following ten species were analyzed, but it was determined that they were unlikely to have suitable habitat in the ROI of the Proposed Action, and therefore are unlikely to occur.

Arizona Cliffrose *(Purshia subintegra)*
This species flowers have five white or yellow petals about 0.4 inch long. This species grows only on Tertiary limestone lakebed deposits. The distinctive white soil color of these deposits can be seen from a distance (USFWS, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Antelopebush *(Purshia glandulosa)*
This species is found on dry slopes, chaparral, Joshua tree woodlands, and pinyon-juniper woodlands at elevations ranging from 2,000 to 9,000 feet in north Transverse and east Peninsular Ranges and desert mountains. This species has a blooming period from April to June (USDA, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Siler Pincushion Cactus *(Pediocactus sileri)*
This species is a small, globose cactus with solitary, occasionally clustered, stems typically 4 inches tall (as tall as 18 inches), and spines that become white with age. Its flowers are yellow with purple veins, and bloom during March and April (USDA, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Fickeisen Plains Cactus *(Pediocactus peeblesianus var. fickeiseniae)*
This species is a candidate for listing with the USFWS and is listed as a sensitive species with the BLM. It is found in gravelly soils and is an unbranched cactus that retreats into the soil after flowering yellow flowers and fruiting. It is found at elevations from 4,000 to 5,000 feet in layers of Kaibob limestone on canyon margins (USFWS, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Jones' Cycladenia *(Cycladenia humilis ssp. jonesii)*
This species is a rhizomatous herb with round, somewhat succulent leaves and small rose-pink hairy flowers that bloom from mid-April to early June. The species can be found in Eriogonum-ephedra, mixed desert shrub and scattered pinyon-juniper communities at elevations ranging from 4,000 to 6,800 feet (USDA, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Mojave Sandpaper Bush *(Petalonyx nitidus)*
This species is found in creosotebush scrub, Joshua tree woodlands, and pinyon-juniper woodlands at elevations between 3,280 and 6,889 feet. This species is a dicot in the family Loasaceae and is a perennial herb (USDA, 2007). It is not anticipated to occur within the vicinity of the Proposed Action due to lack of suitable habitat.

Striped Horsebrush *(Tetradymia argyraea)*
This species is found in pinyon-juniper woodland at elevations of 4,500 to 6,900 feet, mostly in desert mountains. This species flowers from August to September with pale yellow flowers (USDA, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Paradox Milkvetch (*Astragalus holmgreniorum)*
This species is a stemless herbaceous perennial that produces small purple flowers in the spring. It has compound leaves (blue-green below and yellowish-green above) that arise directly from the root crown. This species inhabits areas just under limestone ridges and along draws in gravelly clay hills at elevations ranging from 2,700 to 2,800 feet (USDA, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Varied Fishhook Cactus (*Mammillaria viridiflora*)
This species is known to flower in the spring and fruit in the fall. It is found in semi-desert grasslands, interior chaparral, pinyon-juniper and oak woodlands, crevices, boulders, canyon sides, and gravelly igneous substrates at elevations from 5,600 to 6,500 feet (USDA, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

3.4.4 Special Status Wildlife Species

The USFWS, BLM, and the Arizona Game and Fish Department (AGFD) have identified the following threatened, endangered, and sensitive wildlife species that do occur or that may occur within the ROI of the Proposed Action shown on **table 3-6**.

Table 3-6 Special Status Wildlife Species May Occurring within the ROI of the Proposed Action

Scientific name	Common name	Designation	Agency	Suitable Habitat in ROI of the Proposed Action
Gila elegans	Bonytail chub	Endangered	USFWS	no
Gila cypha	Humpback chub	Endangered	USFWS	no
Gila seminuda	Virgin River chub	Endangered	USFWS	no
Plagopterus argentissimus	Woundfin	Endangered	USFWS	no
Xyrauchen texanus	Razorback sucker	Endangered	USFWS	no
Rana onca	Relict leopard frog	Candidate	USFWS	no
Gopherus agassizii mohavensis	Mojave Desert tortoise	Threatened	USFWS	no
Gopherus agassizii	Sonoran Desert tortoise	Sensitive	AGFD	yes
Lichanura trivirgata gracia	Rosy boa	Sensitive	BLM	no
Heloderma suspectum cinctum	Gila monster	Sensitive	BLM	yes
Accipiter gentilis	Northern goshawk	Sensitive	BLM	no
Charadrius montanus	Mountain plover	Sensitive	BLM	yes
Coccyzus americanus	Yellow-billed cuckoo	Candidate	USFWS	no
Empidonax traillii extimus	Southwestern willow flycatcher	Endangered	USFWS	no
Gymnops californianus	California condor	Endangered	USFWS	no
Haliaeetus leucocephalus	Bald eagle	Threatened	USFWS	no
Pelecanus occidentalis californicus	California Brown Pelican	Endangered	USFWS	no
Rallus longirostris yumanensis	Yuma clapper rail	Endangered	USFWS	no
Strix occidentalis lucida	Mexican spotted owl	Threatened	USFWS	no
Eumops perotis californicus	Greater western mastiff bat	Sensitive	AGFD	no
Microtus mexicanus hualpaiensis	Hualapai Mexican vole	Endangered	USFWS	no
Thomomys umbrinus	Hualapai Pocket gopher	Sensitive	BLM	yes

Source: Griffith, 1998b; USFWS, 2007

The Federal list includes 13 endangered and threatened wildlife species: Mojave desert tortoise (*Gopherus agassizii mohavensis*), Hualapai Mexican vole (*Microtus mexicanus hualpaiensis*),

bonytail chub (*Gila elegans*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*), Virgin River chub (*Gila seminuda*), woundfin (*Plagopterus argentissimus*), California brown pelican (*Pelecanus occidentalis californicus*), bald eagle (*Haliaeetus leucocephalus*), California condor (*Gymnops californianus*), Mexican spotted owl (*Strix occidentalis lucida*), Southwestern willow flycatcher (*Empidonax traillii extimus*), and the Yuma clapper rail (*Rallus longirostris yumanensis*) (USFWS, 2007). Two candidate species are also on the list: relict leopard frog (*Rana onca*) and yellow-billed cuckoo (*Coccyzus americanus*). These species are listed in **table 3-6**.

The BLM has identified five species of special concern: the rosy boa (*Lichanura trivirgata gracia*), mountain plover (*Charadrius montanus*), northern goshawk (*Accipiter gentilis*), the Hualapai pocket gopher (*Thomomys umbrinus),* and the gila monster (*Heloderma suspectum cinctum*) (Griffith,1998b). Additionally, the AGFD has identified the Sonoran desert tortoise (*Gopherus agassizii)* and greater western mastiff bat (*Eumops perotis californicus*) as sensitive species that may occur in the ROI of the Proposed Action (Griffith ,1998b). These species are listed in **table 3-6**.

Species Potentially Occurring within the ROI

Rosy Boa
This snake occurs in rocky brush lands and desert areas. They are attracted to areas of permanent water, but water is not required for this species. The rosy boa feeds on small mammals and birds, usually at night (Griffith, 1998b). The rosy boa may occur in the ROI of the Proposed Action.

Gila Monster
The Gila monster inhabits lower slopes of mountains and nearby outwash plains in arid or semiarid areas. They frequently occur in canyon bottoms or arroyos with either permanent or intermittent water and irrigated lands or rocky areas containing scattered brush (Griffith, 1998b). The Gila monster may occur in the ROI of the Proposed Action.

Sonoran Desert Tortoise
The "Sonoran population" of the desert tortoise is defined as those occurring south and east of the Colorado River. This species occupies rocky and alluvial slopes of Mojave desert scrub and the Arizona Upland and Lower Colorado subdivisions of the Sonora Desert (Murray and Dickenson, 1996).

Desert tortoise populations began to decline in the 1970s due to disease; human-related mortality; predation; and habitat destruction, degradation, and fragmentation (Murray and Dickenson, 1996). As a result of these cumulative impacts, the tortoise was extirpated from large portions of its original range. Three categories (Categories I, II, and III) of desert tortoise habitat were designated by the BLM to set goals for the management of desert tortoise and its habitat based on several criteria. Management of Category I and II areas emphasize maintenance of viable desert tortoise populations in areas where all Category I and most Category II conflicts are resolvable. Category III habitats are generally characterized by lower densities of desert tortoise in areas where habitat has been degraded or where land ownership patterns interfere with effective management.

The BLM has designated areas of Category II and Category III Desert tortoise habitat in the ROI of the Proposed Action shown on **figure 3-2**. The designated areas are identified as the Hualapai Foothills (Category II), Rawhide Mountain/Dutch Flats (Category III), McConnico (Category III), and Hualapai North (Category III). These areas are all south and east of I-40. It is anticipated that tortoises may occur within these designated areas and it may occur in the ROI of the Proposed Action (Griffith, 1998b) even though the Proposed Action is not located within any of the designated habitat areas.

Mountain Plover
The mountain plover occurs on the high plains of the semi-desert regions of the West. It is known to breed in the spring and early summer from Colorado to Montana and can be found the rest of the year in California, and Arizona to a lesser extent. Plovers occur in areas of scattered sagebrush and intermittent patches of bunch grasses and cactus in disturbed areas (Griffith, 1998b). The mountain plover may occur in the ROI of the Proposed Action.

Hualapai Pocket Gopher
This species of pocket gopher is typically found in meadows with loose soils. It plays an important role in aeration of soil (Griffith, 1998b). It is considered a sensitive species by the BLM. It is possible that it could occur in the ROI of the Proposed Action.

Species Unlikely to Occur within the ROI

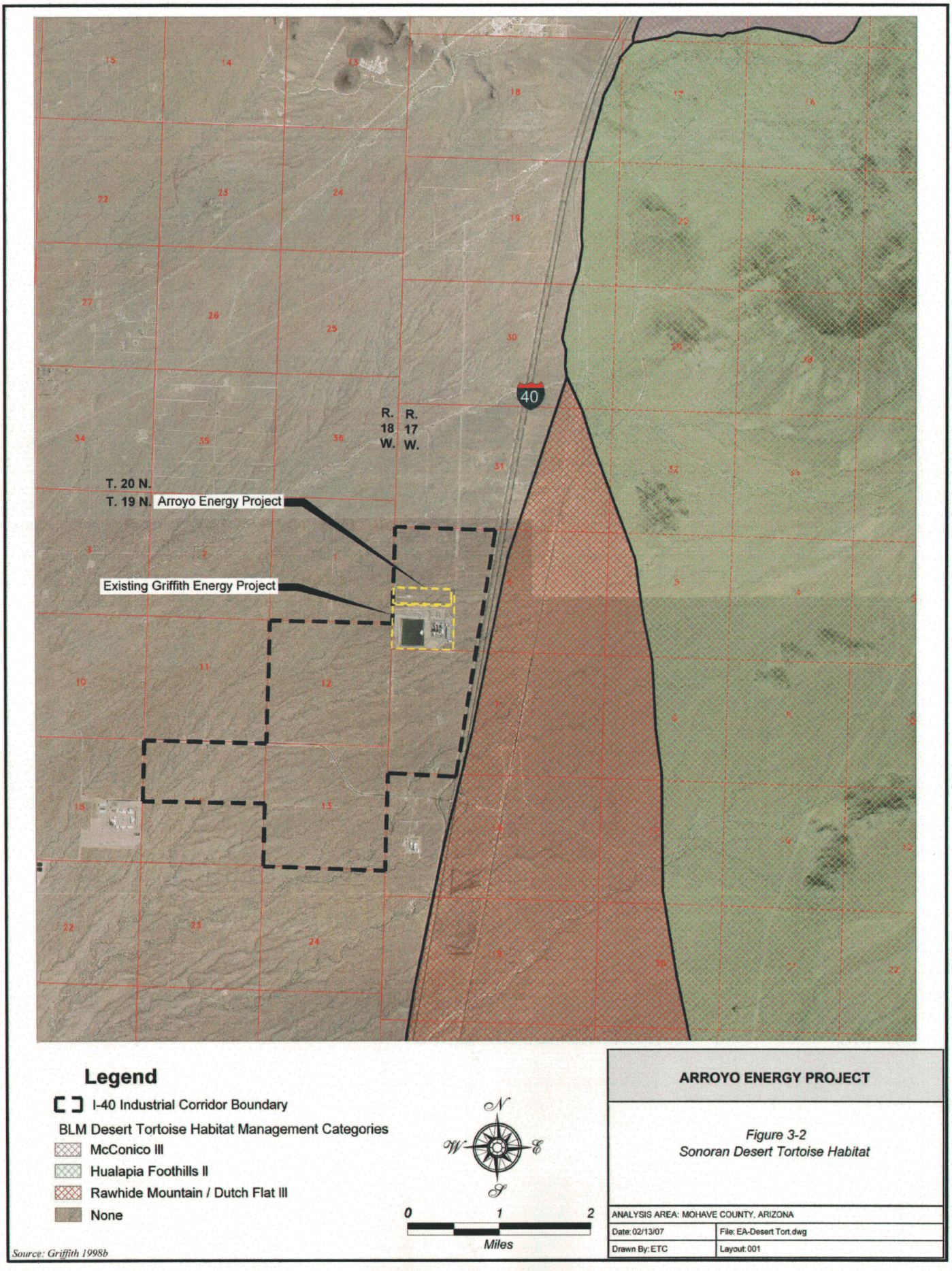
Bonytail Chub
The bonytail chub is associated with open water areas of large river channels. Based on the lack of aquatic habitat, the bonytail chub would not occur in the area (USFWS, 2007).

Humpback Chub
Humpback chub are associated with deep, swift waters such as those found in canyons. Based on the lack of aquatic habitat, the humpback chub would not occur in the area (USFWS, 2007).

Virgin River Chub
The Virgin River chub occurs within runs and pools over substrates of sand and sediment in physically and chemically unmodified areas of the Virgin River. The Proposed Action is outside the Virgin River Basin; therefore, this species does not occur in the area (USFWS, 2007).

Razorback Sucker
The razorback sucker occurs in both rivers and impoundments. Based on the lack of aquatic habitat, the razorback sucker would not occur in the area (USFWS, 2007).

Woundfin
The woundfin is found in the Virgin River within Arizona, Nevada, and Utah. The Proposed Action is outside the Virgin River Basin; therefore, it would not occur in the area (USFWS, 2007).



ARROYO ENERGY PROJECT

Figure 3-2
Sonoran Desert Tortoise Habitat

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 02/13/07	File: EA-Desert Tort.dwg
Drawn By: ETC	Layout: 001

Relict Leopard Frog
This frog occurs in along the Colorado and Virgin Rivers on stream banks and wetlands at elevations of less than 2,000 feet (USFWS, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Mojave Desert Tortoise
The Mojave population of the desert tortoise is found north and west of the Colorado River. It was listed as "threatened" under the California State Endangered Species Act (ESA) in 1989 and the Federal ESA in 1990. A separate, genetically distinct population of desert tortoise has been identified south and east of the Colorado River in Arizona (Sonoran desert tortoise). The primary reasons for listing the Mojave population include deterioration and loss of habitat, collection for pets or other purposes, elevated levels of predation, disease, and the inadequacy of existing regulatory mechanisms to protect desert tortoises and their habitat. The USFWS has designated critical habitat in Arizona for the Mojave desert tortoise. This habitat is limited to extensive areas of mesas and steep talus slopes in parts of the Black Mountains. The designated critical habitat is more than 50 miles north of the Proposed Action. The Mojave desert tortoise does not occur within the area because it only occurs north and west of the Colorado River, and the Proposed Action is south and east of the Colorado River (USFWS, 2007).

California Brown Pelican
This subspecies is found on the Pacific Coast. It rarely migrates to Arizona (USFWS, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Bald Eagle
Although bald eagles may forage over or migrate through the region, no bald eagle nests or wintering roosts are known to occur within the ROI of the Proposed Action. Feeding areas, perches, and night roosts are fundamental elements of bald eagle winter range. Though eagles can fly as far as 15 miles to and from these elements, they occur primarily where all three elements are available in close proximity. Although eagle presence in winter is not necessarily related to open water, eagles usually occur near large rivers and lakes. Perches are an essential element in the bald eagles' selection of foraging areas. Roosts are areas used for sleeping and sheltering from winter storms (Griffith, 1998b). It is not anticipated to occur within the area due to lack of suitable habitat.

California Condor
The California condor is the largest bird in North America with a wingspan of up to 9 feet. Currently, 36 condors have been established into the wild at three sites in California and Arizona. Sixteen are located in the Los Padres National Forest in California; 15 at Vermillion Cliffs, Arizona; and five at Ventana/Big Sur in California. These populations are currently being studied by biologists. The Proposed Action is on the far edge of the species range (USFWS, 2007). It is not anticipated to occur within the area due to lack of suitable habitat.

Mexican Spotted Owl
The Mexican spotted owl typically nests and roosts in mixed coniferous forests (Ganey and Bald, 1989) or ponderosa pine-Gamble oak adjacent to riparian habitats or in canyons (USFWS, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Southwestern Willow Flycatcher
The flycatcher breeds in the United States but winters south of the United States. California, Arizona, and New Mexico comprise the majority of the historic and current range of the flycatcher. Flycatchers typically nest in cottonwood-willow associations along streams, rivers, or other wetland areas (Tibbets et al., 1994, USFWS, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Yuma Clapper Rail
The Yuma clapper rail inhabits dense cattail marshes along the Colorado River. Marsh habitat losses to river water diversion and damming of the Colorado River, dredging operations, mosquito abatement programs, and erosion control efforts have all reduced nesting habitat (Griffith, 1998b, USFWS, 2007). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Yellow-billed Cuckoo
This species occurs in large blocks of riparian woodlands at less than 6,500 feet in elevation (USFWS, 2007). It is not anticipated to occur within the area due to lack of suitable habitat.

Northern Goshawk
The northern goshawk inhabits forested regions of the Northern Hemisphere. This goshawk prefers coniferous forests, but would also inhabit deciduous and mixed forests from sea level to subalpine areas (Griffith, 1998b). It is not anticipated to occur within the ROI of the Proposed Action due to lack of suitable habitat.

Greater Western Mastiff Bat
The greater western mastiff bat roosts in crevices and shallow caves on cliffs and rock faces. Roosts typically have large openings below to allow the bats to drop several feet before exiting the roost. Females give birth to a single young any time between mid-June and mid-August (Hoffmeister, 1986). The greater western mastiff bat is not anticipated to occur within the ROI of the Proposed Action due to the lack of suitable habitat.

Hualapai Mexican Vole
This species is endangered and has been steadily disappearing from its habitat for the last 50 years. However, when it is seen, it is typically found in Northern Arizona including the Grand Canyon and the Flagstaff and Williams areas, which are approximately 115 miles east of the Proposed Action, and from Navajo Mountain in both Arizona and Southern Utah. This species is also found in the Defiance Plateau in Arizona, which is approximately 250 miles northeast of the Proposed Action. The Hualapai Mexican vole is associated with the ponderosa pine-Gambel oak habitat type. It is not anticipated to occur within the area due to lack of suitable habitat (USFWS, 2007).

3.5 CULTURAL RESOURCES

Based on previous inventories; archaeological and historical overviews; and theoretical contributions within anthropology, ethnology, and cultural geography, the NAEP property is expected to contain few prehistoric or historic cultural resources. Cultural resources in the open basin of the Sacramento Valley are expected to be widely distributed at low density and occur as either spatially narrow and linear or small and point-focused entities. Historic cultural resources

are likely to be more common east of the Proposed Action along the historic transportation corridors of Route 66 and the Atchison Topeka and Santa Fe (ATSF) Railway, and in the foothills of the Hualapai Mountains approximately 4 miles to the east.

The development of baseline data for the Proposed Action included a records search and literature review associated with areas within a 1-mile radius of the Proposed Action. Review of AZSITE records, ARCADIS files for Griffith Energy, and site cards and other records at the Arizona State Museum (ASM) and BLM Kingman Office identified four previous cultural resource studies and two formally recorded cultural resource sites within 1 mile of the Proposed Action. Three of the previous cultural resource investigations were for the existing Griffith Energy and associated utility corridors (Ezzo and Späth, 1998; Becker and Huber, 2001; Becker et al. 2001). The fourth investigation was a linear parcel to the northeast along I-40 (Breen, 2004). The two historic cultural resources were historic Route 66 (AZ I:15:156[ASM]), which has been overlain by I-40 in the vicinity of the Proposed Action, and a small historic debris scatter east of I-40 (AZ F:16:1[ASU]). Segments of the historic ATSF are also located east of the I-40 and west of the Hualapai Mountains.

A cultural resource inventory was completed for the 160-acre Griffith Energy property in the west half of the southwest quarter of section 6, T19N, R17W, for Griffith Energy (Ezzo and Späth, 1998). This included a reconnaissance of the NAEP property. The archaeological survey for the Griffith Energy property (as defined in Ezzo and Späth, 1998) identified no prehistoric or historic sites, despite favorable weather conditions, excellent ground surface visibility (95 to 100 percent), and the presence of such opportunities for enhanced subsurface visibility as erosional cuts, roadside ditches, and the backdirt of animal burrows. No areas of Holocene deposition that might contain buried cultural resources were observed, and it was concluded that no surface or subsurface cultural resources exist within the 160-acre parcel, which includes the Proposed Action. The Griffith Energy property inventory focused on the initially proposed plant site footprint and the remainder of the survey was at a reconnaissance level. Therefore, the NAEP property has been resurveyed (Jolly and Späth, 2007). An isolated grinding slick was documented, and no other cultural resources were found.

An ethnographic study of Griffith Energy was completed by the Hualapai Tribe (1999). They expressed no concerns about the Griffith Energy property. They were concerned about the potential for prehistoric camps and other sites in the Hualapai Mountains, the Peacock Mountains, and the foothills, which are all located outside the project area.

3.6 LAND USE AND RECREATION

This section describes the existing land ownership and land uses in the vicinity of the Proposed Action. Current and proposed land management plans and planned future land uses for the area are also described in this section.

3.6.1 Existing Land Ownership and Land Uses

The Proposed Action would be located on a 40-acre parcel of land just west of I-40, approximately 9 miles southwest of the City of Kingman and 1.7 miles north of the Griffith interchange in Mohave County, Arizona. The Proposed Action would be constructed on private lands within the county-designated I-40 Industrial Corridor just north of the existing Griffith

Energy facilities as shown on **figures 3-2** and **3-3**. The NAEP property is located within the Original Griffith Energy property that was approved for power generation by the Arizona Corporation Commission (Case No. 90, Docket L00000H-98-0090, Decision No. 61295). The NAEP property is currently undeveloped, vacant land.

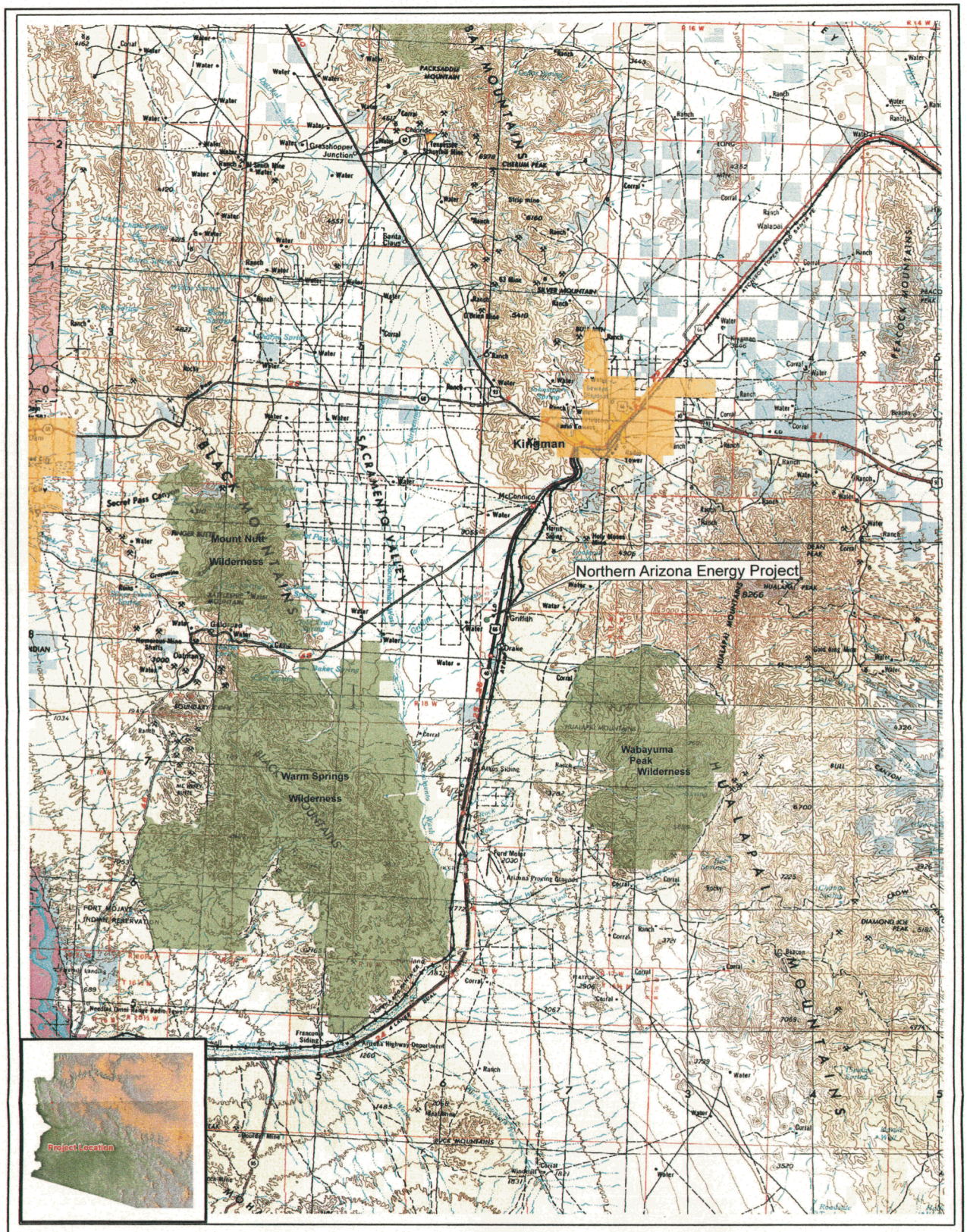
The proposed power plant would be accessed by existing roads via the Griffith interchange on I-40, which travels north-south near the site. From the Griffith I-40 Interchange, access to the proposed power plant would be west on Griffith Road, then approximately 1.7 miles north on South Apache Road, then east on Haul Road to the site entrance. Public access to the site would be controlled through a security gate at the entrance off of Haul Road located along the north boundary of the NAEP property.

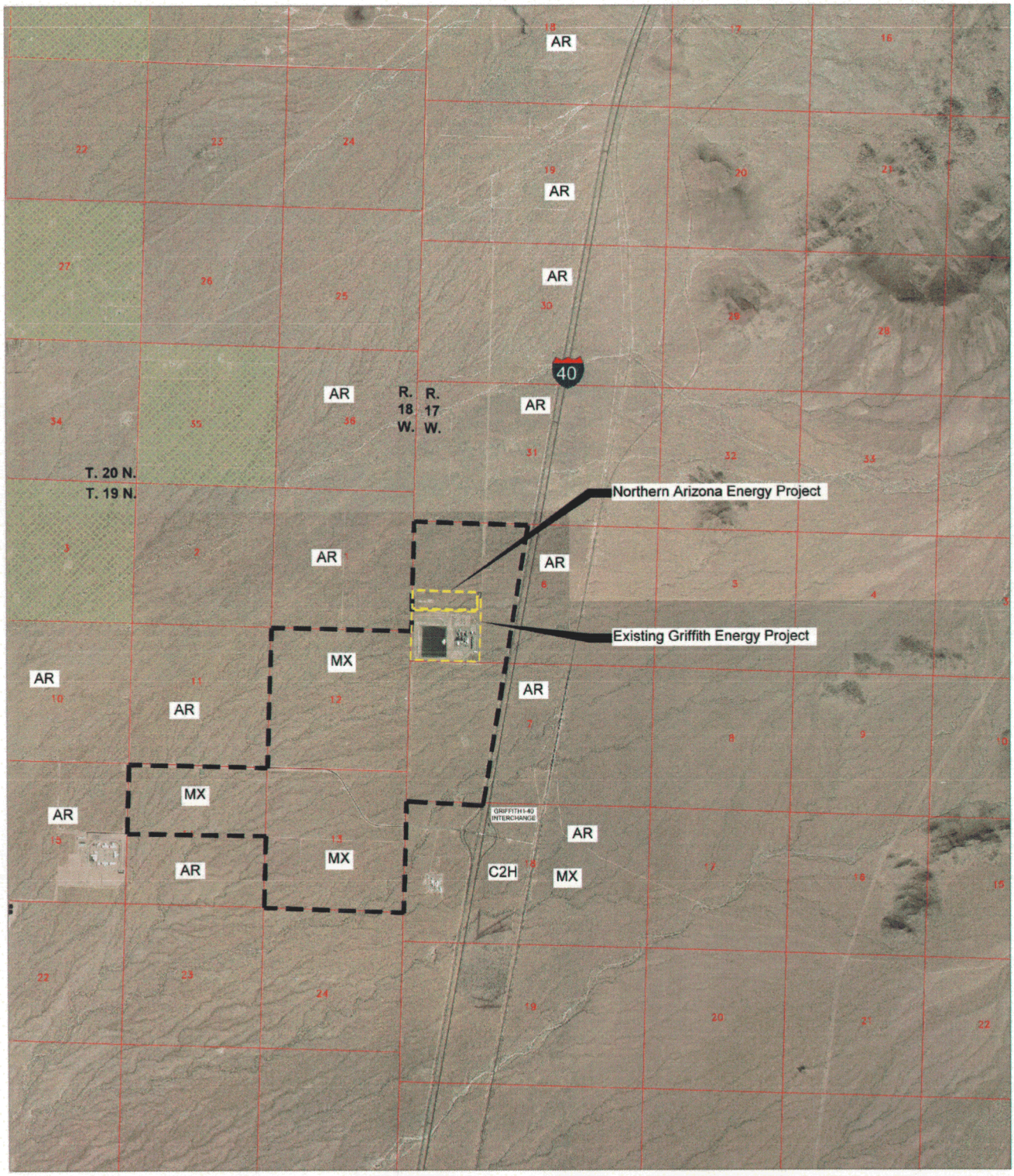
Applicable current and proposed land management plans in the vicinity of the Proposed Action include the original Mohave County General Plan (General Plan), adopted in 1995 and revised in 2003 (Mohave County, 1995); the 2005 Draft General Plan (Mohave County, 2005a); the 2002 Golden Valley Area Plan (Mohave County, 2002); and the Mohave County Zoning Ordinance (Mohave County, 2005b). The amended General Plan designated the I-40 Industrial Corridor; however, the Area Plan for the I-40 Industrial Corridor is not yet finalized. The Zoning Ordinance establishes zoning districts to implement land use controls for development.

The NAEP property is zoned MX. Land uses permitted within MX zoning include light and heavy industry and commercial and industrial uses appropriate to an industrial park such as manufacturing and warehouses. Any uses permitted in the commercial-manufacturing or general manufacturing zones are permitted uses in the MX zone without a zoning use permit. The MX zoning designation permits the development of industrial facilities including electric generation facilities. Existing industrial development in the vicinity of the Proposed Action includes the Praxair industrial gases and liquids facility about 2 miles south of the Proposed Action, existing transmission lines and utilities, I-40 and Route 66, the main line of the Burlington Northern Santa Fe (BNSF) Railway, and three transcontinental natural gas pipeline corridors (Transwestern, El Paso, and Questar).

Figure 3-4 is an aerial photograph showing the current land uses and zoning designations for the NAEP property and surrounding lands. As shown on the aerial photograph, the properties surrounding the I-40 Industrial Corridor are predominantly undeveloped vacant lands. These lands are privately owned and currently zoned for rural uses (primarily rangeland), residential subdivisions, commercial centers, residences, and infrastructure (roads, utilities).

BLM lands in the area are managed for multiple uses and provide for a variety of uses, including grazing and dispersed recreation, such as hunting and off-road vehicle (ORV) use. There are no BLM lands and associated grazing allotments or recreation areas within or adjacent to the Proposed Action. Potential impacts to recreation resources are discussed in the recreation section of this document.


Northern Arizona Energy Project
Kingman
Mount Nutt Wilderness
Warm Springs Wilderness
Wabayuma Peak Wilderness
Project Location
Legend
BLM Wilderness Area
Municipal Area
Land Owner
BLM
Lake Mead N.R.A
Parks & Recreation
Private
State Trust
Havasu N.W.R.
5 2.5 0 5
Miles
Sources: Williams, Prescott, Kingman, & Needles 1:250,000 USGS Quadrangles
NORTHERN ARIZONA ENERGY PROJECT
Figure 3-3
Project Area, Jurisdiction, and Land Status
ANALYSIS AREA: MOHAVE COUNTY, ARIZONA
Date: 02/22/2007
File: 2516/Regional_EA .MXD
Created By: JG
Layout: Regional_EA PDF



Legend

- Transitional Area
- Shrub and Brush Rangeland
- I-40 Industrial Corridor Boundary

Zoning Districts

- AR Agricultural Residential
- MX Heavy Manufacturing
- C2H Highway Commercial

N W E S

0 1 2

Miles

Source: Griffith 1998a

NORTHERN ARIZONA ENERGY PROJECT

Figure 3-4
Existing Land Use and Zoning

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 02/15/07	File: EA- Ex. Landuse-Zoning.dwg
Drawn By: ETC	Layout: 001

3.6.2 Planned Land Uses

Planned land uses in the vicinity of the Proposed Action have been mapped by Mohave County in the General Plan and the 2002 Golden Valley Area Plan, a component of the General Plan as shown in **figure 3-4**. The planned land uses serve as a guide to land use development and to encourage land use patterns that are consistent with the goals of the General Plan, residents, and property owners. Planned land use categories in the General Plan include rural development areas, urban development areas, suburban development areas, and outlying communities. Detailed land use classes within each development area are described as follows:

Rural Development Areas - rural residential (lot sizes 5 acres or larger); rural industrial; public parks; public lands; non-residential uses such as neighborhood commercial, commercial recreation, light industrial, heavy industrial, and airport industrial.

Suburban Development Areas - suburban estates and suburban residential (lot sizes between 1 and 5 acres), public facilities, public parks, and public lands.

Urban Development Areas - low-, medium-, and high-density residential; neighborhood commercial; general commercial; commercial recreation; light industrial; and heavy industrial.

Outlying Communities –development within designated communities in the unincorporated portions of the county may be rural, suburban, or urban.

Based on the General Plan, the planned land use for the area around the Proposed Action is heavy industrial within the boundaries of the I-40 Industrial Corridor as shown on **figure 3-4**. The planned land uses within the I-40 Industrial Corridor also include light industry, manufacturing, and commercial. The I-40 Industrial Corridor between Kingman and Lake Havasu offers large industrial tracts to accommodate warehouse distribution and manufacturing firms that require direct highway access, rail access, and/or natural gas. Major planned developments within the I-40 Industrial Corridor include a Wal-Mart 880,000-square-foot distribution center and a Nutribiotechnologies, Inc. facility.

The planned land uses for the lands surrounding the I-40 Industrial Corridor include Rural Development, Suburban Development, and Urban Development Areas as shown on **figure 3-5**. One urban development area designated as General Commercial is located southwest of the City of Kingman along I-40, and a suburban development area is designated between the General Commercial Area and the I-40 Industrial Corridor.

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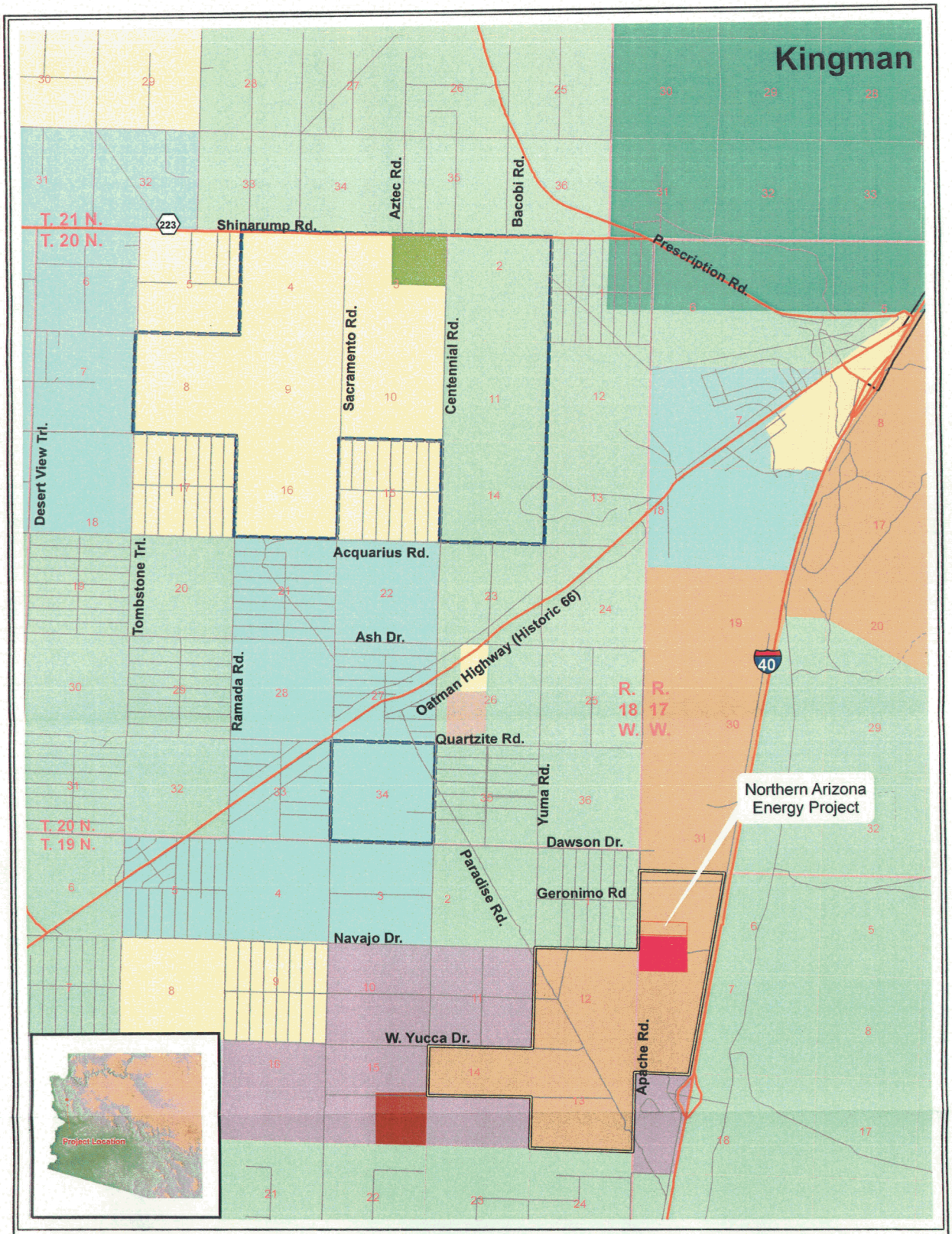

Legend

- Interstate/Highway
- Major Arterial
- Primitive Road/Trail
- Street
- Northern Arizona Energy Property Boundary
- I 40 Industrial Corridor Boundary
- Golden Valley Holdings

LandUse

- Corbat Foothills Recreation Area
- General Commercial
- Griffith
- Heavy Industrial
- Kingman Municipal
- Light Industrial
- Low Density Residential
- Prison
- Public Facilities
- Rural Development Area
- Suburban Development Area
- Urban Development Area

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Miles

Transverse Mercator Projection
1983 North American Datum
Zone 12
Meters

NORTHERN ARIZONA ENERGY PROJECT

Figure 3-5
Planned Land Use

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 3/1/2007	File: 2516/LU_EA.MXD
Created By: JG	Layout: LU_EA.PDF

Several areas near the Proposed Action have been platted for subdivision including Sacramento Ranchos, Golden Valley Ranchos, Paradise Acres, and Sacramento City. The section of land adjoining the western boundary of the NAEP property was subdivided in 1960 and zoned for the Sacramento Ranchos residential subdivision, but is currently undeveloped (Mohave County, 2007a). Golden Valley Ranchos is a proposed residential development located between Shinarump Road (County Highway 223) on the north, Aquarius Drive on the south, Yuma Road on the east, and Tombstone Trail on the west. The proposed Golden Valley South Area Plan (Rhodes, 2005) was prepared as an extension of the previously adopted Golden Valley Area Plan for land development south of Shinarump Road. Sacramento City is the platted section located approximately 2 miles northwest of the Proposed Action. There are currently no housing developments on the platted subdivisions in the vicinity of the Proposed Action as shown on **figure 3-3**.

3.6.3 Recreation

There are no identified plans for development of recreational facilities in the immediate vicinity of the Proposed Action. There is currently no developed recreation near the proposed power plant. No significant recreation occurs on or around the Proposed Action. Dispersed activities, such as hunting and ORV uses, do occur on public lands in the general area.

3.7 TRANSPORTATION

The proposed power plant is accessible via I-40, which bisects the county generally from east to west, although it runs north-south in the vicinity of the Proposed Action. The other major highways that traverse through Kingman include U.S. 93, State Route 66, and State Route 68. Mohave County is served by the BNSF railway, which owns the largest rail network in the United States with more than 31,000 route miles covering 27 states and two Canadian provinces. The BNSF railroad links Mohave County with deepwater ports on the west coast and the Gulf of Mexico, as well as inland points throughout the Midwest, Pacific Northwest, and Southeast. The rail line passes approximately 1 mile east of the Proposed Action.

I-40 is a major corridor for commuting in Mohave County, particularly in the City of Kingman. **Table 3-7** shows the annual average daily traffic (AADT) for the section of I-40 near the Proposed Action between Exit 26 to the Ford Proving Ground in Yuma and Exit 44 to McConnico Road, a distance of 18.15 miles. Traffic counts are also summarized for the 4.55-mile segment of I-40 between Exit 44 and Exit 48 within the southern portion of the City of Kingman. Exit 48 provides access to U.S. 93. **Table 3-7** shows that traffic fluctuated considerably between 2001 and 2005, and has decreased nearly 14 percent from 2001 to 2005 despite ongoing residential development in the vicinity of Kingman. This may have occurred because truck traffic has been re-routed to U.S. 95 instead of Hoover Dam since September 11, 2001 (Nevada Department of Transportation, 2002). Traffic counts for 2005 between Exit 44 and Exit 48 are significantly higher than traffic counts between Exit 26 to Exit 44, having increased steadily since 2001. This indicates that considerable traffic is diverted onto Oatman Road, which provides access to residential subdivisions, outdoor recreation opportunities, and tourist destinations.

Arizona Department of Transportation (ADOT) is preparing the I-40 Regional Transportation Profile, which includes the highway segment that is located just east of the Proposed Action. The purpose of the study is to identify the transportation system needs, deficiencies, and potential project solutions for the I-40 corridor and surrounding communities. The completed report should provide useful data or insights for transportation planning efforts on the highway near the Proposed Action.

3.7.1 Access Roads

Current access to the proposed power plant would be via Haul Road, located along the northern boundary of the NAEP property. The Haul Road is an unimproved, bladed road. The NAEP property also borders South Apache Road on the west; however, there is no planned direct site access from South Apache Road.

3.8 VISUAL RESOURCES

The Proposed Action would be located in a transition area between the Basin and Range and the Colorado Plateau physiographic provinces. The landscape of the general area is characterized by mountain ranges trending north-south with long, linear valleys between the ranges. Geologic formations provide a diverse, scenic terrain. The proposed power plant would lie within the Sacramento Valley, adjacent to the western and northern margins of the Hualapai Mountains. The valley consists of a broad, exposed, flat to undulating terrain that is sparsely vegetated with low-growing desert scrub. Much of the land in the valley outside of the City of Kingman is largely unmodified. These areas include lands under management by the BLM. The Hualapai Mountains to the east and the Black Mountains to the west provide a scenic backdrop to views of the valley.

The Proposed Action would be located on private lands approximately 0.25 mile west of I-40. The surrounding landscape, as seen from the highway, consists of sparsely vegetated, flat terrain backdropped by nearby mountains. The affected viewshed contains the location for the Proposed Action, the existing Griffith Energy facilities, and surrounding public and private lands that would provide a view of the Proposed Action. Distance and intervening landforms to the northeast of the site exclude existing and proposed residential development and the City of Kingman from the viewshed area. Field reconnaissance verified that the proposed facilities would not be visible from scenic highway corridors (Oatman Road) and existing and proposed residential developments in nearby Golden Valley.

The visual resources of the Proposed Action were identified from a variety of public sources and from field reconnaissance conducted during January 2007. The Mohave Land Use Plan and the Arizona BLM web site were reviewed to identify designated scenic resources and special management areas that contain scenic resources.

The factors that were evaluated in assessing the visual setting of the Proposed Action include scenic quality, viewer sensitivity, visibility, and viewer exposure. The assessment is similar to a visual resource inventory that would be conducted on public lands administered by the BLM; however, the factors are not used to develop Visual Resource Classes, which are categories assigned to public lands which serves two purposes: (1) an inventory tool that portrays the

proposed residential developments, or from Oatman Road, so the Proposed Action would not be either.

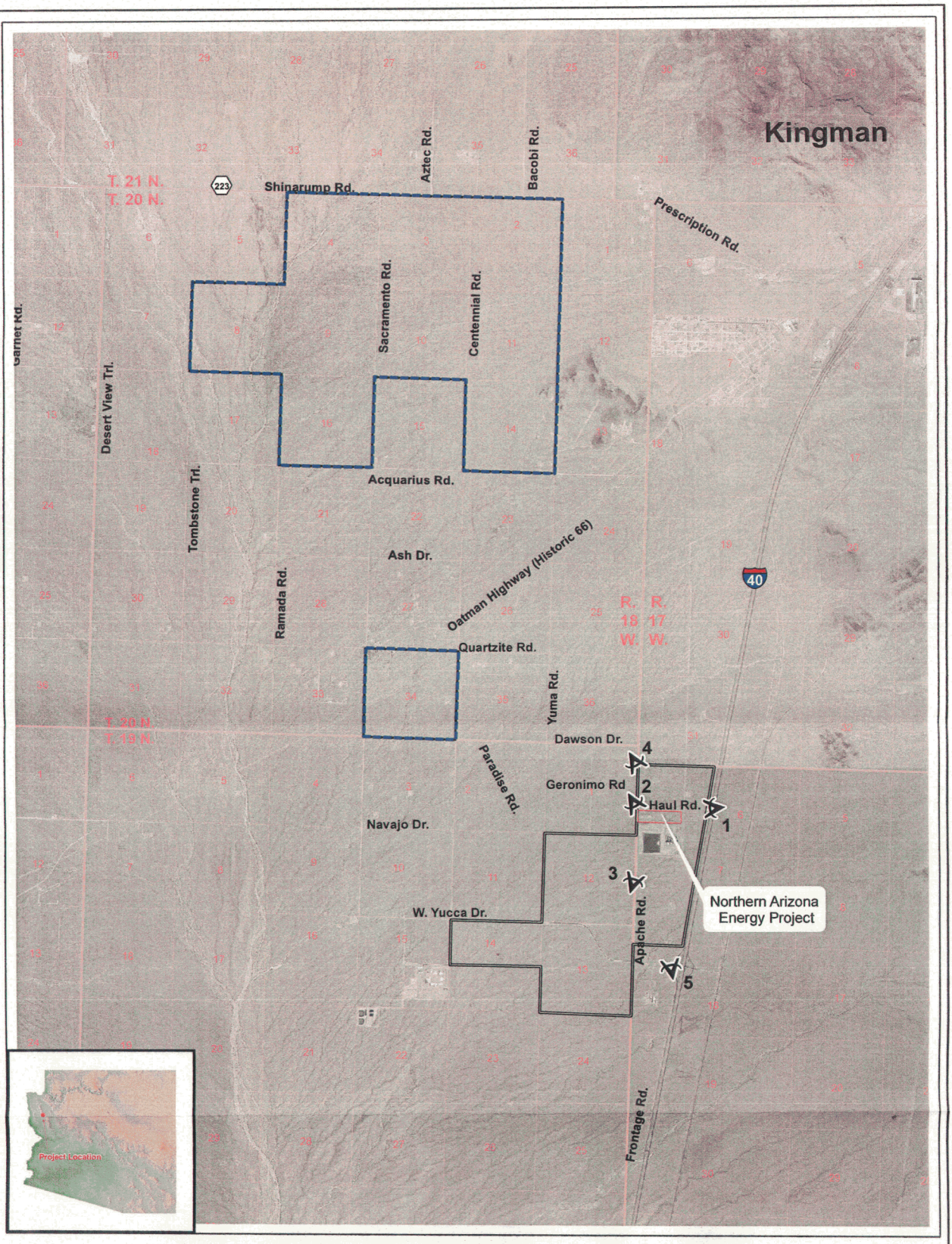
The primary views of the Proposed Action would be from Federal, state, and local travel routes in close proximity to the NAEP property. Travel routes include I-40 and several county roads that access the proposed power plant from the highways. Local roads include South Apache Road along the west boundary of the NAEP property. South Apache Road provides access to West Dawson Drive and West Navajo Drive, which access residences to the west of the proposed power plant.

The nearest areas that provide recreational opportunities include municipal and private facilities in the City of Kingman. Dispersed recreation opportunities, such as hunting and OHV uses, are available on nearby BLM lands. Hiking and camping are also available in the three wilderness areas. The Proposed Action would be located within the background views as seen from the three wilderness areas, but would not easily be visible to the casual observer because of the distances of more than 5 miles. The nearby Praxair facility is visible from the wilderness areas only because the white color of the facility provides a strong contrast, as verified in field reconnaissance for the Griffith Energy Project. The existing Griffith Energy facilities are indistinct to potential viewers in the wilderness. They do not draw the attention of the casual observer because of the distance and because the facility is painted with colors that blend with the landscape so that color, line, form, texture, and scale contrasts with the landscape are low. The lighting at the existing Griffith Energy facilities are visible during periods of darkness from the surrounding wilderness areas, but to a similar degree as nearby industrial developments and passing motorists on I-40.

Nearby residential subdivisions include Paradise Acres and Golden Valley Ranchos northwest of the Proposed Action, and Sacramento Ranchos west of the NAEP property. Residential development is currently sparse in Paradise Acres, which was subdivided in 1961 (Mohave County, 2007a). The Golden Valley Ranchos, which was subdivided in 1959 (Mohave County, 2007a), is also currently sparse. There is no residential development in Sacramento Ranchos, which was subdivided in 1960 (Mohave County, 2007a) and is located west of Apache Road along the west boundary of the NAEP property. The residence nearest to the Proposed Action is in the northeast quarter of section 31, about 2.5 miles northwest of the Proposed Action in the Paradise Acres subdivision.

Five KOPs were selected to represent views of the Proposed Action from I-40 and nearby county roads that cross through undeveloped areas as shown on **figure 3-6**. There are currently no existing and proposed residential developments for these lands; however, there is potential for residential development in the future. The KOPs were selected to best represent people with a concern for visual quality who would view the proposed power plant.

KOP 1 is located 0.3 mile northeast of the northeast corner of the Proposed Action on southbound I-40. The view faces southeast toward Haul Road, the northeast corner of the NAEP property, and the existing Griffith Energy facilities, as shown in the photograph in **figure 3-7**. Haul Road is at the north boundary of the NAEP property.



Legend

- I 40 Industrial Corridor Boundary
- Golden Valley Holdings
- Northern Arizona Energy Property Boundary
- Key Observation Point

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Miles

Transverse Mercator Projection
1983 North American Datum
Zone 12
Meters

NORTHERN ARIZONA ENERGY PROJECT

Figure 3-6
KOP Locations

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 5/30/2007	File: 2516\KOP_EA.MXD
Created By: JG	Layout: KOP_EA.PDF

Existing Condition
Looking southwesterly from Interstate 40 down Haul Road at existing Griffith Energy Project.

Photo Simulation
Simulation of Northern Arizona Energy Project from Interstate 40 looking down Haul Road.

NORTHERN ARIZONA ENERGY PROJECT	
Figure 3-7 *Photo Simulation for* *Key Observation Point 1*	
ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 02/12/2007	File: 2516/EA-KOP-1.MXD
Drawn By: EC	Layout: Figure 3-7 KOP 1.PDF

KOP 2 is located on the southeast corner of Haul Road and the north terminating end of South Apache Road about 0.2 mile from the northwest corner of the Proposed Action. The view faces southeast toward the west side of the NAEP property and the northwest side of the existing Griffith Energy facilities, shown in the photograph in **figure 3-8**.

KOP 3 is located on South Apache Road about 0.85 mile from the southwest corner of the NAEP property. The view faces northeast, providing a view of the existing Griffith Energy, as shown in the photograph in **figure 3-9**.

KOP 4 is located on Apache Road near Dawson Drive about 0.64 mile from the northwest corner of the NAEP property. The view faces southeast, providing a view of the existing Griffith Energy facilities with a scenic backdrop of the Hualapai Mountains, which are visible in the photograph in **figure 3-10**.

KOP 5 is at the Griffith Exit on I- 40 1.6 miles southeast of the proposed NAEP property. The KOP faces west-northwest and provides a view of the existing Griffith Energy as shown of **figure 3-11**. At this distance, the existing facilities are obvious, but are small in scale relative to the surrounding landscape. The Black Mountains are in the background distance zone as viewed from the KOP and provide some screening for the existing plant facilities.

3.8.2 County Scenic Resource Planning

The Mohave County General Plan has developed Scenic Resource Goals to preserve, protect, and enhance scenic routes and vistas that characterize the rural beauty of Mohave County. In order to implement these goals, key scenic routes through the county have been identified. The nearest scenic routes to the Proposed Action are I-40 north of the intersection of State Route 66 (Oatman Highway). Oatman Highway is part of historic Route 66, a National Back Country Byway. The Proposed Action and Griffith Energy are not within the viewshed of this key scenic route.

3.9 NOISE

This section describes the affected environment for noise resources.

3.9.1 Fundamentals of Sound

Discussions of environmental sound levels do not focus on pure tones. Commonly heard sounds have complex frequency and pressure characteristics. Correction factors for adjusting actual sound pressure levels to correspond with human hearing have been determined experimentally. A-weighted (dBA) correction factors are employed for measuring sound levels in ordinary environments. The A-weighted scale is used in most sound level (noise) ordinances and standards. The level of a sound from a source is measured using a Sound Level Meter (SLM) that includes an electrical filter corresponding to the A-weighted curve. The filter de-emphasizes the very low and very high frequencies of sound in a manner similar to the response of the human ear. The SLM performs calculations to determine the average sound level that is recorded at intervals (e.g., 1-minute) in the SLM's memory.

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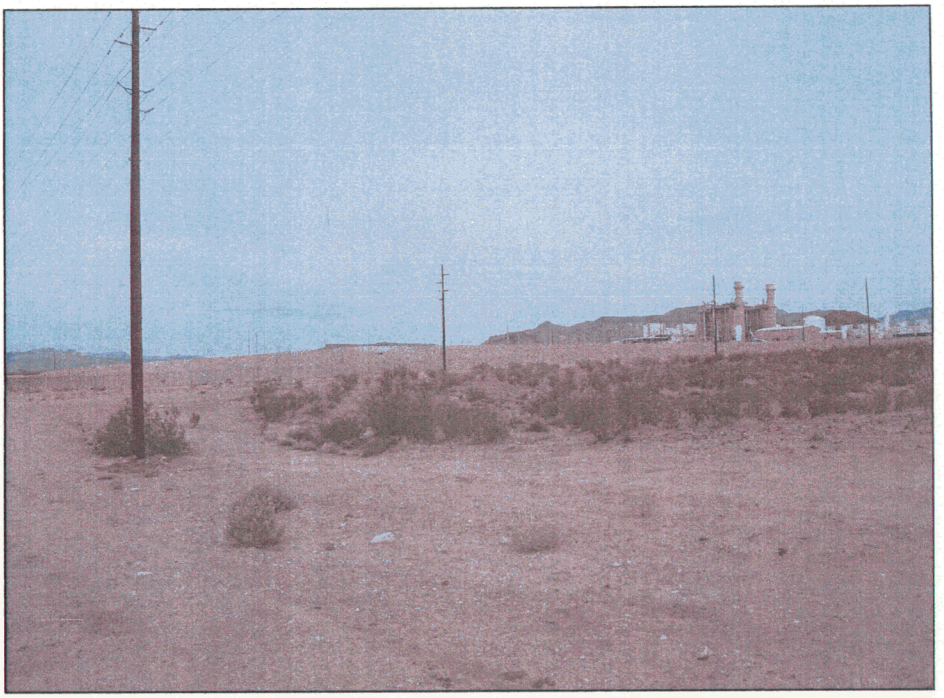
Existing Condition
Looking southeast from intersection of Haul Road and Apache Road at existing Griffith Energy Project.

Photo Simulation
Simulation of Northern Arizona Energy Project from the intersection of Haul Road and Apache Road looking southeast.

NORTHERN ARIZONA ENERGY PROJECT	
Figure 3-8 *Photo Simulation for* *Key Observation Point 2*	
ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 02/12/2007	File: 2516\EA-KOP-2 .MXD
Drawn By: EC	Layout: Figure 3-8 KOP 2.PDF



Existing Condition
Looking northeast from Apache Road at existing Griffith Energy Project.

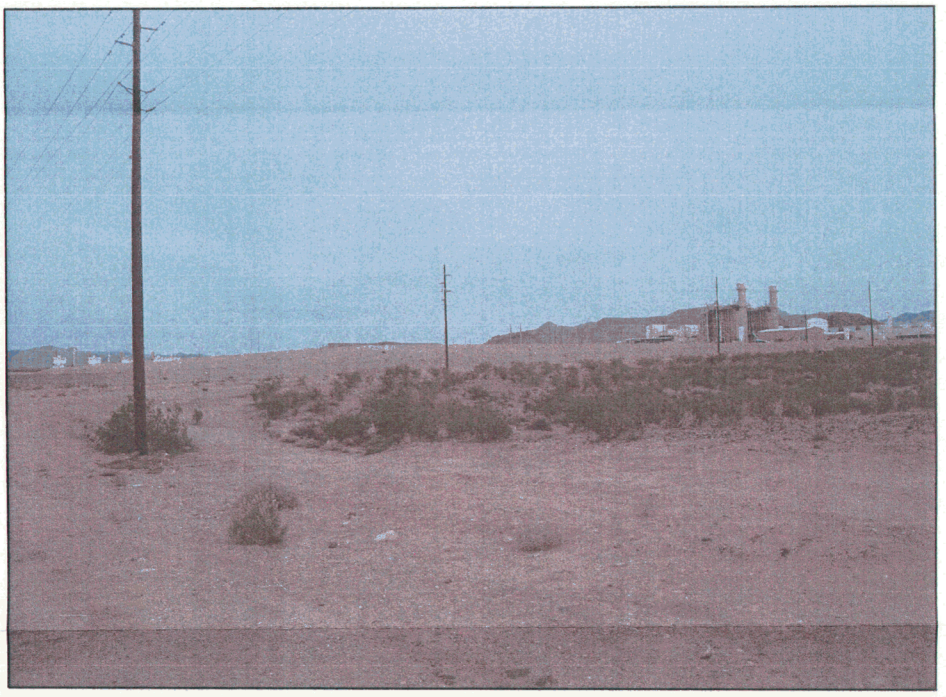
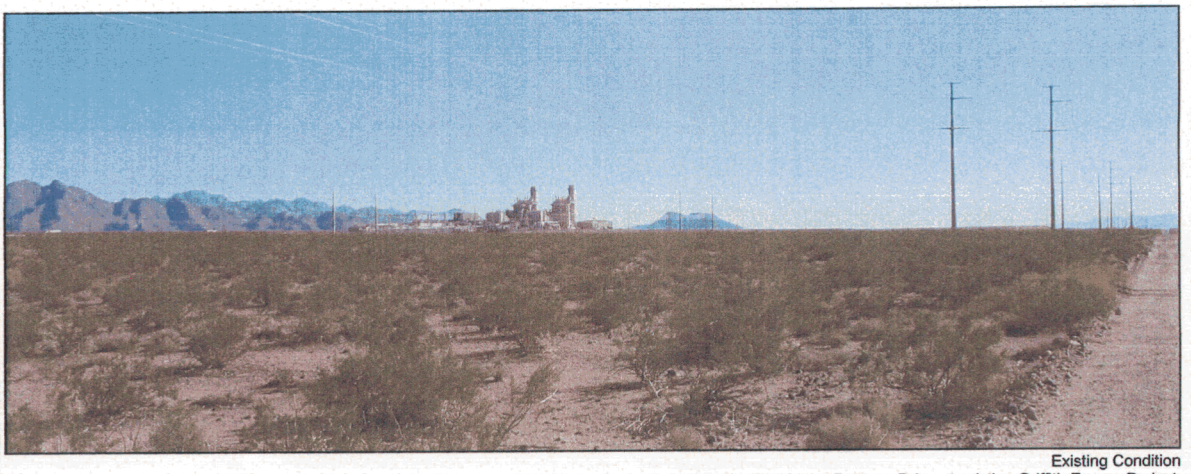


Photo Simulation
Simulation of Northern Arizona Energy Project from Apache Road.

NORTHERN ARIZONA ENERGY PROJECT	
Figure 3-9 *Photo Simulation for* *Key Observation Point 3*	
ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 02/12/2007	File: 2516/EA-KOP-3 .MXD
Drawn By: EC	Layout: Figure 3-9 KOP 3.PDF



Existing Condition
Looking southeast down Apache Road near Dawson Drive at existing Griffith Energy Project.

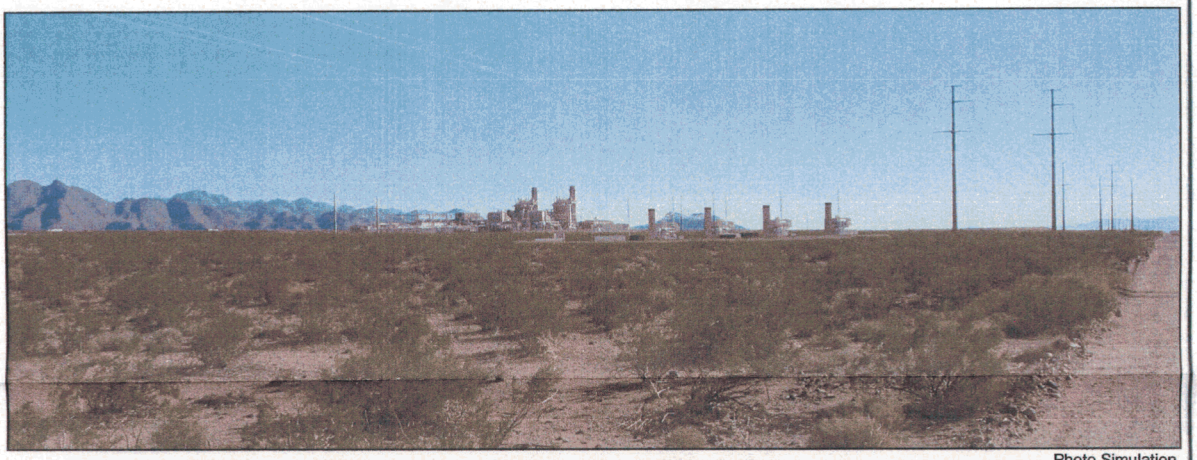
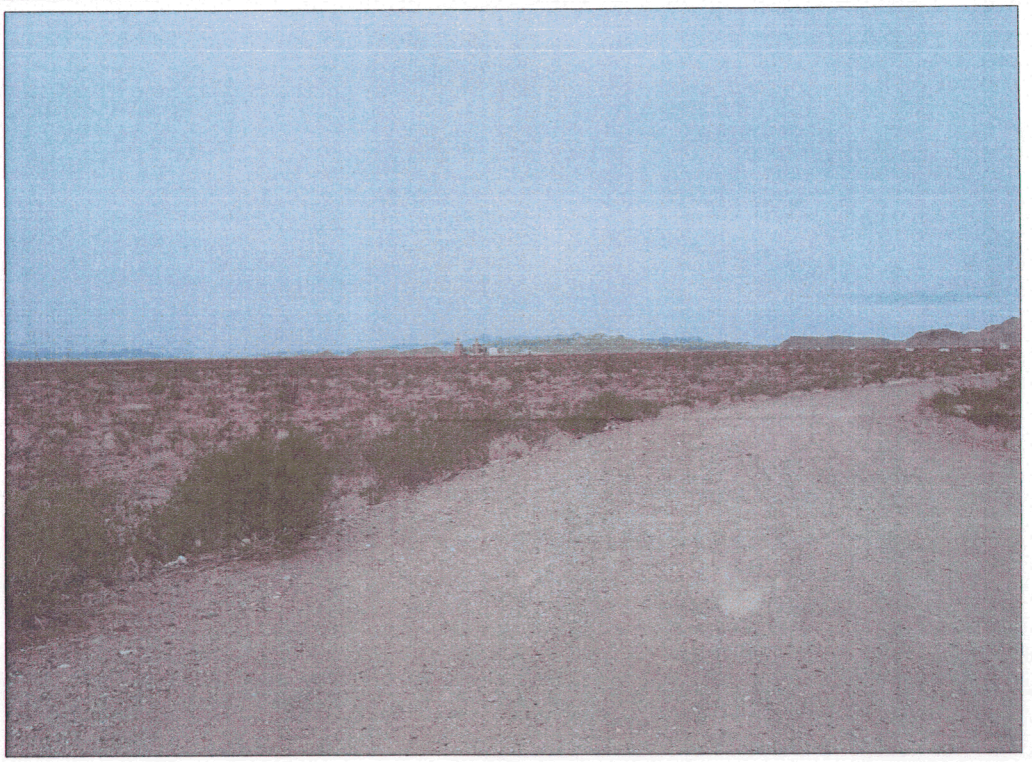


Photo Simulation
Simulation of Northern Arizona Energy Project down Apache Road near Dawson Drive.

NORTHERN ARIZONA ENERGY PROJECT

Figure 3-10
Photo Simulation for
Key Observation Point 4

ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 02/12/2007	File: 2516/EA-KOP-4 MXD
Drawn By: EC	Layout: Figure 3-10 KOP4.PDF



Existing Condition
Looking northwest from the Griffith Exit on Interstate 40 at existing Griffith Energy Project.

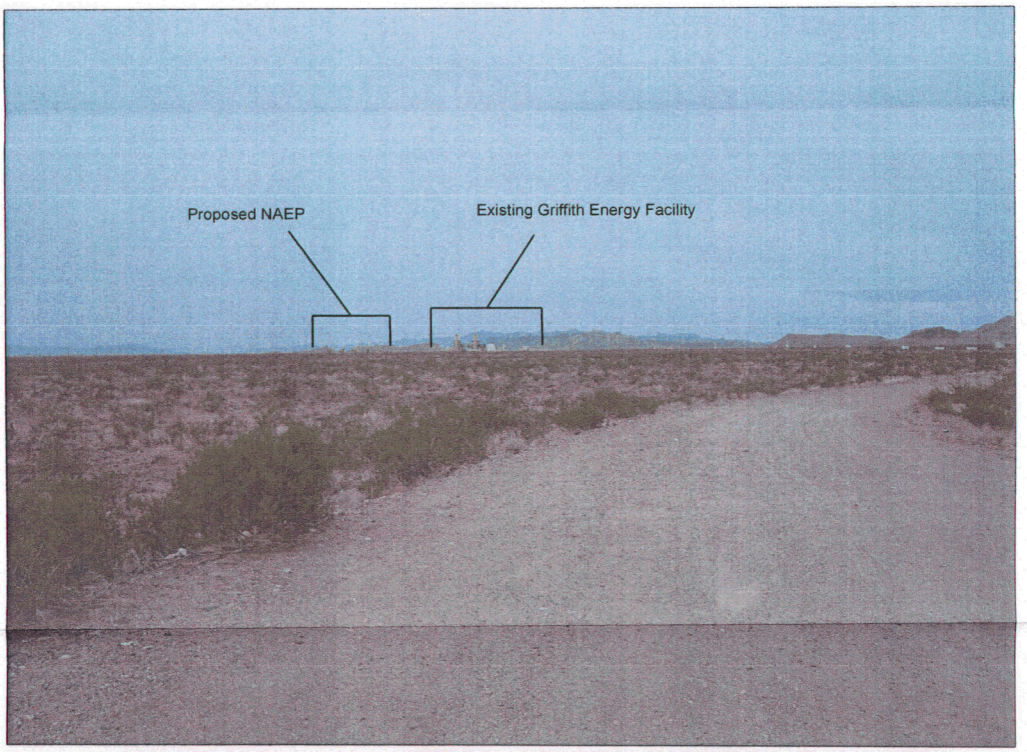


Photo Simulation
Simulation of Northern Arizona Energy Project from Interstate 40 at the Griffith exit ramp located approximately 1.6 miles from NAEP property.

NORTHERN ARIZONA ENERGY PROJECT	
Figure 3-11 *Photo Simulation for* *Key Observation Point 5*	
ANALYSIS AREA: MOHAVE COUNTY, ARIZONA	
Date: 6/28/2007	File: 2516\EA-KOP-5_GriffithExit .MXD
Created By: JG	Layout: EA-KOP5_GriffithExit.PDF

Environmental sound levels are generally described and evaluated in the following ways:

- The equivalent sound pressure level (L_{eq}) is defined as the average sound level, on an energy basis, for a stated period of time (e.g., hourly) at a given location.
- The L_{dn} is the day/night sound level that was adopted by the EPA as a measure of community sound level exposure (Crocker and Kessler, 1982). EPA defines L_{dn} as the average A-weighted sound level for a 24-hour period. Nighttime sound levels (10:00 PM. to 7:00 AM.) are increased by a 10-decibel (dB) weighting factor to account for the public's sensitivity to nighttime sound levels when most people are sleeping. The daytime (7:00 AM to 10:00 PM) energy average sound level is added to a weighted (+10 dB) mean nighttime level. The EPA has accepted the L_{dn} as an environmental noise criterion.
- The EPA has established sound levels that are identified as protective of public health and welfare. EPA identified L_{dn} of 55 dB for residential areas as an outdoor sound level above which the public health and welfare would be affected (EPA, 1974).
- Typical day-night sound levels in urban areas range from 68 to 90 dB, suburban areas average 50 dB, and rural average 39 dB. **Table 3-9** lists the day-night average sound levels for various sources as defined by EPA.

Table 3-9 Examples of Outdoor Day-Night Average Sound Levels in dB Measured at Various Locations

Source	L_{dn} Sound Level (dB)
Apartment next to a freeway	87.5
Urban high-density apartment	78
Urban row housing on a major avenue	68
Wooded residential	51
Agricultural crop land	44
Rural residential	39
Wilderness ambient	35

Source: EPA, 1974

The nearest noise receptor (residence) to the Proposed Action is approximately 2.5 miles to the northwest. The adjacent lands to the west of the NAEP property are zoned by Mohave County for agricultural-residential use.

3.9.2 Existing Noise Sources

The ambient noise in the vicinity of the Proposed Action is almost totally dominated by the traffic noise from I-40 and trains on the BNSF Railway line. The ambient conditions also include the Griffith Energy facilities.

3.9.2.1 Vehicle traffic

In the original Griffith Energy facilities analysis, the average noise level from the traffic on I-40 was calculated using the Federal Highway Administration STAMINA Traffic Noise Prediction Model, version 2.0, and average daily traffic (ADT) in the vicinity of the Proposed Action for

1996. A review of recent ADT values for 2005 show that there has been little change in the local traffic volume; therefore, these estimates should still be valid today.

The STAMINA model was run using these traffic parameters and an average speed of 70 miles per hour (mph). The calculated noise levels at various distances from I-40 are shown on **table 3-10**. The noise from the traffic on I–40 was also calculated at a residence that is closest to the Griffith Energy facilities.

Table 3-10 Noise Levels from I-40 Traffic

Location	Noise (dBA)
400 feet from I-40	62
1,000 feet from I-40	57
2,000 feet from I-40	52
Griffith Energy west property line (South Apache Road)	57
Residence 2.5 miles northwest of Griffith Energy	20

Source: Griffith, 1998b

3.9.2.2 Trains

The precise noise levels from trains is a complex calculation that considers the train speed, the train length, the conditions of the wheels, and the condition of the track (Harris, 1991). Noise from trains has been measured (Harris, 1991) to range from 87 to 96 dBA at 100 feet from a track. A noise level of 92 dBA at 100 feet from the track was used to estimate the noise from trains on the BNSF Railway line. The noise level from a train, a linear source of noise, can be estimated using the following relationship:

$L_2 = L_1 - 10 * LOG (R_2/R_1.)$

Where: L_2 is the noise (dBA) at a distance R_2 from the source

L_1 is the noise measured at a distance R_1 from the source.

Applying the preceding equation and using a train source noise of 92 dBA measured at 100 feet from the track yields the following noise levels shown on **table 3-11** at the locations and distances from the BNSF Railway line in the vicinity of the Proposed Action.

Table 3-11 Noise Levels From Trains on the BNSF Railroad Line

Location	Distance from Track (feet)	Noise (dBA)
I-40	2,400	78
Griffith Energy east property line	5,000	75
Griffith Energy west property line (Apache Road)	5,800	74
400 feet west of Griffith Energy west property line	6,400	74
Residence 2.5 miles northwest of Griffith Energy	15,000	60

Source: Griffith, 1998b

3.9.2.3 Transmission Lines and Interconnections

The electrical effects of transmission lines are those associated with electric field, magnetic field, and corona. Electric and magnetic fields result in induced voltage on objects near the transmission line. Corona effects are manifested in audible noise, radio interference, and television interference. Noise and interference from the existing transmission lines in the area are not noticeable or are mostly minimal where residential and commercial development have occurred adjacent to the existing transmission lines.

3.9.2.4 Existing Griffith Energy

A typical gas-fired power plant generating 520 MW has a characteristic noise level of below 75 dBA at 400 feet from the buildings. This noise level varies somewhat depending on which side of the power plant the receptor is located. A receptor on the side of the plant with the switchyard or the cooling towers would experience somewhat higher noise levels at 400 feet than a receptor on any of the other sides of the plant.

3.10 SOCIOECONOMICS

This section describes the existing population, housing, labor and employment, taxes, and public utilities and services in the vicinity of the Proposed Action. The public utilities and services addressed include electricity and natural gas, urban/domestic water and wastewater, solid waste, educational system, health care, law enforcement, and fire protection as described in the following subsections.

For purposes of the socioeconomic analysis, Mohave County is defined as the ROI for socioeconomic issues related to the Proposed Action. The City of Kingman is the county seat and population center of the county. Mohave County also contains the incorporated Cities of Bullhead City, Colorado City, and Lake Havasu, along with several unincorporated cities.

3.10.1 Population

Mohave County was the fastest growing county in Arizona between 1990 and 2000, with a growth rate of approximately 66 percent (Mohave County, 2005a) as shown in **table 3-12**. Within the unincorporated areas of the county, the population increased by approximately 60 percent in the 1990s. The major cities in Mohave County also experienced significant population growth between 1990 and 2000, as shown in **table 3-12**. The populations of Kingman, Mohave County, and Arizona are expected to continue to increase between 2000 and 2010, as shown in **table 3-13**.

Residents of the Kingman area and Mohave County comprise a fairly homogenous population with a relatively low percentage of minorities. **Table 3-14** illustrates the ethnic distribution in the Kingman area and Mohave County.

Table 3-12 Historical Population Growth

Area	1990	2000	1990-2000 Percent Change
Mohave County (total)	93,497	155, 032	60
Unincorporated	31,519	61,535	51
Major communities:			
Kingman	13,208	20,069	66
Bullhead City	21,951	33,769	65
Colorado City	2,426	3,334	73
Lake Havasu	24,363	41,938	51

Source: Mohave County, 2005a

Table 3-13 Population Projections

Year	Kingman Area	Mohave County	Arizona
2000	37,110	147,529	4,632,875
2010	48,352	194,403	5,652,525

Source: Mohave County, 2005a

Table 3-14 2000 Mohave County and Kingman Ethnic Composition

Race	Mohave County (percent)	Kingman (percent)
White	90.1	89.9
African American	0.5	0.6
Native American	2.4	2.0
Asian or Pacific Islander	0.9	1.5
Other	4.0	3.4
Persons of Hispanic or Latino origins*	11.1	9.2

*Persons of Hispanic or Latino origins may be of any race.

Source: U.S. Census Bureau, 2000a

3.10.2 Housing

The existing housing availability was assessed for Mohave County, Kingman, Bullhead City, Colorado City, and Lake Havasu City.

Table 3-15 shows the total number of housing units in Mohave County for the years 2000 and 2005. Based on the U.S. Census estimates for 2005, there were approximately 94,768 total housing units in the county. An estimated 20,279 units (21.4 percent of the total units) were vacant (U.S. Census Bureau, 2000a). Based on the 2000 census, the vacancy rate for rental housing was 9.2 percent, and another 12.4 percent of the total housing units (9,956 units) were considered "seasonal" and intended for use only occasionally throughout the year (U.S. Census Bureau, 2000a). In 2005, the rental vacancy rate dropped to 3.0 percent (U.S. Census Bureau, 2005).

Table 3-15 Number of Housing Units		
Housing Types	**2000**	**2005 (estimate)**
Housing (Total Units)	80,062	94,768
Vacancy Rate	21.5%	21.4%
Number of Vacant Units	17,253	20,279
Sources: U.S. Census Bureau, 2000a and 2005		

Mohave County has some housing affordability issues, as do other counties in Arizona. In 1999, the median household income for Mohave County was $31,521 (Mohave County, 2005a). In 2000, the median home price in the county was $95,300 (U.S. Census Bureau, 2000a). In 2005, the median household income in the county had increased to $34,477. Most households in the county can afford to pay the median rent, but less than half of the county's households can afford the median priced home (Mohave County, 2005a). As shown in **table 3-16**, housing is generally more expensive in the western part of the county, particularly near Bullhead City.

Table 3-16 2000 Median Home Values and Rent by City		
Place	**Median Home Values**	**Median Monthly Rent**
Mohave County	$95,300	$559
Kingman	$87,500	$510
Bullhead City	$102,500	$591
Lake Havasu City	$99,200	$609
Colorado City	$99,200	$345
Source: Mohave County, 2005a		

3.10.3 Labor and Employment

In 2000, the total civilian labor force for Mohave County was 65,081 individuals, of which 7 percent were unemployed (U.S. Census Bureau, 2000a). In 2005, the estimated civilian work force was 78,828, of which 8.4 percent (or 6,655 individuals) were unemployed (U.S. Census Bureau, 2005).

3.10.4 Taxes

Arizona has a general sales tax of 5.6 percent, and Mohave County has a 0.25 percent general sales tax. In addition, the cities of Bullhead City, Kingman, Lake Havasu City, and Colorado City each have a city sales tax of 2 percent. Colorado City and Kingman have an additional 2 percent tax on hotel and motel stays (Arizona Department of Commerce, 2004). **Table 3-17** shows the real 2002 property tax rates for the major cities in the county.

Table 3-17 Real Property Tax Rates (dollars per $100 assessed valuation)				
	School	**City/Fire**	**Countywide**	**Total**
Kingman	4.91	0.30	4.18	9.39
Bullhead City	5.31	0.00	4.18	9.49
Lake Havasu City	6.53	0.80	4.18	11.51
Colorado City	6.86	0.00	4.18	11.04
Source: Arizona Department of Commerce, 2004				

Property taxes are an important source for locally based revenue. Secured and unsecured personal property and construction in progress are exempt from taxation. Property taxes are based on the assessed valuation of a property. In 2004, the county-wide property tax rate was $4.16 per $100 of assessed valuation, while Kingman's tax rate was $9.37 per $100 of assessed valuation (Arizona Department of Commerce, 2004).

Arizona has adopted a 4-year accelerated depreciation schedule for business property to encourage capital investment in the state. Corporate income tax in Arizona is a flat tax rate of 6.968 percent (Arizona Department of Commerce, 2004).

Legislation passed in 2000 in response to electrical deregulation in Arizona established a new property valuation method for real and personal property of electric generation properties. House Bill (HB) 2324 changed the taxation of electric generating plants from statutory formulas, which were applicable to regulated electric utilities, to a method that is similar to the way that all other business property is valued. The overall result of these changes has been to reduce the taxable value and accelerate the depreciation on generating plants (Arizona Utility Investors Association, 2000). HB 2657 modified the valuation of land used in operating electric generation facilities (Arizona State Legislature, 2007).

3.10.5 Public Utilities and Services

The following discussion summarizes the availability of public utilities and services within the vicinity of the Proposed Action, including electricity and natural gas, urban/domestic water and wastewater, solid waste, educational system, health care, law enforcement, and fire protection.

3.10.5.1 Electricity and Natural Gas

Both electricity and natural gas are provided to the area and the I-40 Industrial Corridor by UES. A Western 230-kV transmission system is currently located at the Griffith Switchyard.

There are two existing UES-owned and operated natural gas pipelines that interconnect with the El Paso, Questar, and Transwestern interstate pipelines and transport natural gas to the I-40 Industrial Corridor. Both pipelines currently terminate at an existing gas regulating/metering station located at the northeast corner of the original Griffith Energy property.

3.10.5.2 Urban/Domestic Water and Wastewater

There is no water system service to much of rural Mohave County. Most water for rural residents is supplied by individual and community wells and authorized suppliers (Mohave County, 2007b). An allotment of 18,500 afy has been transferred to the Mohave County Water Authority from the Colorado River (Kingman, 2007). However, groundwater wells account for most of the water consumed by residents in rural Mohave County.

3.10.5.3 Solid Waste Disposal

Mohave County currently operates two municipal solid waste landfills. There are currently no hazardous waste treatment, storage, or disposal facilities in Mohave County. There are

hazardous waste treatment and storage facilities in the Phoenix area that are regulated by the Arizona Department of Environmental Quality.

3.10.5.4 Educational System

Mohave County has eight school districts, with six districts in the principal population centers. Kingman has eight schools serving its residents. There were 7,300 students enrolled in Kingman schools in the spring of 2004 (Kingman, 2004). The NAEP property is located within an industrial and commercial area (I-40 Industrial Corridor), and there are no schools in the vicinity of the Proposed Action.

Mohave County Community College serves the residents of Mohave County and neighboring communities in California, Nevada, and Utah. The college has campuses in Bullhead City, Colorado City, Kingman, Lake Havasu City, and Fredonia.

3.10.5.5 Health Care

Mohave County is served by three major hospitals with additional clinics and extended care facilities strategically located throughout the county. Kingman currently has one general hospital, Kingman Regional Medical Center (KRMC). KRMC has a Department of Public Safety helicopter (Ranger 41), which provides highway medical evacuations and law enforcement (Arizona Department of Commerce, 2004). The other major hospitals in the county are the Western Regional Medical Center in Bullhead City and the Havasu Samaritan Regional Hospital in Lake Havasu City. There are no health care facilities near the Proposed Action.

3.10.5.6 Law Enforcement

The county is served by a sheriff's department and a police department in each of the major cities. The Mohave County Sheriffs Department has a total of 235 employees, including 127 officers in Kingman, and approximately 130 vehicles county-wide (Kingman, 2004).

3.10.5.7 Fire Protection

Seventeen fire districts operate in Mohave County (Mohave County, 2005b). The fire districts provide services to most of the county's urbanized areas. In addition to these districts, Lake Havasu City and Kingman each operate municipal fire districts. The nearest fire districts are District No 15 in Yucca, approximately 15 miles south of the NAEP property, and District No. 7 in Golden Valley, approximately 3 miles northwest of the NAEP property.

3.11 ENVIRONMENTAL JUSTICE

This section describes the existing minority and low-income populations in the vicinity of the Proposed Action. For the purposes of the environmental justice analysis, the ROI is defined as the census tract within which the Proposed Action is located because census data are not available for the NAEP property itself. The Proposed Action would be located approximately 9 miles southwest of the City of Kingman along I-40 in Mohave County, Arizona.

Environmental justice has been defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development,

implementation, and enforcement of environmental laws, regulations, and policies. Concern that minority and low-income populations might bear a disproportionate share of adverse health and environmental impacts led President Clinton to issue an Executive Order (EO) in 1994 to address these issues. Under EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Federal agencies are directed to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. When conducting NEPA evaluations, the Applicant incorporates environmental justice considerations into both its technical analyses and its public involvement program in accordance with EPA guidelines and the Council on CEQ regulations.

3.11.1 Minority Populations

For the purpose of this EA, "minority" refers to people who classified themselves when census data was gathered as Black or African American, Asian or Pacific Islander, American Indian or Alaskan Native, persons of Hispanic or Latino origins of any race, or other non-white races (CEQ, 1997). Because the Hispanic population can be either white or non-white, it is not possible to calculate minority population by adding racial minorities to the Hispanic population (an ethnic classification). Therefore, this EA includes as minorities all racial and ethnic groups other than non-Hispanic whites.

Demographic information from the U.S. Census Bureau was used to identify minority populations near the Proposed Action. Information on locations and numbers of minority populations was obtained from the 2000 census. Census data are reported on the level of the census tract, a geographic area that varies with size depending largely on population density (low population density census tracts generally cover larger geographical areas).

Table 3-18 shows the racial and ethnic characteristics of the census tract in which the Proposed Action is located. The number of minority individuals in this census tract represents a smaller percentage of the total population than the corresponding county-wide minority population; therefore, the area around the Proposed Action does not meet the criteria for identification as an area with minority populations.

Table 3-18 Census 2000 Racial and Ethnic Characteristics

	Arizona	Mohave County	Kingman	Census Tract of Proposed Action
Total Population	5,130,632	155,032	20,069	3,685
White	75.5%	90.1%	89.9%	90.7%
Black or African American - alone	3.1%	0.5%	0.6%	0.3%
American Indian or Alaska Native - alone	5.0%	2.4%	2.0%	2.6%
Asian	1.8%	0.8%	1.4%	0.4%
Native Hawaiian or Other Pacific Islander - alone	0.1%	0.1%	0.1%	0.2%
Some other race	11.6%	4.0%	3.4%	3.4%
Two or more races	2.9%	2.1%	2.5%	2.4%
Persons of Hispanic or Latino Origins	25.3%	11.1%	9.2%	6.3%

Source: U.S. Census Bureau, 2000a

3.11.2 Low-Income Populations

Environmental justice guidance defines low-income populations using statistical poverty thresholds as defined by the U.S. Census Bureau. Information on low-income populations was developed from 1999 incomes reported in the 2000 census. In 1999, the poverty-weighted average threshold for an individual in the United States was $8,501 (U.S. Census Bureau, 2000b). As shown in **table 3-19**, 13.9 percent of the individuals in both the State of Arizona and Mohave County are below the poverty level. In contrast, 17.7 percent of the individuals in the census tract containing the NAEP property are below the poverty level. In addition, the median household income in the census tract containing the NAEP property is approximately 13 percent lower than the county-wide median household income.

Table 3-19 Percent of Individuals Below Poverty Level in 1999

Indicators	Arizona	Mohave County	Kingman	Census Tract of Proposed Action
Individuals below the poverty level	13.9 %	13.9 %	11.6%	17.7%
Median Household Income	$40,558	$31,521	$34,086	$27,500

Source: U.S. Census Bureau, 2000a

Although the number of low income individuals in the census tract containing the NAEP property is 3.9 percent higher than the number of low-income individuals in the county, the areas surrounding the Proposed Action are not populated. The NAEP property is a designated commercial – industrial area, and no low-income populations reside nearby.

3.12 HEALTH AND SAFETY

This section describes the regional setting and regulatory considerations pertinent to occupational and public health and safety, hazardous materials, and wastes. Existing conditions and potential hazards associated with water quality, air quality, noise, traffic and transportation, and geologic conditions are discussed in their respective resource sections in this chapter.

3.12.1 Regional Setting

The Proposed Action is within the I-40 Industrial Corridor adjacent to the existing Griffith Energy facilities. Other industrial facilities in the vicinity of the Proposed Action include the existing Praxair facility located about 2 miles south. The Proposed Action is located near existing transmission lines and utilities, I-40, the mainline of the BNSF Railway, and three transcontinental natural gas pipeline corridors.

The NAEP property was historically undeveloped land. A Phase I Site Assessment was previously performed for the 160-acre original Griffith Energy property. Based on the results of the Phase I Site Assessment, no hazardous wastes or contamination were identified at the project property (Griffith, 1998a).

3.12.2 Regulatory Considerations

This section summarizes the laws, general policies, and regulations that are pertinent to the Proposed Action. Regulations pertaining to occupational and public health and safety, hazardous materials, and wastes are addressed.

3.12.2.1 Occupational Health and Safety

Occupational health and safety regulations are designed to protect employees. Occupational Safety and Health Administration (OSHA) regulations pertinent to the Proposed Action include 29 CFR 1910 (general industry standards) and 29 CFR 1926 (construction industry standards). In 1972, Arizona adopted OSHA's standards. The Arizona Division of Safety and Health (ADOSH) have an approved plan (29 CFR 1910) with the U.S. Department of Labor to retain jurisdiction over most occupational safety and health issues within Arizona.

3.12.2.2 Hazardous Materials and Wastes

The existing Federal statutes enacted to minimize risks to public health associated with hazardous materials and wastes include the RCRA, the Superfund Amendments and Reauthorization Act of 1986 (SARA), which amended the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or "Superfund") and the Federal Clean Air, Clean Water, and Safe Drinking Water Acts (CAA, CWA, and SDWA). Federal hazardous waste regulations are located in Title 4 of the CFR, parts 260 to 279, which are incorporated by AAC R-18-8-260 to 280. State regulations are located in Arizona Revised Statutes 49-901 through 49-944. Additional Federal and state regulations may apply.

Under CERCLA, listed hazardous substances are defined as the elements, chemical compounds, and hazardous wastes that appear in table 302.4, 40 CFR part 302, Designation, Reportable Quantities, and Notification. The reportable quantity for each listed hazardous substance is also provided in table 302.4. Spills or releases of reportable quantities that occur beyond the boundary of the facility must be reported to EPA and local agencies as required by section 101(14) of CERCLA.

Transportation of hazardous materials is addressed in Federal regulations (Title 49 CFR parts 171–180). Under Title 40 CFR parts 355, 370, and 372, facilities and operations that store significant amounts of chemicals must notify certain government agencies (including the EPA and state and local emergency response agencies. Additional agencies, such as the Coast Guard or U.S. Department of Transportation, must be notified in certain circumstances). The threshold volume (reportable quantity) for most chemicals is 10,000 pounds.

For facilities with an aboveground storage capacity of more than 1,320 gallons of oil or petroleum products, the Federal regulations (Title 40 CFR part 112) require an SPCC Plan. SPCC Plans establish procedures for the storage, handling, and response to spills of hazardous materials and would specifically address each chemical or hazardous material on site. The goal of the SPCC Plan is to prevent spills from leaving the site or reaching waterways including dry washes. All applicable reporting requirements mandated under SARA Title III must be met. All hazardous materials must be stored in structures that meet the requirements of Uniform Fire Code, Article 80. In addition, secondary containment adequate to hold the capacity of the largest

single container with sufficient freeboard for precipitation must be provided. On-site spill and fire response procedures require that a Hazardous Materials Inventory Statement and Management Plan is generally developed and submitted to responding fire departments.

RCRA regulates the generation, transport, and disposal of hazardous waste under the jurisdiction of EPA. In addition, RCRA sets forth a management framework for non-hazardous wastes.

3.13 INTENTIONAL DESTRUCTIVE ACTS

Intentional destructive acts, that is, acts of sabotage, terrorism, vandalism, and theft, sometimes occur at power utility facilities. Vandalism and thefts are most common, and recent increases in the prices of metal and other materials have accelerated thefts and destruction of Federal, state, and local utility property.

The Proposed Action is made up of many components. The proposed power plant would be fenced to restrict access to authorized workers. Security cameras and other specialized equipment would be in place to safeguard the area.

Overhead transmission conductors and the structures that carry them interconnecting the Griffith Switchyard to the proposed power plant are mostly within fenced areas. The conductors use the air as insulation. The structures and tension between conductors ensure that they are high enough above the ground to meet safety standards. Structures are constructed on footings in the ground and are difficult to dislodge.

While the likelihood for sabotage or terrorist acts on the Proposed Action is difficult to predict given the characteristics of the project, it is unlikely that such acts would occur. Even if such an act did occur, it would not have a significant impact on the transmission system or electrical service because the Proposed Action would not be an integral part of Western's main transmission system, and any impacts from sabotage or terrorist acts likely could be quickly isolated. In addition, the DOE, public and private utilities, and energy resource developers include the security measures mentioned above and others to help prevent such acts and to respond quickly if human or natural disasters occur.

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4.0 ENVIRONMENTAL CONSEQUENCES

This chapter evaluates the potential environmental consequences, or impacts, on the environment as a result of constructing and operating the Proposed Action. Chapter 3 described the environment that could be affected by construction and operation of the Proposed Action. All resources described in chapter 3 have the same section numbers in chapter 4 (e.g., 3.2: Water Resources, 4.2: Water Resources) to aid the reader.

Direct and indirect effects of the Proposed Action and No Action Alternative are identified for each resource area. Direct effects are "caused by the action and occur at the same time and place." Indirect effects are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." Indirect effects may include growth inducement and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8, CEQ Terminology and Index).

Mitigation identified early in the planning process is embedded as part of the Proposed Action and included in the description of the Proposed Action. Commitment to this mitigation occurred prior to the evaluation of environmental impacts; therefore, the impact levels identified integrate the effects of the committed mitigation. Additional mitigation may be proposed if the impacts identified from the proposal are found to still be significant. Additional mitigation measures, if any, are described for each affected resource area. The additional mitigation, when properly implemented, would further reduce, minimize, or eliminate impacts from construction and operation of the Proposed Action. Residual impacts after applying this additional mitigation are identified and the level of impact is reassessed.

Issues are concerns raised during scoping. Significance criteria are criteria applicable to the proposed action, which if met would result in a significant impact and cause an EIS to be prepared.

4.1 GEOLOGY AND SOILS

This section describes the potential effects to existing geologic and soil environment for both the Proposed Action and the No Action Alternative.

Issues

- Impacts to important geological features
- Loss of availability of a known mineral resources (e.g., sand and gravel) that would be of value to the region
- Indirect impacts, including property damages or human safety risks, associated with strong seismic ground-shaking or liquefaction
- Soil erosion and subsequent loss or mixing of soils

Significance Criteria

A significant impact on geology and mineral resources would result if the following were to occur from construction or operation of the Proposed Action:

- Soil loss or accelerated erosion due to disturbances that result in the formation of rills and/or gullies, or that result in sediment deposition in downgradient lands
- Structures fail or create hazards to adjacent property due to slope instability, effects of an earthquake, or adverse soil conditions (such as compressible, expansive, or corrosive soils)

4.1.1 Geology and Seismicity

4.1.1.1 Proposed Action

Construction of the proposed power plant would have little impact on the gently sloping topography located at the NAEP property.

Sand and gravel are the only known mineral resources present in the vicinity of the Proposed Action. The 40-acre NAEP property itself would no longer be available for mining of sand and gravel resources. However, this area represents a negligible percentage of the total sand and gravel resource within the Sacramento Valley.

It is estimated that the Proposed Action would consume 4,375,000 MMBtu of gas per year, based on an expected 2,500 annual operating hours for each unit. Natural gas would be sourced primarily from the San Juan and Permian supply basins in the Four Corners region and west Texas. Alternative supply sources would be Rocky Mountain reserves or liquefied natural gas (LNG). Natural gas from the San Juan and Permian basins would be transported to the proposed power plant through the existing TransWestern, El Paso, or Questar interstate pipelines to the UES distribution system that transports gas to the existing Griffith Energy.

Alternative gas supplies that were considered for the Proposed Action include gas from the Rocky Mountain region or LNG supplies delivered to the west coast. Gas from the Rocky Mountain region would be transported to the region on the Kern River pipeline. If LNG supplies would be used, they would be transported via the Baja Norte (from Baja, Mexico to United States/Mexican border) and North Baja pipeline west of Yuma, Arizona to the El Paso Natural Gas Pipeline at Erhenberg, Arizona. Neither of these supply options is currently available to be used by the proposed power plant.

Proved dry natural gas reserves in Texas were estimated at 56,507 billion cubic feet (bcf) as of December 31, 2005; proved reserves for the United States were 204,385 bcf as of the same date (Energy Information Administration 2005). Thus, annual consumption of dry natural gas by the Proposed Action would amount to 0.015 percent of the proved Texas reserves and 0.004 percent of the proved U.S. reserves. Impacts of the consumption of this natural gas on total proved reserves would be very small in comparison with the benefits of the power generated.

Although seismic risk in the vicinity of the proposed power plant is moderate, historically no large earthquakes have occurred close enough to the site to cause significant damage (USGS, 2006a, b). The thick alluvial deposits at the site should prove relatively stable during a small to moderate seismic event. The proposed power plant design would take local seismic risk into consideration to mitigate any potential damage. The potential for impacts from mass wasting is low because of the area's gentle slopes and location away from large drainages, which could be susceptible to flash floods or mud flows.

The Proposed Action would not impact important geological features and would result in minimal loss of mineral resources. Structure failures caused by earth movement are not anticipated because of the stable soils and gentle slopes.

4.1.1.2 No Action Alternative

Under the No Action Alternative, the proposed power plant would not be built; consequently, no associated new environmental consequences relative to geology or geologic hazards would occur.

4.1.2 Soils

A significant impact on soils would result if any of the following were to occur from construction or operation of the Proposed Action:

- Severe erosion due to disturbance of areas of steep slopes (greater than 20 percent)
- Compaction or mixing of soils that would alter revegetative growth
- Loss or alternation of soils that uniquely support threatened or endangered plant species, or contamination of soils that support an existing sensitive ecosystem

4.1.2.1 Proposed Action

The susceptibility of soil to erosion from wind or water varies and depends on soil texture and structure characteristics, topography, surface roughness, amount of vegetative cover, and climate. Water erosion occurs primarily on loose soils on moderate to steep slopes, whereas wind-induced erosion often occurs on dry, sandy soils where vegetation cover is sparse and difficult to maintain.

Construction activities would affect susceptibility of soil to erosion as well as productivity of soil. Increase in soil erosion would result from removal of the protective cover of vegetation, rendering the disturbed soils more susceptible to water erosion during heavy rainfall events. Wind erosion would also increase on areas disturbed during construction.

Clearing and grading activities may subject the NAEP property to erosion because of the removal of protective vegetation, disturbance of shallow soils on steeper slopes, and/or creation of graded cut-and-fill areas. Implementation of erosion control measures during construction would minimize effects of soil disturbance on soil productivity.

A loss of soil productivity would result from mixing the topsoil and subsoil layers during construction. Compaction of soils by construction equipment would inhibit natural revegetation. The potential for soil contamination from hazardous materials and petroleum products would increase during both construction and subsequent operation of the Proposed Action.

The soils that occur on the NAEP property have moderate to low shrink-swell potential. This characteristic can also be accommodated through appropriate engineering design, if necessary.

Although most site soils are classified as not highly susceptible to water and wind erosion, it could take several years to reestablish a protective cover of vegetation on disturbed soils. Low rainfall in the area, combined with the low productivity and the excessive gravel content of these soils, would make reclamation difficult without use of soil amendments and intensive management. Until vegetation is reestablished, erosion control measures, such as mulching, silt fences, and staked hay bales, would be used to substantially reduce water erosion problems.

The Proposed Action would not result in severe erosion or damage to soils that support threatened or endangered species.

4.1.2.2 No Action Alternative

Under the No Action Alternative, no new potential impacts on soil resources would result from construction of the proposed power plant. Soil erosion at the NAEP property would continue at current rates under the current management activities. Soil loss or accelerated erosion due to construction disturbances and the potential formation of rills and/or gullies, or that result in sediment deposition in downgradient lands, would not occur as a result of the Proposed Action.

4.2 WATER RESOURCES

This section describes the potential effects to water resources within the vicinity of the Proposed Action.

Issues

- Discharges of contaminants or significant quantities of sediment into waters or watercourses
- Substantial depletions of surface or groundwater resources
- Substantial alterations in the normal flow of a water body
- Substantial alterations in normal drainage patterns and runoff
- Placement of structures within a 100-year flood hazard area that would impede or redirect flood flows
- Violation of any local, state, or Federal groundwater use regulations

Significance Criteria

A significant impact on surface water would result if any of the following were to occur from construction or operation of the Proposed Action:

- Contamination of surface water from erosion, storm water runoff, or wastewater discharge that would result in a violation of Federal and/or state water quality standards
- Alteration of the existing drainage pattern of the site or area that would result in off-site erosion or siltation, resulting in adverse effects to adjacent properties
- Surface water impacts that would violate section 404 of the CWA or other applicable surface water regulations including state-established standards for designated uses

4.2.1 Surface Water

4.2.1.1 Proposed Action

Surface water would not be used to meet the proposed power plant's water supply needs. The Proposed Action would not be constructed within any designated 100-year floodplains. Construction and operation of the Proposed Action would not change drainage patterns.

The construction of two underground pipelines would result in a temporary impact to two of the washes determined to be waters of the U.S. Construction would occur at two locations within each wash for a total impact of 240 square feet. Once the pipelines are installed, all areas within the washes would be returned to their original grade as much as possible. Approximately 50 feet of the beginning of the third wash determined to be waters of the U.S. is located within the UES gas meter station expansion area. Construction within the expansion area would permanently impact 100 square feet of the wash. The wash within the temporary construction area would be avoided; therefore, no impacts to waters of the U.S. would occur at this location. No other construction activities have been identified that would impact waters of the U.S. The total impact to waters of the U.S. from construction and operation of the Proposed Action includes 240 square feet (0.006 acre) temporarily impacted and 100 square feet (0.002 acre) permanently impacted. Work within these washes would not change drainage patterns.

The USACE regulates the placement of dredge or fill material into jurisdictional waters of the U.S. under section 404 of the CWA. The USACE concurred with the determination that the proposed work impacting waters of the U.S. meets the requirements of Nationwide Permit (NWP) 12. NWP 12 is conditionally certified for water quality by the ADEQ under section 401 of the CWA.

All stormwater and wastewater would be retained on site or removed for disposal to a licensed facility. Only the wastewater generated from the CTG compressor washing would be collected in an underground tank before it is trucked off-site for disposal at a licensed facility.

On-site and off-site stormwater runoff would be routed to the stormwater retention basin by means of swales, ditches, berms, and/or sheet flow. However, where space restriction precludes

the use of open ditches and channels, a series of pipes and inlets would be used. Culverts would be used to convey stormwater under on-site traffic areas.

The storage and use of fuel, lubricants, and other fluids during the construction and operation phase would be managed so spills or leaks of hazardous fluids would be minimized or avoided by restricting the location of refueling activities away from washes and by requiring immediate cleanup of spills and leaks of hazardous materials. In addition, this would be addressed in a site-specific spill plan developed for the Proposed Action.

Wastewater generated by the proposed power plant would be sent to the Griffith Energy wastewater treatment system. Eighty percent of the water would be recovered and sent to the Griffith Energy cooling tower. The remaining 20 percent would be directed to the existing Griffith Energy 25-acre brine disposal pond, which is lined with a virtually impermeable geosynthetic liner. The pond is designed with adequate storage to contain the solids that remain after evaporation. There are no plans to remove material from the pond, reducing the potential for a breach of the liner. The existing Griffith Energy brine disposal pond would require an amended Aquifer Protection Permit (APP) from the ADEQ to acknowledge the receipt of wastewater from the NAEP. The APP would still require monitoring at downgradient existing monitoring wells to ensure that there would be no migration of poor quality waters from the existing Griffith Energy brine disposal pond.

The Proposed Action would not contaminate surface water, and no Federal and/or state water quality standards would be violated. The existing drainage pattern would not be altered or cause off-site erosion or siltation or adverse effects to adjacent properties. Impacts to the ephemeral washes would not violate sections 401 and 404 of the CWA.

4.2.1.2 No Action Alternative

Under the No Action Alternative, the proposed power plant would not be built; consequently, no new environmental consequences relative to surface water would occur. No construction would occur within any of the washes. There would be no contamination of surface water, no alteration of existing drainage patterns, and no violation of sections 401 and 404 of the CWA.

4.2.2 Groundwater

A significant impact on groundwater would result if any the following were to occur from construction or operation of the Proposed Action:

- Groundwater quality degradation that causes groundwater quality to exceed state or Federal standards
- Groundwater depletion or interference with groundwater recharge that adversely affects existing or proposed uses of the groundwater aquifer
- Groundwater withdrawal that results in ground subsidence

4.2.2.1 Proposed Action

Impacts from Groundwater Withdrawals

Water for the Proposed Action would be obtained from Sacramento Valley aquifer. The pumping of groundwater and the delivery to the Proposed Action are described in section 2.1.7.2. The estimated total raw water requirement for the Proposed Action is 160 afy (at the expected 2,500 operating hours) and 268 afy at the theoretical worst-case operating profile of 5,000 operating hours per year.

Several studies have modeled groundwater withdrawal effects on the Sacramento Valley Aquifer. In a 1998 Report, Manera analyzed the potential impacts on the Sacramento Valley Aquifer using the "probable" and the "worst-case" water demand scenarios from construction and operation of Griffith Energy. Prior to the construction of Griffith Energy, the expected probable annual water requirement for Griffith Energy was 3,060 afy. The estimated maximum annual water requirement for Griffith Energy was 5,323 afy (or 3,300 gpm for 8760 hours per year). Both the probable and the worst case were evaluated for impacts, and both quantities were shown to not impact the aquifer or other users (Manera, 1998).

Due to the electric power market conditions between 2001 and 2006, the annual operating hours and actual water demand for the Griffith Energy resulted in annual pumping volumes that were considerably less than the estimated scenarios (SGC, 2007).

An additional study by Manera (2006) evaluated the estimated current water use and potential of the Sacramento Valley Aquifer to meet Griffith Energy's demand. Even though this report assumes much lower water use volumes for Griffith Energy than has been contracted for and previously assessed, this study also concluded that the Sacramento Valley Aquifer is capable of yielding the needed volumes for Griffith Energy, as well as other applicants and water rights holders (Manera, 2006).

The study by SGC (2007) evaluated pumping impacts of the Proposed Action on Sacramento Valley Aquifer. ADWR approved aquifer parameters and the computer program THEWELLS were utilized to simulate impacts from pumping at "worst-case" rate of 268 afy. More detailed description of analysis assumptions and conclusions is provided in the SGC 2007 report.

The study (SGC, 2007) projected drawdown caused by the Proposed Action's worst-case scenario at 15 feet after 40 years of continuous pumping. Based on Manera's (1998) study, Griffith Energy's withdrawals over 40 years would result in drawdown of 110 feet for the "worst-case" and 70 feet for the "probable" pumping volume. However, the actual annual pumping volumes and consequent drawdowns have been less than projected. Consequently, combining the projected 15 feet of drawdown from the Proposed Action's "worst-case" scenario with actual drawdown likely results in total impact that is still less than Manera's (1998) previously projected impacts of 110 feet (SGC, 2007). No additional impact on the Sacramento Valley aquifer would be realized from the Proposed Action.

SGC (2007) also evaluated cumulative aquifer impacts at the County Well Field using "worst-case" annual pumping for the Proposed Action (40 years), Griffith Energy (40 years), the Golden Valley 5800 (100 years), and the Golden Valley Irrigation District (GVID) projects (100 years),

as well as accounting for the regional decline trend. Based on their analysis, the projected cumulative aquifer drawdown was 395 feet. This projected drawdown is less than the 508 feet that comprises the saturated thickness' recoverable volume (66 percent of 770 feet). Thus, even after considering the projected "worst-case" demand of all other major groundwater pumping, the aquifer still has additional pumping capacity at the County Well Field (SGC, 2007).

Additionally, ADWR (2007) assessed impacts to water resources from NAEP pumping with respect to overall impacts on water supplies in Mohave County and impacts to existing and planned developments in Mohave County. ADWR well impact analysis of NAEP pumpage predicted maximum drawdown of 15 feet after 40 years of pumping at the maximum projected withdrawal rate of 270 afy. A drawdown of 4 feet would be expected to occur at approximately 0.75 mile, and drawdown of 1 foot would be expected at approximately 6.7 miles from the pumping well (ADWR, 2007). Details of this analysis are attached in **appendix A**.

Results of the ADWR well impact analysis indicate that the existing Mohave County well field, which supplies the county industrial park, and the Golden Valley development supply wells would be most affected by the withdrawals for NAEP. However, ADWR concludes that the drawdowns would be small enough and will probably have insignificant impacts on water supplies for these developments (ADWR, 2007).

Based on the comparison of the expected annual volume of water used by the NAEP to the estimated annual recharge for the Sacramento Valley Groundwater basin, ADWR concluded that NAEP may potentially have a small impact on the annual water budget for the basin; however, the expected NAEP water use probably falls within the range of uncertainty of the ADWR recharge estimate (ADWR, 2007).

The estimated total water use over the life expectancy of the NAEP represents less than 1 percent of estimated groundwater in storage in the basin and therefore indicates that any impacts to overall water supplies in the basin will be insignificant (ADWR, 2007). The ADWR impact analysis report is attached in **appendix A**.

Impacts to Groundwater Quality

The storage and use of fuel, lubricants, and other fluids during the construction and operation phase would be managed to minimize or avoid spills or leaks of hazardous fluids by restricting the locations of refueling activities and by requiring immediate cleanup of spills and leaks of hazardous materials. In addition, this would be addressed in a site-specific spill plan developed for the Proposed Action. The plan would identify any hazardous materials that would be used, precautions to prevent spills, and employee awareness training.

Oil and diesel fuel would be stored in clearly marked tanks on-site which would be provided with secondary containment structures. Construction equipment would be maintained regularly, and the source of any leaks would be identified and repaired. Any soil contaminated by fuel or oil spills would be removed and disposed by a contractor to an approved disposal site. Lubricating oils, acids for equipment cleaning, and concrete curing compounds are potentially hazardous wastes which may be associated with construction activities. These would be placed in containers within secondary containment structures on site and disposed of at a licensed

treatment and/or disposal facility in accordance with local or state regulations and in compliance with manufacturers' recommendations. Paint containers would be tightly sealed to prevent leaks or spills. Excess paint would not be discharged to the stormwater system, but would be disposed of consistent with manufacturers' recommendations and according to applicable governmental regulations.

The process wastewater disposal from the proposed power plant would be integrated with the existing Griffith Energy wastewater system.

Subsidence Impacts

As a condition of the original permit for Griffith Energy, subsidence monitoring has been conducted at the location of the wellfield in the Sacramento Valley. This monitoring has shown that no subsidence has taken place as a result of pumping water from this location. In addition, because of the local geology in this area, no future subsidence is expected to occur due to implementation of the Proposed Action.

Summary of Impacts to Groundwater

The Proposed Acton would not degrade groundwater quality. The groundwater withdrawal rates from the Proposed Action, including the worst-case scenario, would not affect existing or proposed future uses of the Sacramento Valley Aquifer. Groundwater withdrawal would not cause ground subsidence.

4.2.2.2 No Action Alternative

No construction would occur under the No Action Alternative. Without the proposed power plant, there would be no change to Griffith Energy's contracted groundwater supply and no new well construction. The No Action Alternative would not degrade water quality, deplete or interfere with existing or proposed future uses of the Sacramento Valley Aquifer, or cause ground subsidence.

4.3 AIR QUALITY

This section describes the impacts to air resources for both the Proposed Action and No Action Alternative.

Issues

- Significant increase of any criteria pollutant for which the Proposed Action region is in non-attainment under an applicable local, state, or Federal ambient air quality standard
- Violation of an ambient air quality standard for any criteria pollutant for which the Proposed Action region is in attainment under an applicable local, state, or Federal ambient air quality standard
- Violation of any air quality standard or air quality-related value guideline at any Federally designated Class I area

- Indirect contribution to violation of any local, state, or Federal air quality standard from increased fugitive dust emissions

Significance Criteria

A significant impact on air quality would result if any of the following were to occur as a direct result of the Proposed Action:

- Predicted concentrations of criteria air pollutants would exceed state and/or Federal ambient air quality standards
- Predicted concentrations would exceed the maximum allowable PSD increments for PM_{10}, NO_2 or SO_2
- Predicted air pollutant emissions resulting in a change in visibility that would exceed Federal Class I standards

4.3.1 Regulatory Status

While emissions from the Proposed Action would not exceed any Federal significance thresholds, ADEQ has deemed that the Proposed Action is a modification to an existing major stationary source; therefore, EPA would be reviewing the permit application and ADEQ's proposed permit to ensure that all Federal program requirements are met.

ADEQ has determined that, while the Proposed Action would be a minor source by itself, for significance purposes, the emissions generated by the existing Griffith Energy facility needs to be included in determining significance. Griffith Energy is a Class I PSD facility. As such, for permitting purposes, the proposed power plant would also be classified as a Class I facility. Because the Proposed Action emissions would not exceed the significance thresholds for major modification (18 AAC §R18-2-101.106), no additional PSD analysis would be required for this proposed power plant.

40 CFR part 60 establishes NSPS for specific emission sources. 40 CFR 60 subpart KKKK: Standards of Performance for Stationary Combustion Turbines lists affected emission sources as stationary combustion turbines with a heat input at peak load equal to or greater than 10 MMBtu/hr which commenced construction, modification, or reconstruction after February 18, 2005. Each CTG has a heat input greater than 10 MMBtu/hr, and construction of the facility has not yet commenced; therefore, this regulation would be applicable.

The facility would not emit any of the individual HAPs included in the NESHAPs rules (40 CFR61) and would not be a major source of HAPs. Therefore, the Federal MACT provisions in 40 CFR63 do not apply to the Proposed Action.

The Proposed Action would be subject to the CAA Title IV Acid Rain Program, 40 CFR 72. NAEP filed an Acid Rain Permit Application with ADEQ in conjunction with its Class I Permit Application.

4.3.2 Air Quality Impacts

The Proposed Action would be composed of four GE LM6000 PC SPRINT NxGen CTGs with inlet air chillers. The proposed power plant would be designed to produce 175 MW of net electrical output with a heat rate of 9,975 Btu/kWh HHV based on the design condition ambient temperature of 90 °F. The CTGs are capable of rapid startup, allowing the Proposed Action to respond to fluctuations in electric demand within 10 minutes. Site conditions, combustion turbine equipment, and emissions control equipment are described in chapter 2.

NAEP submitted a Class I Permit Application to ADEQ in March 2007. The application included an ambient air quality impact assessment which verified that the Proposed Action would not cause or contribute to any violations of state or Federal ambient air quality standards.

4.3.3 Proposed Action

This section describes the impacts to air resources posed by the Proposed Action. There would be temporary impacts to air resources during the construction of transmission lines, power plant, and associated facilities. State-of-the-art emission control technology would be used to reduce emissions of NO_2 and CO.

4.3.3.1 Impacts from Construction

Impacts from construction would include fugitive dust and exhaust emissions from vehicles and diesel-powered generators. At the proposed power plant and along service corridors within the vicinity, air pollutant emissions that result from the operation of vehicles during construction activities are expected to be minor and temporary. Impacts from fugitive dust would be mitigated. Re-entrained dust from vehicle travel would be minimized by applying dust suppression. Reducing speed limits would also minimize dust emissions. Fugitive dust emissions would also occur during earth-moving activities. Soil handling activities would be minimized, and dust suppression, such as watering, would be implemented. Soil stockpiles would be covered or watered. After construction, temporary construction areas would be brought back to pre-project conditions, and all unpaved ground surfaces would be covered with gravel. Impacts from fugitive dust would be short in duration and would not be expected to exceed NAAQS.

Impacts from vehicle emissions and diesel-powered generators during construction are expected to be minor and temporary. Vehicular and crankcase emissions from gasoline and diesel engines would comply with applicable mobile source emission regulations.

4.3.3.2 Impacts from Operations

The Proposed Action includes the following sources of air pollutants:

- Four GE LM6000 PC SPRINT NxGen CTGs
- One six-cell, 7,600 gpm chiller module

The combustion turbines would be powered by natural gas. Anticipated hourly emission levels for the aforementioned equipment are shown in **table 4-1**. ADEQ issued Proposed Air Quality

Permit No. 43801 for the Proposed Action on June 19, 2007. Allowable annual emission limits included in ADEQ's proposed permit are listed in **table 4-2**. The emissions data are based on manufacturer-supplied emission factors and are supplemented, where necessary, with EPA default emission factors obtained from AP-42 (EPA, 2004). The CTGs can operate year-round, generally with one unit offline at any given time. **Figure 2-2** shows the plot plan layout for the above mentioned equipment.

Table 4-1 Estimated Project Hourly Emissions

Source	Hourly Emissions (lb/hr)[1]					
	NO_x	CO	SO_x[2]	$PM_{10}/PM_{2.5}$	VOC[3]	HAPs[4]
Four Combustion Turbines	31.6	23.09	24.56	10.8	11.02	1.23
Chiller				0.16		

Notes:
1 Total emissions are based on all four LM6000 combustion gas turbines operating.
2 SO_x emissions are based on the presence of sulfur in the fuel. A nominal amount of sulfur (5 grains per 100 standard cubic feet) was assumed to be present.
3 VOC = Volatile Organic Compound
4 HAP = Hazardous Air Pollutants

Table 4-2 Allowable Project Emission Limits[1]

Source	Annual Emissions (ton/yr)[2]					
	NO_x	CO	SO_x[3]	$PM_{10}/PM_{2.5}$	VOC	HAPs
Four Combustion Turbines	39.0	90.0	36.0	14.0	36.0	1.63
Chiller[4]				0.47		
Facility Total	39.0	90.0	36.0	14.47	36.0	1.63
PSD Significance Thresholds	40	100	40	15	40	NA[3]
Title V Threshold	100	100	100	100	100	10/25

Notes:

1 Based on ADEQ Proposed Permit No. 43801, issued June 19, 2007.
2 Total emissions are based on all four LM6000 combustion gas turbines operating ~10,500 hours/year.
3 SOx emissions are based on the presence of sulfur in the fuel. Pipeline quality natural gas with a maximum total sulfur content of 20 grains per 100 standard cubic feet or less would be used.
4 Chiller would operate when ambient temperature is higher than 60 °F. Annual emissions based on 6,000 hour/yr operation.

Table 4-3 presents the estimated HAP emissions and associated Arizona de minimis emission thresholds.

Emissions from the CTGs would be controlled by a combination of water injection and SCR to reduce NO_x emissions and an oxidation catalyst to reduce CO and VOC emissions. After passing through the SCR system, the exhaust gases would exit through the attached stack. Each of the four exhaust stacks would be approximately 85 feet tall and 10 feet in diameter. The stacks would be equipped with CEMS and test connections for performance monitoring.

Table 4-3 Estimated HAP Emissions and Associated Arizona De Minimis Emission Thresholds

HAP	Emissions			Emission De Minimis Thresholds	
	lb/hr	lb/yr	ton/yr	(lb/hr)	(lb/yr)
1,3-Butadiene	0.001	1.97	0.001	N/A	0.39
Acetaldehyde	0.069	183.25	0.092	N/A	5.3
Acrolein	0.011	29.32	0.015	0.013	0.129
Benzene	0.021	54.98	0.027	N/A	1.5
Ethyl Benzene	0.055	146.6	0.073	14	6,442
Formaldehyde	0.380	1,007.90	0.504	N/A	0.9
Hexane	0.298	788.45	0.394	659	13,689
Naphthalene	0.002	5.96	0.003	N/A	0.35
POM[1]	0.004	10.08	0.005	N/A	0.013
Propylene Oxide	0.050	132.86	0.066	N/A	N/A
Toluene	0.111	595.58	0.298	109	146,766
Xylene[2]	0.001	293.21	0.147	98	644
HAPs (total)			1.625		

[1] Polycyclic Organic Matter (selected compound: Benzo(a)pyrene)
[2] Mixed isomers

4.3.3.3 Air Modeling

Ambient air impacts from the Proposed Action emissions were evaluated using approved air pollutant dispersion models.

Potential impacts on ambient air quality from the Proposed Action alone, as well as in combination with the existing Griffith Energy, were assessed using SCREEN3 and Version 3 (Release 02035) of the Industrial Source Complex – Short Term model (ISCST3), both EPA-approved air quality dispersion models.

These models are mathematical descriptions of atmospheric diffusion and dispersion, allowing a pollutant source impact to be calculated at specified locations out to distances up to 50 kilometers. While AERMOD has been adopted as the EPA guideline model (replacing ISCST3 after November 9, 2006), a full meteorological data set has not yet been established for the project area. Due to this factor, and because the proposed power plant is a minor source, ADEQ has agreed that the use of ISCST3 is acceptable for analyzing the emission effects of the Proposed Action.

The impact analysis was used to determine the maximum ground level impacts of the Proposed Action alone and combined with Griffith Energy. The results were compared with the NAAQS and AAAQG values. The goal of the modeling was to demonstrate that the NAAQS and AAAQG values would not be exceeded by the modeled potential maximum impacts from the Proposed Action and Griffith Energy.

In accordance with the air quality impact analysis guidelines developed by EPA (40 CFR part 51, Appendix W: Guideline on Air Quality Models), the ground level impact analysis includes the following assessments:

- Impacts in simple, intermediate, and complex terrain;
- Aerodynamic effects (downwash) due to nearby building(s) and structures; and
- Impacts from inversion breakup (fumigation).

Simple, intermediate, and complex terrain impacts were assessed for all meteorological conditions that would limit the amount of final plume rise because plume impaction on elevated terrain might cause high ground level concentrations, especially under stable atmospheric conditions.

4.3.3.3.1 Evaluation of Compliance with NAAQS

The maximum facility impacts calculated from each of the modeling analyses described above are summarized in **table 4-4**.

To determine the overall air quality impacts, the modeled concentrations were added to the maximum background ambient air concentrations and then compared to the applicable NAAQS.

Background ambient air quality data for the Proposed Action were provided by the ADEQ air assessment section. Ambient NO_2, SO_2, PM_{10}, $PM_{2.5}$, and CO data were collected at various monitoring stations around Mohave County and have been deemed adequate for use in evaluating impacts from the Proposed Action.

Table 4-4 Maximum Potential Impact from Refined Modeling

Pollutant	Averaging Time	Modeled Concentration (µg/m³)	
		Proposed Action	Proposed Action and Griffith Energy Combined
NO_2	Annual	0.091	8.38
SO_2	3-hour	6.4	8.28
	24-hour	0.92	2.37
	Annual	0.070	0.31
CO	1-hour	12.5	590.4
	8-hour	2.47	93.94
$PM_{10}/PM_{2.5}$	24-hour	0.74	13.9
	Annual	0.039	1.42

µg/m³ = micrograms per cubic meter

Maximum ground level impacts due to operation of the Proposed Action are shown together with the background concentrations and relevant NAAQS in **table 4-5**. Using the conservative assumptions described earlier, the results indicate that the Proposed Action would not cause or contribute to violations of any state or Federal air quality standards.

Table 4-5 Modeled Maximum Project Impacts with Griffith Energy

Pollutant	Averaging Time	Maximum Combined Facility Impact (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	NAAQS (µg/m³)	Percent of NAAQS	
						Modeled Combined Facility Impact	Total Impact
NO_2	Annual	8	4	12	100	8%	12%
SO_2	3-hour	8	246	254	1300	1%	20%
	24-hour	2	52	54	365	1%	15%
	Annual	0.3	6	6	80	<1%	8%
CO	1-hour	590	582	1,172	40,000	2%	3%
	8-hour	94	582	676	10,000	1%	7%
PM_{10}	24-hour	14	46	60	150	9%	40%
	Annual	1	14	15	50	3%	31%

µg/m³ = micrograms per cubic meter

4.3.3.3.2 Evaluation of Compliance with AAAQG Values

The procedure described above for determining criteria pollutant impacts was also followed in determining the ambient impacts of noncriteria pollutants for demonstrating compliance with the AAAQG. These guidelines define allowable 1-hour, 24-hour, and annual average concentrations for noncriteria pollutants to protect public health. **Table 4-6** summarizes the results of the analysis for the Proposed Action. The values are presented in scientific notation (e.g., 1.00E+02 = 1.00 X 10^2 = 100).

Table 4-6 Summary of AAQG Modeling Results for Project

AAAQG Pollutant	1-Hour Impact (µg/m³)	1-Hour AAAQG (µg/m³)	24-Hour Impact (µg/m³)	24-Hour AAAQG (µg/m³)	Annual Impact (µg/m³)	Annual AAAQG (µg/m³)
1,3-Butadiene	3.88E-04	7.20E+00	2.63E-05	1.90E+00	2.09E-06	6.70E-02
Acetaldehyde	3.71E-02	2.30E+03	2.51E-03	1.40E+03	2.00E-04	5.00E-01
Acrolein	5.94E-03	6.70E+00	4.00E-04	2.00E+00	--	--
Ammonia			8.42E-01	1.40E+02		
Benzene	1.11E-02	6.30E+02	7.50E-04	5.10E+01	6.00E-05	1.40E-01
Ethylbenzene	2.97E-02	4.50E+03	2.01E-03	3.50E+03	--	--
Formaldehyde	2.04E-01	2.00E+01	1.38E-02	1.20E+01	1.09E-03	8.00E-02
Hexane	1.60E-01	5.30E+03	1.08E-02	1.40E+03		
Napthalene	1.21E-03	6.30E+02	8.00E-05	4.00E+02	--	--
Propylene Oxide	2.69E-02	1.50E+03	1.82E-03	4.00E+02	1.40E-04	2.00E+00
Toluene	1.21E-01	4.70E+03	8.15E-03	3.00E+03	--	--
Xylenes	5.94E-02	5.50E+03	4.01E-03	3.50E+03	--	--

µg/m³ = micrograms per cubic meter

The combined emissions from the Proposed Action and Griffith Energy were also evaluated for compliance with the AAAOG. The analysis shows that the modeled ambient concentrations of each of the noncriteria pollutants emitted from the combined facilities would be below all AAAQG standards.

Table 4-7 shows that the modeled ambient concentrations of each of the noncriteria pollutants emitted from the combined facilities would be below all AAAQG standards.

Table 4-7 Summary AAAOG Combined Modeling Results for NAEP and Griffith

AAAQG Pollutant	1-Hour Impact (µg/m³)	1-Hour AAAQG (µg/m³)	24-Hour Impact (µg/m³)	24-Hour AAAQG (µg/m³)	Annual Impact (µg/m³)	Annual AAAQG (µg/m³)
1,3-Butadiene	1.78E-03	7.20E+00	2.90E-04	1.90E+00	2.00E-05	6.70E-02
Acetaldehyde	1.67E-01	2.30E+03	2.76E-02	1.40E+03	1.99E-03	5.00E-01
Acrolein	2.76E-02	6.70E+00	4.63E-03	2.00E+00	--	--
Ammonia			1.69E+00	1.40E+02		
Benzene	6.57E-02	6.30E+02	1.16E-02	5.10E+01	1.04E-03	1.40E-01
Ethylbenzene	1.51E-01	4.50E+03	2.58E-02	3.50E+03	--	--
Formaldehyde	9.46E-01	2.00E+01	1.57E-01	1.20E+01	1.12E-02	8.00E-02
Hexane	7.26E-01	5.30E+03	1.20E-01	1.40E+03		
Napthalene	8.15E-03	6.30E+02	1.46E-03	4.00E+02	--	--
Propylene Oxide	4.45E+00	1.50E+03	2.37E-01	4.00E+02	3.77E-02	2.00E+00
Toluene	6.12E-01	4.70E+03	1.04E-01	3.00E+03	--	--
Xylenes	3.20E-01	5.50E+03	5.52E-02	3.50E+03	--	--

µg/m³ = micrograms per cubic meter

The Proposed Action would comply with annual emission limits prescribed for a minor air emission source and would be subject to the annual emission limits that would be at or below the following levels:

- NO_x 40 tons per year
- CO 100 tons per year
- VOC 40 tons per year
- SO_x 40 tons per year
- PM_{10} 15 tons per year

Therefore, impacts to air quality would be less than the applicable air quality standards for the Proposed Action.

4.3.4 No Action Alternative

Under the No Action Alternative, the proposed power plant would not be built, and impacts to air resources in the area would remain the same as those under existing conditions. This would not increase the concentrations of criteria air pollutants and encroach upon state and/or Federal ambient air quality standards or Federal Class I visibility standards.

4.4 BIOLOGICAL RESOURCES

The biological resources within the ROI of the Proposed Action include vegetation species; wildlife species; and threatened, endangered, and sensitive wildlife and vegetation species. Impacts to the biological resources within the ROI of the Proposed Action were assessed taking into consideration the adjacent infrastructure and human activity, the type of construction that is to occur at the NAEP property, and the habitat types present.

Issues

- Potential effects on wildlife species
- Potential effects on vegetation
- Potential effects on threatened, endangered, and sensitive species

4.4.1 Vegetation

Significance Criteria

A significant impact on vegetation and wetlands/riparian areas would result if any of the following were to occur from construction or operation of the Proposed Action:

- Loss to any population of sensitive plants that would jeopardize the continued existence of that population
- Loss to any population of plants that would result in a species being listed or proposed for listing as endangered or threatened
- Introduction or increase in spread of noxious weeds
- Loss of a Federal or state protected wetland(s), as defined by section 404 of the CWA or other applicable regulations
- Indirect loss of wetlands or riparian areas caused by degradation of water quality, diversion of water sources, or erosion and sedimentation resulting from altered drainage patterns

4.4.1.1 Proposed Action

Most impacts to vegetation would be minimal due to the existing infrastructure and human activity already in place adjacent to the Proposed Action at the Griffith Power Plant. In addition, there are only 8 acres of disturbance, making the impacts to vegetation in the area minimal. Potential impacts to vegetation would be associated with ground disturbance related to construction of the Proposed Action. Permanent vegetation loss would occur due to placement of new structures and associated with construction of facilities. An accidental take of sensitive vegetation would be minimal, and it is unlikely to jeopardize the continued existence of the population. It is also unlikely that a take of any vegetation species within the ROI would result in a species being listed or proposed for listing as threatened or endangered. It is possible that the Proposed Action would facilitate the spread of a noxious weed species in the ROI if noxious weeds occur in the site, especially in the disturbed area in the northwest corner because the area

is already disturbed by the existing adjacent infrastructure, and noxious weeds thrive in disturbed areas. However, no populations of noxious weed species have been identified on the site.

4.4.1.2 No Action Alternative

The no action alternative would not change existing conditions at the NAEP property and, therefore, would have no impact on vegetation species in the area.

4.4.1.3 Wetlands and Riparian

No wetlands or riparian vegetation are present in the ROI (Avant, 2007). Therefore, there would be no loss of a Federal or state protected wetland under the Proposed Action and the No Action Alternative.

4.4.2 Wildlife

Significance Criteria

Impacts to wildlife would occur when habitats or individuals are disturbed or lost during the Proposed Action construction or operation. The significance of the impact depends in part on the sensitivity of the population. A significant impact on wildlife would result if any of the following were to occur from construction or operation of the Proposed Action:

- Loss to any population of sensitive wildlife that would jeopardize the continued existence of that population
- Loss to any population of animals that would result in the species being listed or proposed for listing as endangered or threatened
- Introduction of constituents into a water body (such as brine disposal ponds) in concentrations that could cause adverse effects on wildlife
- Interference with the movement of any native, resident, or migratory wildlife species for more than two reproductive seasons
- Local loss of wildlife habitat (compared to total available resources within the area) or habitat productivity
- Interference with nesting or breeding periods of any species
- Reduction in the range of occurrence of any wildlife species

4.4.2.1 Proposed Action

Potential impacts to wildlife associated with construction of the Proposed Action are expected to be minimal because power generation facilities and human activity are already in place adjacent to the NAEP property. Construction activities associated within the Proposed Action would temporarily disturb birds, reptiles, and big game mammals utilizing these habitats. The short-term displacement of wildlife would be related to the increased activity and noise associated with construction. This would especially impact any bird species that may be migrating through the area. In addition, direct mortality could occur for any small mammals and reptiles that may use the area for habitat.

Impact to wildlife would be less than significant because the NAEP project would only disturb approximately 8 acres, resulting in minimal long-term habitat loss for wildlife. The habitat encountered within the NAEP property is widely distributed in the region; therefore, loss of this habitat would neither affect the viability of any species, nor interfere with the movement of any species for more than two reproductive seasons. Loss to sensitive wildlife will be unlikely, would not jeopardize a population, and would not result in the listing or the proposed listing of a species as endangered or threatened. It is not anticipated that there will be an introduction of constituents into any water body. It is also unlikely that the proposed action will interfere with nesting or breeding periods or reduce the range of any species.

4.4.2.2 No Action Alternative

The No Action Alternative would not change existing conditions at NAEP property and, therefore, would have no impact on wildlife species.

4.4.3 Special Status Plant and Wildlife Species

Significance Criteria

A significant impact on endangered or threatened species or their critical habitats would result if any of the following were to occur from construction or operation of the Proposed Action:

- Jeopardizing the continued existence of a Federally listed species
- Loss of individuals of a population of species that would result in lowering a species status (e.g., from threatened to endangered)
- Adversely modifying Critical Habitat to the degree that it would no longer support the species for which it was designated
- Modification of habitat used by special status species for resting, nesting, feeding, or escape cover

4.4.3.1 Proposed Action

The construction and operation of the Proposed Action is not expected to have any adverse impacts on Federal and/or state listed wildlife and plant species of special concern. Based on site-specific surveys that were conducted for Griffith Energy (Griffith, 1998b), several species may occur in the ROI. No surveys were conducted for these species in the ROI for the Proposed Action. However, the surveys did not identify the presence of any Federal- and/or state-listed wildlife or plant species of special concern. Therefore, it is unlikely that any of the potential species would occur in this area. Impacts would be short-term and minimal.

Impact to endangered species and Critical Habitat areas would be less than significant because there are no known occurrences on the NAEP property or nearby areas and there are only 8 acres of disturbance associated with development of the proposed power plant.

4.4.3.2 No Action Alternative

The No Action Alternative would not change existing conditions at the NAEP property and, therefore, would have no impact on special status species in the area.

4.5 CULTURAL RESOURCES

The Proposed Action is not expected to impact cultural resources. As previously noted, reconnaissance surveys for Griffith Energy that included the Proposed Action (Ezzo and Späth, 1998) encountered no cultural resources. A recent Class III survey of the NAEP property (Jolly and Späth, 2007) also found no eligible cultural resources.

Issues

- Potential effects on any properties or sites listed in or eligible for the National Register of Historic Places
- Potential effects on any Native American Traditional Cultural Properties (TCPs) or traditional values

Evaluating cultural resources or TCPs involves two distinct subsets of concern. These subsets can overlap to a greater or lesser extent, depending on interests and perspectives of the evaluator, but for present purposes, it is simplest to retain the categories of prehistoric and historic cultural resources and TCPs.

4.5.1 Prehistoric and Historic Cultural Resources

Significance Criteria

A significant impact on cultural resources would result if any of the following were to occur from construction or operation of the Proposed Action:

- Damage to or loss of a site of archaeological, tribal, or historical value that is listed, or eligible for listing, on the National Register of Historic Places (NRHP)
- Adverse impacts to NRHP eligible properties that cannot be satisfactorily mitigated as determined through consultation with the State Historic Preservation Office, Tribes, and other interested parties

The Proposed Action is located within the Basin and Range physiographic province. Although this region has, in general, been sparsely inhabited, it has been utilized by human societies for at least 12,000 years. Evidence of human occupation is preserved in prehistoric and historic sites and in isolated cultural artifacts and features. Many classes of known prehistoric and historic resources tend to be clustered in the general vicinity of traditional trails and historic transportation corridors, and the trails and transportation corridors themselves are cultural resources.

Classes of prehistoric resources found in the region include but are not limited to rock shelters, artifact scatters (particularly lithic scatters), rock rings and cleared circles, trails, rock art, and

hearths or roasting pits. Common historic site classes include but are not limited to artifact scatters, historic roads, railroad corridors and associated facilities, mining prospects, and claim or survey cairns.

Available inventory information and more general studies of the region indicate that prehistoric and historic sites are not generally abundant in the open basin areas like the Sacramento Valley, particularly in the open flats where water and natural shelter are often limited. Dames and Moore (1996) for the nearby Kingman-Havasu Transmission Project suggested that prehistoric and historic site density could be expected to be less than four to five sites per square mile or one site every 2 to 3 miles along a linear corridor. Higher site densities can reasonably be expected in the Hualapai Mountains, where water; natural shelter; and plant, animal, and mineral resources are more abundant approximately 4 miles to the east. Dames and Moore also assumed, on the basis of available studies, that prehistoric and historic sites would be most abundant in foothill areas, on certain ancient pediments covered with desert pavement, at tool stone source areas, and along historic transportation corridors.

Within this context, cultural resources that may potentially be affected by the Proposed Action must be evaluated for eligibility for listing on the NRHP, and those which are eligible or currently listed are deemed "historic properties." Section 106 processing, or parallel processing under a separate programmatic agreement as permitted under 36 CFR part 800, then proceeds to the identification of effects on historic properties and the further determination of whether potential effects to historic properties are categorized as no effect, no adverse effect, or adverse effect. If adverse effects are identified, avoidance or treatment plans may be developed.

No historic properties have been identified that would be affected by the Proposed Action. There would be no damage to or loss of any known site of archaeological, tribal, or historical value that is listed or eligible for listing on the NRHP.

4.5.2 Traditional Cultural Properties

Significance Criteria

A significant impact on Native American religious concerns would result if any of the following were to occur from construction or operation of the Proposed Action:

- Loss or degradation of a TCP or sacred site, or if the property or site is made inaccessible for future use
- Disturbance of any human remains including those interred outside of formal cemeteries
- Unmitigated adverse effect to a TCP determined to be NRHP eligible or identified as important to tribes.

The Proposed Action is located within the traditional territories of several tribes. These tribes may include individuals who utilize the vicinity of the Proposed Action to maintain aspects of their traditional cultures. The Hualapai Tribe (1999) conducted an ethnographic study for Griffith Energy and identified some of the concerns they have in the general study area. Proper

tribal consultation and communication processes would be and are presently being undertaken to identify sensitive localities in or surrounding the Proposed Action.

One possible issue of concern is potential disturbance of undocumented human remains. Procedures for consultation with tribal groups regarding unavoidable or unanticipated disturbance of human remains and funerary objects are specified in the 1992 Native American Graves Protection and Repatriation Act and amendments to the Arizona Antiquities Act. Another issue of potential concern is disturbance to localities or natural features named in traditional stories. One of these localities in the area is Hualapai Peak, which is a distinctive named locality in the traditional stories of the Hualapai Tribe.

The Hualapai Tribe conducted a survey of the NAEP property during 2007. No TCPs or sacred sites have been identified by tribes within the NAEP property, and the Proposed Action would not impair access to any known sacred site for future use. There is no formal cemetery or any known human remains within the NAEP property. Therefore, there is no known potential to disturb any human remains. However, if human remains are encountered during the Proposed Action, all work would be halted and the tribes, State Historic Preservation Office (SHPO), and Western would be notified. The Proposed Action is located within the viewshed of the Hualapai Peak, which is of traditional importance to the Hualapai Tribe. However, the Proposed Action would not appreciably alter the character of that viewshed.

4.5.3 Proposed Action

A previous archaeological survey of the NAEP property (Ezzo and Späth, 1998) observed no surface or subsurface prehistoric or historic resources. The recent Class III survey of the NAEP property (Jolly and Späth, 2007) also found no significant prehistoric or historic resources. Accordingly, no impacts to cultural properties, including TCPs, are expected to occur from installation, operation, or maintenance of the Proposed Action.

4.5.4 No Action Alternative

The No Action Alternative would not involve development of additional facilities, and there would be no additional effect to cultural or historic properties in the area.

4.6 LAND USE AND RECREATION

This section analyzes the potential effects to existing and planned land uses, including residential uses, for each alternative. For the purposes of this discussion, "short-term" has been defined as the period during construction and shortly thereafter, and "long-term" has been defined as the life of the Proposed Action and beyond.

Issues

- Potential effects on current and planned land uses
- Potential effects on residential and recreational uses

Significance Criteria

A significant impact on land use and agricultural practices would result if any of the following were to occur from construction or operation of the Proposed Action:

- Conflict with applicable land use plans, policies, goals, or regulations
- Results in nuisance impacts attributable to incompatible land uses
- Conflict with existing or planned public utilities and services, water conveyance facilities, and/or utility rights-of-way
- Foreclosure of future land uses

4.6.1 Proposed Action

The Proposed Action would utilize an undeveloped portion of the parcel originally developed for Griffith Energy. The Proposed Action would be located on a 40-acre privately owned parcel of land within the I-40 Industrial Corridor. Within the 40-acre NAEP property, approximately 8 acres would be developed for the proposed power plant.

The planned land uses for the lands surrounding the I-40 Industrial Corridor include Rural Development, Suburban Development, and Urban Development Areas as shown o **figure 3-3**. Several areas near the Proposed Action have been platted for subdivision; however, there are currently no housing developments in the vicinity of the Proposed Action as shown on **figure 3-3**. The nearest residence is approximately 2.5 miles northwest of the NAEP property. Therefore, the Proposed Action would not be expected to impact residential areas.

The Proposed Action would be in conformance with the Mohave County Zoning Ordinance and planned land uses in the vicinity. No local land use permits, such as conditional use or special use permits, would be required by Mohave County, given the MX zoning of the NAEP property. Industrial land uses on the Proposed Action and within the I-40 Industrial Corridor would be compatible with Mohave County's previously planned land uses for development as outlined in the amended General Plan. The Proposed Action is located in the vicinity of existing industrial development, which includes the Praxair facility that manufactures specialty gases, as well as a prison. Proposed facilities for this industrial park include a Wal-Mart distribution center, Envirotech, and a Nutribiotechnologies, Inc. facility.

Within the MX zoning district, facilities between 0.25 and 1 mile of any Federal highway have a height limit of 150 feet. The Proposed Action would be within 1 mile of I-40, and the maximum height for the proposed power plant exhaust stacks would be 85 feet. Therefore, the Proposed Action would comply with the industrial performance standards for the MX zone.

The Proposed Action would be developed on approximately 8 acres of undeveloped land within the I-40 Industrial Corridor. Short-term indirect impacts to nearby residential areas may occur during construction as a result of the generation of dust and noise, the physical intrusion of the construction employees and equipment, and increased traffic volumes or delays. A temporary construction area would be utilized during the construction phase of the Proposed Action. Dust and vehicle emissions from construction activities would be limited and short-term as a result of implementation of dust control measures and duration of the project-related construction.

During the construction phase, public access on Griffith and South Apache Roads could be temporarily disrupted at some locations. These short-term impacts are not expected to be significant because they would be temporary during the 9- to 12-month construction period, and the closest residence is approximately 2.5 miles northwest of the Proposed Action.

The Proposed Action would not have any appreciable long-term adverse impacts on the surrounding land uses because of the localized nature of disturbance and because no existing residences or other sensitive land uses were identified in the immediate vicinity. The Proposed Action would be compatible with the county's zoning regulations and planned land uses for the I-40 Industrial Corridor and would comply with the industrial performance standards for the MX zone. Because the Proposed Action would be compatible with the current zoning regulations and the General Plan's planned land uses for the Proposed Action, no long-term impacts to planned land uses from the construction and operation of the Proposed Action are expected.

The Proposed Action would not have any appreciable short-term or long-term adverse impacts on the surrounding land uses because of the localized nature of disturbance and because no existing residences or other sensitive land uses were identified in the immediate vicinity. Therefore, the Proposed Action would not be expected to result in nuisance impacts to residential areas attributable to incompatible land uses.

The Proposed Action would be compatible with the county's zoning regulations, planned land uses for the I-40 Industrial Corridor, and the General Plan's planned future land uses for the land area affected by the Proposed Action; therefore, no conflicts with other existing or planned services, facilities, or rights-of-way are anticipated.

The future land uses for the properties affected by the Proposed Action are outlined in Mohave County's amended General Plan as industrial. The NAEP property is located in the vicinity of existing industrial development, which includes the existing Griffith Energy property, the Praxair facility, and a prison. Proposed facilities for this industrial park include a Wal-Mart distribution center, Envirotech, and a Nutribiotechnologies, Inc. facility. The Proposed Action would result in long-term foreclosure of the property for uses other than industrial; however, industrial land uses on the NAEP property and within the I-40 Industrial Corridor would be compatible with Mohave County's previously planned land uses for development as outlined in the amended General Plan.

The planned land uses for the lands surrounding the I-40 Industrial Corridor include Rural Development, Suburban Development, and Urban Development Areas as shown on **figure 3-4**. The Proposed Action would not preclude the planned future land uses for nearby properties.

4.6.2 No Action Alternative

The No Action Alternative would result in no new impacts to existing or planned land uses in the area. Operation of the existing industrial facilities located within the I-40 Industrial Corridor would continue and the Proposed Action would not be constructed. There would be no conflicts with existing land use policies or uses and no effect on potential future uses associated with the Proposed Action.

4.7 TRANSPORTATION

I-40 provides the primary access to the Proposed Action. Haul Road is located along the north boundary of the NAEP property and connects with I-40. The proposed power plant is also accessible from South Apache Road, which connects with I-40 via the Griffith interchange to the south. In addition, the BNSF railway line provides rail service to the existing Griffith Energy, which is adjacent to the Proposed Action.

Issues

- Employees commuting to the proposed power plant during construction
- Proposed power plant employees commuting on I-40 and arterial streets
- Suitability of existing access roads and constructed roads for access into proposed power plant

Significance Criteria

Significant impact on transportation would result if the following were to occur from construction or operation of the Proposed Action:

- Increase in number of vehicles transporting hazardous materials that would create additional danger to motorists
- Increases in traffic that exceed a level of service established by the local or state transportation management agency
- Creation of road dust and/or severe road damage at levels that create hazardous situations for motorists and pedestrians
- Cause major traffic delays on a primary transportation corridor
- Conflicts with transportation rights-of-way

4.7.1 Proposed Action

Impacts on transportation for construction of the Proposed Action would be short-term. Traffic on Apache Road would be interrupted to permit construction of a temporary equipment delivery crossing and for delivery of project facility components. Other traffic effects related to the Proposed Action would include daily commuting by construction employees and other construction-related delivery traffic.

Access to the proposed power plant would be via the Griffith interchange of I-40, which travels north-south near the Proposed Action. From the Griffith interchange, access to the proposed power plant would be west on Griffith Road, then approximately 1.7 miles north on South Apache Road, then east on Haul Road to the proposed power plant entrance. Heavy equipment delivery trucks would use a separate entrance from Haul Road into the proposed power plant. Currently, the Griffith interchange is used by Griffith Energy facilities employees, Praxair employees, and minor local traffic. The increase in usage of the Griffith interchange is not expected to exceed the design capacity for traffic levels on these roads.

All equipment and material deliveries would utilize the proposed power plant access via South Apache Road and Haul Road. Truck deliveries of equipment and materials would occur from the initial construction notice to proceed through the entire duration of the Proposed Action.

Construction of the Proposed Action would be expected to occur over a 9- to 12-month period. Activities typically take place 5 to 6 days a week. While employment levels would fluctuate each month, peak employment would occur at month 4 with as many as 162 workers. It is expected that most of these construction workers would commute to the Proposed Action via I-40, resulting in an increase in traffic during peak periods. During operations traffic increases would be minimal as a result of maintenance activities and the community of two to four permanent employees. Employee-generated traffic is not expected to cause traffic delays or diminished levels of service. Parking would be available in designated areas within the NAEP property.

Licensed vendors would be contracted for the transport of hazardous materials and wastes, including both fuels and non-fuel substances, and are evaluated in section 4.12 – Health and Safety. Over-the-road hazards associated with the transport of hazardous materials and wastes would be minimized by adherence with the applicable U.S. Department of Transportation and ADOT regulations.

Construction traffic would increase traffic levels on I-40 for the duration of construction activities; however, increases in traffic levels occurring at any one time would be expected to fall within the current capacity of the highway. Traffic congestion on highways is measured using a Level of Service (LOS) grading system. I-40 is rated with LOS A, which describes a free flow condition that corresponds to 0 to 0.20 volume/capacity ratio (Arizona Department of Transportation, 1999). Roadway segments with LOS A have substantial excess capacity. Project-related increases in traffic levels would be temporary.

Safety practices, such as use of construction cones or barriers, flag persons, lights, warning signs, and walkways, would be implemented to reduce impacts to public travel and safety as needed.

Impacts to public health and safety associated with project-related traffic are evaluated in section 4.12 – Health and Safety. Impacts to motorists and pedestrians from fugitive dust associated with vehicular traffic during construction and operation of the Proposed Action are expected to be unlikely, and therefore not significant with the implementation of mitigation included as part of the Proposed Action as described in chapter 2. Under implementation of these mitigation measures, health and safety impacts would be less than significant because there would be no anticipated hazards beyond limits set by health and safety regulatory agencies.

Existing design and safety deficiencies on I-40 are likely to be compounded by the construction vehicles, which in turn would likely elevate the potential for trucking accidents and spills along the transportation route. Maintenance of the roadway surface would reduce potential impacts.

There would be no major traffic delays or conflicts with existing transportation rights-of-way from project-related construction traffic on Haul Road, which does not access any other existing land uses in the vicinity of the Proposed Action. Construction traffic turning on to Haul Road from I-40 is not expected to cause traffic delays. If necessary, safety practices, such as use of

construction cones or barriers, flag persons, lights, warning signs, and walkways, would be implemented to reduce impacts to public travel and safety.

4.7.2 No Action Alternative

Under the No Action Alternative, there would be no increase in traffic levels on I-40 or Apache Road over existing levels. There would be no increased traffic hazards, no exceedance of established level of service, and no changes to existing traffic patterns or use associated with the Proposed Action.

4.8 VISUAL RESOURCES

Issues

- Potential effects of structures and facilities on scenic quality

Significance Criteria

The assessment of visual impacts was based on methodology described in the BLM Visual Contrast Rating Handbook (BLM Manual Handbook 8431-1) in its visual contrast rating system. Visual impacts may result from the construction, operation, and/or maintenance of the Proposed Action. The measure of potential adverse impacts on visual resources is typically the degree of perceived change that would occur in the landscape as a result of project implementation (as seen from sensitive viewpoints) and from the effects to the aesthetic values of the landscape. Visual contrast usually results from:

- Landform modifications associated with facility construction,
- Removal of vegetation required by project construction and operation, and/or
- Introduction of new structures to the landscape.

A significant impact on visual resources would result if any of the following were to occur from construction or operation of the Proposed Action:

- Degradation of the scenic quality of the landscape as viewed in the foreground and middleground distance zones from sensitive viewpoints
- Predicted air pollutant emissions causing a change in visibility that would exceed Class I standards
- Conflict with visual standards identified by a Federal land management agency
- Lighting not consistent with Mohave County lighting ordinance
- Intrusion on a viewshed from a cultural resource that is registered (or eligible for registration) with the NRHP or from a TCP identified as important to tribes
- Visual interruption that would dominate a unique viewshed or scenic view

4.8.1 Proposed Action

Impacts to the visual resources in the vicinity of the Proposed Action from the development of the proposed power plant and the ancillary facilities would occur as short-term disturbance of the landscape by construction activities and long-term addition resulting from the addition of facilities to the landscape. These effects would result from changes to the physical setting and visual quality of the landscape and how the landscape is experienced from sensitive viewpoints including travel routes, residences, and wilderness areas. Over the long-term life of the Proposed Action, the facilities would introduce new elements into the landscape that would alter the existing form, line, color, and texture of the existing landscape.

Short-term impacts to the visual character of the Proposed Action's landscape would likely occur over the construction period. Activities typically would take place five to seven days a week. There would also be traffic associated with moving equipment over public highways and local roads. These visual intrusions would be most noticeable to travelers on I-40.

Long-term impacts would result from the addition of the Proposed Action to the landscape. The Proposed Action, particularly its taller features, would constitute a moderate additive visual impact because they would be a noticeable change to a previously undeveloped landscape. The Proposed Action is on private land approximately 0.25 mile west of I-40 and would be within the viewshed of travelers on the highway, from residential areas in the valley, and in portions of wilderness. The proposed power plant would be lit during periods of darkness, creating a moderate additive visual impact, characteristic for an industrial area. Lighting would be designed to cause the least visual intrusion.

Effects to visual resources from the development of the Proposed Action facilities would result from changes to the physical setting and visual quality of the landscape and from effects on the landscape as experienced from sensitive viewpoints including travel routes, residences, and popular use areas. The Proposed Action would not significantly change the character of the existing landscape, as the associated facilities would repeat the form, line, color, scale, and texture elements of the existing Griffith Energy facilities, which characterize the existing landscape and is adjacent to the Proposed Action.

The Proposed Action facilities would provide additive forms, lines, colors, and textures to the existing industrial character of the landscape, as they would be within the viewshed of travelers on the highway. The geometric, rectangular block forms of the Proposed Action facilities would be visible from the highway but would be painted to harmonize with landscape colors and the existing plant facilities, and would result in a low to moderate contrast with the surrounding landscape.

The most visible component of the Proposed Action facilities from all viewpoints would be the exhaust stacks. Each of the four turbines would have an attached exhaust stack that would be approximately 85 feet tall and 10 feet in diameter. The four exhaust stacks would create additional columns and vertical forms that would be obvious to viewers on I-40. However, the stacks would be smaller in scale than the existing Griffith Energy exhaust stacks and cooling towers, which range in height from 90 to 150 feet. Because the stacks would repeat the existing vertical line and columnar form, but would be smaller in scale than the existing Griffith Energy stacks, they would be difficult to discern when viewed from most viewing areas, depending on

the angle of view. The Proposed Action would not be visible from existing or proposed residential developments. The Proposed Action facilities would be difficult to discern from the existing Griffith Energy facilities and the surrounding facilities as viewed from the three wilderness areas.

The proposed power plant would not contribute a steam plume from the chiller module. The time of operation for a peaking unit such as NAEP in the desert southwest would be during hot summer days. The Proposed Action would not likely be in operation when the ambient temperature is less than 75 °F, and operation at these temperatures is not likely to produce a plume. Normally, the temperature and humidity conditions suitable for plume creation would not occur any time during the year in this climate.

The Proposed Action facilities would be artificially lit as necessary to enhance the safety of personnel. Night lighting would increase the visibility of the facility to all viewpoints. The additive light, glare, or backscatter illumination visible to sensitive viewpoints would be minimized by the use of directional shielding of lights. The off-site visibility and potential glare of the lighting would be restricted by the screening structures to be placed around the facility's major equipment, specification of non-glare fixtures, and placement of lights to direct illumination into only those areas where it is needed.

The Federal Aviation Administration (FAA) requires that any permanent object that exceeds an overall height of 200 feet above ground level or exceeds any obstruction standard contained in Federal Aviation Regulation (FAR) part 77 be lighted with a flashing lighting system. Because the exhaust stacks are 85 feet tall and more than 3 nautical miles from the nearest airport (as per FAR part 77), blinking safety lights would not be required.

There would be minimal short-term adverse effects to visual resources from the construction and operation of infrastructure including gas, water, and electric interconnections. These required infrastructures would be available to the Proposed Action within the NAEP property boundary and from the adjacent Griffith Energy property.

KOPs were selected to represent viewpoints from transportation routes and nearby residential subdivisions (**figure 3-6**). **Figures 3-7** through **3-11** each depict a simulation of the Proposed Action facilities that would be visible from each KOP.

KOP 1 provides a simulated view shown on **figure 3-7** of the Proposed Action from southbound I-40 towards Haul Road, which is at the north boundary of the NAEP property. The facilities are slightly smaller in scale than the existing Griffith Energy facilities, so that the existing plant is the dominant feature. In addition, the exhaust stacks of the existing plant are skylined against the Black Mountains (in the wilderness), drawing the attention of most viewers from the proposed facilities, which are shorter and are not skylined. The proposed facilities would provide a weak contrast with existing industrial landscape elements. The existing landscape character would not change.

KOP 2 provides a simulated view shown on of the Proposed Action from Haul Road and South Apache Road about 0.2 mile from the northwest corner of the NAEP property. The facilities are in close proximity to the viewpoint (**figure 3-8**), and would be a dominant feature in the landscape, obscuring the backdrop of the Hualapai Mountains to the southeast. The proposed

facilities would provide a weak contrast with existing industrial landscape elements, and the overall industrial landscape character would not change. The existing landscape character would not change.

KOP 3 provides a simulated view shown on **figure 3-9** of the Proposed Action from South Apache Road about 0.85 mile from the southwest corner of the NAEP property. The view faces northeast, providing a view of the facilities to the north of the existing Griffith Energy facilities. The facilities are slightly smaller in scale than the existing Griffith Energy facilities, which would be the dominant industrial feature in the landscape. In addition, the exhaust stacks of the existing Griffith Energy facilities are skylined against the Hualapai Mountains, which would also draw the attention of most viewers from the facilities, as the Proposed Action would not include any facilities that are skylined against the mountains. The proposed facilities would provide a weak contrast with existing industrial landscape elements The existing landscape character would not change.

KOP 4 provides a simulated view shown on **figure 3-10** of the Proposed Action from South Apache Road near Dawson Drive about 0.64 mile north of the northwest corner of the NAEP property. The view faces southeast, providing a view of the facilities at a closer distance to the viewer than the existing Griffith Energy facilities. As seen from the distance and viewing angle, the overall mass and strong vertical elements of the exhaust stacks are a noticeable addition to the existing impact from the existing Griffith Energy facilities. Although the exhaust stacks would be easily noticeable, there would be a weak contrast of the proposed facilities with the existing landscape, resulting in a small increase in the industrial elements of the rural/industrial landscape character.

Figure 3-11 provides a simulation of the Proposed Action from KOP 5, which is on I-40 1.6 miles southeast of the NAEP property. As shown in the simulation, the proposed NAEP facilities would be northwest of the existing Griffith Energy facilities. The four CTGs would be visible as regularly spaced, geometric forms with strong vertical lines that constitute an incremental impact of industrial features in addition to the existing Griffith facilities. The Black Mountains form a backdrop in the background distance zone that provides some screening for the proposed NAEP facilities. The proposed facilities would provide a weak contrast with existing industrial landscape elements. The existing landscape character would not change.

Other sensitive viewing areas include trails in the nearby Wilderness Areas that provide expansive views of the Sacramento Valley, including the NAEP property. The Thimble Butte trailhead is located on Oatman Road at the north boundary of the Warm Springs Wilderness. A visual simulation was prepared for the Griffith Energy (Griffith, 1998b) from this location. At the distance of more than 8 miles, the simulated Griffith Energy facility was very difficult to discern because of the small scale of the facilities relative to the surrounding landscape. At this distance, the facility would have been visible only if there were a strong color contrast, as is evident in the appearance of the existing Praxair facility, which is located at about the same distance from the KOP. The trail that extends south into the wilderness is located in a drainage and does not provide views of the Sacramento Valley and the NAEP property.

Two trailheads are located at the west boundary of the Mount Nutt Wilderness. The trails extend west into the wilderness. Both trailheads are located more than 10 miles northwest of the proposed NAEP facilities. The proposed facilities would be very small in scale, and would not

be visible to users of the trails once the facilities are painted to harmonize with the surrounding landscape colors.

The ongoing economic and population growth of Mohave County is expected to continue into the future. The visual character of the Proposed Action, particularly in and adjacent to the I-40 Industrial Corridor, would continue to change as a result of additional industrial development.

Long-term visual impacts resulting from the installation and operation of the Proposed Action would be minimized by implementing mitigation focused on facility design measures. Mitigation measures would include painting plant facilities with colors similar to the surrounding desert landscape, principally tan, sand, and buff colors. Mitigation measure would also include selecting plant lighting to reduce lighting impacts. Mitigation of surface disturbance would include revegetation of disturbed areas.

The Proposed Action would result in an incremental increase of the industrial component of the existing landscape, which contains the existing Griffith Energy facilities in a rural setting. The character of the landscape would continue to be more industrially modified; however, visual degradation of the landscape would be minimal. The Proposed Action would not conflict with visual standards of any agency or the lighting standards of Mohave County. There would be no intrusion on a viewshed from a cultural resource that is registered (or eligible for registration) with the NRHP or from a TCP identified as important to tribes, and the facilities would not dominate a unique viewshed or scenic view. Class I visibility standards would not be exceeded.

4.8.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed and operated. There would be no additional impacts to visual resources from the Proposed Action, but future development in the I-40 Industrial Corridor would be expected, with attendant visual impacts.

4.9 NOISE

This section describes the impacts to noise resources for both the Proposed Action and No Action Alternative.

Issues

- Exposure of persons to, or generation of, noise or vibration levels in excess of any standards established in the local general plan or noise ordinance, or any other applicable standards of other agencies
- Substantial permanent increase in ambient noise or vibration levels in the above existing levels without the Proposed Action
- Substantial temporary or periodic increase in ambient noise or vibration levels in the vicinity above levels existing without the Proposed Action

Significance Criteria

A significant impact on noise would result if any of the following were to occur from construction or operation of the Proposed Action:

- Exceedance of local, state, or Federal noise regulations or guidelines
- Imposition of restrictions by increased noise levels on land currently planned for residential development
- Direct or indirect effect by increased noise levels on any traditional use or TCP locations that are NRHP registered or eligible, or identified as important to tribes

4.9.1 Proposed Action

4.9.1.1 Construction

Noise generated during the construction phase would result from the operation of construction equipment and vehicles. **Table 4-8** presents typical noise levels for construction equipment at a distance of 45 feet (Crocker and Kessler, 1982). These values assume that the equipment is operating at full power.

Table 4-8 Typical Construction Noise Levels

Equipment Category	Noise Level at 45 ft (dBA)
Dump Truck	88
Portable Rock Drill	88
Concrete Mixer Truck	85
Pneumatic Tool	85
Grader	85
Front-End Loader	84
Mobile Crane	83
Excavator	82
Backhoe	81
Dozer	78
Generator	78

Source: Crocker and Kessler, 1982

The typical noise at 45 feet from a construction site would be 85 dBA because the construction equipment would typically spread throughout a construction site and may not be operating concurrently. This value and the data presented above indicate that there would be a temporary increase in ambient noise that would be limited to the construction phase of the Proposed Action. The propagation of noise depends on many factors including atmospheric conditions, ground cover, and the presence of any natural or man-made barriers. As a general rule, noise decreases by approximately 6 dBA with every doubling of the distance from the source (Bell, 1982). Therefore, noise levels at various distances from the construction site can be predicted and are shown in **table 4-9**.

Construction noise generated by the Proposed Action would be intermittent in nature and would be temporary, as the construction period is estimated to be 9 to 12 months. Up to 6 months of the construction period would involve performance testing of the proposed power plant equipment. During this startup and testing period, noise levels would be consistent with noise levels during operation.

Table 4-9 Predicted Noise Near Construction Activities	
Distance from construction site (feet)	**Predicted Noise Level (dBA)[1]**
45	85
90	79
180	73
360	67
720	61
1440	55

[1] Approximated typical noise level at 45 feet from a construction site.
Source: Bell, 1982

The nearest noise receptor (residence) to the NAEP property would be approximately 2.5 miles to the northwest. At this distance, the noise from construction of the Proposed Action would be significantly lower and near the background level. Rural areas typically have background levels between 35 and 50 dBA. The actual noise level at distance would vary with wind direction and velocity.

It is expected that most construction would occur during daylight hours. Some deliveries and continuous construction activities, such as foundation pours would be required during non-daylight hours. During startup and testing, performance testing would also require some continuous work, but the noise profile associated with these activities would be consistent with operational levels. Impacts to noise are expected to be minor and short in duration.

4.9.1.2 Operations

The CTGs are housed in a metal enclosure to protect the units from the elements and for noise reduction. The primary noise sources anticipated with operation of the proposed power plant include the CTG inlet, the CTG compartments, the exhaust ductwork, the stack, gas compressors, and the chiller module. Secondary noise sources are anticipated to include the GSU transformers and miscellaneous pumps, fans, and compressors. All equipment sound levels were estimated based on available data from the equipment manufacturers. Equipment purchased for the proposed power plant would be specified for equivalent A-weighted sound pressure levels not to exceed 85 dBA at 3 feet. Should the purchased equipment emit sound levels that exceed the OSHA permissible noise limits (CFR 29, 1910.95), administrative or engineering controls would be utilized, such as personal protective equipment.

4.9.1.3 Noise Profile

The sound power level (PWL) for each equipment noise source is listed in **table 4-10**. These equipment sound level specifications are provided from the vendors based on standard packaged equipment.

Table 4-10 Equipment Sound Power Levels	
Noise Source	**dBA**
Air Compressor Skid	103
Air Inlet Filter House	94
Ammonia Forwarding Pumps	98
Ammonia Injection Skid	98
Ammonia Vaporizer	98
Auxiliary Skid	103
Auxiliary Transformer	89
Chiller skid	103
Cooling / Purge Air Fans	95
Demineralized Water Pumps	98
Fuel Gas Compressors	109
Fuel Gas Regulator Skid	99
Generator Enclosure Walls	95
Generator Exhaust Silencer, Damper & Exit	94
Generator Vent Fan Motor & Shell Surfaces	88
Rooftop Ventilation Fans	88
Selective Catalytic Reduction Unit	100
Step-Up Transformer	99
Turbine Enclosure Walls	98
Turbine Exhaust Duct Casing	97
Turbine Exhaust Stack	133
Turbine Lube Oil Cooler (fin-fan)	104
Turbine Vent Fan Discharge	93
Turbine Vent Surfaces	96
Wastewater Forwarding Pumps	98

Table 4-11 shows the noise levels expected to be generated from operation of the Proposed Action. The proposed power plant would be expected to have a characteristic noise level (L_{dn}) of 47.8 dBA at the NAEP property boundary at South Apache Road. Noise propagating to the east, south, and north toward and parallel to I-40 would generally be masked by I-40 traffic and the occasional train passing east of the Interstate. Noise propagating toward the west would be at levels slightly above the background noise of the Interstate and train noise. The noise at the closest residence, 2.5 miles to the northwest of the proposed power plant, would be dominated by the noise produced by the existing Griffith Energy equipment and facilities.

At the northern boundary (Haul Road) the NAEP property would have an estimated L_{eq} of 55 dBA and an L_{dn} of 62 dBA. South Apache Road is approximately 1,000 feet from the proposed power plant and 2,000 feet from the existing Griffith Energy facilities. Although the proposed power plant is closer to South Apache Road, it is estimated to have a lower impact than the existing Griffith Energy facilities at this location.

Table 4-11 Noise Levels Expected From Operation of the Project vs. Noise Levels from I-40

Location	Sound Levels (dBA)			
	NAEP Project		Griffith Energy	I-40 Traffic[2]
	L_{eq}	L_{dn}[1]	L_{eq}	L_{eq}
400 Feet from Source	49.3	55.7	75	62
1,000 Feet from Source	41.3	47.8	67	57
2,000 Feet from Source	34.1	40.5	61	52
1 Mile from Source	25.6	32.0	53	41
2 Miles from Source	19.6	26.0	47	30
2.5 Miles from Source (nearest residence)	17.7	24.1	45	20

1. $L_{dn} = 10 * \log \{1/24 [15 * (10^{Ld/10}) + 9 * (10^{(Ln+10)/10})]\}$
   Ld is the average daytime noise level L_{eq} dBA.
   Ln is the average nightime noise level L_{eq} dBA.
   Values above were calculated assuming Ld = Ln
   L_{eq} is defined as the average sound level, on an energy basis, for a stated period of time (e.g. hourly) at a given location
   L_{dn} is defined as the average A-weighted sound level for a 24-hour period.
2. I-40 radiates noise as a line source while the proposed power plant would radiate noise as a point source. Therefore, road noise diminishes with distance.

Source: Griffith, 1998b

Impacts to noise resources from the Proposed Action are expected to be minor. The proposed power plant is expected to emit operational sound levels that are below existing background sound levels. Sound levels during construction may be temporarily elevated above existing background levels (**table 4-11**).

The proposed power plant is not expected to exceed local, state, or Federal noise regulations or guidelines. There is currently no planned residential development in the vicinity of the NAEP property, and there would be no noise level restrictions. No TCPs or sacred sites have been identified within the Proposed Action, and the Proposed Action would not impair access to any known sacred site for future use.

4.9.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not go forward, and there would be no associated noise impacts.

4.10 SOCIOECONOMICS

Issues

- Social and economic impacts in the vicinity of the Proposed Action which include, but are not limited to, construction and operational period impacts related to local and regional population, housing, labor market, or demand on public services
- Fiscal impacts within local jurisdictions which include, but are not limited to, taxation and property values
- Induced growth impacts attributed from the Proposed Action

Significance Criteria

A significant impact on social and economic values would result if any of the following were to occur from construction or operation of the Proposed Action:

- An increase in population that would create shortages of housing and place an excessive burden on local government and community facilities and services
- Creation of a need for new infrastructure systems including power or gas utilities, communications systems, water and sewer services, or solid waste disposal systems
- Long-term economic benefit (A positive impact that could be considered significant)
- Reduction or depletion of groundwater that results in a substantial loss of beneficial uses, such as residential or commercial uses which require low amounts of water

4.10.1 Proposed Action

The analyses indicated that implementation of the Proposed Action would not result in significant direct or indirect adverse effects on regional population, labor market, housing, demand for public services, fiscal or induced growth factors. The potential effects to these socioeconomic resources are discussed in the following subsections.

4.10.1.1 Population

An estimate of construction staffing by month is provided in **table 2-5.** The peak construction workforce would be 162 employees. It is expected that most construction workers are available within the Kingman, Yucca, and Lake Havasu areas. The Proposed Action would not require a large influx of new employees into the region. Peak employment for the Proposed Action would represent less than 0.1 percent of the total population of the Kingman Area. Therefore, local or regional population impacts are anticipated to be minimal. While some employees with specialized skills may not be available within the region and may come from outside the area, it is expected that these workers would be required for a short time only and would not relocate permanently.

4.10.1.2 Housing

The potential demand for new permanent housing is expected to be minimal. New or commuting construction workers could affect temporary housing stock such as motels or weekly rentals. Because the Proposed Action is located approximately 15 miles from the community of Kingman, some workers may also be accommodated in personal trailers or motor homes.

4.10.1.3 Labor and Employment

The Proposed Action may affect the local labor market and economy in a variety of ways. Project-related employment includes both direct and indirect employment. Direct employment effects are classified as the actual number of employees required to build and operate the Proposed Action. Indirect effects involve support industries which provide services to the power generation industry. The local economy would be affected positively by direct project spending

and induced economic effects, which occur as a result of employees and businesses spending income within the area.

Project-related employment would occur in two phases. The first phase includes the employment of a labor force for construction, followed by a smaller level of employment required for operation and management of the Proposed Action. Construction is anticipated to occur over a 9- to 12-month period and would require a variety of tradesmen and contractors with a peak construction workforce of 162 employees. The employment force would include both skilled and non-skilled workers.

Two to four permanent workers would be needed for operation of the Proposed Action. This would include full-time operational and maintenance staff.

It is anticipated that most of the required labor pool would be available in the Kingman, Yucca, and Lake Havasu areas. To the extent that some specialized skill classes are not available in the area, it is assumed that these workers would migrate to the area on a temporary basis during the construction phase. The peak construction employment for the Proposed Action would represent approximately 0.2 percent of the total civilian labor force in Mohave County. For operations, employment would be less than 0.1 percent of the total civilian labor force. Therefore, potential impacts to local employment are anticipated to be minimal and beneficial.

The Kingman, Yucca, and Lake Havasu areas would gain some economic benefit from the expenditures for construction of the Proposed Action. The Proposed Action would increase the assessed value of the NAEP property, resulting in a substantial increase in property tax revenues to Mohave County. In addition, a variety of other state and local tax payments would be incurred during construction, producing additional revenues to various agencies. The projected taxes to be paid by the Proposed Action over the life of the project are discussed in section 4.10.1.4.

The Proposed Action would be located in the I-40 Industrial Corridor. The Proposed Action would not have any direct growth-inducing effects because it is designed to sell power on the open market and not necessarily to local users. Indirect growth-inducing effects are not likely to occur from any increased reliability of electrical service in Mohave County. A change in the ability of the county to attract new businesses is not anticipated.

4.10.1.4 Fiscal Impacts

There would likely be some fiscal benefits derived from the Proposed Action. In the short term, the construction work force would increase revenues in the retail and service sectors of the economy. The total cost of the Proposed Action is estimated to be in the range of $140 to $160 million. The cost includes the CTGs, gas compressors, transformers, chiller, and all ancillary balance of plant equipment as well as all civil works, construction labor, construction materials, and engineering.

In the long term, the available power would provide greater reliability of service in area communities. The newly available power would also contribute to the stability of the regional power grid. The Proposed Action would provide up to two to four relatively high-paying jobs for the long term.

Property taxes paid by electric generating facilities can be an important component of the county tax revenues. Based on various assumptions including a personal property tax base of approximately $100 million and a tax-in-service Years of Service (YOS) date of July 1, 2009, the estimated annual property taxes payable by the Applicant are shown in **table 4-12**. **Table 4-12** also provides the allocation of such payments among the various taxing authorities based on the allocation factors in effect for 2006.

Annual property tax revenues paid over the life of the project would total $25.3 million, ranging from $0.2 to $1.7 million annually, as shown in **table 4-12**. In the fiscal year 2004-2005, Mohave County realized $34.2 million in property tax revenues, which accounted for 24 percent of the total operating revenue (Mohave County, 2005c). The property tax revenues paid by the Applicant would represent an annual increase of approximately 0.6 to 5.0 percent compared to current property tax revenues. In addition to property tax revenue, Mohave County will benefit from a portion of the sales tax paid by the Applicant during construction.

There would be beneficial fiscal impacts during both construction and operation of the Proposed Action. Fiscal benefits would primarily result from construction materials purchased locally and from annual property taxes paid over the life of the project.

4.10.1.5 Public Utilities and Services

Potential impacts to public services could result during construction or operation of the Proposed Action if additional project-related demands impacted existing public utilities and services such as police, fire, medical, and other emergency services. It is not expected that these effects would be significant with implementation of the standard construction health and safety measures included as part of the Proposed Action including site fencing, an on-site fire protection system, a worker safety program, and communication equipment to alert local emergency services when necessary.

Existing infrastructure for the gas, water, and electric interconnections are available to the Proposed Action within its property boundary or from the adjacent Griffith Energy property. The Proposed Action would interconnect with the Western 230 kV system at the existing Griffith Switchyard. No new transmission line laterals or other off-site infrastructure development would be required for the Proposed Action.

High-pressure natural gas would be supplied to the Proposed Action from the UES gas distribution system located adjacent to the NAEP property. Natural gas would be delivered via two existing UES-owned and operated gas pipelines that interconnect with the El Paso and Transwestern interstate pipelines and transport natural gas to the I-40 Industrial Corridor. Both pipelines terminate at an existing gas regulating/metering station located at the northeast corner of the Original Griffith Energy property. As previously described in chapter 2, section 2.1.5, an adequate supply of natural gas is available to meet the gas requirements of the Proposed Action.

Solid wastes would be generated primarily by construction. Operational wastes would be generated mostly from operations employees and would be minimal. The wastes generated from construction and operation are described in section 4.12.1.3. The amounts of wastes generated would be too small to affect the life expectancy of the two municipal solid waste facilities

Table 4-12Tax Revenue Forecast: Mohave County

Year	Kingman Unified School District #20	Mohave County General Fund	Mohave Community College	School District #20 Class A Bonds	Mohave County Library District	Fire District Assistance Fund	Mohave County TV District	Mohave County Flood Control	Total (1) All Authorities
Allocation (2)	49.5%	23.9%	12.8%	6.3%	4.6%	1.4%	1.2%	0.3%	100.0%
YOS + 1	396,000	191,200	102,400	50,640	36,800	11,360	9,840	2,000	**800,000**
YOS + 2	544,500	262,900	140,800	69,630	50,600	15,620	13,530	2,750	**1,100,000**
YOS + 3	693,000	334,600	179,200	88,620	64,400	19,880	17,220	3,500	**1,400,000**
YOS + 4	792,000	382,400	204,800	101,280	73,600	22,720	19,680	4,000	**1,600,000**
YOS + 5	841,000	406,300	217,600	107,610	78,200	24,140	20,910	4,250	**1,700,000**
YOS + 6	792,000	382,400	204,800	101,280	73,600	22,720	19,680	4,000	**1,600,000**
YOS + 7	792,000	382,400	204,800	101,280	73,600	22,720	19,680	4,000	**1,600,000**
YOS + 8	742,500	358,500	192,000	94,950	69,000	21,300	18,450	3,750	**1,500,000**
YOS + 9	693,000	334,600	179,200	88,620	64,400	19,880	17,220	3,500	**1,400,000**
YOS + 10	693,000	334,600	179,200	88,620	64,400	19,880	17,220	3,500	**1,400,000**
YOS + 11	643,500	310,700	166,400	82,290	59,800	18,460	15,990	3,250	**1,300,000**
YOS + 12	643,500	310,700	166,400	82,290	59,800	18,460	15,990	3,250	**1,300,000**
YOS + 13	594,000	286,800	153,600	75,960	55,200	17,040	14,760	3,000	**1,200,000**
YOS + 14	544,500	262,900	140,800	69,630	50,600	15,620	13,530	2,750	**1,100,000**
YOS + 15	495,000	239,000	128,000	63,300	46,000	14,200	12,300	2,500	**1,000,000**
YOS + 16	445,000	215,100	115,200	56,970	41,400	12,780	11,070	2,250	**900,000**
YOS + 17	445,000	215,100	115,200	56,970	41,400	12,780	11,070	2,250	**900,000**
YOS + 18	396,000	191,200	102,400	50,640	36,800	11,360	9,840	2,000	**800,000**
YOS + 19	346,500	167,300	89,600	44,310	32,200	9,940	8,610	1,750	**700,000**
YOS + 20	297,000	143,400	76,800	37,980	27,600	8,520	7,380	1,500	**600,000**
YOS + 21	247,500	119,500	64,000	31,650	23,000	7,100	6,150	1,250	**500,000**
YOS + 22	198,000	95,600	51,200	25,320	18,400	5,680	4,920	1,000	**400,000**
YOS + 23	148,500	71,700	38,400	18,990	13,800	4,260	3,690	750	**300,000**
YOS + 24	99,000	47,800	25,600	12,660	9,200	2,840	2,460	500	**200,000**
TOTAL									**25,300,000**

Notes:

(1) Based on estimated personal property tax base of $100 million.

(2) YOS = Years of Service.

Source: NAEP, 2007

currently operated by Mohave County. The Proposed Action would dispose of hazardous wastes at a permitted hazardous waste facility either in Phoenix or another location.

Water supply for the Proposed Action would be obtained from the Sacramento Valley aquifer previously described in chapter 2, section 2.1.7.

A fire protection system would be developed for the Proposed Action as part of its safety program as described in chapter 2, section 2.1.9.1. The Proposed Action would include an underground firewater loop interfaced with the existing Griffith Energy firewater system. The ground disturbance associated with installation of the underground firewater loop would occur within the NAEP property. Analysis of this disturbance is included in the analysis of construction-related impacts for other resource sections. There would be two connections to two different portions of the Griffith Energy firewater loop. The Proposed Action would not require on-site storage of firewater because it would be served from the existing Griffith Energy.

Because a large influx of new employees is not anticipated in the region, there are minimal expected effects to public utilities and services in Kingman or other local communities resulting from increased population effects. Local schools are not expected to experience significant increases in enrollment from construction workers' children.

4.10.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed, and there would be no project-related effects to socioeconomics such as the associated economic benefits and potential demands on infrastructure, housing, and local government and community facilities and services.

4.11 ENVIRONMENTAL JUSTICE

Issues

- Disproportionate adverse health or environmental impacts to minority populations
- Disproportionate adverse health or environmental impacts to populations living below the poverty level

Significance Criteria

A significant impact on social and economic values would result if any of the following were to occur from construction or operation of the Proposed Action:

- Impacts associated with environmental justice are considered to be significant if the impacts of construction and operation of the Proposed Action would have disproportionately high and adverse impacts on minority or low-income populations.
- They are also considered significant if affected minority or low-income populations were not informed of and offered an opportunity for meaningful involvement to ensure that their interests and concerns about the Proposed Action would be considered.

4.11.1 Proposed Action

Impacts on minority or low-income populations that could result from the Proposed Action were analyzed for the geographic area in which the Proposed Action would be located to determine if there would be a disproportionately high and adverse impact on minority populations. To meet current and future power demands in this area of Arizona, the Proposed Action would need to be located somewhere within this region. Therefore, the environmental justice analysis focuses on the local region, specifically Mohave County, and the location for the Proposed Action (census tract). For this analysis, the racial and ethnic characteristics of the census tract containing the Proposed Action were compared to those of Mohave County.

This section summarizes the analysis of potential project-related impacts on minority or low-income populations in the geographic area in which the Proposed Action would be located to determine if there would be disproportionately high and adverse impact on minority populations. In addition, Western has coordinated with tribes and tribally affiliated interests to identify potential impacts and measures that would be taken to mitigate impacts to cultural resources. Studies pertaining to cultural resources, including cultural landscapes, are described in another section of this document.

Section 3.11 identified minority and low-income populations in the vicinity of the Proposed Action pursuant to EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (59 FR 7629). This section discusses the potential for environmental justice impacts to those populations. The ROI for the environmental justice analysis includes the census tract containing the Proposed Action. The impact analysis was performed in three steps:

- Identify minority and/or low-income populations in the vicinity of the Proposed Action.
- Identify the anticipated impacts from implementation of the Proposed Action.
- Determine if the anticipated project-related impacts would disproportionately impact the minority and/or low-income populations.

The analysis protocol for identifying minority or low-income populations follows the guidelines described in the Environmental Justice Guidance under the NEPA (CEQ, 1997). Information on locations and numbers of minority and low-income populations for the census tract containing the Proposed Action was obtained from when census data was gathered. As stated in chapter 3, section 3.11.1, "minority" refers to people who classified themselves in the 2000 census as Black or African American, Asian or Pacific Islander, American Indian or Alaskan Native, Hispanic of any race or origin, or other non-White races (CEQ, 1997). As stated in chapter 3, section 3.12.1, environmental justice guidance defines low-income populations using U.S. Census Bureau statistical poverty thresholds. Information on low-income populations was developed from 1999 incomes reported in the 2000 census. In 1999, the poverty-weighted average threshold for an individual was $8,501 (U.S. Census Bureau, 2000b).

Second, the anticipated impacts from implementing the Proposed Action were analyzed. Analyses of potential impacts from the Proposed Action are provided in chapter 4 for each resource including: geology and soils, water resources, air resources, biological resources,

cultural resources, land use and recreation, transportation, visual resources, noise, socioeconomics, and health and safety during the construction, operation, and maintenance phases of the Proposed Action.

Third, an analysis was performed to determine if the anticipated impacts of the Proposed Action would disproportionately affect minority and low-income populations. The basis for making this determination was a comparison of locations predicted to experience human health or environmental impacts with any areas in the ROI known to contain high percentages of minority or low-income populations, as reported by the U.S. Census Bureau and defined by the CEQ. Impacts on minority or low-income populations that could result from the Proposed Action were analyzed for the geographic area in which the Proposed Action would be located to determine if they would have disproportionately high and adverse impacts. Impacts related to the Proposed Action were analyzed within the census tract containing the NAEP property.

Analysis of environmental justice impacts is also applied to issues that are unique to and involve Native Americans, particularly to cultural resource issues. Input from tribal representatives would determine if significant impacts are likely to occur to cultural resources of importance to the tribes. Potential impacts of the Proposed Action related to Native American cultural resources could occur not only to individual resources, but also to the traditional, sacred, and historic landscape of the area within which the NAEP property is located. Impacts to the cultural landscape and individual resources could have a significant impact on the role of the landscape in tribal traditions and the use of the landscape by tribal members.

4.11.1.1 Minority Populations

Disproportionately high and significant effects to minority populations are unlikely based on a lower percentage of minority populations in the census tract containing the NAEP property compared with Mohave County as a whole, and because the Proposed Action is not anticipated to have any significant adverse impacts. In particular, no minority populations reside nearby because the NAEP property is located within a designated commercial-industrial area.

The census tract containing the NAEP property has a lower minority population than Mohave County as a whole. The total minority population in the census tract containing the NAEP property is estimated at 9.3 percent of the total population compared to a 9.9 percent county-wide minority population (U.S. Census Bureau, 2000a).

Compared to the composition of the entire Mohave County population, there is no substantial increase in the percentage of minority populations in the vicinity of the Proposed Action. In addition, the Proposed Action would have low potential effects to human health and/or the environment. Therefore, there would be no disproportionately high and adverse effects to minority populations from the Proposed Action.

4.11.1.2 Low-Income Populations

The low-income population (individuals below poverty level) within the census tract containing the NAEP property represents approximately 17.7 percent of the total population. The low-income population within Mohave County as a whole is 13.9 percent. The low-income population within the census tract containing the NAEP property represents a slightly higher

percent of poverty level individuals compared to the population in Mohave County (3.9 percent higher). However, compared to the low-income composition of the entire Mohave County population, this is not considered to be a substantial increase in the proportion of low-income individuals in the vicinity of the Proposed Action. Based on these criteria and the low potential of the Proposed Action to significantly affect human health and/or the environment, there would be no disproportionately high and adverse effects to low-income populations expected to be caused by the Proposed Action.

4.11.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be built and operated, and there would be no impact to any populations including minority or low-income populations.

4.12 HEALTH AND SAFETY

Issues

- Worker safety and health
- Public health and safety
- Hazardous materials and waste disposal

Significance Criteria

A significant impact on public health would result if any of the following were to occur from construction or operation of the Proposed Action:

- Creation of worker health hazard(s) beyond limits set by health and safety regulatory agencies or that endangers human life and/or property
- Serious injuries to workers, visitors to the area, or area residents
- Changes in traffic in the area that result in hazardous situations for motorists
- An increase in the size and volume of a water body (e.g. wastewater and brine disposal ponds) that fosters breeding insects that may transmit hazardous diseases (e.g., West Nile virus)

A significant impact would result from the transport, storage, and use of hazardous materials or creation of hazardous wastes if any of the following were to occur during construction or operation of the Proposed Action:

- Improper disposal of solid or sanitary waste generated by the Proposed Action that would pose a threat to the public health and environment in the vicinity
- Spills or releases of hazardous materials, hazardous substances, or oil at or above reportable quantities within the area that would pose a threat to public health and the environment in the vicinity

4.12.1 Proposed Action

Construction and operation of the Proposed Action may expose proposed power plant workers and/or the public to hazards affecting health and safety. Potential health and safety hazards associated with the Proposed Action include construction and occupational hazards, potential accidental spills of hazardous materials and wastes including both fuels and non-fuel substances, and fire hazards. The risk of a spill would be proportionate to the amount of chemicals and materials transported, stored, and used. The operator's adherence to regulations and required environmental health and safety plans would minimize the potential for spills.

Standard safety procedures for construction and operation of the Proposed Action would be implemented to minimize the probability of an accidental spill or fire. An SPCC Plan and Contingency Plan would be implemented to minimize the potential for accidental spills of hazardous materials and wastes. Adherence to these procedures and development of emergency plans with defined fire prevention and firefighting procedures would minimize the risk to the public. The construction, operation, and maintenance of the Proposed Action would be consistent with safety considerations, and the Proposed Action would not offer public access.

4.12.1.1 Worker Health and Safety

During construction and operation of the Proposed Action, the Applicant and its contractors would comply with the requirements of the applicable OSHA and ADOSH regulations. Implementation and compliance with these codes and standards would be a contractual and legal responsibility of the party performing construction. In addition, utility safety standards and the Applicant's construction standards would be implemented for all construction activities.

The risks associated with construction accidents increase based on the duration of the construction period and the number of workers at any given time (see chapter 2, section 2.1.10.4 for construction workforce details). The primary hazards for employees would include typical construction site injuries related to trips and falls, working at heights, operating or working near heavy equipment, and exposures to fuels or chemicals. A Construction Safety Program would be developed and implemented by the contractor performing construction to ensure compliance with OSHA and ADOSH codes and other safe work practices to minimize potential adverse impacts to worker health and safety during construction. The Construction Safety Program would include plans with response procedures for emergencies including fires, employee injuries, and releases of fuels or chemicals; and telephone numbers for medical and emergency services and emergency contacts. The plans would be readily available to the employees and posted at both the company offices and the field facilities. Employees and subcontractors would be trained in the proper transfer procedures, storage and use of fuels and hazardous materials, as well as emergency response procedures.

The types of hazardous materials used at the facility are discussed in section 4.12.1.3. Quantities of each material used will be provided in the site-specific SPCC Plan to be developed prior to the start of construction. Hazardous materials anticipated to be on site during construction include equipment fuels (gasoline and diesel), lubricants, solvents, and various chemicals. These materials would be handled according to standard safety precautions described in the Construction Safety Program and manufacturers' specifications for use, where appropriate. No exposure to hazardous wastes or soil contamination is anticipated during construction.

Potential health impacts to construction workers from the Proposed Action would also include fugitive dust and noise typical of construction sites as discussed in chapter 4. Construction workers could be exposed to airborne emissions from routine activities such as welding, soldering, grinding, painting, and cleaning operations. The potential noise impact to workers would include heavy equipment operation and other activities. Noise exposures would be intermittent, but may be intense and would be evaluated at the time of construction.

A comprehensive occupational safety and health program would be developed and implemented to optimize minimize safe and healthy working conditions during all phases of construction and operation of the Proposed Action. The contractor would be required to prepare and conduct an Applicant-approved safety program in compliance with all applicable Federal, state, local, and Applicant safety standards and requirements. The safety program would include, but not be limited to, procedures for accident prevention, use of protective equipment, medical care of injured employees, safety education, fire protection, and general health and safety of employees and the public. Employees would be trained to minimize hazards during both construction and operations. Training would also be required for spill response and use of spill containment equipment. The Applicant would also establish provisions for taking appropriate actions in the event that the contractor fails to comply with the approved safety program.

Potential health and safety hazards during construction and operation of the Proposed Action would be minimized by implementation of the mitigation measures included as part of the Proposed Action Description in chapter 2. Under implementation of these mitigation measures, health and safety impacts to the proposed power plant workers would be less than significant because there would be no anticipated worker hazards beyond limits set by health and safety regulatory agencies, no elevated threat to human life and/or property, and little or no exposure to hazardous wastes.

4.12.1.2 Public Health and Safety

The public would not have access to the facility; therefore, public health and safety risks would be limited to off-site effects. Construction and operation of the Proposed Action would result in minimal increases in traffic volumes on public roads in the vicinity of the Proposed Action, along with proportionate increases in noise and air emissions from project-related vehicles and equipment, fugitive dust from roads, and a very slight increased risk of traffic accidents. Under implementation of the Proposed Action, impacts to public health and safety associated with noise, vehicle emissions, and fugitive dust associated with vehicular traffic during construction and operation of the Proposed Action are expected to be unlikely. A very slight increased risk of traffic accidents would occur temporarily during construction. During operations, the two to four permanent employees would not increase the risk of traffic accidents.

During construction and operation of the Proposed Action, public health and safety could potentially be affected by potential spills or leaks in storage containers for fuel, lubricants, fluids, and chemical if spills were to migrate off site. On-site spills would not impact the public because the public would not have access to the facility, and spills would be cleaned up immediately to prevent off-site migration. The risk of accidental spills would be reduced by compliance with existing regulations applicable to the transport, storage, use, and disposal of hazardous materials and wastes. The Applicant and their contractors understand the financial

and environmental risks of accidental spills. Adequate control measures would be taken to prevent off-site releases of hazardous materials or wastes during both construction and operation of the Proposed Action. Specific control measures for fuels, non-fuel hazardous materials, and wastes are discussed in the following paragraphs.

As previously discussed in chapter 3, section 3.12, a project-specific SPCC Plan would be prepared establishing procedures for the storage, handling, and response to spills of fuels and other hazardous materials. The SPCC Plan would specifically address each hazardous material that could be used or stored on-site and measures to contain, stop, or control spills to prevent hazardous materials from leaving the site. All hazardous materials would be stored in structures that meet the requirements of the fire code with adequate secondary containment. The SPCC Plan would include the location of spill control equipment, procedures for control of releases, and protocols for shutting down ignition sources in the event of a release of gas. A Hazardous Materials Inventory Statement and Management Plan would be developed and submitted to responding fire departments. All applicable spill reporting requirements would be met. The SPCC Plan would include telephone numbers for medical and emergency response personnel and agencies and procedures for handling and disposing of spilled chemicals, oils, hazardous materials, contaminated soils, or other contaminated materials. The procedures are also intended to reduce hazardous materials exposure to workers and the public.

During operation of the Proposed Action, public health and safety could potentially be affected if spills or leaks of wastewater or very saline brine water occurred. The Proposed Action is designed to be a zero-discharge facility as discussed in section 4.2.

Public health and safety would likely be protected by the Applicant's compliance with all applicable Federal and state laws including spill prevention and control measures for hazardous materials and wastes. Potential public health and safety impacts during construction and operation of the Proposed Action would also be minimized by implementation of the mitigation measures described in this section and included in the Proposed Action description in chapter 2, section 2.4. Under implementation of the proposed mitigation measures, no health and safety impacts are anticipated.

West Nile Virus

Operation of the proposed NAEP facilities would not require an increase in the size or volume of a water body for process wastewater because the process wastewater disposal would be integrated with the existing Griffith Energy wastewater system. The existing Griffith Energy 25-acre brine disposal pond would be adequate for the disposal of all plant wastewater and stormwater discharges from the NAEP property.

Stormwater runoff would be managed to avoid standing water on the NAEP property to minimize the potential for the breeding of insects that may transmit diseases such as the West Nile Virus. On-site stormwater runoff would be routed to the west of the proposed power plant by means of swales, ditches, and sheet flow. However, where space restriction precludes the use of open ditches and channels, a series of pipes and inlets would be used. Culverts would be used to convey stormwater under on-site traffic areas. Stormwater runoff would discharge by gravity from the proposed power plant area to a 1-acre stormwater retention basin located west of the

proposed power plant to prevent stormwater from leaving the NAEP property. Water which typically flows across the site during storm events would be routed to the stormwater retention basin instead of being discharged below the site. Off-site runoff would be routed around the NAEP property using berms and ditches. The stormwater retention basin is unlikely to foster breeding insects that may transmit hazardous diseases because the retained water is anticipated to evaporate and/or infiltrate rapidly. The Griffith pond is unlikely to allow insect breeding because it is anticipated to be too salty. In the event that insects appear to be breeding in the stormwater retention basin or Griffith pond, appropriate control measures will be taken.

4.12.1.3 Hazardous Materials and Waste Management

Hazardous materials that may be used during construction and operation of the Proposed Action include both fuels and limited quantities of hazardous non-fuel substances which pose a potential for leaks and spills as shown in **table 4-12**. In addition, construction and operation of the Proposed Action would generate wastes including solid and liquid wastes. Vendors would be contracted for the transport of hazardous materials and wastes including both fuels and non-fuel substances. Over-the-road hazards associated with the transport of hazardous materials and wastes would be minimized by adherence with the applicable U.S. Department of Transportation and ADOT regulations.

NAEP would implement the standard operating procedures (SOP)s as described in the SPCC Plan for the transfer, storage, and use of hazardous materials including both fuels and non-fuel substances. Transfers of hazardous materials and refueling operations would be limited to specific locations and would follow specific procedures to prevent leaks and spills from contaminating the environment. Storage locations for hazardous materials and fuels would have adequate secondary containment, and the spill prevention measures would be implemented as described in the SPCC Plan. NAEP would also implement the project-specific Contingency Plan to minimize the potential risks associated with hazardous materials and wastes. Management procedures for fuels, hazardous materials, and wastes would be implemented to minimize the risk of releases as discussed in the following subsections.

Fuels and Lubricants

During construction, the storage and use of fuels, lubricants, and other petroleum-based fluids would be confined to the NAEP property, and there would be no public access to the facility. Therefore, it is unlikely that the public would be exposed to project-related hazardous materials. If hazardous materials were to spill on site and migrate off site, the public could potentially be exposed. This impact would be minimized or avoided by restricting the location of refueling activities and by requiring immediate cleanup of spills and leaks of hazardous materials.

Oil and diesel fuel would be stored in clearly marked tanks on site which would be provided with adequate secondary containment structures. Construction equipment would be maintained regularly, and the source of any leaks would be identified and repaired. Any soil or water contaminated by fuel or oil spills would be removed and disposed by a contractor to an approved disposal site. Lubricating oils, acids for equipment cleaning, and concrete curing compounds are potentially hazardous wastes which may be associated with construction activities. These would be placed in containers within secondary containment structures on site and disposed of at a

licensed treatment and/or disposal facility in accordance with local or state regulations and in compliance with manufacturers' recommendations. Paint containers would be tightly sealed to prevent leaks or spills. Excess paint would not be discharged to the stormwater system, but disposed of consistent with manufacturers' recommendations and according to applicable governmental regulations.

The potential for spills or leaks of fuels or hazardous materials during construction and operation of the Proposed Action would be minimized or avoided by providing adequate secondary containment, restricting the location of refueling activities, and immediately cleaning up spills and leaks. Preparation and implementation of the project-specific SPCC Plan, as previously discussed in chapter 3, section 3.12, would minimize the potential for fuel or lubricant spills or adverse health and safety to on-site personnel, the public, or the environment. Therefore, risks to health and safety associated with fuels or lubricants are anticipated to be less than significant.

Hazardous Non-fuel Substances

During construction and operation of the Proposed Action, a variety of chemicals and hazardous materials would potentially be used as shown in **table 4-13**. Potentially hazardous materials used at the proposed power plant would be stored in limited quantities. The quantities of hazardous non-fuel substances will be provided in the site-specific SPCC Plan to be developed prior to the start of construction. The Proposed Action would comply with the handling and disposal procedures identified in the Material Safety Data Sheets (MSDSs) for each substance.

The storage, handling, and use of all chemicals would be performed using applicable laws, ordinances, regulations, and standards. All chemicals would be stored in appropriate storage containers, with secondary containment, as appropriate. As needed, the R-123 refrigerant from the chillers would be periodically reclaimed with certified equipment operated by certified technicians, and would be recycled or disposed of.

Table 4-13 Chemicals and Hazardous Materials

Chemical Use	Use
Sodium hypochlorite or sodium bromide	Biocide for water treatment
Sodium hydroxide	pH control for cooling tower
Sulfuric acid	pH control for cooling tower
Sulfur hexafluoride	Insulating gas for electric equipment
Ammonia	Control of nitrous oxide emissions in CTG exhaust gas stream
R-123	Refrigerant for chiller units
Water treatment chemicals/alkaline inhibitor	Scale control, pH control, corrosion control, and as a biocide
Carbon dioxide	Fire protection system
Mineral oil	Insulating fluid for transformers
Lubricating oil	Rotating equipment
No. 2 Diesel fuel	Backup fuel for combustion turbines
Battery acid	Emergency battery banks
Various cleaning chemicals	Plant maintenance

Source: Griffith, 1998b

Preparation and implementation of the project-specific SPCC Plan, as previously discussed in chapter 3, section 3.12, would minimize the potential for spills of hazardous materials or adverse

impacts to on-site personnel and the surrounding public and environment. All hazardous materials would be stored according to state and Federal regulations, and any spills would be cleaned up, which would include proper disposal of contaminated soils. Therefore, risks to health and safety associated with spills or releases of hazardous materials are anticipated to be less than significant.

Waste Management

During construction, a number of non-regulated wastes would be generated, including wood and metal construction scrap, waste oil from equipment, and cleaning wastes. The quantities of waste being disposed at the landfill would be small and would not substantially affect the life of the existing landfill. Domestic waste generated by the construction work force would be kept in appropriate containers and properly disposed. The construction contractor would be required to develop measures to properly handle and dispose of waste including:

- Storing construction scrap and debris in disposal bins and dumpsters on the site, which would be picked up regularly by a disposal contractor and disposed of at an approved local landfill
- Collecting and storing waste oil and cleaning waste in approved containers to be picked up for recycling or disposal at a licensed disposal facility
- Using portable toilets during construction. A licensed contractor would handle and dispose of waste.

Small amounts of waste would be generated during operation of the Proposed Action such as minor packing materials or paper associated with operations. Such waste would be handled and disposed at a licensed landfill.

The Proposed Action would be constructed and operated to minimize the volume of hazardous waste that would require off-site disposal. To the extent practicable, materials would be consumed, recycled, or neutralized. Off-site disposal would be limited to mostly small quantities of solid waste and hazardous waste, primarily hydrocarbons. For the small volumes of hazardous waste generated, the facility would obtain a hazardous waste identification number under hazardous waste rules and dispose of the hazardous waste according to state and Federal regulations. Mineral oil in transformers must be replaced periodically and would be recycled or disposed of in accordance with state and Federal used oil regulations. Used oils and other wastes would be stored in properly contained barrels or tanks and removed for off-site recycling and disposal at approved facilities.

During both construction and operation of the Proposed Action, personnel would use the existing Griffith Energy sanitary facilities with no increase in design capacity required for the additional personnel. During periodic major maintenance events, portable facilities would be provided to accommodate the additional maintenance workers.

The Applicant is committed to preventing and reducing pollution at the source, and would implement strategies employing waste minimization, waste management, recycling, and spill prevention during plant operation. All wastes generated at the proposed power plant would be

recycled or disposed of in accordance with applicable laws and regulations. Therefore, there would be little risk to health and safety associated with hazardous or non-hazardous wastes.

4.12.1.4 Fires and Explosions

Natural gas would fuel the Proposed Action via high-pressure gas pipelines and large-diameter natural gas transmission lines located at the adjacent Griffith Energy. There is a potential for fires or explosions if gas were released as a result of leaks or ruptures of the natural gas pipelines. Pipes, valves, or connections could fail, resulting in the release of gas ranging from minor leaks to catastrophic rupture. Most pipeline ruptures are caused when heavy equipment accidentally strikes a pipeline that is operating in close proximity. Ruptures can result in an explosion and fire if a spark or open flame were to ignite the escaping gas. However, the potential for such failures in gas containment would be low because construction in the vicinity of the natural gas pipelines would be in accordance with applicable U.S. Department of Transportation standards to minimize the potential for a leak or rupture. Frequent signage is also installed along the existing pipelines to reduce the risk of accidental ruptures caused by excavating equipment. Monitoring the flow in the pipeline either by remote sensors or by daily inspections of the flow meters reduces the probability of ruptures by promoting prompt detection of leaks. The Applicant would implement a monitoring program for detecting leaks or pre-leak conditions for the natural gas supply facilities in adherence to an approved schedule for the life of the Proposed Action. Industry standards of valving and emergency shutoff controls and procedures would also be used and maintained.

A fire protection system would be developed for the Proposed Action as part of its safety program described in chapter 2, section 2.1.9.1. The Proposed Action would include an underground firewater loop interfaced with the existing firewater system at Griffith Energy. There would be two connections to two different portions of the Griffith Energy firewater loop. Water supply for the Proposed Action would be obtained from the Griffith Energy as previously described in chapter 2, section 2.7. Therefore, the Proposed Action would not require on-site storage of firewater and no incremental water supply obligation from the I-40 Industrial Corridor Water System is required to serve the Proposed Action.

The proposed power plant would not be located within a designated Fire District. A private company, Inland Valley Fire, serves Griffith Energy and the Arizona State Prison in Kingman 24 hours a day. The Inland Valley Fire equipment, which includes a fire truck, ambulance, and staff, is located in the vicinity. It is anticipated that NAEP would contract with Inland Valley Fire Company to provide fire protection.

4.12.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed or operated, and there would be no associated health and safety impacts.

4.13 CUMULATIVE IMPACTS

Cumulative impacts can be the consequence of individually minor but collective actions of existing facilities and reasonably foreseeable future actions occurring over time. Based on the land use plans developed by Mohave County and the plans of developers in the area, it is

expected that the I-40 Industrial Corridor would continue to be developed for industrial uses and that additional housing and population growth would occur in Mohave County. The impacts of the proposed NAEP Project would contribute cumulatively to the impacts associated with this planned development.

Although future development of the I-40 Industrial Corridor is planned and expected, no projects are proposed currently. Consequently, no projections about future developments and their impacts to resources, such as air, water, biological, and cultural resources are available and any projections developed here would be speculative. Of most concern in this arid environment would be the potential impact to the Sacramento Valley aquifer. The Proposed Action was found to have only a minimal impact to the ground water resource and no impact or minimal impact to all other environmental components. Therefore, the Proposed Action would not contribute substantially to cumulative impacts.

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5.0 PERSONS AND AGENCIES CONSULTED

5.1 PUBLIC PARTICIPATION

The public participation program for the NAEP included contacts with individuals and Federal, state, and local agencies, public notices, the mailing of a scoping letter, and agency and public meetings.

5.1.1 Agency and Public Meetings

The following meetings were held for agency personnel and for the public to discuss and collect comments on the NAEP:

- An informational open house meeting for the public, hosted by the Applicant, was held on February 5, 2007 in Golden Valley from 4:00 p.m. to 7:00 p.m. This open house meeting was advertised in local papers and 400 announcements were mailed directly to all property owners within 5 miles of the NAEP property.
- A forum was held by the Applicant in Lake Havasu, Arizona on February 5, 2007 from 12:00 p.m. to 2:00 p.m. with key community leaders and elected officials.
- Public scoping for the EA developed by Western included the mailing a scoping letter to all interested parties (including all property owners within 2 miles of the NAEP.

A copy of the scoping letter is provided in **appendix B**.

5.1.2 Agencies and Organizations Consulted

Western, as the lead Federal agency, has consulted with Federal, state, and local agencies, Native American groups, organizations, and individuals regarding the proposed NAEP. The following is a list of contacts that were made during the scoping process and the preparation of Draft EA.

Federal Agencies

Environmental Protection Agency
- Air Division, Region 9
- Communities and Ecosystem Division, Region 9

U.S. Department of Agriculture
- Natural Resources Conservation Service

U.S. Department of Homeland Security
- Federal Emergency Management Agency, Region IX

U.S. Department of Housing and Urban Development
- San Francisco Regional Office

U.S. Department of Interior
- Bureau of Indian Affairs
  - Colorado River Agency
  - Ft. Yuma Agency
  - Truxton Canon Agency
  - West Regional Office
  - Environmental Quality Services

Bureau of Land Management
Kingman Field Office
State Director
Fish and Wildlife Service
Bill Williams Wildlife Refuge
Ecological Services Field Office, Phoenix
Havasu National Wildlife Refuge
Oakland Regional Office
National Park Service
Air Resources Division
Glen Canyon National Recreation Area
Grand Canyon National Park
Grand Canyon Science Center
Intermountain Field Area
U.S. Geological Survey
Grand Canyon Monitoring and Research Center
U.S. Department of the Army
Corps of Engineers, Los Angeles District
U.S. Department of Transportation
Arizona Division Office

State Agencies
Arizona Corporation Commission Utilities Division
Arizona Department of Environmental Quality
Air Quality Division, Permits Section
Air Quality Division, Planning Section
Counsel
Northern Regional Office
Water Quality Division
Arizona Department of Transportation
Kingman District
Office of Risk Management
Roadside Development Section
Arizona Department of Water Resources
Arizona Game and Fish Department
Kingman Office
Arizona Office of the Governor
Governor
Natural Resources, Agriculture and Environment
Arizona State Land Department
Right of Way
Arizona State Parks
Arizona State Historic Preservation Office
Cooperative Extensions Services

Local Agencies
City of Kingman

Special Projects Administration
Kingman Airport Authority
LaPaz County
Board of Supervisors
Mohave County
Board of Supervisors
Bullhead City Municipal Court
Bullhead City Public Library
Community College
Information Technology Department
Kingman Public Library
Mohave Valley Campus Library
Parks Department
Public Works
Planning and Zoning Department
Transportation Commission

Native American Tribes and Communities

Agua Caliente Band of Cahuilla Indians
Historic Preservation
Ak-Chin Indian Community
Chemehuevi
Tribal Council
Cocopah Indian Tribe
Cocopah Museum
Colorado River Indian Tribe
Fort McDowell Yavapai Nation
Cultural Preservation Office
Fort Mojave
Aha Makav Cultural Society
Tribal Council
Fort Yuma-Quechan Indian Tribe
Cultural Preservation Committee
Hopi Tribe
Historic Preservation Office
Hualapai
Department of Cultural Resources
Tribal Council
Kumeyaay
Campo Band
Viejas Band
Navajo Nation
Historic Preservation Office
Salt River Pima-Maricopa Indian Community
Tonto Apache Tribe

Yavapai-Apache Nation
Yavapai Prescott Indian Tribe
Department of Cultural Resources

Organizations

A/M Gas N Go Inc 50
Audubon Arizona
Arizona Cattleman's Association
Arizona Desert Bighorn Sheep Society
Arizona Electric Power Cooperative, Inc.
Arizona Nature Conservancy
Arizona Wildlife Federation
Blake Cattle Company
Calpine
Calvin James LLC
CEJ LLC
Center for Biological Diversity
Century 21
Coldwell Banker
Council of Energy Resource Tribes
Desert Tortoise Council
El Paso Natural Gas Company
Environmental Defense Fund, Inc.
Ford Motor Company
Arizona Proving Grounds
Gerdau Ameristeel
Globe Corporation
Historic 66 Association of Arizona
Information Society for Protection of Mustangs and Burros
Kiewit Western Company
Kingman Area Chamber of Commerce
Kingman Daily Miner
Land and Water Fund of the Rockies
McKee Foods Corporation
M. De Torro LLC
M&M 2000 LLC
McKee Foods Transportation, LLC
National Parks and Conservation Association
National Tribal Environmental Council
National Wildlife Federation
North Coast Village LLC
Northern Arizona Audubon Society
Northwestern University
Institute for Policy Research
Outback Off-Road Adventures
PDQ Rock & Sand
Prescott Audubon Society

Roadway Express
Sante Fe Railroad
Sierra Club
    Southwest Office
Southwest Network for Environmental and Economic Justice
Sun Up II LLC
TEPPCO
The Nature Conservancy
    Western Resource Office
    Northern Arizona Program and Hart Prairie Preserve
Unisource Energy Services
W F Cattle Company
Walnut Creek Development Company
Wild Horse Organized Assistance
Valley Pioneer Water Company

Individuals
Allen & Lillian C. Smith Trustees
Bonnie & Brien Giglio
Brad L. McCoy
Charles John Romer Trustee
Christopher B. Martin Jr
Daniel E. Calwell
David R. Carey
Donna L. Baker
Edward A. Sr & Donna M. Austin Jr
Elmer Wallace
Fatco Tr 4446
George & Monica C. Banuelos CPWRS
James Blake
James & Karen Dove Jr
James E. & Beverly N. Brand CPWRS
Jack Erhart
Jack E. & Navis L. Runyan
Jeannie Hirschfeld Etal Jr
Max D. Linn
Michael W. Reilly
Scot A. Durst Jt
Thomas L. Cloos Etal Jr
Travis Holyoak
Timothy Huddleston
Wendy Carlson
William & Christine Summitt Trustees
Verna A. Schwab
Victoria Torres-Huerta

5.1.3 List of Preparers

Name	Responsibility
Western Area Power Administration	
Lynn Almer	Water Resources
Erica Walters	Climate and Air Quality
Misti Schriner	Biological Resources
Mary Barger and Steve Tromly	Cultural Resources
Nancy Werdel	Land Use, Recreation, and Socioeconomics
Robert Scott	Visual
Ken Mathias	Health and Safety
Doug Harness	Legal
Glenn Wallace and Mark Wieringa	Western's Project Management; Document Coordination
ARCADIS	
Jackie Headrick	Water Resources, Geology, and Soils
Gordon Frisbie and Susan Riggs	Air Quality and Noise
Janell Harvey and Pat Golden	Biological Resources
Carl Spath and Don Jolly	Cultural Resources
Kathryn Cloutier	Land Use, Socioeconomics, Health and Safety, Environmental Justice
Lisa Welch	Visual, Transportation, and Recreation
Jason Gregory	GIS, Simulations
Randy Schroeder and Eric Cowan	Project Management; Document Coordination
Sierra Research	
Mark Peak	Air Quality

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APPENDIX A — ADWR HYDROLOGIC REVIEW

ARIZONA DEPARTMENT OF WATER RESOURCES

HYDROLOGY DIVISION

MEMORANDUM

TO: Arizona Power Plant and Transmission Line Siting Committee

THRU: Frank Putman, Chief Hydrologist

FROM: Dale Mason, Hydrologist, Water Resources Section

DATE: July 18, 2007

RE: Hydrologic Review of the Northern Arizona Energy Project's Power Plant Application, Docket Number L-00000FF-07-0134-00133.

Summary

On April 26, 2007, the Arizona Corporation Commission Utilities Division Staff requested that the Arizona Department of Water Resources (ADWR) address the following subjects regarding the Northern Arizona Energy Project (NAEP) application. Those subjects are: 1) will the project have a detrimental impact upon water supplies in Mohave County, and 2) will the project have any impact on water supplies for existing or known planned developments in Mohave County.

The answer to the first question, will the NAEP have a detrimental impact upon water supplies in Mohave County, is no. A comparison of the expected annual volume of water used by the NAEP to the estimated annual recharge for the Sacramento Valley Groundwater basin indicates that the NAEP may potentially have a small impact on the annual water budget for the basin. A second comparison of the estimated total water use over the life expectancy of the NAEP to estimates of groundwater in storage in the basin indicates that any impacts to overall water supplies in the basin will be insignificant.

The answer to the second question, will the NAEP have an impact on water supplies for existing or known developments, is that the NAEP will probably have an insignificant impact on any such developments. A well impact analysis of NAEP pumpage predicts a maximum drawdown of 15 feet at the pumping well after 40 years of pumping at the maximum projected annual withdrawal rate of 270 acre-feet per year (Figure 1). A drawdown of 4 feet is expected to occur at approximately three-quarters of a mile from the pumping well, and a drawdown of 1 foot is expected at approximately 6.7 miles from the pumping well after 40 years (Figure 1). Wells for the Golden Valley – Phase 1 development can expect additional drawdowns of between 1 to 2 feet after 40 years due to the NAEP. Proposed wells for the planned Golden Valley - Phase 2 development may experience additional drawdowns of 1 to 4 feet (Figure 1).

In all cases, the impacts from the NAEP would by considered insignificant. A detailed discussion of the potential impacts from NAEP is included below.

Impact to Water Resources

Estimates of the annual ground-water outflow from the Sacramento Valley basin have ranged from less than 500 ac-ft per year to as much as 10,000 ac-ft per year (Gillespie, J.B. and Bentley, C.B., 1971; Freethey, G.W. and Anderson, T.W., 1986; Owens-Joyce, 1987; Rascona, S.J., 1991; ADWR, 1997). Groundwater in Sacramento Valley generally flows to the south, paralleling Sacramento Wash, before turning east and flowing out of the basin near Topock, Arizona. In 1997, the ADWR estimated ground-water outflow from the Sacramento Valley basin to be 1,200 ac-ft per year (ADWR, 1997). This estimate was based on water level data, aquifer test results, and a geologic cross-section across Sacramento Valley's ground-water outflow point near Topock, Arizona. Water levels in wells in the southern part of the Sacramento Valley basin have generally been steady over the past 20 to 30 years indicating that the basin's ground-water outflow probably has not been greatly affected by pumpage in the central part of the valley. Therefore, the basin's outflow is probably equal to the annual aquifer recharge.

The NAEP is a peaking plant that will be used to supply electrical power during times of peak demand and is expected to run an average 2,500 hours per year and use 160 acre-feet of water per year. A worst case scenario of the NAEP running for 5,000 hours per year would result in a water use of 270 acre-feet per year. The range of water use by the NAEP represents from 13 to 22 percent of the estimated annual recharge for the Sacramento Valley basin. However, the expected NAEP annual water use probably falls within the range of uncertainty of the ADWR recharge estimate.

Current water use in Sacramento Valley is estimated at about 2,900 ac-ft per year (Tadayon, 2004, Southwest Groundwater, 2007). Water uses consist of about 1,500 ac-ft for municipal/domestic use and about 1,400 ac-ft of industrial pumpage. The majority of the industrial pumpage, about 1,200 ac-ft per year, is for the Griffith Power Plant. Annual historic water use estimates have ranged from less than 500 ac-ft per year to as much as 6,000 ac-ft per year during the late 1960s and the 1970s (Rascona, 1991; Tadayon, 2004). The high water use during the 1960s and 1970s was due to withdrawals for mineral extraction and processing by the Cyprus Metals Company (Rascona, 1991). In 1989 the mine was placed on stand-by and withdrawals for mining have decreased to about 300 ac-ft per year. Future pumpage in Sacramento Valley may exceed 30,000 ac-ft per year if the planned developments reach full build out, the mine becomes active again, and the Mohave County water system reaches its maximum capacity of 4,800 gallons per minute (7,260 ac-ft per year).

Estimates of the volume of groundwater in storage above 1,200 feet below land surface and available for withdrawal in Sacramento Valley basin ranges from 2.3 to 13 million acre-feet (Gillespie, J.B. and Bentley, C.B., 1971; Freethey, G.W. and Anderson, T.W., 1986; ADWR, 1994). Total water use by the NAEP over its 40 year life expectancy would be between 6,400 and 10,800 acre-feet, which represents much less than one percent of the total groundwater available in storage.

Impact to Future Developments

A well impact analysis of NAEP pumpage assigned to a single well in the existing Mohave County Well field produced a maximum drawdown of 15 feet at the well after 40 years of pumping the maximum projected annual withdrawals of 270 acre-feet per year (Figure 1). A drawdown of 4 feet is expected to occur at approximately three-quarters (0.75) of a mile from the well, and a drawdown

of 1 foot is expected at approximately 6.7 miles from the well after 40 years (Figure 1).

The well impact analysis indicates that the existing Mohave County well field, which supplies water to the county industrial park, will be most affected by withdrawals for the NAEP (Figure 1). After 40 years the existing county wells can expect additional drawdowns of between 3 and 15 feet. Wells supplying two major proposed developments may also be slightly affected by withdrawals for the NAEP. Water supply wells for the permitted Golden Valley development can expect additional drawdowns of between 1 and 2 feet after 40 years due to NAEP pumpage (Figure 1). Wells for the proposed Golden Valley Phase 2 development, which is under review by the ADWR, may experience additional drawdowns of 1 to 4 feet after 40 years at its proposed well sites (Figure 1). Drawdowns of such small amounts will probably have an insignificant impact on the water supplies for these developments.

Attachments:

Figure 1). Maps showing NAEP well impact analysis and locations of existing and future developments, Sacramento Valley

References:

Arizona Department of Water Resources, 1994, Arizona water resources assessment, Volume II, Hydrologic summary: Arizona Department of Water Resources, 236 p.

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Gillespie, J.B. and Bentley, C.B., 1971, Geohydrology of Hualapai and Sacramento Valleys, Mohave County, Arizona: U.S. Geological Survey Water-Supply Paper 1899-H, H1-H37, 2 sheets.

Owens-Joyce, Sandra, 1987, Estimates of annual average tributary inflow to the lower Colorado River, Hoover Dam to Mexico: U.S. Geological Survey Water-Resources Investigation Report87-4078, 1 sheet.

Rascona, S.J., 1991, Maps showing groundwater conditions in the Sacramento Valley Basin, Mohave County, Arizona - 1991: Arizona Department of Water Resources Hydrologic Maps Series Report Number 21, 1 sheet.

Southwest Ground-water Consultants, Inc, 2007, Evaluation of pumping impacts of the Northern Arizona Energy Project (NAEP) on the Mohave County water system well field and the Sacramento Valley Aquifer. Mohave County, Arizona.

Tadayon, Saeid, 2004, Water withdrawals for irrigation, municipal, mining, thermoelectric-power, and drainage uses in Arizona outside of Active Management Areas, 1991-2000: U.S. Geological Survey, Scientific Investigation Report 2004-5293, 28 p.

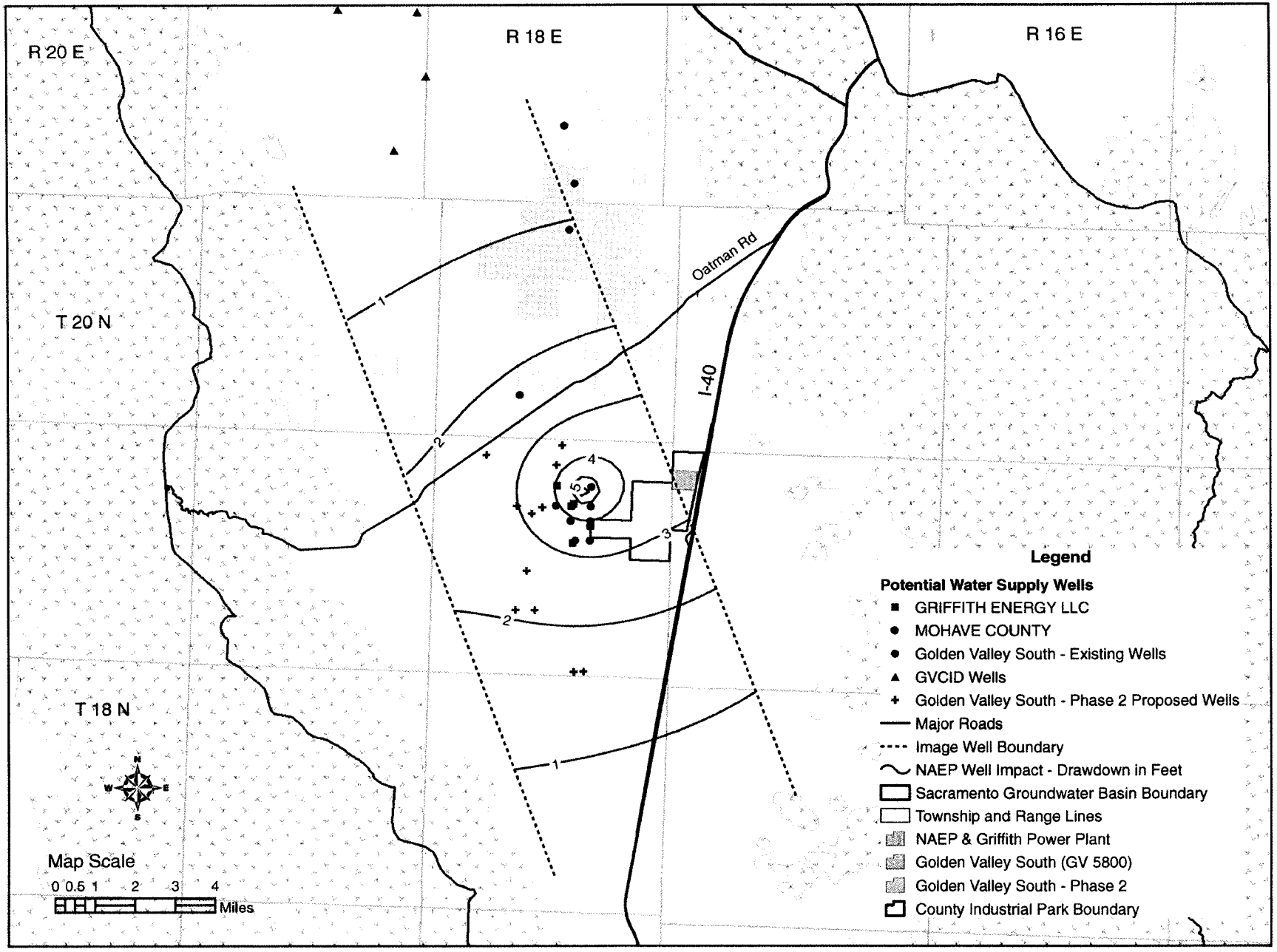


Figure 1. Map showing NAEP impact analysis and existing and planned developments, Sacramento Valley.

APPENDIX B — WESTERN SCOPING NEWSLETTER

Western
AREA POWER
ADMINISTRATION

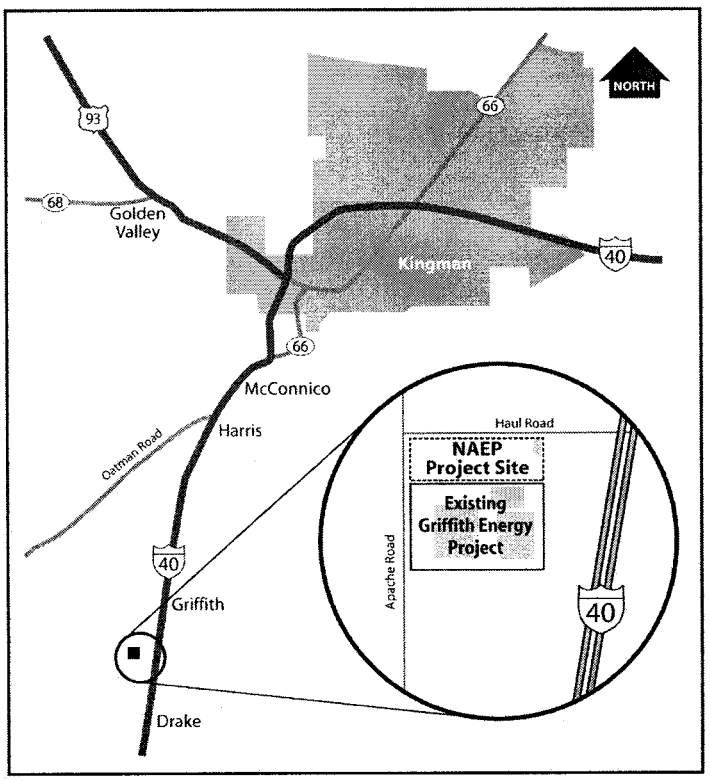
Northern Arizona
ENERGY PROJECT

MARCH 2007

New 175-MW powerplant planned for Mohave County, Ariz., site

Western Area Power Administration, a power marketing agency of the U.S. Department of Energy, wants to hear your comments about a proposed power generation facility that would interconnect with Western's transmission system.

Northern Arizona Energy, LLC proposes to construct the Northern Arizona Energy Project, a natural gas fired, simple-cycle power plant located on private lands located about 9 miles south of Kingman, Ariz. The proposed project would supply power to utilities in Arizona and surrounding regions to serve their customers during periods of peak electricity demand. Construction of the proposed project would start in late 2007 and be complete by May 2008.



The proposed project would be located on an approximately 40-acre parcel of land just north of the existing Griffith Energy Project. Gas and water would be provided by the adjacent Griffith Energy Project. Within the parcel, approximately 8 acres would be used for equipment, a stormwater retention basin and interconnection facilities. The proposed project would be interconnected to the regional transmission grid via transmission interconnections at the existing Griffith Switchyard, owned and operated by Western. The Griffith Switchyard would be expanded about 1 acre to accommodate the interconnection with the proposed project. A temporary construction area for contractor facilities, construction parking, and equipment and material lay down would be located east of the power plant site and would require about 3 acres.

Why the Northern Arizona Energy Project?

The Northern Arizona Energy Project is being developed in response to several factors, including:

- Extreme historical and forecasted peak load growth in Mohave County and across Arizona
- Arizona utilities seeking peaking resources
- No existing simple-cycle units in Mohave County to serve peak load profile
- Use of existing I-40 Industrial Corridor infrastructure at property boundaries
  - Existing gas transportation capacity and meter station
  - Western's existing Griffith 230-kV Switchyard
  - Mohave County water system

What facilities and equipment are planned?

Equipment associated with the proposed project would include four General Electric LM6000 PC SPRINT NxGen 45 megawatt combustion turbine generators with inlet air chiller modules. The proposed project would be designed to produce 175 MW of net electrical output. However, annual average output of the proposed project would not exceed 50 average MW. The generators are capable of rapid startup within 10 minutes, allowing the proposed project to respond to fluctuations in electric demand.

The equipment and facilities would be arranged for optimum use of the power plant site as well as to ensure operability and maintainability. Conceptual engineering studies have been conducted to define the specific equipment requirements and to confirm the suitability of the proposed site.

Why is Western involved in the Northern Arizona Energy Project?

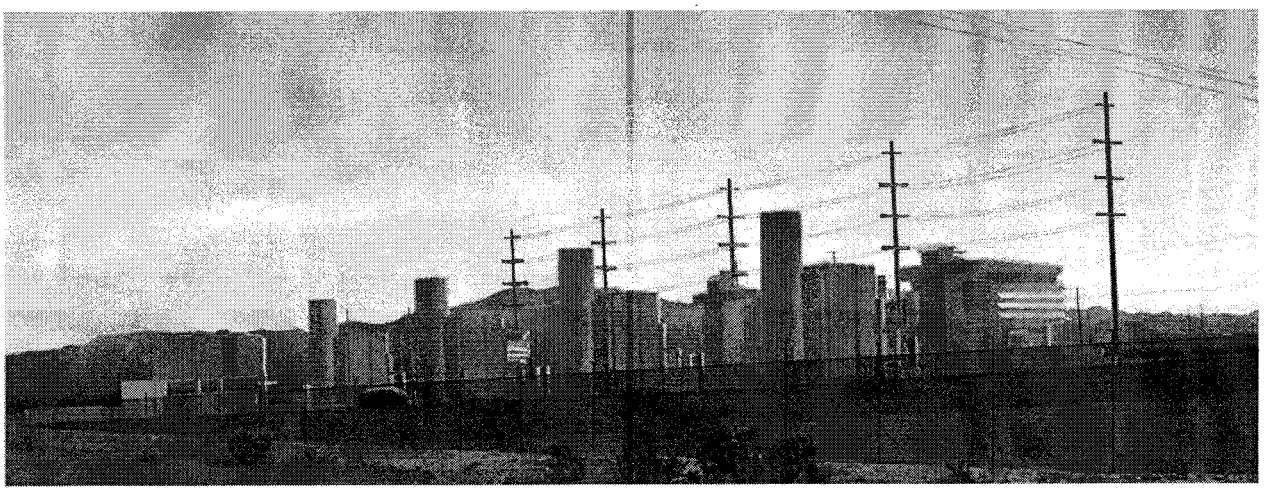
Western operates and maintains about 17,000 miles of high-voltage transmission lines and associated facilities within a 15-state region of the central and western United States. Federal law requires us to provide eligible organizations open access to transmission services so that they can move power to load areas. We provide these services through an interconnection if there is available capacity on the Federal transmission system.

Any entity requesting transmission services must abide by our Open Access Transmission Service Tariff, including our Large Generator Interconnection Procedures. More information about these requirements is available on our Web site at **http://www.wapa.gov/transmission/interconn.htm.**

The owners of the proposed project requested an interconnection with Western's transmission system at Griffith Swithyard. This interconnection request triggers a Federal National Environmental Policy Act review process in addition to the state's permitting processes. Before Western can agree to the construction and interconnection of the proposed project, we must consider the project's potential environmental impacts.

Western needs your help to address environmental impacts

Public involvement is an important and integral part of Western's NEPA process. Scoping involves actively acquiring input from interested Federal, state, tribal and local agencies and the public. Information gained during scoping assists Western in identifying potential environmental issues, alternatives and mitigation measures associated with constructing and operating the proposed project. Scoping also helps narrow the



This visual simulation shows the proposed Northern Arizona Energy Project viewed from the intersection of Haul Road and Apache Road looking southeast.

scope of issues so the analysis of environmental impacts can focus on areas of high interest and concern.

Western wants you to comment on the proposal, offer suggestions to improve the proposal and even suggest alternative actions. Western is also asking you to identify any issues of concern about potential environmental impacts. You can provide input into this process by e-mailing, delivering, or sending by mail or fax your comments by March 31, 2007 to John Holt or by mailing the enclosed addressed response sheet.

This newsletter also serves as Western's notification of plans to prepare an environmental assessment. The EA will provide Western with a framework to analyze and judge the magnitude of environmental impacts. If Western finds that there are no significant environmental impacts, we can issue a "finding of no significant impact" and move forward with the proposed project. If the EA process identifies likely unmitigated significant impacts, an environmental impact statement process will be initiated to take a more detailed look at the impacts and alternative approaches to the proposed project.

If you would like to receive a copy of the Draft EA for review, please note so on the response sheet. Western will also be the lead agency for compliance with the National Historic Preservation and Endangered Species acts.

Preliminary issues

The following issues and concerns have been identified as among those that should be examined for impacts. The list will be finalized during Western's EA process and used to prepare the Draft EA.

- Air emissions from the combustion turbines
- Noise generated by the combustion turbines
- Loss of desert habitat
- Construction worker travel effects on local transportation facilities
- Changes in land use
- Influx of construction workers and effects on local infrastructure
- Water required by the proposed power plant

Where can I get more information?

Mr. John Holt
Western Area Power Administration
P.O. Box 6457
Phoenix, AZ 85005-6457
Phone: 602/605-2525
Fax: 602/605-2630
E-mail: holt@wapa.gov

Ms. Dana Diller
Northern Arizona Energy Project
6410 E. Everett Dr.
Scottsdale, AZ 85254
Phone: 480/664-8154

You can also find out more about the proposed project by visiting us online at **www.wapa.gov/transmission/internaep.htm**

What Is the EA schedule?

- **Early March 2007** – Scoping notice sent to stakeholders; comments solicited to help define EA scope
- **March 31, 2007** – EA scoping period closes
- **April 2007** – Western incorporates scoping comments and distributes Draft EA for review
- **August 2007** – Western determines whether to prepare a FONSI or an EIS and issues a FONSI or EIS determination

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Western Area Power Administration
P.O. Box 6457
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