BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF UNS ELECTRIC, INC., IN CONFORMANCE WITH THE REQUIREMENTS OF A.R.S. § 40-360, ET SEQ., FOR A DISCLAIMER OF JURISDICTION, OR, IN THE ALTERNATIVE, A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE EXPANSION OF BLACK MOUNTAIN GENERATING STATION, A NATURAL GAS-FIRED, COMBUSTION TURBINE POWER PLANT NEAR KINGMAN, ARIZONA IN MOHAVE COUNTY.	Docket No. L-00000F-24- XXXX-00XX Case No. **NOTICE OF FILING**

OSBORN MALEDON ATTORNEYS AT LAW

UNS Electric, Inc., ("UNS or Applicant"), through undersigned counsel, provides notice of filing its Application for a Disclaimer of Jurisdiction, or in the Alternative, a Certificate of Environmental Compatibility ("CEC") seeking authority to add four separate natural gas units—each with an individual nameplate rating of 50 megawatts ("MW")—to the existing Black Mountain Generating Station, a natural gas-fired, combustion turbine power station near Kingman, Arizona in Mohave County.

Pursuant to A.R.S. Sections 40-360 through 40-260.14 and AAC R14-3-201 through R14-3-200, enclosed are 25 copies of the Application. The filing fee required by A.R.S. Section 40-360.09 is also enclosed.

Communications concerning the Application (including data requests) should be addressed to:

Meghan H. Grabel
Elias J. Ancharski
Osborn Maledon, PA
2929 N. Central Ave Suite 2000
Phoenix Arizona 85012

And

Clark Bryner
Tucson Electric Power Company
4350 E. Irvington Rd.
Mailstop CB200
P.O. Box 711
Tucson, AZ 85702

RESPECTFULLY SUBMITTED this 8th day of March, 2024.

OSBORN MALEDON, P.A.

Meghan Grabel
Elias Ancharski
2929 N. Central Ave 20th Floor
Phoenix, Arizona 85012
mgrabel@omlaw.com
eancharski@omlaw.com
Attorneys for UNS Electric, Inc.

ORIGINAL of the foregoing and 25 copies were filed this 8th day of March, 2024 with:

Utilities Division-Docket Control
ARIZONA CORPORATION COMMISSION
1200 W. Washington Street
Phoenix, Arizona 85007

COPIES of the foregoing hand-delivered this day to:

Adam Stafford
Chairman, Arizona Power Plant and
Transmission Line Siting Committee
15 South 15th Avenue
Phoenix, Arizona 85007-2926
Adam.Stafford@azag.gov

COPIES of the foregoing e-mailed this day to:

Legal Division
ARIZONA CORPORATION COMMISSION
1200 W. Washington Street

Phoenix, Arizona 85007
legaldiv@azcc.gov

Utilities Division
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007
utildivservicebyemail@azcc.gov

Glennie Reporting Services, LLC
1555 East Orangewood
Phoenix, AZ 85020
admin@glennie-reporting.com

By: Patricia A. Palmer

APPLICATION FOR A DISCLAIMER OF JURISDICTION, OR, IN THE ALTERNATIVE, A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

Black Mountain Expansion Project

Prepared for

Arizona Power Plant and Transmission Line Siting Committee

Submitted by

UNS Electric, Inc.

2024

Case No. _____

BEFORE THE
ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF UNS ELECTRIC, INC., IN CONFORMANCE WITH THE REQUIREMENTS OF A.R.S. § 40-360, ET SEQ., FOR A DISCLAIMER OF JURISDICTION, OR, IN THE ALTERNATIVE, A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE EXPANSION OF BLACK MOUNTAIN GENERATING STATION, A NATURAL GAS-FIRED, COMBUSTION TURBINE POWER PLANT NEAR KINGMAN, ARIZONA IN MOHAVE COUNTY.	Docket No. L-00000F-24-XXXX-00XX Case No. XXX

APPLICATION FOR DISCLAIMER OF JURISDICTION OR, IN THE ALTERNATIVE, CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

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LIST OF EXHIBITS

REQUEST FOR DISCLAIMER OF JURISDICTION

Pursuant to Arizona Administrative Code ("A.A.C.") R14-3-203(D), UNS Electric, Inc. ("UNSE" or "Applicant") hereby files this Application to request a disclaimer of jurisdiction over its Black Mountain Expansion Project. Arizona Administrative Code R14-3-203(D) provides: "An application may be filed in the alternative in situations where the applicant is in doubt as to whether an application is required by law. In such instances the application shall request a disclaimer of jurisdiction from the [Arizona Power Plant and Transmission Line Committee ("Committee")] or, in the alternative, a certificate of environmental compatibility ["CEC"]." The present Application satisfies the requirements of A.A.C. R14-3-203(D) by providing a skeletal CEC Application. However, in the interest of preserving time and resources, the Applicant intends for the focus of the initial hearing to be on the legal argument underpinning its request for a disclaimer of jurisdiction. If the request for a disclaimer of jurisdiction is rejected by the Committee, the Applicant will move to continue the hearing pursuant to A.A.C. R14-3-209 and pause the timeclock applicable to CEC proceedings, while simultaneously waiving its right to construct the facilities provided in A.R.S. § 40-360.08, so that the Applicant may request a review of the Committee's decision to the Arizona Corporation Commission ("Commission") and thereafter in court, if necessary. If the Committee's decision is upheld by the Commission and in any subsequent court proceedings, UNSE will withdraw this CEC Application and refile it at a later date with a more robust factual record for the Committee's consideration in a subsequent evidentiary proceeding.

UNSE plans to add four separate natural gas units—each with an individual nameplate rating of 50 megawatts ("MW")—to the Applicant's existing Black Mountain Generating Station, a natural gas-fired, combustion turbine power station near Kingman, Arizona in Mohave County (the additions hereinafter referred to as "Black Mountain Expansion Project" or "Project").[1] The Project is required to meet future load growth across UNSE's service territory, maintain reliability for both existing and future customers, and reduce reliance on wholesale market purchases to meet retail demand.

Arizona's line siting statutes (A.R.S. § 40-360 *et. seq.*, "Siting Statutes") require "every utility planning to construct a plant, transmission line or both" to "first file with the [Arizona Corporation Commission] an application for a certificate of environmental compatibility." A.R.S. § 40-360.03. Importantly, "plant" is defined as:

> **[E]ach separate** thermal electric, nuclear or hydroelectric **generating unit with a nameplate rating of one hundred megawatts or more**. . . .

A.R.S. § 40-360(9) (emphasis added).

[1] UNSE's 2023 Integrated Resource Plan ("IRP") calls for the addition of 200MW of natural gas turbines to support system reliability during the summer months. Specifically, the IRP calls for the addition of four new fast-start, fast-ramping aeroderivative combustion turbines. Pursuant to A.A.C. R14-2-705(B), UNSE plans to issue an all-source Request for Proposal to meet this need.

The plain language of the statute is clear – separate generating units with nameplate ratings under 100 MWs do not require a CEC. Because each of the generating units that UNSE is constructing has a nameplate rating under that 100MW threshold, UNSE is not legally required to obtain a CEC to construct the Project. Notably, the existing natural gas units at Black Mountain were constructed by their previous owner without a CEC because they, too, each have a nameplate rating under 100MW. Specifically, the existing Black Mountain Generating Station is comprised of two separate units, each with a nameplate rating of 61 megawatts. Importantly, the Commission has addressed several issues related to the Black Mountain Generation Station without suggesting that a CEC should have been obtained for them. For example, in Decision No. 70186 (February 27, 2008), the Commission approved various agreements related to the sale of the station to UNSE. Further, in Decision No. 71914 (September 30, 2010), the Commission approved a "rate reclassification" process to include the station in UNSE's rate base. In Decision 72213 (March 3, 2011), the Commission further confirmed that the station would be included in UNSE's rate base upon the completion of three conditions, none of which related to a CEC. The Company therefore respectfully requests that the Committee and Commission disclaim jurisdiction over the Black Mountain Expansion Project.

The Company understands that the Committee has entertained CEC applications from applicants seeking to build a project with a cumulative capacity in excess of 100MW, even though each separate unit included as part of the project was under 100MW.[2] However, UNSE respectfully disagrees that a CEC is necessary in such circumstances under the express language of the statute, which explicitly references the capacity of "each separate" generating unit, without regard to the cumulative capacity of a project. When a statute is clear and unambiguous, courts apply its plain language in interpreting its provisions. *See, e.g., Kent K. v. Bobby M.*, 210 Ariz. 279, 283 (2005). *See also* A.R.S. § 1-213 (requiring that statutory "[w]ords and phrases shall be construed according to the common and approved use of the language."). Courts give the statute's words their ordinary meaning and give meaning to every word so that no word is rendered superfluous. *Secure Ventures, LLC v. Gerlach*, 249 Ariz. 97, 99 (App. 2020). To effectuate that cause, courts may look to dictionary definitions. *State v. Pena*, 235 Ariz. 277, 279 (2014).

The Siting Statutes' CEC requirement applies to "a plant," which it defines as "each separate thermal electric, nuclear or hydroelectric generating unit. . . ." A.R.S. § 40-360(9). The *American Heritage Dictionary of the English Language* defines "each" as "[b]eing one of two or more considered individually."[3] "Separate" is defined as "[n]ot touching or adjoined; detached" and "[e]xisting or considered as an independent entity."[4] "Unit," in turn, is defined as "[a]n individual, group, structure, or other entity regarded as an elementary

[2] *See,* for example, Tucson Electric Power Company's siting of ten (10) generating units, each with a nameplate capacity of 20MW, as part of its RICE Project (Decision No. 76638 (March 29, 2018)).

[3] *Each,* AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (5th ed. 2022), https://www.ahdictionary.com/word/search.html?q=each (last visited Nov. 16, 2023).

[4] *Separate,* AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (5th ed. 2022), https://www.ahdictionary.com/word/search.html?q=separate (last visited Nov. 16, 2023).

structural or functional constituent of a whole."[5] These definitions make clear that the capacity threshold for a "plant" is determined by looking at a singular, individual generating unit rather than a group of units. Any other reading would render the statute's use of the words "each separate" superfluous, in direct violation of basic statutory interpretation principles. *See Secure Ventures, LLC v. Gerlach*, 249 Ariz. 97, 99 (App. 2020).

This reading is underscored by the use of the word "nameplate" to determine whether the capacity threshold is met. In the energy context, the "nameplate" rating or capacity of a generator is the maximum amount of energy that unit can produce, as rated by its manufacturer. For example, the Nuclear Regulatory Commission ("NRC") defines "generator nameplate capacity" as "[t]he maximum amount of electric energy that a generator can produce under specific conditions, as rated by the manufacturer. Generator nameplate capacity is usually expressed in kilovolt-amperes (kVA) and kilowatts (kW), as indicated on a nameplate that is physically attached to the generator."[6] Similarly, the US Energy Information Agency states that "[n]ameplate generator capacity is determined by the generator's manufacturer and indicates the maximum output of electricity a generator can produce without exceeding design thermal limits."[7] Lastly, the 7th Circuit has ruled that "[n]ameplate capacity is the capacity figure stamped on a generating unit by its manufacturer and includes the capacity necessary to power the unit itself."[8]

As these definitions indicate, the nameplate rating of a generating unit is typically contained on a physical plate attached to it. For example, each of the two existing generation units at the Black Mountain Generating Station has its own separate nameplate showing a rating of 61 MW, and each of the proposed generation units will have its own, separate nameplate showing individual ratings of 50 MW. If the Legislature had intended to combine the ratings, it would not have referred to the physical nameplate on each separate unit to determine the capacity threshold.

In contrast to Arizona's CEC requirement, other jurisdictions have siting laws that require approval where any facility individually **or in combination with other facilities** at the same site generate their respective capacity thresholds. For example, Iowa requires utilities to seek a certificate of public convenience before constructing a "facility," which it defines as:

> any electric power generating plant **or a combination of plants at a single site**, owned by any person, **with a total capacity of twenty-five megawatts** of electricity or more and those associated transmission lines connecting the generating plant to

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[5] *Unit*, AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE (5th ed. 2022), https://www.ahdictionary.com/word/search.html?q=unit (last visited Nov. 16, 2023).

6 https://www.nrc.gov/reading-rm/basic-ref/glossary/generator-nameplate-capacity.html (visited February 20, 2024).

7 https://www.eia.gov/tools/faqs/faq.php?id=101&t=3 (visited February 20, 2024

8 Madison Gas & Elec. Co. v. U.S. E.P.A., 25 F.3d 526, 529 (7th Cir. 1994); accord JEA v. Florida Power & Light Co., 6 So. 3d 1247, 1248 (Fla. Dist. Ct. App. 2009)(quoting Madison Gas & Elec. Co.).

> either a power transmission system or an interconnected primary transmission system or both.

Iowa Code § 476A.5 (emphasis added).

Similarly, Minnesota law requires the issuance of a certificate for the construction of a "large energy facility," which is defined as "any electric power generating plant **or combination of plants at a single site with a combined capacity** of 50,000 kilowatts or more . . ." *See* Minnesota Statute § 216B.2421(1) (emphasis added).

Federal law also exempts certain power production facilities from permitting and regulatory requirements when they fall below a certain size threshold. To be exempt, a utility must demonstrate, among other criteria, that a facility:

> [H]as a **power production capacity which, together with any other facilities located at the same site** (as determined by the Commission), is **not greater than 80 megawatts**. . . .

16 U.S.C. § 796(17)(A)(iii) (emphasis added).

If the Arizona legislature had intended to consider the combined nameplate ratings of multiple generating units in its definition of "plant" for the purposes of determining whether a CEC is required, it could have done so, as the federal, Iowa, and Minnesota legislatures did. It did not. Because Arizona's Siting Statutes are clear and unambiguous as to the definition of "plant," courts can and would rely on the plain language used in that definition to determine its meaning.

In this case, UNSE intends to add four separate generating units to the Black Mountain Generating Station. Those units are independent of one another and can operate individually to supply the necessary level of electricity to meet demand. Put another way, UNSE can choose which units operate at any given time irrespective of the other units' operational status and are thus "separate" from one another. Because the "nameplate rating" of each of those units is under 100MW, a CEC is not required for their construction.

As currently required by A.A.C. R14-3-203(D), this Application presents the basic information required by A.A.C. R14-3-203 and Exhibit 1 of the Rules of Practice and Procedure Before Power Plant and Transmission Line Siting Committee. As noted earlier, the purpose of this Application is to seek a ruling from the Committee on whether the Project needs a CEC as a legal matter. UNSE respectfully requests that the Committee disclaim jurisdiction over this Project for the reasons set forth above. If it does not, UNSE will move to continue this proceeding under A.A.C. R14-3-209 so that it may appeal the Committee's decision.

APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

1. Name and address of Applicant:

UNS Electric, Inc.
88 East Broadway Blvd, Tucson, AZ 85701
PO Box 711, Tucson, AZ 85702

Legal Representatives

Name: Meghan H. Grabel, Osborn Maledon PA
Address: 2929 N. Central Ave., Suite 2000, Phoenix, AZ 85012
Telephone: 602-640-9000
Email: mgrabel@omlaw.com

and

Name: Megan Hill, UNS Electric, Inc.
Address: 88 E. Broadway Blvd., HQE910, Tucson, AZ 85701
Telephone: (520) 918-8373
Email: Megan.Hill@tep.com

2. Name, address and telephone number of a representative of Applicant who has access to technical knowledge and background information concerning this Application and who would be available to answer questions or furnish additional information:

Clark Bryner
Manager, Transmission Line Siting
UNS Electric, Inc.
88 East Broadway Blvd, Tucson, AZ 85701
PO Box 711, Tucson, AZ 85702
Telephone: (520) 4011175

3. Dates on which Applicant filed a plan in compliance with A.R.S. § 40-360.02(B), in which the facilities for which this application is made were described:

Pursuant to A.R.S. § 40-360.02(B), UNSE filed a plan regarding the proposed Black Mountain Expansion Project on November 6, 2023.

4. Description of the proposed facility, including:

a. With respect to an electric generating plant:

i. Type of generating facilities (nuclear, hydro, fossil-fueled, etc.).

Natural gas.

ii. Number and size of proposed units.

Four natural gas units, each with an individual nameplate rating of 50 MW.

iii. The source and type of fuel to be utilized, including a proximate analysis of fossil fuels.

UNSE purchases natural gas on the spot market and through hedging contracts that are consistent with the Company's hedging policy. Natural gas is sourced from the San Juan basin and is delivered through Transwestern's interstate natural gas pipeline to the facility.

iv. Amount of fuel to be utilized daily, monthly and yearly.

These figures are based on running all four turbines at 30% Capacity Factor.

	Daily	Monthly	Yearly
Fuel (MMBtu)	12,859.2	398,635.2	4,693,608

v. Type of cooling to be utilized and source of any water to be utilized.

Turbine lube oil/hydraulic cooling and air to air heat exchangers. Turbine inlet cooling will be wet cooling (cooling tower). Water will be sourced from wells.

vi. Proposed height of stacks and number of stacks, if any.

Four stacks, each at 90 feet.

vii. Dates for scheduled start-up and firm operation of each unit and date construction must commence in order to meet schedules.

UNSE estimates that the Black Mountain Expansion Project will commence operation in 2027.

viii. To the extent available, the estimated costs of the proposed facilities and site, stated separately. (If application contains alternative sites, furnish an estimate for each site and a brief description of the reasons for any variations in estimates.)

The estimated cost of the Project is $218 million, which amount includes all engineering, procurement, and construction of both the four proposed generating units, a short generation tie line, and interconnection improvements at the Griffith substation. The generation tie line will be the subject of a separate CEC application.

ix. Legal description of proposed site. (If application contains alternative sites, list sites in order of applicant's preference with a summary of reasons for such order of preference and any changes such alternative sites would require in the plans reflected in (i) through (viii) hereof.)

The proposed plant is located in unincorporated Mohave County, Arizona within Section 5, Township 24 South, Range 14 East.

5. List the areas of jurisdiction [as defined in A.R.S. § 40- 360(1)] affected by each alternative site or route and designate those proposed sites or routes, if any, which are contrary to the zoning ordinances or master plans of any of such areas of jurisdiction.

The Project is located within Mohave County. Additionally, UNSE has identified the City of Kingman as an affected jurisdiction.

6. Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion.

UNSE has compiled geographical reviews and environmental studies to support this Application. Information and reports on these study efforts are contained in the following exhibits, which may be amended if the Committee does not disclaim jurisdiction over this Application:

Exhibit A	Location and Land Use Maps
Exhibit B	Environmental Report
Exhibit C	Areas of Biological Wealth
Exhibit D	Biological Resources
Exhibit E	Scenic Areas, Historic Sites and Structures, and Archaeological Sites
Exhibit F	Recreational Purposes and Aspects
Exhibit G	Concepts of Proposed Facilities
Exhibit H	Existing Plans
Exhibit I	Anticipated Noise and Interference with Communication Signals
Exhibit J	Special Factors (Includes Public Involvement)

CONCLUSION

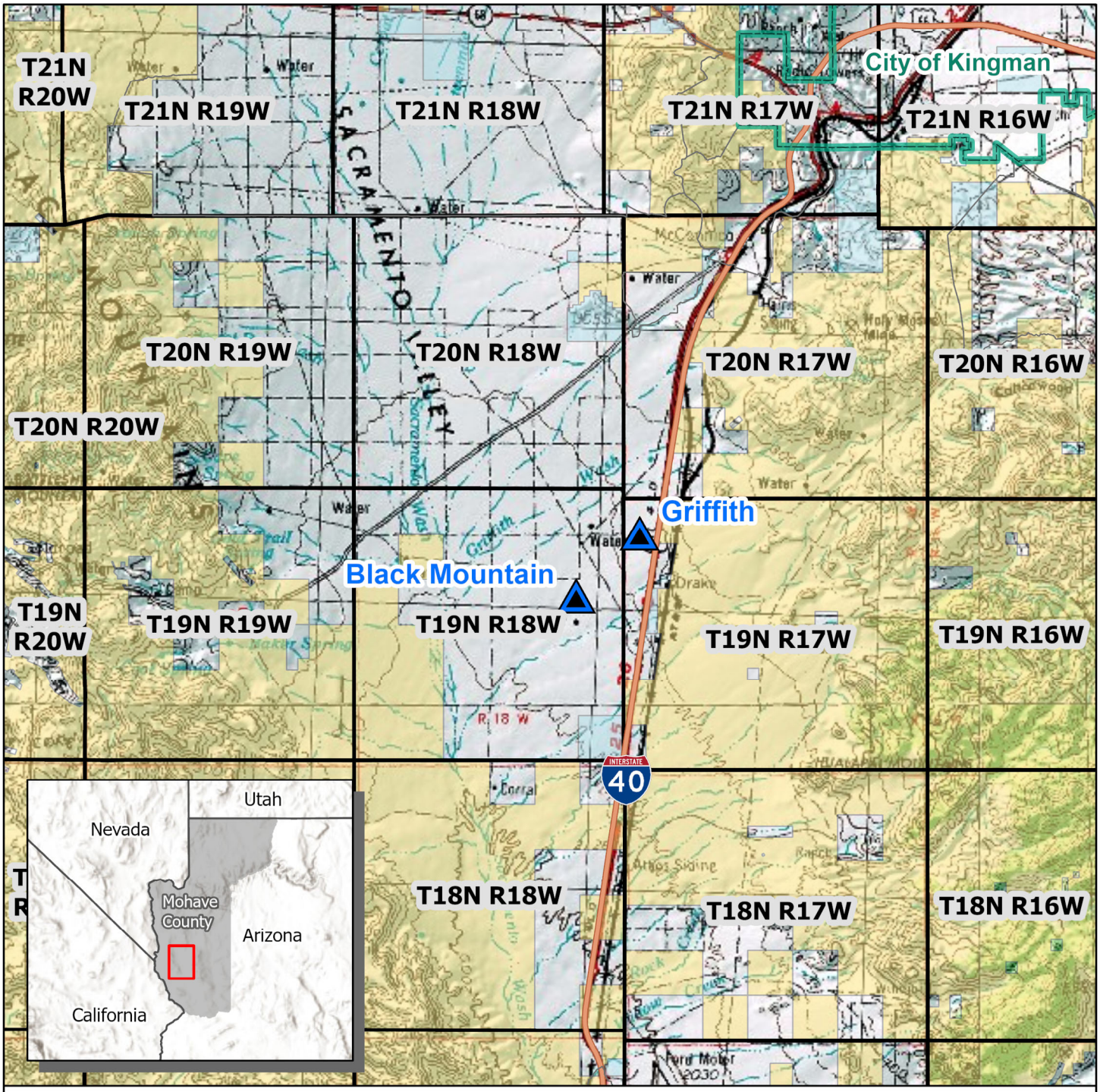
This project is needed to provide continued reliability in UNSE's service territory. Given the nature of the project, as discussed above, the Committee should disclaim jurisdiction over it because it does not meet the statutory definition of "plant" found in ARS § 40-360.03. Nevertheless, the Project serves the broad public interest because it enhances Arizona's access to an adequate, economical and reliable supply of electric power, with minimal impact to the environment and ecology of the State. If the Committee declines to disclaim jurisdiction over the Project, and that rejection is ultimately upheld, UNSE respectfully requests that the Committee permit it to withdraw this Application and refile a new one to provide additional evidence prior to making any determination as to whether the Commission should issue a CEC for the Black Mountain Expansion Project.

UNS Electric, Inc.

By: _____

Clark Bryner,
Manager, Transmission Line Siting
UNS Electric, Inc.

Exhibit A-1



- Power Plant / Substation
- Incorporated City Boundary
- Bureau of Indian Affairs (BIA)
- Bureau of Land Management (BLM)
- Private (No Color)
- State
- US Fish and Wildlife (USFW)

Sources: Esri, UNS Electric, Mohave County, and Bureau of Land Management.
Projection: NAD 1983 UTM Zone 12N
Basemap: Esri USA Topo Map

This map is for planning purposes only. UNSE and UNS Energy make no warranty of its accuracy.

0 1 2 3 4
Miles

Scale: 1:250,000

UniSourceEnergy SERVICES

Exhibit A-1

Black Mountain Generating Station Expansion Project

Project Vicinity

Exhibit A-2

Proposed Facilities

Sources: Esri, UNS Electric, Mohave County, and Bureau of Land Management.
Projection: NAD 1983 UTM Zone 12N
Basemap: Esri Bing Maps Hybrid

This map is for planning purposes only. UNSE and UNS Energy make no warranty of its accuracy.

0 500
Feet

Scale: 1:7,000

UniSourceEnergy SERVICES

Exhibit A-2

Black Mountain Generating Station Expansion Project

Project Site

Exhibit B

December 18, 2006

Chuck Komadina
Unisource Energy Services
4250 W. Yucca Drive
Kingman, AZ 86401

RE: Black Mountain Generating Station Jurisdictional Waters

Dear Mr. Komadina,

On October 3-4, 2006, David Taylor and myself, both Army Corps of Engineers (ACOE) Certified delineators of "waters of the US" assessed the north ½ of Section 14, Township 19 North, Range 18 West in Mohave County, Arizona for the presence of ACOE jurisdictional waters. Our assessment was based on guidelines that are currently being revised by ACOE. Therefore, the assessment was for planning purposes only and the areas delineated will not necessarily be the same under new guidelines.

Following our assessment, we provided Unisource Energy Services (Unisource) with the delineated areas marked on an aerial photograph and made suggestions as to where the generating station could be placed to avoid disturbance to the jurisdictional waters. On November 29, 2006 Unisource gave Tierra a proposed development plan for the site. Tierra overlaid this plan on the aerial photo with the jurisdictional delineation and reviewed potential impacts to waters of the US (see attached).

Under current ACOE Nationwide Permit No. 39 – Residential, Commercial, and Institutional Developments, ACOE must be notified if disturbance to waters of the US exceeds $1/10^{th}$ of an acre. Based on the proposed location of the generating station it appears the footprint of the station avoids any disturbance to jurisdictional waters. A fence crosses the wash near the northwest corner of the site. It is suggested that fence posts be placed outside of the banks of the wash and that the fencing allow water and debris to flow freely. There are also ponds located opposite the wash from the generating station. Any utilities that need to be run between the generating station and the ponds should be bored beneath the wash to avoid disturbance or, if trenching is used, disturbance should be kept below 1/10 of an acre to avoid ACOE notification. Lastly, Yuma Road, which accesses the site is considered part of the Proposed Action, and any improvements to this road at wash intersections, should be considered when determining the total disturbance to waters of the US.

In conclusion, the site itself does not impact waters of the US, however Unisource should consider all related actions, such as utility installation, fence placement, and road improvements and determine the total disturbance of these actions. If total disturbance of all related actions does not exceed $1/10^{th}$ of an acre, then no further work is required as it relates to waters of the US. However, if these actions result in a loss greater than $1/10^{th}$ of an acre, than an official ACOE jurisdictional delineation and Preconstruction Notification should be completed.

If I can provide additional information or assistance, please let me know.

Sincerely,

Renee M. Ericson
Environmental Project Manager
Tierra Right of Way Services
1575 E. River Road, Suite 201
Tucson, AZ 85718

Attachment

Cc: Don Gin
Laura Pinnas

PROJECT# 6T0-271A

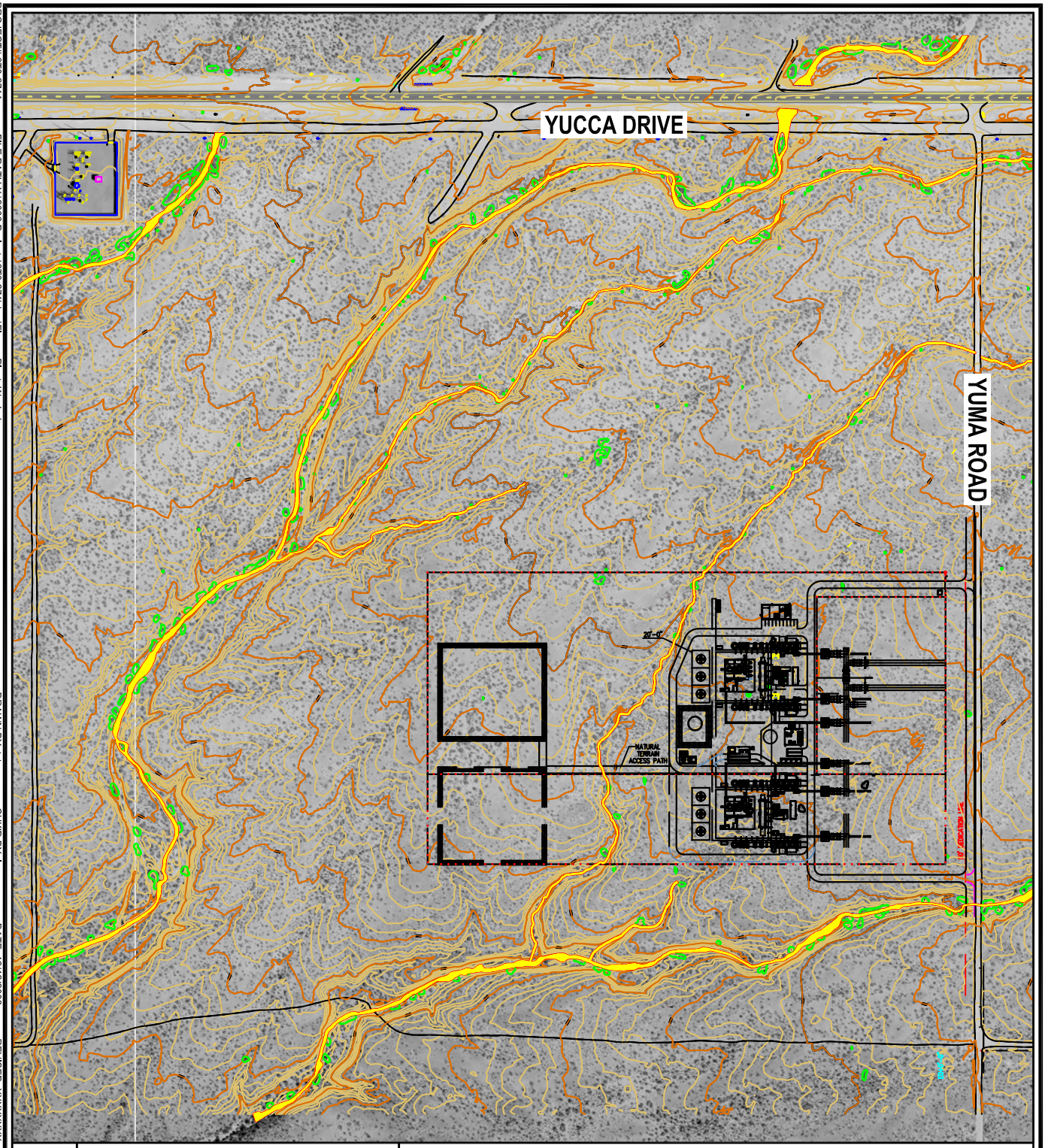
FILE PATH:X:\2006 Projects\6T0-271\dwg\Figure_Plant_Wash.dwg

DRAWN BY: tst

CHK'D BY: jp

DATE: 12/12/2006

REVISED: XXXXXXXX



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Jurisdictional Water Of The US

Black Mountain Generating Station

Project: 6T0-271A

UniSourceEnergy SERVICES
Energizing Arizona

Tierra Right of Way Services

Black Mountain Generating Station Location.

APPENDIX A

AMBIENT AIR IMPACT ANALYSIS OF EMISSIONS FROM THE UNISOURCE ENERGY DEVELOPMENT COMPANY BLACK MOUNTAIN GENERATING STATION NEAR KINGMAN, ARIZONA

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TABLES

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FIGURES

A.1. INTRODUCTION

This appendix presents an ambient air impact analysis of emissions from the Unisource Energy Development Company, Black Mountain Generating Station (BMGS) to be located approximately 12 miles southeast of Kingman, Arizona. The analysis is based on the emissions inventory for the BMGS discussed in Section 2 and provided in Appendix B of this application, and follows the methodology outlined in the protocol document: *Modeling Protocol to Assess Ambient Air Quality Impacts From the UNS Electric, Inc. Black Mountain Generating Station Near Kingman, Arizona*, submitted to the Arizona Department of Environmental Quality (ADEQ) on November 17, 2006. The protocol was approved by ADEQ in a meeting with Tucson Electric Power on December 12, 2006.

The objectives of the dispersion modeling were: (a) to quantify the maximum predicted impacts and anticipated background concentrations for comparison with applicable National Ambient Air Quality Standards (NAAQS), and (b) to quantify the maximum predicted impacts for comparison with applicable Arizona Ambient Air Quality Guideline (AAAQG) concentrations. The ensuing sections of this document describe the methodology that was used to conduct the modeling and the modeling results.

A.1.1 Facility Description

The BMGS major plant components will consist of two (2) GE LM6000PC-Sprint, simple-cycle natural gas-fired combustion turbines rated at 48.0 MW each, an emergency diesel generator rated at 600 kW, and a three (3) cell cooling tower. The facility will be operated intermittently to provide peaking power and voltage support for Unisource Energy Development Company's Arizona electric operations.

A.1.2 Site Description

The BMGS will be located in Mohave County, approximately 10 miles southeast of Kingman, Arizona, and 1.5 miles west of Interstate-40 as shown in Figure A.1.1. Regionally, the facility location is in the Mexican Highlands Section of the Basin and Range Physiographic Province which is characterized by northerly trending fault block mountains separated by broad, down-faulted valleys (see Figure A.4.1). The site is at an elevation of approximately 2,300 feet.

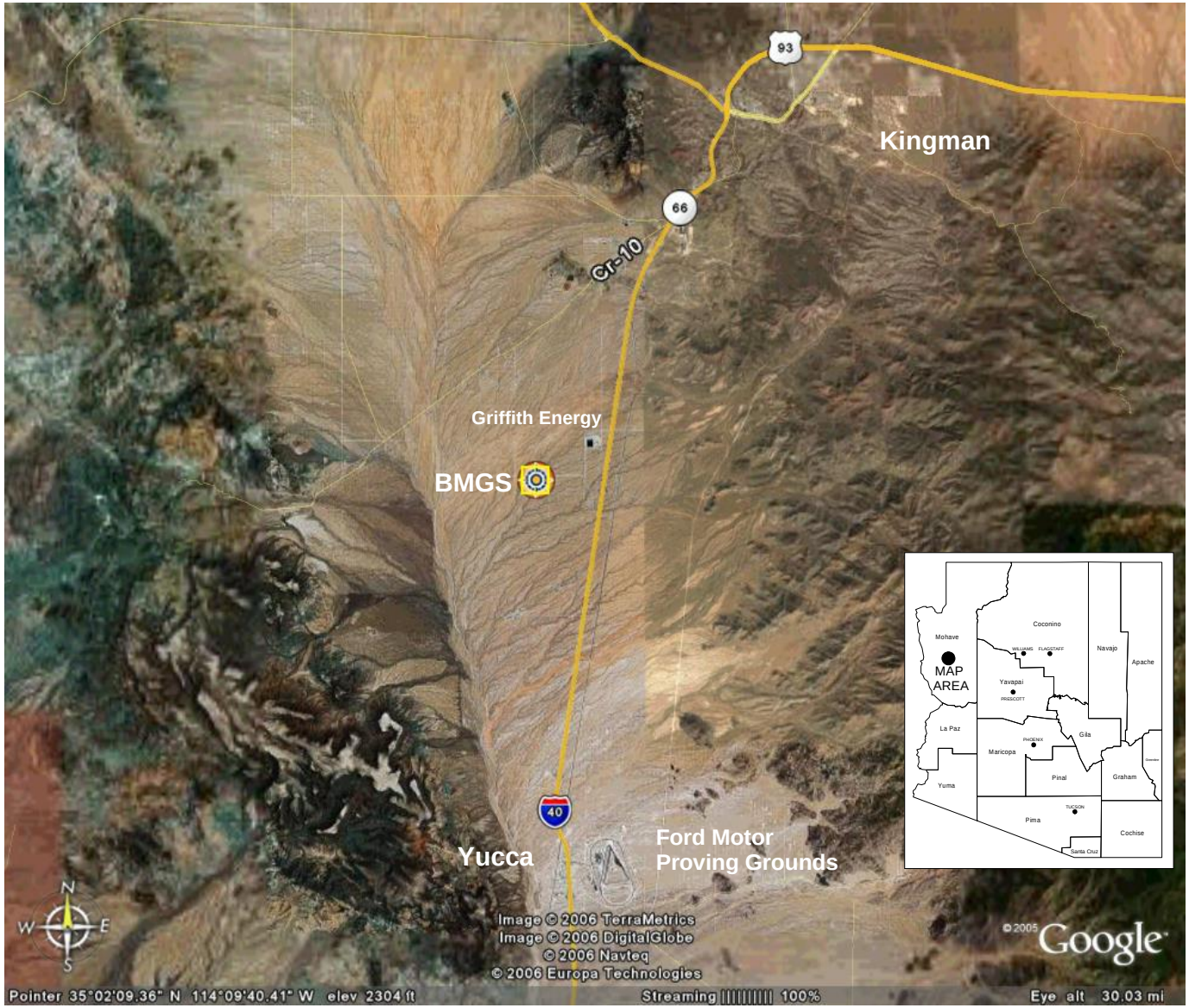


Figure A.1.1 General location map showing the Black Mountain Generating Station location near Kingman, Arizona.

A.2. REGULATORY STATUS

A.2.1 Source Designation

The BMGS will be a non-categorical stationary source. The BMGS will take a voluntary annual NOx emission limit of less than 250 tons per year. Therefore, NOx emissions from the facility will not be subject to PSD regulations. The remaining criteria pollutant emissions from the facility will also be below the New Source Review major source threshold of 250 tons/year. Thus, the facility will not be subject to PSD regulations. The facility will, however, qualify as a Title V source having individual criteria pollutant emissions with the potential to exceed 100 tons per year. Consequently, the facility will operate under a Class 1 Permit issued by the ADEQ. Additionally, the potential to emit hazardous air pollutants (HAPs) will be less than 10 tons/year for any individual (HAP), and less than 25 tons/year for all HAPs combined and therefore, the facility will not be a major HAP source.

A.2.2 Area Classifications

The Kingman area is classified as "attainment" (better than national standards) for total suspended particulates (TSP), particulate matter less than 10 microns nominal aerodynamic diameter (PM_{10}), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and ozone (O_3) (see 40 CFR Part 81.303).

A.2.3 Baseline Area

The BMGS will be located within the Mohave-Yuma Intrastate Air Quality Control Region (AQCR) which encompasses the counties of La Paz, Mohave and Yuma. This AQCR represents the "baseline area" for PSD purposes. The BMGS, however, will not be subject to PSD regulations.

A.2.4 Baseline Dates

The PM_{10} minor source baseline date for the Mohave-Yuma Intrastate AQCR was triggered on July 15, 1998 by ADEQ's completeness determination for the Calpine-Southpoint Generating Station, Fort Mohave Indian Reservation, Mohave County application. The SO_2 minor source baseline date was triggered on March 15, 1999 by ADEQ's completeness determination for the North Star Steel, McConnico, Mohave County application. The NO_2 minor source baseline date was triggered on April 10, 1991 by ADEQ's completeness determination for the Mohave Pipeline Operating Company, Topock, Mohave County application.

A.2.5 Increment Consumption and Expansion

Not Required - the BMGS will not be subject to PSD regulations.

A.3. AMBIENT DATA REQUIREMENTS

A.3.1 Pre-Application Air Quality Monitoring

Since the BMGS will not be subject to PSD regulations, no pre-application air quality monitoring was conducted.

A.3.2 Meteorological Monitoring

No on-site meteorological monitoring was conducted as part of the modeling. The meteorology that was used to conduct the modeling is discussed in Section A.4.

A.3.3 Background Concentrations

Criteria pollutants for which background concentrations were considered for the BMGS modeling are PM_{10}, NO_2, CO, and SO_2. As specified in the ADEQ modeling guidance (see: *Air Dispersion Modeling Guidelines for Air Quality Permits*, December 2004), consideration of background concentrations of AAAQG pollutants is not required in AAAQG analyses and thus they were not considered herein.

A.3.3.1 PM_{10}

PM_{10} measurements in the vicinity of the proposed BMGS were measured by Praxair for a number of years ending in 2002 (see ADEQ annual air quality reports, Praxair, Kingman SW, I-40 and Griffith Road). The highest annual concentration measured during the last three years of measurements at the Praxair Kingman SW site (200, 2001 and 2002) was 14 $\mu g/m^3$ and the highest 24-hour average concentration was 53 $\mu g/m^3$. These values were used as background PM_{10} concentrations for the modeling proposed herein.

A.3.3.2 NO_2

Since NO_2 is formed by the oxidation of nitric oxide (NO) which is a byproduct of combustion, the NO_2 monitoring sites in Arizona are located in urban areas (Phoenix and Tucson) and near major coal-fired electrical power plants (Springerville, Page, and Bullhead City). There are no monitoring sites in the immediate vicinity of the proposed BMGS. Although the BMGS area near Kingman is not too distant from Bullhead City (~40 miles), it is at a much higher elevation (2,300' vs. 500'). Consequently, background NO_2 values near the BMGS will be much less than those in Bullhead City.

Without a representative monitoring station to determine background NO_2 concentrations, modeling results from the air impact analysis conducted as part of the permit application for the Griffith Energy Facility (see: *Air Quality Permit Application, Griffith Energy 650MW Facility Near Kingman, Arizona*, submitted to ADEQ, October 1998) were used for background concentrations. The modeling conducted for the Griffith Energy Facility included emissions from the facility and all other significant NO_2 sources in the area. The modeled maximum annual NO_2 concentration was 10.9 $\mu g/m^3$. This value was used to represent the annual background NO_2 concentration for the BMGS modeling.

A.3.3.3 CO

CO is produced in the incomplete combustion of fuels and anthropogenic activities (automobiles, construction equipment, lawn and garden equipment, commercial and residential heating, etc.) represent the major source of emissions. Thus, the CO monitoring sites in Arizona are located exclusively in urban areas (Phoenix, Tucson and Casa Grande [monitoring suspended in 2003]).

Without a representative monitoring station to determine background CO concentrations, modeling results from the air impact analysis conducted as part of the permit application for the Griffith Energy Facility referenced above were used for background concentrations. The modeled maximum 1-hour and 8-hour CO concentrations were 1,828 $\mu g/m^3$ and 637 $\mu g/m^3$, respectively. These values were used to represent the 1-hour and 8-hour background CO concentrations for the BMGS modeling.

A.3.3.4 SO_2

Historically, the principal source of SO_2 emissions in Arizona has been the smelting of copper and coal fired power plants. Urban areas also represent a major source of SO_2 emissions. Thus, the SO_2 monitoring sites in Arizona are located in the historical smelting areas (Miami, Globe, Hayden), near power plants (Springerville, Page and Bullhead City) and in urban areas (Phoenix and Tucson). As stated above, although the BMGS area near Kingman is not too distant from Bullhead City (~40 miles), it is at a much higher elevation (2300' vs. 500'). Consequently, background SO_2 values near the BMGS will be much less than those in Bullhead City.

Without a representative monitoring station to determine background SO_2 concentrations, modeling results from the air impact analysis conducted as part of the permit application for the Griffith Energy Facility referenced above were used for background concentrations. The modeled maximum 3-hour, 24-hour and annual SO_2 concentrations were 8.0 $\mu g/m^3$, 3.9 $\mu g/m^3$ and 0.4 $\mu g/m^3$, respectively. These values were used to represent the 3-hour, 24-hour and annual background SO_2 concentrations for the BMGS modeling.

A.4. TOPOGRAPHY, CLIMATOLOGY AND METEOROLOGY

A.4.1 Regional Topography

The BMGS will be located in what is referred to as the Sacramento Valley which trends northwest to southeast with elevations at approximately 2,300 feet. The valley is bordered by the Black Mountains on the west, which rise to approximately 4,000 feet, and the Hualapai Mountains to the east, which rise to approximately 6,000 feet (Figure A.4.1).

A.4.2 Regional Climatology

The climate of the area is semi-arid with precipitation varying with elevation. The period of record (1950-2005) average annual precipitation measured at the Yucca 1 NNE, National Weather Service (NWS) cooperative station (#029645), operated by the Ford Motor Proving Grounds in Yucca, Arizona, is 7.6 inches (Western Region Climate Center, www.wrcc.dri.edu). Precipitation falls during two distinct periods of the year: winter precipitation (December, January, February) associated with regional storms that originate in the Pacific (34% of annual total) and summer precipitation (July, August, September) associated with the Arizona Monsoon (30% of annual total).

Temperatures regionally are moderate to extreme with maximums and minimums also varying with elevation. The period of record average monthly maximum temperatures at the Yucca 1 NNE monitoring station vary from a low of 60.3°F in December to a high of 102.8°F in June. Average monthly minimum temperatures range from a low of 37.1°F in January to a high of 75.7°F in July.

A.4.3 Modeling Meteorological Data

A.4.3.1 Surface Data

The modeling was based on 1997 surface weather observations from the Ford Motor Proving Grounds in Yucca, Arizona (NWS COOP Station #029645, Yucca 1 NNE). This data set was provided by ADEQ and was used to permit the Griffith Energy Facility, located a few miles northeast from the proposed BMGS. A wind rose for the 1997 surface data from the Ford Motor Proving Grounds is shown in Figure A.4.2. This wind rose shows the dominant wind directions that would be expected within the Sacramento Valley which has a northwest to southeast orientation.

As shown in the wind rose table in Figure A.4.2, the Ford Motor Proving Grounds surface data has 312 hours of missing data (this includes wind speed, wind direction and temperature), which represents a data recovery percentage of 96.4%.

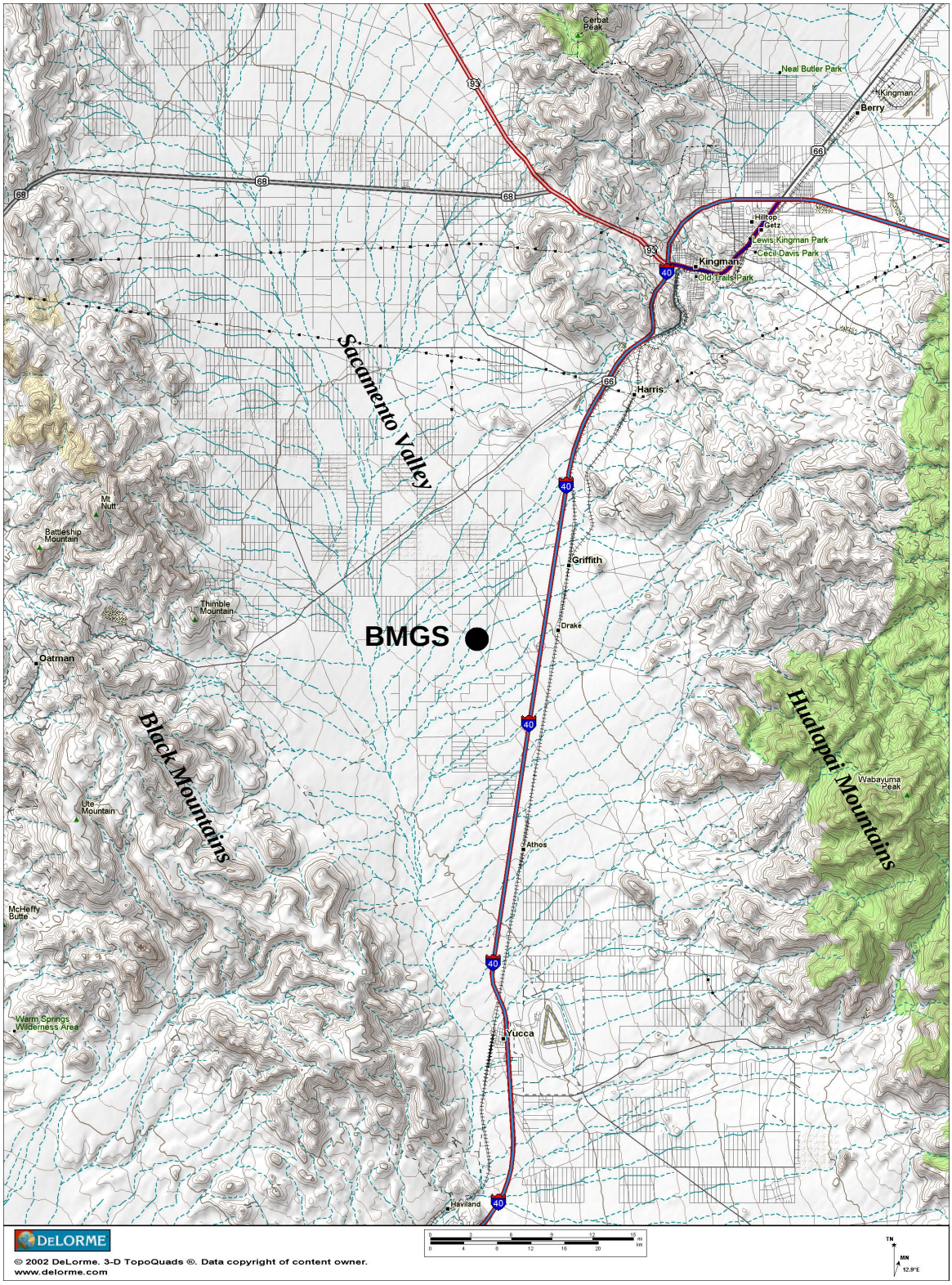
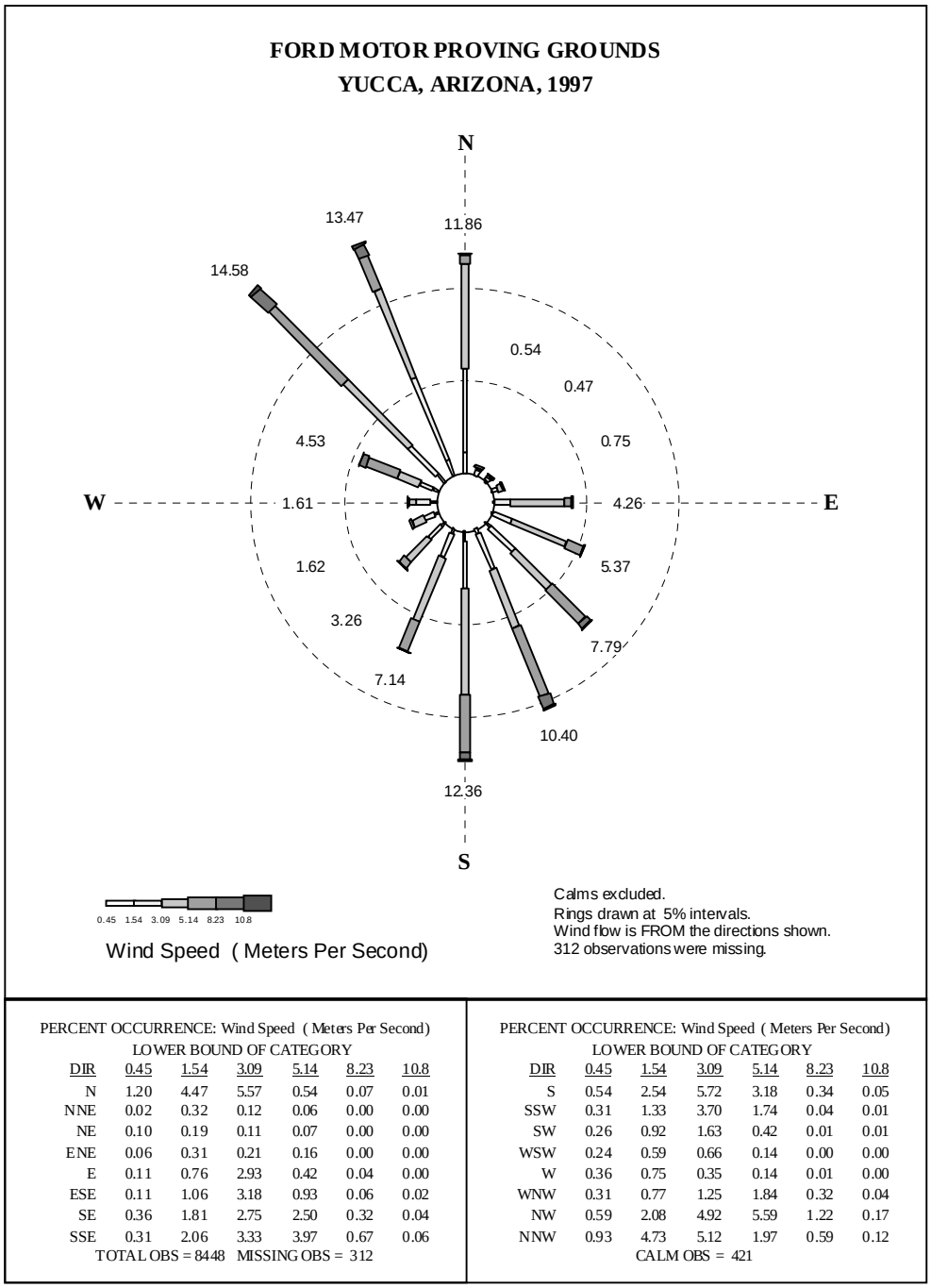


Figure A.4.1 Regional topography surrounding the proposed BMGS near Kingman, Arizona.



PERCENT OCCURRENCE: Wind Speed (Meters Per Second)
LOWER BOUND OF CATEGORY

DIR	0.45	1.54	3.09	5.14	8.23	10.8
N	1.20	4.47	5.57	0.54	0.07	0.01
NNE	0.02	0.32	0.12	0.06	0.00	0.00
NE	0.10	0.19	0.11	0.07	0.00	0.00
ENE	0.06	0.31	0.21	0.16	0.00	0.00
E	0.11	0.76	2.93	0.42	0.04	0.00
ESE	0.11	1.06	3.18	0.93	0.06	0.02
SE	0.36	1.81	2.75	2.50	0.32	0.04
SSE	0.31	2.06	3.33	3.97	0.67	0.06

TOTAL OBS = 8448 MISSING OBS = 312

PERCENT OCCURRENCE: Wind Speed (Meters Per Second)
LOWER BOUND OF CATEGORY

DIR	0.45	1.54	3.09	5.14	8.23	10.8
S	0.54	2.54	5.72	3.18	0.34	0.05
SSW	0.31	1.33	3.70	1.74	0.04	0.01
SW	0.26	0.92	1.63	0.42	0.01	0.01
WSW	0.24	0.59	0.66	0.14	0.00	0.00
W	0.36	0.75	0.35	0.14	0.01	0.00
WNW	0.31	0.77	1.25	1.84	0.32	0.04
NW	0.59	2.08	4.92	5.59	1.22	0.17
NNW	0.93	4.73	5.12	1.97	0.59	0.12

CALM OBS = 421

Figure A.4.2 Wind rose for the Ford Motor Proving Grounds 1997 surface wind measurements.

A.4.3.2 Sky Cover Data

The modeling was conducted using the recently approved EPA guideline model developed by the EPA in conjunction with the American Meteorological Society called the AMS/EPA Regulatory Model (AERMOD). AERMOD is explained further below. AERMOD requires parameters for determining boundary layer conditions which include opaque sky cover (or total sky cover). The Ford Motor Proving Grounds surface measurements do not include sky cover data. Consequently, the concurrent sky cover data for the 1997 surface measurements were obtained from the NWS Kingman Airport (WBAN 93167). The 1997 Kingman Airport data had 182 hours of missing data for opaque sky cover which represents a data recovery percentage of 97.9%.

A.4.3.3 Upper Air Data

AERMOD also requires upper air data. Upper air data for 1997 were obtained from the NWS Mercury Desert Rock station (WBAN 03160). The NWS Mercury Desert Rock station is located in Mercury, Nevada and is the closest NWS station with upper air data.

A.4.3.4 Meteorological Data Processing for AERMOD

The NWS Kingman Airport and Mercury Desert Rock upper air data described above were obtained from BEE-Line Software (P.O. Box 7348, Asheville, NC 28802, (828) 628-0636). BEE-Line Software provided the data in a format ready for use by the U.S. Environmental Protection Agency (EPA) AERMET computer program (*User's Guide for the AERMOD Meteorological Preprocessor (AERMET)*, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions, Monitoring, and Analysis Division, Research Triangle Park, North Carolina, EPA-454/B-03-002, November 2004). The AERMET program serves as the meteorological preprocessor for AERMOD. AERMET is designed to combine and quality control onsite and NWS surface and upper air data for use by AERMOD.

AERMET was used to combine the Ford Motor Proving Grounds onsite data, the NWS Kingman Airport surface data, and the Mercury Desert Rock upper air data into AERMOD ready surface and upper air input files. All AERMET input and output processing files are provided on the CD in Appendix A.2 of this document.

A.5. MODELING ANALYSIS DESIGN

A.5.1 Model Selection

Evaluation of the maximum ambient air quality impacts from the proposed BMGS was conducted using AERMOD (*User's Guide for the AMS/EPA Regulatory Model – AERMOD,* U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions, Monitoring, and Analysis Division, Research Triangle Park, North Carolina, EPA-454/B-03-001, September 2004). Applied Environmental Consultants, Inc. (AEC) uses the commercial version of AERMOD from BEE-Line Software.

A.5.2 Model Input Defaults/Options

The recommended regulatory default options for AERMOD as stated in the EPA *Guideline on Air Quality Models* (*Guidelines*, 40 CFR Part 51, Appendix W, November 2005) were used for the model runs. The regulatory default options in AERMOD include the use of stack-tip downwash, incorporation of the effects of elevated terrain, and calms and missing data processing routines.

The missing data processing routines that are included in AERMOD allow the model to handle missing meteorological data in the processing of short term averages. The model treats missing meteorological data in the same way as the calms processing routine (i.e., it sets the concentration values to zero for that hour and calculates the short term averages according to EPA's calms policy, as set forth in the *Guidelines*). Calms and missing values are tracked separately for the purpose of flagging the short term averages. An average that includes a calm hour is flagged with a 'c', an average that includes a missing hour is flagged with an 'm', and an average that includes both calm and missing hours is flagged with a 'b'. If the number of hours of missing meteorological data exceeds 10 percent of the total number of hours for a given model run, a cautionary message is written to the main output file, and the user is referred to Section 5.3.2 of *On-site Meteorological Program Guidance for Regulatory Modeling Applications* (EPA, 1987).

A.5.3 Rural/Urban Classification

For modeling purposes, the rural/urban classification of an area is determined by either the dominance of a specific land use or by population data in the study area. Generally, if the sum of heavy industrial, light-moderate industrial, commercial, and compact residential (single and multiple family) land uses within a three kilometer radius from the facility are greater than 50%, the area is classified as urban. Conversely, if the sum of common residential, estate residential, metropolitan natural, agricultural rural, undeveloped (grasses), undeveloped (heavily wooded) and water surfaces land uses within a three kilometer radius from the facility are greater than 50%, the area is classified as rural. Alternatively, if the population is greater than 750 persons per km^2, the area is also classified as urban.

As shown in the aerial photograph in Figure A.1.1 and the topographic map in Figure A.4.1, rural land use in the area surrounding the proposed BMGS location is much greater than 50%. Thus, the rural classification was used in the modeling.

A.5.4 Receptor Network

Following the *ADEQ Guidance*, the receptor grid configuration shown in Figure A.5.2 was modeled which consisted of the following:

- receptors spaced at 25 meters along the Process Area Boundary (PAB);
- receptors spaced at 100 meters from the PAB to 1 kilometer;
- receptors spaced at 200 meters from 1 kilometer to 2 kilometers;
- receptors spaced at 500 meters from 2 kilometer to 5 kilometers and
- receptors spaced at 1,000 meters from 5 kilometers to 10 kilometers.

A.5.5 Receptor Elevations

Receptor elevations were determined from digital elevation model (DEM) data distributed by the USGS, and were based on North American Datum 1927 (NAD27). The 7.5-minute DEM provides coverage in 7.5 X 7.5-minute blocks. Each file provides the same coverage as a standard 1:24,000 scale quadrangle map.

The DEM data were processed with AERMAP (*User's Guide for the AERMOD Terrain Preprocessor (AERMAP)*, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions, Monitoring, and Analysis Division, Research Triangle Park, North Carolina, EPA-454/B-03-003, October 2004). AERMAP, like AERMET, is a preprocessor program which was developed to process terrain data in conjunction with a layout of receptors and sources to be used in AERMOD. For complex terrain situations, AERMOD captures the essential physics of dispersion in complex terrain and therefore, needs elevation data that convey the features of the surrounding terrain. In response to this need, AERMAP first determines the base elevation at each receptor. AERMAP then searches for the terrain height and location that has the greatest influence on dispersion for each individual receptor. This height is referred to as the hill height scale. Both the base elevation and hill height scale data are produced by AERMAP as a file or files which are then inserted into an AERMOD input control file. The files produced by AERMAP for the modeling presented herein are provided on the CD in Appendix A.2.

A.5.6 Modeling Domain

The AERMAP terrain preprocessor requires the user to define a modeling domain. The modeling domain is defined as the area that contains all the receptors and sources being modeled with a buffer to accommodate any significant terrain elevations. Significant terrain elevations include all the terrain that is at or above a 10% slope from each and every receptor.

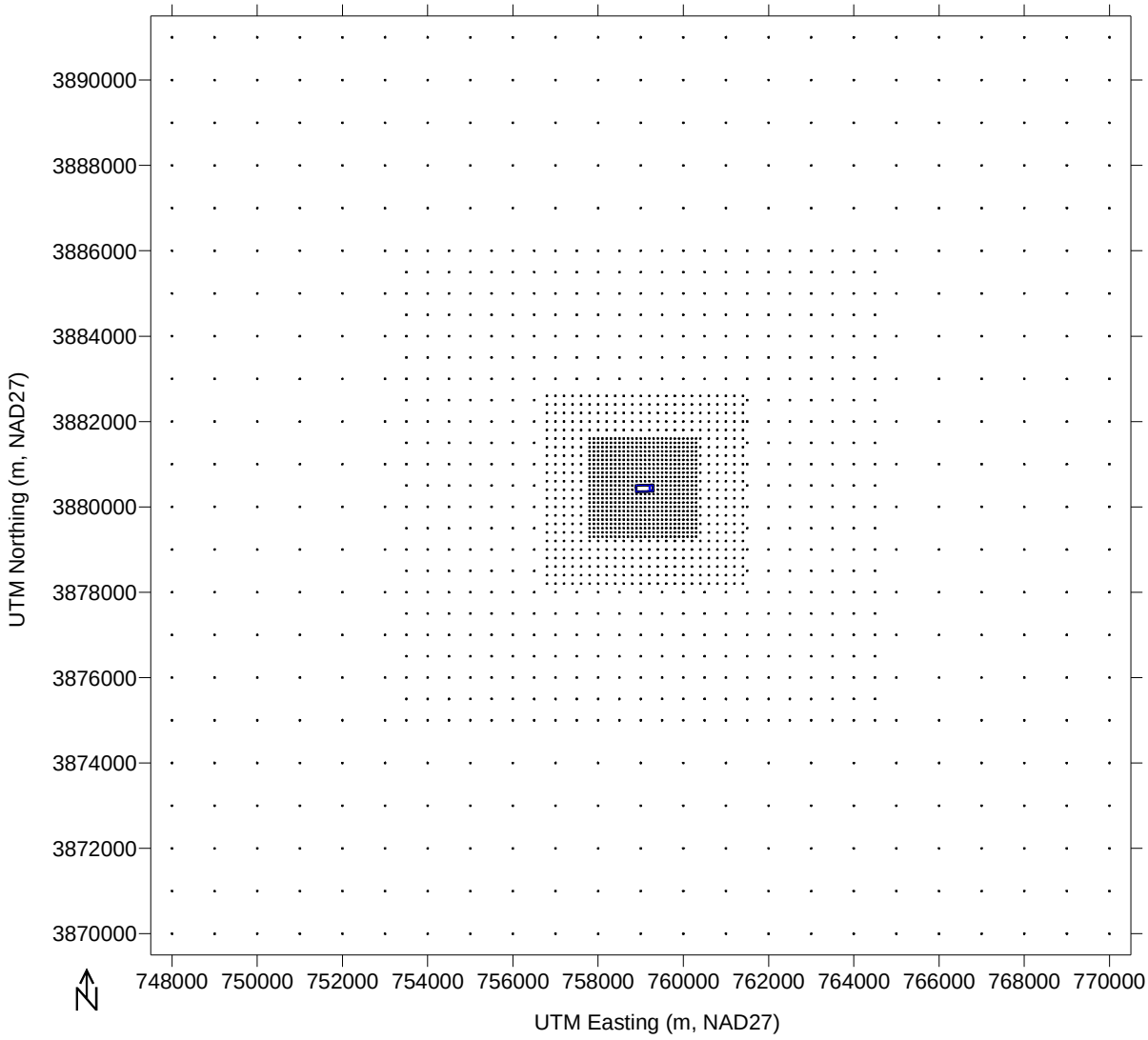


Figure A.5.1 Receptor grid network used for the BMGS modeling.

BEE-Line's software automatically calculates the modeling domain based on the receptor grid being used and identifies each 7.5-minute DEM quadrangle that must be used in AERMAP to meet the 10% slope requirement. A listing of the DEM quadrangles defining the modeling domain for the modeling presented herein is provided in Appendix A.1.

A.5.7 Surface Characteristics

Surface conditions at the measurement site, referred to as the surface characteristics, influence boundary layer parameter estimates generated by AERMOD. Obstacles to the wind flow, the amount of moisture at the surface, and reflectivity of the surface all affect the boundary layer estimates. These influences are quantified through the surface albedo, Bowen ratio and roughness length, and are introduced into AERMOD through the files generated by AERMET.

The albedo is the fraction of total incident solar radiation reflected by the surface back to space without absorption. Typical values range from 0.1 for thick deciduous forests to 0.90 for fresh snow. The daytime Bowen ratio, an indicator of surface moisture, is the ratio of the sensible heat flux to the latent heat flux and is used for determining planetary boundary layer parameters for convective conditions. While the diurnal variation of the Bowen ratio may be significant, the Bowen ratio usually attains a fairly constant value during the day. Midday values of the Bowen ratio range from 0.1 over water to 10.0 over desert. The surface roughness length is related to the height of obstacles to the wind flow and is, in principle, the height at which the mean horizontal wind speed is zero. Values range from less than 0.001 m over a calm water surface to 1 m or more over a forest or urban area. The AERMET User's Manual provides guidance on specifying the values of surface albedo, Bowen ratio and roughness length by land use type and season.

The values for surface albedo, Bowen ratio and roughness length can be entered into the AERMET preprocessor based on frequency and sector. The frequency defines how often these characteristics change, or alternatively, the period of time over which these characteristics remain constant. The frequency can be annual, seasonal (winter [December, January, February], spring [March, April, May], summer [June, July, August], fall [September, October, November]), or monthly, corresponding to 1, 4, or 12 periods, respectively.

Sectors refers to the number of non-overlapping sectors into which the 360° compass is divided. A minimum of 1 and a maximum of 12 sectors can be specified (i.e., 1 sector of 360°, up to 12 non-overlapping sectors of 30°). Thus, AERMET allows the values for surface albedo, Bowen ratio and roughness length to be entered annually, seasonally or monthly for each sector, the number of which can range between 1 and 12. As shown in Figure 1.1, the area surrounding the proposed BMGS location is undeveloped, high desert terrain in all directions. Consequently, surface characteristics will be entered for a single sector.

The surface characteristics used in the modeling were entered on a seasonal basis and are listed in Table A.5.1. The values selected are based on the guidance provided in the AERMET User's Manual and were selected based on the land use shown in Figure A.1.1.

Table A.5.1 Surface Characteristics Used in the AERMOD Modeling

Surface Characteristic	Spring	Summer	Autumn	Winter
Albedo [a]	0.30	0.28	0.28	0.28 [b]
Bowen Ratio [a, c]	3.0	4.0	6.0	6.0
Surface [a] Roughness	0.30	0.30	0.30	0.15

[a] Values for "Desert Shrubland".

[b] Since guidance albedo values for winter are for snow covered surfaces (which are generally not present for the Kingman area), the value for autumn was used for winter.

[c] Values for "Average Moisture Conditions".

A.5.8 Source Characterization

Emissions sources at the BMGS include: (a) two turbine generators; (b) a 3-cell cooling tower; and (c) a 900 hp emergency diesel generator. The turbine generators and emergency generator were modeled as point sources using the physical dimensions of the stacks for each source. The cooling tower was modeled as three separate point sources representing the three cooling tower cells. The modeling parameters for each source are listed in Table A.5.2 (see footnote in Table A.5.2 for details). The stack parameters for the two new turbines are based on the GE LM6000PC-Sprint, simple cycle natural gas-fired combustion turbine.

A.5.9 Building Downwash

Building downwash effects were evaluated by incorporating the appropriate building/structure dimensions into the AERMOD input files using BEE-Line's commercial version of EPA's Building Profile Input Program for PRIME (BPIPPRM) software. The BPIPPRM program is EPA approved and includes the latest EPA building downwash algorithms. The downwash files generated by BPIPPRM program are provided on the CD in Appendix A.2. A plan view map showing the facility layout with the dominant structures potentially affecting downwash is shown in Figure A.5.2.

Table A.5.2 Modeling Source Parameters For the Proposed BMGS

Source ID	Source Description	UTM Easting (m)	UTM Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp. (°F)	Exit Velocity (fps)	Stack Diameter (ft)
UNIT1	LM6000PC-Sprint [a] Combustion Turbine Unit 1 Stack	759206.00	3880472.94	2307	65.00	824.8	124.42	10.17
UNIT2	LM6000PC-Sprint [a] Combustion Turbine Unit 2 Stack	759207.77	3880421.12	2307	65.00	824.8	124.42	10.17
EGEN	Emergency Generator [b]	759216.04	3880453.58	2307	7.11	1027.0	238.35	0.67
CT1A	Cooling Tower Cell A [c]	759197.17	3880454.34	2307	44.83	91.9	28.08	11.16
CT1B	Cooling Tower Cell B	759197.31	3880447.00	2307	44.83	91.9	28.08	11.16
CT1C	Cooling Tower Cell C	759197.45	3880439.68	2307	44.83	91.9	28.08	11.16

[a] Exit velocities for the turbines based on maximum heat input of 395.1 MMBtu/hr using natural gas, an F-factor for natural gas of 8710 dscf/MMBtu, and a stack temperature of 824.8 °F, corrected to 15% O_2, 6.00% moisture and a site pressure of 25.98 in. Hg.

[b] Stack parameters for the emergency generator are based on manufacturer supplied information.

[c] Stack parameters for the cooling tower cells based on a fan exit area of 97.9 ft^2 which converts to a diameter of 11.16 ft.

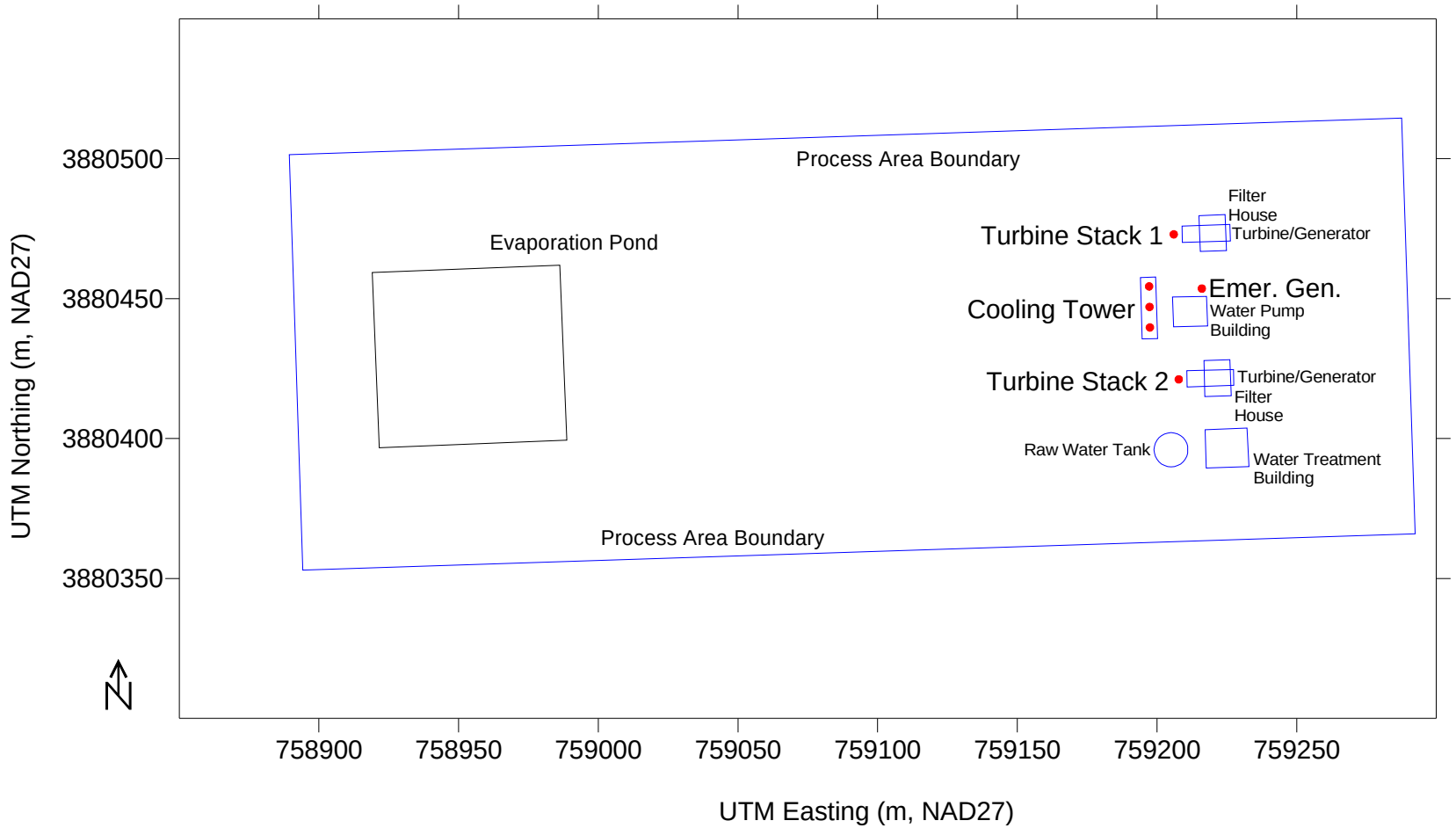


Figure A.5.2 Plan view map of proposed BMGS showing buildings, locations of turbine stacks and process area boundary.

A.6. EMISSIONS INVENTORY

An emissions inventory for the BMGS is discussed in Section 2 and presented in Appendix B of this application. The criteria pollutant inventory as modeled is summarized in Table A.6.1 and is discussed further below.

A.6.1 Annual Criteria Pollutant Emissions Modeling

Evaluations of the turbine emissions indicate that worst case hourly emissions are under 100% load conditions and not during start-up. Consequently, the annual modeling for PM_{10} and SO_2 was based upon worst case hourly turbine emissions, assuming continuous operation. BMGS will take a voluntary annual NOx emission limit of less than or equal to 244 tons per year. Consequently, the annual modeling for NOx was based on the voluntary annual emission limit, with emissions divided evenly between the two combustion turbine sources (122 tons per year for each UNIT1 and UNIT2). Annual cooling tower emissions were also based on continuous operation while the annual emissions for the emergency generator were based on 500 hours/year operation.

A.6.2 Short-Term Criteria Pollutant Emissions Modeling

Modeling for the short-term averaging periods was based upon worst case hourly emissions for each source.

A.6.3 AAAQG Emissions Modeling

The AAAQG modeling was based upon actual emission rates from each emission unit. The AAAQG pollutant inventory is presented in Table A.6.2.

Table A.6.1 BMGS Worst Case Modeling Emission Rates

Source ID	Source Description	Averaging Period							
		PM_{10} 24-Hour (lbs/hour)	PM_{10} Annual (tons/year)	CO 1-Hour (lbs/hour)	CO 8-Hour (lbs/hour)	SO_2 3-Hour (lbs/hour)	SO_2 24-Hour (lbs/hr)	SO_2 Annual (tons/year)	NO_x Annual (tons/year)
UNIT1	LM6000PC-Sprint [a] Combustion Turbine Unit 1 Stack	3.00	13.14	26.70	26.70	1.34	1.34	5.88	122.0 [b]
UNIT2	LM6000PC-Sprint [a] Combustion Turbine Unit 2 Stack	3.00	13.14	26.70	26.70	1.34	1.34	5.88	122.0 [b]
EGEN	Emergency Generator	0.63	0.16 [c]	4.95	4.95	2.91	2.91	0.73 [c]	5.40 [c]
CT1A	Cooling Tower Cell A	3.58E-08	1.57E-07						
CT1B	Cooling Tower Cell B	3.58E-08	1.57E-07						
CT1C	Cooling Tower Cell C	3.58E-08	1.57E-07						

[a] Except for NO_x, emissions based on worst case hourly emissions that occur when a unit is operating at 100% of full load.

[b] Based on the annual two unit emission cap of 244 tons/year.

[c] Based on annual operating hours of 500 hours/year.

Table A.6.2 AAAQG Modeling Inventory for the Two Turbines and Emergency Generator at the BMGS [a]

Pollutant [a]	Turbine Unit 1		Turbine Unit 2		Emergency Generator	
	Maximum Hourly Emission Rate (lbs/hour) [e]	Annual Emissions 8,760 hr/yr basis (tons/year)	Maximum Hourly Emission Rate (lbs/hour) [e]	Annual Emissions 8,760 hr/yr basis (tons/year)	Maximum Hourly Emission Rate (lbs/hour) [e]	Annual Emissions 500 hr/yr basis (tons/year)
1,3 Butadiene	1.70E-04	7.44E-04	1.70E-04	7.44E-04	--	--
Acetaldehyde	1.58E-02	6.92E-02	1.58E-02	6.92E-02	1.51E-04	3.77E-05
Acrolein	2.53E-03	1.11E-02	2.53E-03	1.11E-02	4.71E-05	1.18E-05
Benzene	4.74E-03	2.08E-02	4.74E-03	2.08E-02	4.64E-03	1.16E-03
Ethylene Benzene	1.26E-02	5.54E-02	1.26E-02	5.54E-02	--	--
Formaldehyde	2.81E-01	1.23E+00	2.81E-01	1.23E+00	4.72E-04	1.18E-04
Naphthalene	5.14E-04	2.25E-03	5.14E-04	2.25E-03	7.77E-04	1.94E-04
PAH	8.69E-04	3.81E-03	8.69E-04	3.81E-03	1.27E-03	3.17E-04
Propylene Oxide	1.15E-02	5.02E-02	1.15E-02	5.02E-02	1.67E-02	4.17E-03
Toluene	5.14E-02	2.25E-01	5.14E-02	2.25E-01	1.68E-03	4.20E-04
Xylenes	2.53E-02	1.11E-01	2.53E-02	1.11E-01	1.15E-03	2.89E-04

[a] Includes only those pollutants with AAAQG concentrations – see inventory in Appendix B of this application.

A.7. DISPERSION MODELING IMPACT ANALYSIS

Complete listings of the predicted concentrations of each emissions specie at each receptor are provided in the modeling output files on the CD attached in Appendix A.2.

A.7.1 NAAQS Analysis

Demonstration of protection of NAAQS is accomplished by comparison of the maximum ambient impact to the applicable standard. The maximum ambient impact for short term averaging periods (24-hour or less) is defined as the sum of the highest 2nd high modeled concentration and the respective background concentration. For the annual averaging period, the maximum ambient impact equals the highest modeled annual concentration plus the measured annual background concentration. The modeling results demonstrating protection of the NAAQS for PM_{10}, CO, SO_2, and NO_x are summarized in Table A.7.1. The modeling results for each individual emissions specie are discussed below.

Table A.7.1 Maximum Ambient Concentrations Due to Emissions from the BMGS Plus Background Concentrations With Comparison to Applicable NAAQS

Emission Specie	Averaging Period	Modeled Conc. ($\mu g/m^3$)	UTM Easting (m)	UTM Northing (m)	Background Conc. ($\mu g/m^3$) [b]	Maximum Ambient Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
PM_{10}	24-hour	16.1	759212.88	3880512.0	53	69.1	150
	Annual	0.3	759212.88	3880512.00	14	14.3	50
CO	1-hour	404.3	759212.88	3880512.0	1,828	2,232	40,000
	8-hour	227.1	759212.88	3880512.0	637	864	10,000
SO_2	3-hour	196.3	759212.88	3880512.0	8	204	1,300
	24-hour	74.3	759212.88	3880512.0	4	74.7	365
	Annual	1.1	759212.88	3880512.0	0.4	1.5	80
NO_x	Annual	8.5	759212.88	3880512.0	11	19.5	100

[a] Highest 2nd high concentration.

[b] See Section A.3.3 for description of background monitoring sites.

A.7.1.1 PM10 Concentrations

The predicted highest 2nd high 24-hour PM_{10} concentration was 16.1 $\mu g/m^3$ and the maximum annual concentration was 0.3 $\mu g/m^3$. The locations of these predicted concentrations are shown in Figure A.7.1. The predicted concentrations added to the 24-hour and annual background PM_{10} concentrations of 53 $\mu g/m^3$ and 14 $\mu g/m^3$, respectively yield total 24-hour and annual impacts of 69.1 $\mu g/m^3$ and 14.3 $\mu g/m^3$, respectively. These total impacts are below the 24-hour and annual NAAQS for PM_{10} of 150 $\mu g/m^3$ and 50 $\mu g/m^3$, respectively.

A.7.1.2 CO Concentrations

The predicted highest, 2nd high 1-hour CO concentration was 404.3 $\mu g/m^3$ and the highest, 2nd high 8-hour CO concentration was 227.1 $\mu g/m^3$. The locations of these predicted concentrations are shown in Figure A.7.1. The predicted concentrations added to the 1-hour and 8-hour background CO concentrations of 1,828 $\mu g/m^3$ and 637 $\mu g/m^3$, respectively yield total 1-hour and 8-hour impacts of 2,232 $\mu g/m^3$ and 864 $\mu g/m^3$, respectively. These total impacts are below the 1-hour and 8-hour NAAQS for CO of 40,000 $\mu g/m^3$ and 10,000 $\mu g/m^3$, respectively.

A.7.1.3 SO2 Concentrations

The predicted highest, 2nd high 3-hour SO_2 concentration was 196.3 $\mu g/m^3$, the highest, 2nd high 24-hour SO_2 concentration was 74.3 $\mu g/m^3$ and the maximum annual SO_2 concentration was 1.1 $\mu g/m^3$. The locations of these predicted concentrations are shown in Figure A.7.1. The predicted concentrations added to the 3-hour, 24-hour and annual background SO_2 concentrations of 8 $\mu g/m^3$, 4 $\mu g/m^3$ and 0.4 $\mu g/m^3$, respectively yield total 3-hour, 24-hour and annual impacts of 204 $\mu g/m^3$, 74.7 $\mu g/m^3$ and 1.5 $\mu g/m^3$, respectively. These total impacts are below the 3-hour, 24-hour and annual NAAQS for SO_2 of 1,300 $\mu g/m^3$, 365 $\mu g/m^3$ and 80 $\mu g/m^3$, respectively.

A.7.1.4 NOx Concentrations

The predicted maximum annual NO_x concentration was 8.5 $\mu g/m^3$. The location of this predicted concentration is shown in Figure A.7.1. The predicted concentration added to the annual background NO_x concentrations of 11 $\mu g/m^3$ yields a total annual impact of 19.5 $\mu g/m^3$. This total impact is below the annual NAAQS for NO_x of 100 $\mu g/m^3$.

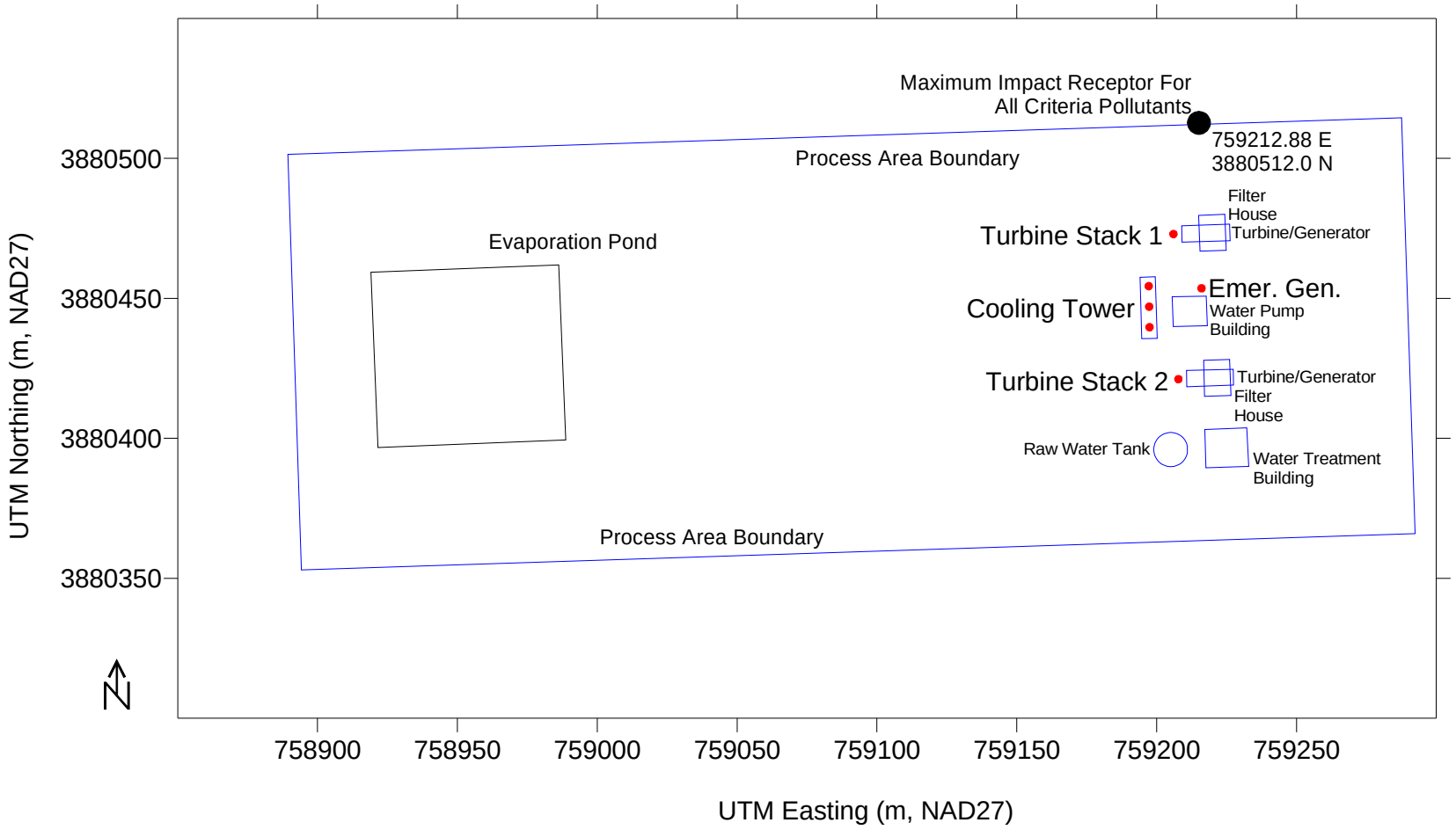


Figure A.7.1 Plan view showing location of maximum modeled concentrations for all criteria pollutants.

A.7.2 AAAQG Analysis

The AAAQG modeling was based upon worst-case emission rates of each AAAQG pollutant from each emission unit. The results of the modeling are summarized in Table A.7.2. The results indicate that the ambient impacts due to AAAQG emissions do not exceed the applicable AAAQG levels.

Table A.7.2 Summary of AAAQG Modeling Results

AAAQG Pollutant	1-Hour Impact ($\mu g/m^3$)	1-Hour AAAQG ($\mu g/m^3$)	24-Hour Impact ($\mu g/m^3$)	24-Hour AAAQG ($\mu g/m^3$)	Annual Impact ($\mu g/m^3$)	Annual AAAQG ($\mu g/m^3$)
Acetaldehyde	4.01E-02	2.30E+03	5.12E-03	1.40E+03	1.10E-03	5.00E-01
Acrolein	6.42E-03	6.70E+00	1.59E-03	2.00E+00	--	--
Benzene	3.93E-01	6.30E+02	1.56E-01	5.10E+01	3.17E-02	1.40E-01
1,3-Butadiene	4.30E-04	7.20E+00	3.00E-05	1.90E+00	1.00E-05	6.70E-02
Ethylbenzene	3.21E-02	4.50E+03	2.38E-03	3.50E+03	--	--
Formaldehyde	7.12E-01	2.00E+01	5.31E-02	1.20E+01	1.14E-02	8.00E-02
Napthalene	6.58E-02	6.30E+02	2.62E-02	4.00E+02	--	--
Propylene Oxide	1.41E+00	1.50E+03	5.63E-01	4.00E+02	1.14E-01	2.00E+00
Toluene	1.42E-01	4.70E+03	5.67E-02	3.00E+03	--	--
Xylenes	9.73E-02	5.50E+03	3.88E-02	3.50E+03	--	--

APPENDIX A.1

LIST OF DEM QUADRANGLES DEFINING MODELING DOMAIN

Calculate Domain and Quads Report 9/7/2006 4:48:16 PM
BEEST Version 9.50

BEE-Line Software
Copyright (C) 1996 - 2004
Phone (828) 628-0636
Fax (828) 628-0635
info@beeline-software.com

User Slope: 10%

Quads Analyzed and Selected

Selected?	Ref.Num	Max Elevation (m)	(ft)	Slope (%)	Name
	34113C4	1113.0	3651.6	0.81	PALMERITA RANCH, AZ
	34113C5	964.0	3162.7	0.68	ARTILLERY PEAK, AZ
	34113C6	1027.0	3369.4	0.83	RAWHIDE WASH, AZ
	34113C7	767.0	2516.4	0.47	CENTENNIAL WASH, AZ
	34113C8	656.0	2152.2	0.31	CASTANEDA HILLS SW, AZ
	34114C1	710.0	2329.4	0.40	MONKEYS HEAD, AZ
	34114C2	650.0	2132.5	0.30	GENE WASH, CA
	34114C3	1091.0	3579.4	1.01	WHIPPLE WASH, CA
	34114C4	1258.0	4127.3	1.26	WHIPPLE MOUNTAINS SW, CA
	34114C5	821.0	2693.6	0.55	SAVAHIA PEAK, CA
	34114C6	1055.0	3461.3	0.85	SAVAHIA PEAK SW, CA
	34114C7	1309.0	4294.6	1.12	MOPAH PEAKS, CA
	34114C8	1191.0	3907.5	0.88	MARTINS WELL, CA
	34115C1	477.0	1565.0	0.02	EAST OF MILLIGAN, CA
	34113D4	1466.0	4809.7	1.44	ARRASTRA MOUNTAIN, AZ
	34113D5	1194.0	3917.3	1.18	SIGNAL MOUNTAIN, AZ
	34113D6	1046.0	3431.8	1.05	SIGNAL, AZ
	34113D7	1073.0	3520.3	1.19	MCCRACKEN PEAK, AZ
	34113D8	807.0	2647.6	0.71	CASTANEDA HILLS, AZ
	34114D1	897.0	2942.9	0.89	MOHAVE SPRINGS, AZ
	34114D2	767.0	2516.4	0.63	STANDARD WASH, AZ
	34114D3	502.0	1647.0	0.08	LAKE HAVASU CITY SOUTH, AZ
	34114D4	439.0	1440.3	0.00	HAVASU LAKE, CA
	34114D5	472.0	1548.6	0.02	SAVAHIA PEAK NE, CA
	34114D6	673.0	2208.0	0.36	SAVAHIA PEAK NW, CA
	34114D7	1148.0	3766.4	1.06	MOHAWK SPRING, CA
	34114D8	778.0	2552.5	0.43	WEST OF MOHAWK SPRING, CA
	34115D1	1488.0	4881.9	1.26	WILHELM SPRING, CA
	34113E4	1308.0	4291.3	1.38	KAISER SPRING, AZ
	34113E5	1323.0	4340.6	1.65	GREENWOOD PEAK, AZ
	34113E6	1464.0	4803.1	2.27	GROOM SPRING, AZ
	34113E7	1193.0	3914.0	1.91	DUTCH FLAT SE, AZ
	34113E8	872.0	2860.9	1.17	DUTCH FLAT SW, AZ
	34114E1	1199.0	3933.7	2.12	BUCK MOUNTAINS SE, AZ
	34114E2	1549.0	5082.0	3.12	CROSSMAN PEAK, AZ
	34114E3	1183.0	3881.2	2.07	LAKE HAVASU CITY NORTH, AZ
	34114E4	850.0	2788.7	1.08	CASTLE ROCK, AZ

	34114E5	1126.0	3694.2	1.66	CHEMEHUEVI PEAK, CA
	34114E6	658.0	2158.8	0.42	SNAGGLETOOTH, CA
	34114E7	886.0	2906.8	0.77	STEPLADDER MOUNTAINS, CA
	34114E8	838.0	2749.3	0.58	STEPLADDER MOUNTAINS SW, CA
	34115E1	1457.0	4780.2	1.34	PAINTED ROCK WASH, CA
	34113F4	1647.0	5403.5	2.18	ELEPHANT MOUNTAIN, AZ
	34113F5	1076.0	3530.2	1.39	WIKIEUP, AZ
	34113F6	1541.0	5055.8	3.14	AUBREY PEAK, AZ
	34113F7	1956.0	6417.3	5.69	BEECHER CANYON, AZ
	34114F1	794.0	2605.0	1.59	BUCK MOUNTAINS NE, AZ
	34114F2	728.0	2388.5	1.27	BUCK MOUNTAINS, AZ
	34114F3	742.0	2434.4	1.34	FRANCONIA, AZ
	34114F4	708.0	2322.8	1.09	TOPOCK, AZ
	34114F5	904.0	2965.9	1.54	WHALE MOUNTAIN, CA
	34114F6	871.0	2857.6	1.09	MONUMENTAL PASS, CA
	34114F7	895.0	2936.4	0.91	STEPLADDER MOUNTAINS NE, CA
	34114F8	847.0	2778.9	0.66	STEPLADDER MOUNTAINS NW, CA
	34115F1	1277.0	4189.6	1.19	LITTLE PIUTE MOUNTAINS, CA
	34113G4	1895.0	6217.2	2.83	CEDAR BASIN, AZ
	34113G5	1595.0	5232.9	2.88	TULE WASH, AZ
	34113G6	1471.0	4826.1	3.58	GUNSIGHT CANYON, AZ
X	34113G7	2199.0	7214.6	10.03	DIAMOND JOE PEAK, AZ
X	34113G8	1930.0	6332.0	17.65	CREAMERY CANYON, AZ
	34114G1	1012.0	3320.2	7.79	YUCCA SE, AZ
	34114G2	1101.0	3612.2	9.05	YUCCA, AZ
	34114G3	1040.0	3412.1	8.19	WARM SPRINGS SE, AZ
	34114G4	516.0	1692.9	0.50	WARM SPRINGS SW, AZ
	34114G5	312.0	1023.6	0.00	NEEDLES, CA
	34114G6	967.0	3172.6	1.58	NEEDLES SW, CA
	34114G7	1010.0	3313.6	1.27	FLATTOP MOUNTAIN, CA
	34114G8	1006.0	3300.5	1.00	WEST OF FLATTOP MOUNTAIN, CA
	34115G1	1264.0	4147.0	1.22	FENNER SPRING, CA
	34113H4	1855.0	6086.0	2.78	GONZALES WASH, AZ
	34113H5	1690.0	5544.6	3.18	TOM BROWN CANYON, AZ
	34113H6	1288.0	4225.7	3.03	PILGRIM WASH, AZ
X	34113H7	2196.0	7204.7	10.97	HIBERNIA PEAK, AZ
X	34113H8	2317.0	7601.7	42.29	WABAYUMA PEAK, AZ
X	34114H1	1587.0	5206.7	25.65	YUCCA NE, AZ
X	34114H2	1105.0	3625.3	20.40	YUCCA NW, AZ
X	34114H3	1329.0	4360.2	27.51	WARM SPRINGS, AZ
	34114H4	1109.0	3638.5	7.83	BOUNDARY CONE, AZ
	34114H5	369.0	1210.6	0.00	NEEDLES NE, AZ
	34114H6	932.0	3057.7	1.51	NEEDLES NW, AZ
	34114H7	953.0	3126.6	1.16	BANNOCK, CA
	34114H8	861.0	2824.8	0.74	HOMER, CA
	34115H1	1103.4	3620.0	0.98	GOFFS, CA
	35113A4	1884.0	6181.1	2.84	PENITENTIARY MOUNTAIN, AZ
	35113A5	1789.0	5869.4	3.44	AUSTIN PEAK, AZ
	35113A6	1381.0	4530.8	3.38	BOTTLENECK WASH, AZ
X	35113A7	2441.0	8008.5	12.54	DEAN PEAK, AZ
X	35113A8	2566.0	8418.6	48.04	HUALAPAI PEAK, AZ
X	35114A1	1505.0	4937.7	115.62	KINGMAN SE, AZ
X	35114A2	931.0	3054.5	In Ext.	KINGMAN SW, AZ
X	35114A3	1587.0	5206.7	93.90	MOUNT NUTT, AZ
	35114A4	1269.0	4163.4	9.78	OATMAN, AZ
	35114A5	473.0	1551.8	0.06	DAVIS DAM SE, AZ
	35114A6	1095.0	3592.5	2.04	MOUNT MANCHESTER, CA

	35114A7	1067.0	3500.7	1.43	EAST OF HOMER MOUNTAIN, CA
	35114A8	1185.0	3887.8	1.34	HOMER MOUNTAIN, CA
	35115A1	1286.0	4219.2	1.26	SIGNAL HILL, CA
	35113B4	1821.0	5974.4	2.72	BULL SPRING, AZ
	35113B5	1829.0	6000.7	3.54	TIN MOUNTAIN, AZ
	35113B6	1476.0	4842.5	3.73	TIN MOUNTAIN NW, AZ
X	35113B7	2173.0	7129.3	10.84	HUALAPAI SPRING, AZ
X	35113B8	2107.0	6912.7	37.56	RATTLESNAKE HILL, AZ
X	35114B1	1571.0	5154.2	122.93	KINGMAN, AZ
X	35114B2	1391.0	4563.6	102.98	KINGMAN NW, AZ
X	35114B3	1357.0	4452.1	68.40	SECRET PASS, AZ
X	35114B4	1412.0	4632.5	11.51	UNION PASS, AZ
	35114B5	608.0	1994.8	0.74	DAVIS DAM, AZ
	35114B6	1477.0	4845.8	3.27	BRIDGE CANYON, NV
	35114B7	1501.0	4924.5	2.45	JUNIPER MINE, NV
	35114B8	1257.0	4124.0	1.48	WEST OF JUNIPER MINE, CA
	35115B1	1498.0	4914.7	1.59	EAST OF GROTTO HILLS, CA
	35113C4	1946.0	6384.5	2.88	TUCKAYOU SPRING, AZ
	35113C5	2019.0	6624.0	3.83	VALENTINE SE, AZ
	35113C6	1671.0	5482.3	4.02	HACKBERRY, AZ
	35113C7	1915.0	6282.8	7.12	PEACOCK PEAK, AZ
	35113C8	1189.0	3901.0	5.31	KINGMAN AIRPORT, AZ
X	35114C1	1890.0	6200.8	11.01	STOCKTON HILL, AZ
	35114C2	1699.0	5574.1	9.54	CERBAT, AZ
	35114C3	1414.0	4639.1	7.13	GRASSHOPPER JUNCTION SE, AZ
	35114C4	1471.0	4826.1	6.57	BURNS SPRING, AZ
	35114C5	652.0	2139.1	0.81	SPIRIT MOUNTAIN SE, AZ
	35114C6	1719.0	5639.8	3.74	SPIRIT MOUNTAIN, NV
	35114C7	1476.0	4842.5	2.29	SEARCHLIGHT SE, NV
	35114C8	1100.0	3608.9	1.15	TENMILE WELL, NV
	35115C1	1700.0	5577.4	1.86	HART PEAK, CA
	35113D4	1827.0	5994.1	2.41	CHEROKEE POINT, AZ
	35113D5	1565.0	5134.5	2.35	TRUXTON, AZ
	35113D6	1730.0	5675.9	3.32	VALENTINE, AZ
	35113D7	1593.0	5226.4	3.63	ANTARES, AZ
	35113D8	1322.5	4339.0	3.16	LONG MOUNTAIN, AZ
	35114D1	1948.0	6391.1	5.54	ELEMENTS CANYON, AZ
	35114D2	2124.0	6968.5	6.19	CHLORIDE, AZ
	35114D3	1449.0	4753.9	3.65	GRASSHOPPER JUNCTION, AZ
	35114D4	1264.0	4147.0	2.86	GRASSHOPPER JUNCTION NW, AZ
	35114D5	1270.0	4166.7	2.43	SPIRIT MOUNTAIN NE, AZ
	35114D6	636.0	2086.6	0.42	SPIRIT MOUNTAIN NW, NV
	35114D7	1245.0	4084.6	1.56	FOURTH OF JULY MOUNTAIN, NV
	35114D8	1318.0	4324.1	1.42	SEARCHLIGHT, NV
	35115D1	1755.0	5757.9	1.84	HOPPS WELL, NV
	35113E4	1726.0	5662.7	1.96	PEACH SPRINGS, AZ
	35113E5	1733.0	5685.7	2.27	MILKWEED CANYON SE, AZ
	35113E6	2033.0	6669.9	3.21	MILKWEED CANYON SW, AZ
	35113E7	1810.0	5938.3	3.09	MUSIC MOUNTAINS SE, AZ
	35113E8	1056.7	3467.0	1.45	MUSIC MOUNTAINS SW, AZ
	35114E1	1187.0	3894.4	1.78	MOUNT TIPTON SE, AZ
	35114E3	1382.0	4534.1	2.25	DOLAN SPRINGS, AZ
	35114E4	1577.0	5173.9	2.68	MIDDLE WATER SPRING, AZ
	35114E5	1662.0	5452.8	2.66	MOUNT PERKINS, AZ
	35114E6	820.0	2690.3	0.70	MOUNT DAVIS, AZ
	35114E7	1542.0	5059.1	1.84	IRETEBA PEAKS, NV
	35114E8	1353.0	4439.0	1.32	NELSON SW, NV

35115E1	1601.0	5252.6	1.48	HIGHLAND SPRING, NV
35113F4	1593.0	5226.4	1.53	PEACH SPRINGS CANYON, AZ
35113F5	1520.0	4986.9	1.58	HINDU CANYON, AZ
35113F6	1662.0	5452.8	1.97	MILKWEED CANYON NW, AZ
35113F7	2041.0	6696.2	2.78	MUSIC MOUNTAINS NE, AZ
35113F8	1886.0	6187.7	2.60	MUSIC MOUNTAINS NW, AZ
35114F1	1163.7	3818.0	1.29	RED LAKE, AZ
35114F2	1489.0	4885.2	1.88	MOUNT TIPTON NW, AZ
35114F3	1581.0	5187.0	2.05	WHITE HILLS EAST, AZ
35114F4	1200.0	3937.0	1.34	WHITE HILLS WEST, AZ
35114F5	1130.0	3707.3	1.15	MOHAVE MINE, AZ
35114F6	782.0	2565.6	0.51	FIRE MOUNTAIN, AZ
35114F7	1530.0	5019.7	1.55	NELSON, NV
35114F8	1489.0	4885.2	1.34	KEYHOLE CANYON, NV
35115F1	1488.0	4881.9	1.21	MCCULLOUGH MOUNTAIN NE, NV
35113G4	1894.0	6213.9	1.69	TRAVERTINE RAPIDS, AZ
35113G5	1504.0	4934.4	1.33	SEPARATION CANYON, AZ
35113G6	1595.0	5232.9	1.54	SPENCER CANYON, AZ
35113G7	1723.0	5652.9	1.79	HORSE FLAT, AZ
35113G8	2061.0	6761.8	2.33	QUARTERMASTER CANYON SW, AZ
35114G1	1967.0	6453.4	2.20	GARNET MOUNTAIN, AZ
35114G2	1463.0	4799.9	1.46	GOLD BASIN, AZ
35114G3	1563.0	5128.0	1.61	SENATOR MOUNTAIN, AZ
35114G4	1193.0	3914.0	1.06	SENATOR MOUNTAIN SW, AZ
35114G5	987.0	3238.2	0.74	HOUSHOLDER PASS, AZ
35114G6	870.0	2854.3	0.54	WILLOW BEACH, AZ
35114G7	1110.0	3641.7	0.81	BOULDER CITY SE, NV
35114G8	1097.0	3599.1	0.73	BOULDER CITY SW, NV
35115G1	1322.0	4337.3	0.91	SLOAN SE, NV
35113H4	2012.0	6601.0	1.61	PRICE POINT, AZ
35113H5	1943.0	6374.7	1.63	AMOS POINT, AZ
35113H6	1843.0	6046.6	1.59	DEVILS SLIDE RAPIDS, AZ
35113H7	1673.0	5488.8	1.44	QUARTERMASTER CANYON, AZ
35113H8	1835.0	6020.3	1.66	GRAPEVINE CANYON, AZ
35114H1	1654.0	5426.5	1.45	MEADVIEW SOUTH, AZ
35114H2	1428.0	4685.0	1.17	GARNET MOUNTAIN NW, AZ
35114H3	1177.0	3861.5	0.87	SENATOR MOUNTAIN NE, AZ
35114H4	1039.0	3408.8	0.70	SENATOR MOUNTAIN NW, AZ
35114H5	1662.0	5452.8	1.42	MOUNT WILSON, AZ
35114H6	1308.0	4291.3	0.96	RINGBOLT RAPIDS, AZ
35114H7	1110.0	3641.7	0.70	BOULDER CITY, NV
35114H8	1258.0	4127.3	0.81	BOULDER CITY NW, NV
35115H1	1548.0	5078.7	1.04	SLOAN NE, NV

Quads Required to Cover Domain

File	Name
34113G7.DEM	DIAMOND JOE PEAK, AZ
34113G8.DEM	CREAMERY CANYON, AZ
34114G1.DEM	YUCCA SE, AZ
34114G2.DEM	YUCCA, AZ
34114G3.DEM	WARM SPRINGS SE, AZ
34114G4.DEM	WARM SPRINGS SW, AZ
34113H7.DEM	HIBERNIA PEAK, AZ
34113H8.DEM	WABAYUMA PEAK, AZ
34114H1.DEM	YUCCA NE, AZ

34114H2.DEM YUCCA NW, AZ
34114H3.DEM WARM SPRINGS, AZ
34114H4.DEM BOUNDARY CONE, AZ
35113A7.DEM DEAN PEAK, AZ
35113A8.DEM HUALAPAI PEAK, AZ
35114A1.DEM KINGMAN SE, AZ
35114A2.DEM KINGMAN SW, AZ
35114A3.DEM MOUNT NUTT, AZ
35114A4.DEM OATMAN, AZ
35113B7.DEM HUALAPAI SPRING, AZ
35113B8.DEM RATTLESNAKE HILL, AZ
35114B1.DEM KINGMAN, AZ
35114B2.DEM KINGMAN NW, AZ
35114B3.DEM SECRET PASS, AZ
35114B4.DEM UNION PASS, AZ
35113C7.DEM PEACOCK PEAK, AZ
35113C8.DEM KINGMAN AIRPORT, AZ
35114C1.DEM STOCKTON HILL, AZ
35114C2.DEM CERBAT, AZ
35114C3.DEM GRASSHOPPER JUNCTION SE, AZ
35114C4.DEM BURNS SPRING, AZ

APPENDIX A.2

CD CONTAINING ALL MODELING INPUT AND OUTPUT FILES

Exhibit C

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
2221 WEST GREENWAY ROAD
PHOENIX, AZ 85023-4399
(602) 942-3000 • AZGFD.GOV

GOVERNOR
JANET NAPOLITANO
COMMISSIONERS
CHAIRMAN, JOE MELTON, YUMA
MICHAEL M. GOLIGHTLY, FLAGSTAFF
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BOB HERNBRODE, TUCSON
JENNIFER L. MARTIN, PHOENIX
DIRECTOR
DUANE L. SHROUFE
DEPUTY DIRECTOR
STEVE K. FERRELL

October 2, 2006

Mr. Charles W. Komadina
Tucson Electric Power Company
1 S. Church Ave.
P.O. Box 711
Tucson, AZ 85702

Re: Special Status Species Information for **Township 19 North, Range 18 West, Section 14 North ½; Proposed Installation of 2 Combustion Turbine-Generators.**

Dear Mr. Komadina:

The Arizona Game and Fish Department (Department) has reviewed your request, dated September 25, 2006, regarding special status species information associated with the above-referenced project area. The Department understands the proposed project would include the construction of a new electrical power generating station which would consist of two simple cycle combustion turbine-generators. During review of your project, we noticed you obtained a project receipt from the On-Line Environmental Review Tool on September 11, 2006, which shows the special status species documented as occurring in the project vicinity (5-mile buffer). We also noticed that Renee Erickson from Tierra entered the same project on September 27, 2006. Currently, based on the information we received in your letter, we do not have more project specific recommendations beyond those provided on your project receipt.

The Department appreciates the opportunity to review your project. Please remember for future project reviews to send in an initialed and signed project receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how activities are to be accomplished, and project locality information must be submitted. This process is outlined on your project receipt under the Recommendations Disclaimer section. If you have any questions regarding this letter, please contact me at (602) 789-3606. General status information, county and watershed distribution lists and abstracts for some special status species are also available on our web site at http://www.azgfd.gov/hdms.

Sincerely,

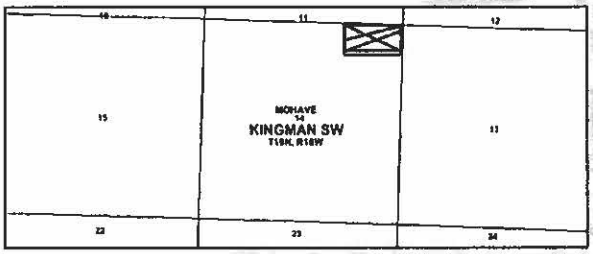
Ginger L. Ritter
Project Evaluation Program Specialist

cc: Rebecca Davidson, Project Evaluation Program Supervisor
Kevin Morgan, Habitat Program Manager, Region III

AGFD #M06-09292748

Arizona's On-line Environmental Review Tool
Search ID: 20060911001230
Project Name: Sacramento
Date: 9/11/2006 2:48:02 PM

Project Location



The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 5 miles of Project Vicinity:

Name	Common Name	ESA	USFS	BLM	State
Gopherus agassizii (Sonoran Population)	Sonoran Desert Tortoise	SC			WSC
Heloderma suspectum cinctum	Banded Gila Monster	SC		S	
Penstemon albomarginatus	White-margined Penstemon	SC		S	SR

Project Name: Sacramento
Submitted By: Charles Komadina
On behalf of: PRIVATE
Project Search ID: 20060911001230
Date: 9/11/2006 2:47:47 PM
Project Category: Energy Storage/Production/Transfer,Energy Production (generation),coal or gas power plant (new)
Project Coordinates (UTM Zone 12-NAD 83): 211684.498, 3881909.722 meter
Project Length: 5898.130 meter
County: MOHAVE
USGS 7.5 Minute Quadrangle ID: 696
Quadrangle Name: KINGMAN SW
Project locality is currently being scoped

Location Accuracy Disclaimer

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

 APPLICATION INITIALS: _____

Arizona's On-line Environmental Review Tool
Search ID: 20060911001230
Project Name: Sacramento
Date: 9/11/2006 2:48:02 PM

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: http://arizonaes.fws.gov/.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

Disclaimer:

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area.
2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HDMS data contains information about species occurrences that have actually been reported to the Department.

Arizona Game and Fish Department Mission

To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and

 APPLICATION INITIALS: _____

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Energy Storage/Production/Transfer,Energy Production (generation),coal or gas power plant (new)

Project Type Recommendations:

Based on the project type entered; coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

Based on the project type entered; coordination with State Historic Preservation Office may be required http://www.pr.state.az.us/partnerships/shpo/shpo.html#anchor561695

Based on the project type entered; coordination with the Environmental Protection Agency may be required http://www.epa.gov/

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (including spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

Project Location and/or Species recommendations:

HDMS records indicate that one or more native plants listed on the Arizona Native Plant Law and Antiquities Act have been documented within the vicinity of your project area (refer to page 1 of the receipt). Please contact:

Arizona Department of Agriculture

1688 W Adams
Phoenix, AZ 85007

 APPLICATION INITIALS: _____

Phone: 602-542-4373

HDMS records indicate that Sonoran desert tortoise have been documented within the vicinity of your project area (refer to the species list on page 1 of the receipt). Please review the Tortoise Handling Guidelines found on the Environmental Review Home Page.

HTTP://WWW.AZGFD.GOV/HGIS/tORTOISE%20%HANDLING%20GUIDELINES.PDF

Recommendations Disclaimer:

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project.
2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development.**
3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).**
7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
2221 West Greenway Road
Phoenix, Arizona 85023-4312
Phone Number: (602) 789-3600
Fax Number: (602) 789-3928

Terms of Use

By using this site, you acknowledge that you have read and agree to these terms. Department staff may revise these terms periodically. If you continue to use our website after we post changes to these terms, it will mean that you accept such changes. If at any time you do not wish to accept the Terms, you may choose not to use the website.

1. This Environmental Review and project planning website was developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.
2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .
3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.
4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information

 APPLICATION INITIALS: _____

becomes available, this review may need to be reconsidered.
5. A signed and initialed copy of the Environmental Review Receipt indicates that the receipt has been read and all terms therein agreed to by the signer of the Environmental Review Receipt.

Security:

The Environmental Review and project planning web application operates on a complex State computer system. This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence of such monitoring to law enforcement officials. Unauthorized attempts to upload or change information; to defeat or circumvent security measures; or to utilize this system for other than its intended purposes are prohibited.

This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6) months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records.

Signature:_____

Date:_____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

 APPLICATION INITIALS: _____

Arizona's On-line Environmental Review Tool
Search ID: 20060911001230
Project Name: Sacramento
Date: 9/11/2006 2:48:02 PM

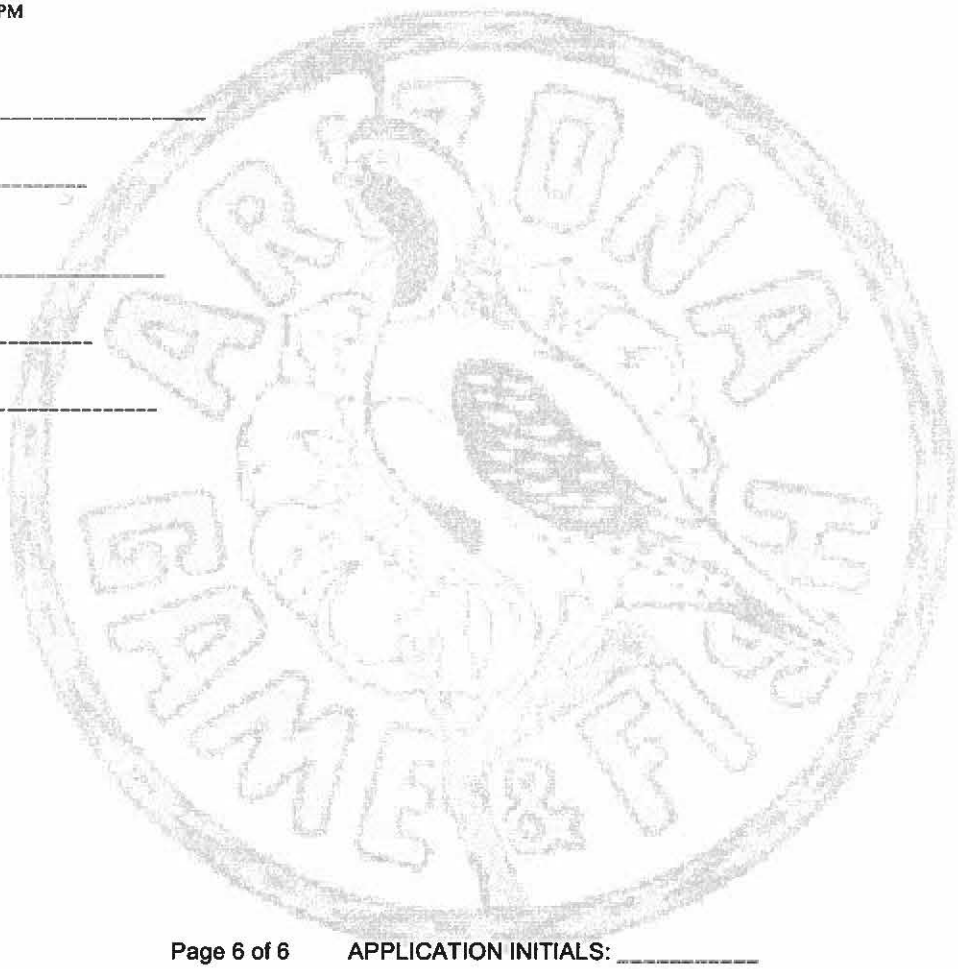
Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____



 APPLICATION INITIALS: _____

COUNTY	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	NESL	MEXFED	STATE	ELCODE_BCD	SRANK	GRANK
Maricopa	Phyllorhynchus browni lucidus	Maricopa Leaf-nosed Snake			S		PR		ARADB25012	S2	G5T2Q
Maricopa	Pipistrellus hesperus	Western Pipistrelle							AMACC03010	S5	G5
Maricopa	Plagiobothrys pringlei	Pringle Popcorn-flower							PDBOR0V0V0	S2	G2G4
Maricopa	Poeciliopsis occidentalis occidentalis	Gila Topminnow	LE				A	WSC	AFCNC05021	S1S2	G3T3
Maricopa	Pternohyla fodiens	Lowland Burrowing Treefrog						WSC	AAABC06010	S1S2	G4
Maricopa	Purshia subintegra	Arizona Cliff Rose	LE					HS	PDROS1E080	S1	GNA
Maricopa	Rallus longirostris yumanensis	Yuma Clapper Rail	LE				P	WSC	ABNME0501A	S3	G5T3
Maricopa	Rana yavapaiensis	Lowland Leopard Frog	SC		S		PR	WSC	AAABH01250	S4	G4
Maricopa	Rhinichthys osculus	Speckled Dace	SC	S			P		AFCJB37050	S3S4	G5
Maricopa	Salvia davidsonii	Davidson Sage							PDLAM1S0E0	S2?	G2?
Maricopa	Sauromalus ater (Arizona Population)	Arizona Chuckwalla	SC	S			A		ARACF13013	S4	G5T4Q
Maricopa	Selaginella eremophila	Desert Spike Moss							PPSEL010G0	S3S4	G4
Maricopa	Senecio arizonicus	Arizona Groundsel							PDAST8H070	S4	G4
Maricopa	Solanum heterodoxum	Melonleaf Nightshade							PDSOL0Z0X0	S4	G4G5
Maricopa	Sonorella allynsmithi	Squaw Peak Talussnail	SC		S				IMGASC9010	S1	G1
Maricopa	Stenocereus thurberi	Organ Pipe Cactus						SR	PDCAC10020	S4	G5
Maricopa	Strix occidentalis lucida	Mexican Spotted Owl	LT		S	3	A	WSC	ABNSB12012	S3S4	G3T3
Maricopa	Tadarida brasiliensis	Brazilian Free-tailed Bat							AMACD01010	S3S4	G5
Maricopa	Tantilla nigriceps	Plains Black-headed Snake							ARADB35050	S3	G5
Maricopa	Tetracoccus fasciculatus var. hallii	Hall Shrub Spurge							PDEUP1C021	S3S4	G4T4
Maricopa	Thamnophis eques megalops	Northern Mexican Gartersnake	SC		S		A	WSC	ARADB36061	S2S3	G5T5
Maricopa	Tumamoca macdougalii	Tumamoc Globeberry		S	S			SR	PDCUC0S010	S3	G4
Maricopa	Vauquelinia californica ssp. sonorensis	Arizona Sonoran Rosewood		S					PDROS1R024	S1	G4T1
Maricopa	Xantusia bezyi	Bezy's Night Lizard							ARACK01060	S?	G1G3
Maricopa	Xyrauchen texanus	Razorback Sucker	LE		S	2	P	WSC	AFCJC11010	S1	G1
Mohave	Accipiter gentilis	Northern Goshawk	SC		S	4	A	WSC	ABNKC12060	S3	G5
Mohave	Aechmophorus clarkii	Clark's Grebe				4		WSC	ABNCA04020	S3	G5
Mohave	Agosia chrysogaster chrysogaster	Gila Longfin Dace	SC	S			A		AFCJB37151	S3S4	G4T3T4
Mohave	Allium bigelovii	Bigelow Onion						SR	PMLIL02070	S2S3	G3
Mohave	Amsonia jonesii	Jones Blue Star							PDAPO030A0	S2	G4
Mohave	Amsonia tomentosa var. stenophylla	Narrowleaf Blue Star							PDAPO030L1	S3	G4T4
Mohave	Antirrhinum kingii	King Snapdragon							PDSCR2S040	S3	G4
Mohave	Antrozous pallidus	Pallid Bat							AMACC10010	S4S5	G5
Mohave	Anulocaulis leiosolenus	Ringstem							PDNYC05040	S3	G4
Mohave	Aquila chrysaetos	Golden Eagle				3	P		ABNKC22010	S4	G5

COUNTY	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	NESL	MEXFED	STATE	ELCODE_BCD	SRANK	GRANK
Mohave	Arctomecon californica	Las Vegas Bearpoppy	SC					SR	PDPAP02010	S2	G3
Mohave	Artemisia pygmaea	Pygmy Sagebrush							PDAST0S1E0	S1	G4
Mohave	Asclepias cryptoceras	Hidden Horn Milkweed							PDASC020C0	S1	G4
Mohave	Asio otus	Long-eared Owl							ABNSB13010	S2B,S3S4N	G5
Mohave	Astragalus acutirostris	Beaked Milk-vetch							PDFAB0F040	S1?	G4
Mohave	Astragalus ampullarius	Gumbo Milk-vetch	SC		S				PDFAB0F0L0	S1	G2
Mohave	Astragalus ensiformis	Pagumpa Milk-vetch							PDFAB0F380	S2	G3
Mohave	Astragalus episcopus var. lancearius	Lancer Milk-vetch							PDFAB0F392	S2	G3G4T2T3
Mohave	Astragalus geyeri var. triquetrus	Beaver Dam Milk-vetch	SC	S					PDFAB0F3M2	S1	G4T2T3
Mohave	Astragalus holmgreniorum	Holmgren Milk-vetch	LE					HS	PDFAB0F9Z0	S1	G1
Mohave	Astragalus lentiginosus var. ambiguus	Freckled Milk-vetch	SC						PDFAB0FB91	S1	G5T1Q
Mohave	Astragalus newberryi var. aquarii	Aquarius Milkvetch		S					PDFAB0F5Y5	S1	G5T1
Mohave	Astragalus striatiflorus	Striped Flower Milk Vetch							PDFAB0F8K0	S2	G3
Mohave	Astragalus titanophilus	Limestone Milk Vetch							PDFAB0F8Y0	S3	G3
Mohave	Astragalus toanus var. scidulus	Diamond Butte Milkvetch		S					PDFAB0F8Z1	S1	G4G5T1T3
Mohave	Athene cunicularia hypugaea	Western Burrowing Owl	SC	S		4	A		ABNSB10012	S3	G4T4
Mohave	Balsamorhiza hookeri var. hispidula	A Balsamroot							PDAST11041	S1	G5T3T5
Mohave	Buddleja utahensis	Utah Butterfly Bush							PDBUD01080	S2	G4
Mohave	Bufo microscaphus	Arizona Toad	SC		S				AAABB01110	S3S4	G3G4
Mohave	Buteo albonotatus	Zone-tailed Hawk							ABNKC19090	S4	G4
Mohave	Buteo regalis	Ferruginous Hawk	SC			3		WSC	ABNKC19120	S2B,S4N	G4
Mohave	Buteo swainsoni	Swainson's Hawk							ABNKC19070	S3	G5
Mohave	Buteogallus anthracinus	Common Black-Hawk			S		A	WSC	ABNKC15010	S3	G4G5
Mohave	Camissonia brevipes	Golden Suncup	SC						PDONA03070	S1	G4G5
Mohave	Camissonia exilis	Slender Evening-primrose	SC					SR	PDONA030J0	S1	G1
Mohave	Camissonia parryi	Parry Evening-primrose							PDONA03180	S3	G3?
Mohave	Camissonia specuicola ssp. hesperia	Grand Canyon Evening-primrose	SC						PDONA031J1	S1	G2T1
Mohave	Camissonia specuicola ssp. specuicola	Ditch Evening Primrose							PDONA031J2	S1	G2T1
Mohave	Carex scirpoidea var. curatorum	Kaibab Sedge							PMCYP03F30	S1	G2
Mohave	Castilleja stenantha	California Indian Paintbrush							PDSCR0D222	S2S3	G5TNR
Mohave	Catostomus clarki	Desert Sucker	SC	S					AFCJC02040	S3S4	G3G4
Mohave	Catostomus insignis	Sonora Sucker	SC	S			P		AFCJC02100	S3	G3
Mohave	Catostomus latipinnis	Flannelmouth Sucker	SC	S	S				AFCJC02110	S2	G3G4
Mohave	Charina trivirgata gracia	Desert Rosy Boa	SC	S	S				ARADA01021	S3	G4G5T3
Mohave	Chloroceryle americana	Green Kingfisher							ABNXD02020	S2	G5
Mohave	Chrysothamnus teretifolius	Roundleaf Rabbitbrush							PDAST2C0C0	S2S3	G4
Mohave	Cicindela oregona maricopa	Maricopa Tiger Beetle	SC	S	S				IICOL02362	S3	G5T3

COUNTY	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	NESL	MEXFED	STATE	ELCODE_BCD	SRANK	GRANK
Mohave	Circus cyaneus	Northern Harrier					A		ABNKC11010	S1S2B,S5N	G5
Mohave	Cirsium virginense	Virgin Thistle	SC					SR	PDAST2E3F0	S1	G2
Mohave	Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo	C		S	2		WSC	ABNRB02022	S3	G5T3Q
Mohave	Cordylanthus nevinii	Nevin Bird's-beak							PDSCR0J0E0	S1	G2G4
Mohave	Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC			4			AMACC08014	S3S4	G4T4
Mohave	Coryphantha missouriensis	Missouri Corycactus						SR	PDCAC0X020	S3	G5
Mohave	Crotalus oreganus abyssus	Grand Canyon Rattlesnake			S				ARADE02121	S4	G5T4
Mohave	Cryptantha capitata	Hermit Catseye							PDBOR0A0E0	S3S4	G4
Mohave	Cryptantha semiglabra	Fredonia Catseye							PDBOR0A2R0	S1?	G1?
Mohave	Cycladenia humilis var. jonesii	Jones' Cycladenia	LT					HS	PDAPO09012	S1	G3G4T2
Mohave	Cynanchum utahense	Utah Swallowwort							PDASC050M0	S2	G4
Mohave	Cyprinodon macularius	Desert Pupfish	LE				P	WSC	AFCN802060	S1	G1
Mohave	Dipodomys microps celsus	A Chisel-toothed Kangaroo Rat				4			AMAFD03025	S3	G5T4
Mohave	Echinocactus polycephalus var. polycephalus	Clustered Barrel Cactus						SR	PDCAC05033	S2	G3G4T3T4
Mohave	Echinocactus polycephalus var. xeranthemoides	Grand Canyon Cottontop Cactus						SR	PDCAC05032	S2S3	G3G4T1T3
Mohave	Empidonax traillii extimus	Southwestern Willow Flycatcher	LE		S	2		WSC	ABPAE33043	S1	G5T1T2
Mohave	Encelia frutescens var. resinosa	Rayless Encelia							PDAST3F032	S4	G5T4
Mohave	Enceliopsis argophylla	Silverleaf Sunray		S					PDAST3G010	S2	G2G3
Mohave	Enceliopsis nudicaulis	Nudestem Sunray							PDAST3G030	S2	G5
Mohave	Ephedra funerea	Death Valley Mormon Tea							PGEPH010E0	S1	G2
Mohave	Epilobium hornemannii ssp. hornemannii	Hornemann Willow Herb							PDONA060C2	S3?	G5T5
Mohave	Eptesicus fuscus	Big Brown Bat							AMACC04010	S4S5	G5
Mohave	Ericameria cervina	Tawny Turpentine Bush							PDAST3L040	S1	G3?
Mohave	Erigeron lobatus	Lobed Fleabane							PDAST3M2C0	S3	G4
Mohave	Eriogonum darrovii	Darrow's Buckwheat							PDPGN081K0	S2	G2
Mohave	Eriogonum heermannii var. subracemosum	Heermann Wild-buckwheat							PDPGN082P7	S4	G5T4?
Mohave	Eriogonum jonesii	Jones' Buckwheat							PDPGN08380	S2	G2
Mohave	Eriogonum mortonianum	Morton Wild-buckwheat	SC		S			SR	PDPGN083Z0	S1	G1
Mohave	Eriogonum racemosum var coccineum	Scarlet Wild-buckwheat							PDPGN086E1	S2S3	G4QT2T3Q
Mohave	Eriogonum racemosum var. zionis	Zion Wild-buckwheat							PDPGN086E2	S1	G4QT2Q
Mohave	Eriogonum thompsoniae var. albiflorum	White-flow Thompson Wild Buckwheat							PDPGN085T1	S1	G4T2T3
Mohave	Eriogonum thompsoniae var. atwoodii	Atwood Wild-buckwheat	SC		S			SR	PDPGN085T2	S1	G4T1

COUNTY	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	NESL	MEXFED	STATE	ELCODE_BCD	SRANK	GRANK
Mohave	Eriogonum thompsoniae var. thompsoniae	Ellen Wild-buckwheat							PDPGN085T3	S2	G4T4
Mohave	Eriogonum viscidulum	Sticky Buckwheat	SC	S					PDPGN08690	S1	G2
Mohave	Escobaria vivipara var. rosea	Viviparous Foxtail Cactus						SR	PDCAC0X0G8	S3	G5T3
Mohave	Euderma maculatum	Spotted Bat	SC				PR	WSC	AMACC07010	S1S2	G4
Mohave	Eumeces gilberti rubricaudatus	Western Red-tailed Skink					PR		ARACH01065	S3S4	G5T4Q
Mohave	Eumeces skiltonianus	Western Skink							ARACH01110	S2	G5
Mohave	Eumops perotis californicus	Greater Western Bonneted Bat	SC						AMACD02011	S1S2	G5T4
Mohave	Falco peregrinus anatum	American Peregrine Falcon	SC		S	4	A	WSC	ABNKD06071	S4	G4T4
Mohave	Flaveria mcdougallii	Grand Canyon Flaveria						SR	PDAST3V070	S2	G2
Mohave	Fremontodendron californicum	Flannel Bush		S				SR	PDSTE03010	S2S3	G4
Mohave	Galium bifolium	Twoleaf Bedstraw							PDRUB0N090	S1	G5
Mohave	Gila cypha	Humpback Chub	LE			2		WSC	AFCJB13080	S1	G1
Mohave	Gila elegans	Bonytail	LE			1	P	WSC	AFCJB13100	S1	G1
Mohave	Gila robusta	Roundtail Chub	SC		S	2	PR	WSC	AFCJB13150	S2	G3
Mohave	Gila seminuda	Virgin River Chub	LE		S			WSC	AFCJB13170	S1	G1
Mohave	Gopherus agassizii (Mohave Population)	Mohave Desert Tortoise	LT				A	WSC	ARAAF01012	S2	G4T3Q
Mohave	Gopherus agassizii (Sonoran Population)	Sonoran Desert Tortoise	SC				A	WSC	ARAAF01013	S4	G4T4
Mohave	Haliaeetus leucocephalus	Bald Eagle	LT,PDL		S		P	WSC	ABNKC10010	S2S3B,S4N	G5
Mohave	Haliaeetus leucocephalus (wintering pop.)	Bald Eagle	LT,PDL		S		P	WSC	ABNKC10012	S4N	G5
Mohave	Haplopappus salicinus	Salty Goldenweed							PDASTDJ030	S3	G3
Mohave	Haplopappus scopulorum	Grand Canyon Evening Daisy							PDASTDJ020	S4	G4
Mohave	Helianthus anomalus	Hopi Sunflower							PDAST4N040	S2	G3
Mohave	Heloderma suspectum cinctum	Banded Gila Monster	SC	S			A		ARACE01011	S4	G4T4
Mohave	Heuchera rubescens	Red Alum Root							PDSAX0E100	S4	G5
Mohave	Idionycteris phyllotis	Allen's Big-eared Bat	SC	S					AMACC09010	S2S3	G3G4
Mohave	Ipomopsis congesta ssp. frutescens	Shrub Gilia							PDPLM06033	S1	G5T3T4
Mohave	Krameria parvifolia	Small-flower Ratany							PDKRA01050	S4	G4G5
Mohave	Lampropeltis pyromelana infralabialis	Utah Mountain Kingsnake			S				ARADB19041	S1	G4G5T3
Mohave	Lasionycteris noctivagans	Silver-haired Bat					PR		AMACC02010	S3S4	G5
Mohave	Lasiurus blossevillii	Western Red Bat						WSC	AMACC05060	S2	G5
Mohave	Lasiurus cinereus	Hoary Bat							AMACC05030	S4	G5
Mohave	Laterallus jamaicensis coturniculus	California Black Rail	SC		S		PR	WSC	ABNME03041	S1	G4T1
Mohave	Lepidomeda mollispinis mollispinis	Virgin Spinedace	SC					WSC	AFCJB20031	S1	G1G2T1
Mohave	Leucocrinum montanum	Mountain Star-lily							PMLIL18010	S1	G5

COUNTY	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	NESL	MEXFED	STATE	ELCODE_BCD	SRANK	GRANK
Mohave	Lupinus latifolius ssp. leucanthus	Broadleaf Lupine			S				PDFAB2B29D	S1	G5T1T2
Mohave	Lycium torreyi	Torrey Wolf-berry							PDSOL0G0K0	S2	G4G5
Mohave	Machaeranthera arida	Arid Tansy-aster							PDAST64040	S1	G3G4
Mohave	Machaeranthera bigelovii var. bigelovii	Bigelow's Tansy-aster							PDAST64071	S2	G4G5T3T4
Mohave	Macrotus californicus	California Leaf-nosed Bat	SC					WSC	AMACB01010	S3S4	G4
Mohave	Mammillaria viridiflora	Varied Fishhook Cactus						SR	PDCAC0A0D0	S4	G4
Mohave	Mentzelia memorabalis	September 11 Stickleaf		S					PDLOA03290	S1	G1
Mohave	Microtus mexicanus hualpaiensis	Hualapai Mexican Vole	LE					WSC	AMAFF11212	S1	G5T1Q
Mohave	Mortonia scabrella var. utahensis	Utah Sandpaper Bush							PDCEL09030	S4	G4G5
Mohave	Myotis californicus	California Myotis							AMACC01120	S4S5	G5
Mohave	Myotis ciliolabrum	Western Small-footed Myotis	SC	S					AMACC01140	S3	G5
Mohave	Myotis occultus	Arizona Myotis	SC	S					AMACC01160	S3	G3G4
Mohave	Myotis thysanodes	Fringed Myotis	SC	S					AMACC01090	S3S4	G4G5
Mohave	Myotis velifer	Cave Myotis	SC	S					AMACC01050	S4	G5
Mohave	Myotis volans	Long-legged Myotis	SC	S					AMACC01110	S3S4	G5
Mohave	Myotis yumanensis	Yuma Myotis	SC						AMACC01020	S3S4	G5
Mohave	Nama pusillum	Littleleaf Nama							PDHYD0A0C0	S1	G4
Mohave	Nycticorax nycticorax	Black-crowned Night-heron							ABNGA11010	S3	G5
Mohave	Nyctinomops femorosaccus	Pocketed Free-tailed Bat		S					AMACD04010	S2S3	G4
Mohave	Nyctinomops macrotis	Big Free-tailed Bat	SC	S					AMACD04020	S2S3	G5
Mohave	Opuntia basilaris var. aurea	Yellow Beavertail						SR	PDCAC0D300	S3	G3
Mohave	Opuntia basilaris var. longiareolata	Grand Canyon Beavertail Cactus						SR	PDCAC0D054	S2	G5T2Q
Mohave	Opuntia echinocarpa	Straw-top Cholla						SR	PDCAC0D2W0	S5	G5
Mohave	Opuntia nicholii	Navajo Bridge Cactus						SR	PDCAC0D0W0	S4	G4Q
Mohave	Opuntia superbospina	Kingman's Prickly-pear						SR	PDCAC0D1Q0	SH	GHQ
Mohave	Opuntia whipplei var. multigeniculata	Blue Diamond Cholla	SC					SR	PDCAC0D1N1	S1	G4?T1Q
Mohave	Opuntia whipplei var. whipplei	Whipple Cholla						SR	PDCAC0D1N3	S1	G4?T4?
Mohave	Orobanche uniflora ssp. occidentalis	Broom Rape							PDORO040F1	S1	G5T5
Mohave	Ostrya knowltonii	Knowlton Hop Hornbean							PDBET05020	S3	G3G4
Mohave	Panicum mohavense								PMPOA4K1G0	S1	G1
Mohave	Paronychia jamesii	James Whitlow Wort							PDCAR0L0E0	S2	G4
Mohave	Pediocactus peeblesianus var. fickeiseniae	Fickeisen Plains Cactus	C		S	3		HS	PDCAC0E051	S1S2	G1G2T1T2
Mohave	Pediocactus sileri	Siler Pincushion Cactus	LT	S				HS	PDCAC0E060	S3	G3
Mohave	Pediomelum castoreum	Beaver Dam Scurf Pea	SC						PDFAB5L050	S1	G3
Mohave	Pediomelum epipsilum	Kane Scurf-pea	SC						PDFAB5L0F1	S1	G4?T1
Mohave	Penstemon albomarginatus	White-margined Penstemon	SC	S				SR	PDSCR1L070	S2	G2
Mohave	Penstemon bicolor ssp. roseus	Cerbat Beardtongue	SC	S				SR	PDSCR1L0S2	S2	G3T3Q

COUNTY	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	NESL	MEXFED	STATE	ELCODE_BCD	SRANK	GRANK
Mohave	Penstemon distans	Mt. Trumbull Beardtongue	SC	S	S			SR	PDSCR1L6W0	S2	G2
Mohave	Penstemon petiolatus	Sheep Range Beardtongue		S					PDSCR1L4Z0	S1	G2G3
Mohave	Penstemon pseudoputus	Kaibab Beardtongue							PDSCR1L7K0	S3	G3
Mohave	Petalonyx nitidus	Shiny-leaved Sandpaper Plant							PDLOA04020	S2	G4
Mohave	Petalonyx parryi	Parry Sandpaper Plant							PDLOA04030	S1	G2G3
Mohave	Peteria thompsoniae	Thompson's Peteria							PDFAB32020	S2S3	G4
Mohave	Phacelia constancei	Constance Caterpillar Weed							PDHYD0C0X0	S2	G4
Mohave	Phacelia cronquistiana	Cronquist's Phacelia							PDHYD0C520	S1	G1
Mohave	Phacelia parishii	Parish's Phacelia		S					PDHYD0C3G0	S1	G2G3
Mohave	Phacelia rafaelensis	A Phacelia							PDHYD0C400	S2	G3
Mohave	Phlox cluteana	Navajo Mountain Phlox							PDPLM0D0G0	S2	G2
Mohave	Pipistrellus hesperus	Western Pipistrelle							AMACC03010	S5	G5
Mohave	Plagopterus argentissimus	Woundfin	LE,XN					WSC	AFCJB33010	S1	G1
Mohave	Poa secunda	Sandberg's Bluegrass							PMPOA4Z2Y0	S5	G5
Mohave	Polygala acanthoclada	Thorn Milkwort							PDPGL02020	S4	G4
Mohave	Polygala rusbyi	Hualapai Milkwort			S				PDPGL021H0	S3	G3
Mohave	Proboscidea parviflora	Small-flower Unicorn-plant							PDPED06040	S4	G4G5
Mohave	Pseudacris regilla	Pacific Treefrog							AAABC05100	S2,SE	G5
Mohave	Psorothamnus arborescens var. pubescens	Mohave Indigo Bush							PDFAB3C013	S2	G5T2
Mohave	Purshia glandulosa	Waxy Bitterbrush							PDROS1E010	S1	G5
Mohave	Purshia subintegra	Arizona Cliff Rose	LE					HS	PDROS1E080	S1	GNA
Mohave	Pyrgulopsis bacchus	Grand Wash Springsnail	SC	S	S				IMGASJ0150	S1	G1
Mohave	Pyrgulopsis conica	Kingman Springsnail	SC	S	S				IMGASJ0160	S1	G1
Mohave	Pyrgulopsis deserta	Desert Springsnail		S	S				IMGASJ0390	S1	G2
Mohave	Rallus longirostris yumanensis	Yuma Clapper Rail	LE				P	WSC	ABNME0501A	S3	G5T3
Mohave	Rana onca	Relict Leopard Frog	C		S			WSC	AAABH01150	SU	G1
Mohave	Rana pipiens	Northern Leopard Frog			S	2		WSC	AAABH01170	S2	G5
Mohave	Rana yavapaiensis	Lowland Leopard Frog	SC		S		PR	WSC	AAABH01250	S4	G4
Mohave	Ranunculus andersonii var. juniperinus	Juniper Buttercup							PDRAN0L093	S1	G4T3?Q
Mohave	Rhinichthys osculus	Speckled Dace	SC	S			P		AFCJB37050	S3S4	G5
Mohave	Rosa stellata ssp. abyssa	Grand Canyon Rose	SC	S	S			SR	PDROS1J153	S2	G4T2
Mohave	Salvia columbariae	California Sage							PDLAM1S0D0	S4S5	G5
Mohave	Salvia davidsonii	Davidson Sage							PDLAM1S0E0	S2?	G2?
Mohave	Salvia pachyphylla	Hopi Sage				4			PDLAM1S180	S1	G4
Mohave	Sclerocactus parviflorus	Glen Canyon Cactus							PDCAC0J040	S3S4	G4
Mohave	Selaginella leucobryoides	Virgin Narrows Spike Moss							PPSEL010P0	S2	G3
Mohave	Selaginella watsonii	Alpine Spike Moss							PPSEL011D0	S2S3	G4
Mohave	Selinocarpus nevadensis	Desert Moonpod							PDNYC0F040	S3S4	G5

COUNTY	SCIENTIFIC NAME	COMMON NAME	ESA	BLM	USFS	NESL	MEXFED	STATE	ELCODE_BCD	SRANK	GRANK
Mohave	Senecio arizonicus	Arizona Groundsel							PDAST8H070	S4	G4
Mohave	Senna armata	Desert Cassia							PDFAB491T0	S1	G4G5
Mohave	Solidago spectabilis	Remarkable Goldenrod							PDAST8P1Y0	S1S2	G4
Mohave	Sophora arizonica	Arizona Necklace							PDFAB3N020	S3	G3
Mohave	Sophora stenophylla	Narrowleaf Mescal Bean							PDFAB3N080	S2	G4
Mohave	Spea intermontana	Great Basin Spadefoot							AAABF02030	S2	G5
Mohave	Stillingia linearifolia	Linearleaf Sand Spurge							PDEUP1B020	S3S4	G4
Mohave	Stillingia spinulosa	Spiny Sand Spurge							PDEUP1B040	S3S4	G4
Mohave	Strix occidentalis lucida	Mexican Spotted Owl	LT		S	3	A	WSC	ABNSB12012	S3S4	G3T3
Mohave	Tadarida brasiliensis	Brazilian Free-tailed Bat							AMACD01010	S3S4	G5
Mohave	Tetracoccus fasciculatus var. hallii	Hall Shrub Spurge							PDEUP1C021	S3S4	G4T4
Mohave	Tetradymia argyraea	Silver Felt Thorn							PDAST95010	S1	G4?
Mohave	Tetradymia axillaris var. longispina	Longspine Cotton Thorn							PDAST95022	S1	G4T4
Mohave	Tetradymia stenolepis	Owens Valley Cotton Thorn							PDAST95090	S2	G4
Mohave	Thelypodiopsis purpusii	Kearney Mustard							PDBRA2M070	S2	G4?
Mohave	Thelypteris puberula var. sonorensis	Aravaipa Wood Fern		S					PPTHE05192	S2	G5T3
Mohave	Townsendia smithii	Blackrock Ground Daisy		S					PDAST9C0R0	S1	G1
Mohave	Tricardia watsonii	Three Hearts		S					PDHYD0F010	S2	G4
Mohave	Trifolium kingii ssp. macilentum	King Clover							PDFAB40172	S1	G5T2T4
Mohave	Xantusia arizonae	Arizona Night Lizard			S				ARACK01050	S3	G3
Mohave	Xyrauchen texanus	Razorback Sucker	LE		S	2	P	WSC	AFCJC11010	S1	G1
Mohave	Yucca whipplei	Our Lords Candle						SR	PMAGA0B0X0	S3S4	G4G5
Mohave	Ziziphus obtusifolia	Lotebush							PDRHA0E030	S3S4	G4G5
Navajo	Acanthochiton wrightii	Green Stripe							PDAMA04010	S2?	G5
Navajo	Accipiter gentilis	Northern Goshawk	SC		S	4	A	WSC	ABNKC12060	S3	G5
Navajo	Agosia chrysogaster chrysogaster	Gila Longfin Dace	SC	S			A		AFCJB37151	S3S4	G4T3T4
Navajo	Agrimonia gryposepala	Hook-nosed Agrimony							PDROS03030	S4	G5
Navajo	Aletes macdougallii	Vagabond Parsnip							PDAPI03050	S2	G3
Navajo	Aletes sessiliflorus	Sessileflower Indian Parsley							PDAPI03060	S1	G3
Navajo	Amsonia peeblesii	Peebles Blue Star				4			PDAPO030E0	S3	G3
Navajo	Anodonta californiensis	California Floater	SC		S				IMBIV04020	S1S2	G3Q
Navajo	Aquila chrysaetos	Golden Eagle				3	P		ABNKC22010	S4	G5
Navajo	Asclepias welshii	Welsh's Milkweed	LT			3		HS	PDASC02290	S1	G1
Navajo	Asio otus	Long-eared Owl							ABNSB13010	S2B,S3S4N	G5
Navajo	Astragalus cottamii	Cottam Milk-vetch							PDFAB0F5P3	S1	G4T4
Navajo	Astragalus desperatus var. conspectus	Barneby Milk-vetch							PDFAB0F2T4	S2S3	G5T3
Navajo	Astragalus xiphoides	Gladiator Milk Vetch	SC					SR	PDFAB0F9T0	S3	G3

Project Evaluation Request
Arizona Game and Fish Department

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Project Evaluation Objectives:

Habitat Evaluation incorporates fish and wildlife resource needs or features in land and water development projects and land and water management planning efforts in Arizona.

Habitat Protection ensures habitat protection through environmental compliance and regulation, and to monitor the implementation and effectiveness of mitigation commitments for various land and water development projects and management planning activities in Arizona.

Instructions: The Following materials are required to process the request • **Completed form** • **Map(s) delineating the project area (preferably a USGS quadrangle map)** • **Relevant attachments (other supportive documents, photographs, etc.)**	Send to: **Arizona Game and Fish Department** **Project Evaluation Program, WMHB** **2221 West Greenway Road** **Phoenix, Arizona 85023-4312** **Fax 602-789-3928**

Applicant Requesting Project Evaluation	Date of Request:		
Name	Organization		
Street Address	City	State	Zip Code
E-Mail Address	Telephone Number	Fax Number	

Individual/Organization/Agency Proposing Project (if different from above)			
Name	Organization		
Street Address	City	State	Zip Code
E-Mail Address	Telephone Number	Fax Number	

Location of Proposed Project *Remember to attach a topographic and/or plat map delineating the project area*		
County(ies)		
Township(s)	Range(s)	Section(s)

Proposed Project Information
Project Number or Site Name:
What is the proposed date you intend to begin work on the project?

Proposed Project Information (continued)

Please briefly describe the project and project activities.

Briefly describe current land uses and habitat types in the project area.

List any waterbodies such as rivers, intermittent streams, lakes, or wetlands within or near the project area. Xeric washes should also be described, along with any anticipated impacts as a result of the project.

List any reports that have been prepared to describe the habitat that will be affected by the proposed project (e.g. habitat reconnaissance surveys, wetland delineation, etc.)

List any other resources or reviews that relate to the proposed project (correspondence, other phases of the project, other alternatives, etc.)

List any permits, licenses, or regulatory approvals you have or plan on applying for, or have already received as part of this project.

Return as hard copy to AZ Game & Fish Dept., Project Evaluation Program-Habitat Branch, 2221 West Greenway Road, Phoenix, AZ 85023-4312 or via email to pep@azgfd.gov or fax 602-789-3928

GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES ENCOUNTERED ON DEVELOPMENT PROJECTS

Arizona Game and Fish Department
Revised January 17, 1997

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

Desert tortoises of the Sonoran population are those occurring south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position at all times and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 105 degrees fahrenheit unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to two miles, but no further than necessary from its original location. If a release site, or alternate burrow, is unavailable within this distance, and ambient air temperature exceeds 105 degrees fahrenheit, the Department should be contacted to place the tortoise into a Department-regulated desert tortoise adoption program. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, will also be placed in desert tortoise adoption programs. *Managers of projects likely to affect desert tortoises should obtain a scientific collecting permit from the Department to facilitate temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

- These guidelines do not apply to the Mohave population of desert tortoises (north and west of the Colorado River). Mohave desert tortoises are specifically protected under the Endangered Species Act, as administered by the U.S. Fish and Wildlife Service.

- These guidelines are subject to revision at the discretion of the Department. We recommend that the Department be contacted during the planning stages of any project that may affect desert tortoises.

- Take, possession, or harassment of wild desert tortoises is prohibited by state law. Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.

RAC:NLO:rc

Tucson Electric Power Company
One South Church Avenue, Post Office Box 711
Tucson, Arizona 85702

Area Code 520
Telephone571-4000

Certified Mail

September 25, 2006

Mr. Steve Spangle
U.S. Fish & Wildlife Service
Arizona Ecological Service Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021

Dear Mr. Spangle:

Subject: Request for Project Review and List of Potentially Occurring Threatened and Endangered Species: UNS Electric, Inc. (Kingman Southwest, AZ U.S.G.S. Quadrangle Map)

UNS Electric, Inc. proposes to install two simple-cycle combustion turbine-generators, each capable of producing approximately less than 47.3 Mw. These units will be located near the UNS Electric's Sacramento Substation, approximately 13 miles southwest of Kingman, Arizona. This project is being proposed to increase the reliability of the areas electrical distribution system by supplying peaking power, backup power and voltage stabilization for the Mohave County service area.

TEP is requesting an U.S. Fish & Wildlife Service project review to address wildlife issues, as well as information on the status of any protected species, species of concern, or critical habitats occurring or potentially occurring within the proposed project area. This information will be used for evaluating potential environmental impacts to protected species, and species of concern. The feedback provided by your department will be used in determining if a biological survey of the property is needed.

A project review is requested for the proposed generating station site. The site is a green field site, located in Mohave County, Township T19N, Range 18W, north half of Section 14 (Kingman Southwest, AZ U.S.G.S. Quadrangle Map). The property is owned by UNS Electric. A project map is attached that outlines the areas that might be affected by the proposed electrical generating station. Notable intermittent washes will be avoided; however, smaller insignificant washes will be filled. The approximate area needed for the generating station is 70 to 100 acres. The outlined area represents 320 acres of land owned by UNS Electric where approximately 70 to 100 acres will be selected and developed for the proposed electrical generating station.

To assist you with the project evaluation, attachments are included as follows: 1) A completed project evaluation request form; 2) a 7.5' USGS Kingman Southwest, AZ Quadrangle map; 3) two Mohave County maps and 4) two Mohave County Assessor maps.

It would be appreciated if you could respond as soon as possible by e-mail (ckomadina@tep.com) or fax (520-571-4140) followed by hardcopy.

If you have any questions concerning this letter, please call me at (520) 745-3148.

Sincerely,

Charles W. Komadina
Director, Corporate Environmental
Compliance & Permits

File: Kingman (Generation)

bc: T. McKenna
C. DeMasi
M. Greer
D. Gin
L. Aitken
L. Gray
T. Ferry
M. Gin
M. Gibelyou

Project Evaluation Request

Arizona Game and Fish Department

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Send to:
Arizona Game and Fish Department
Project Evaluation Program, WMHB
2221 West Greenway Road
Phoenix, Arizona 85023-4312
Fax 602-789-3928

Applicant Requesting Project Evaluation

	Date of Request: September 25, 2006		
Name: Charles W. Komadina	Organization Tucson Electric Power		
Street Address Mail Stop OH127, P.O. Box 711	City Tucson	State Arizona	Zip Code 85702
E-Mail Address Ckomadina@tep.com	Telephone Number (520)745-3148	Fax Number (520)571-4140	

Individual/Organization/Agency Proposing Project (if different from above)

Name Charles W. Komadina	Organization UNS Electric, Inc.		
Street Address Mail Stop OH127, P.O. Box 711	City Tucson	State Arizona	Zip Code 85702
E-Mail Address Ckomadina@tep.com	Telephone Number (520)745-3148	Fax Number (520)571-4140	

Location of Proposed Project [illegible]

County(ies)
Mohave County

Township(s)	Range(s)	Section(s)
T19N	R18W	North half of Section 14

Proposed Project Information

Project Number or Site Name:

UNS Electric, Inc. Sacramento Generation Station (project name is subject to change)

What is the proposed date you intend to begin work on the project?

Earth work (grading) is tentatively planned for May 2007.

Proposed Project Information Form (continued)

Please briefly describe the project and project activities.

UNS Electric, Inc. proposes to grade and fill as needed, approximately 70 to 100 acres out of 320 acres of land owned by UNS Electric, Inc. The land clearing and leveling is needed to be prepared for construction of a new electrical power generating station which will consist of two simple cycle combustion turbine-generators (90 Mw), an evaporation pond, a substation and associated equipment and buildings.

Briefly describe current land uses and habitat types in the project area.

The current land use is undisturbed open land. Mohave County has zoned the land as "M-X heavy manufacturing which includes utility power stations.

The dominant vegetation pattern for the site is the Creosote Bush / White Bur Sage and several types of cacti.

List any waterbodies such as rivers, intermittent streams, lakes, or wetlands within or near the project area. Xeric washes should also be described, along with any anticipated impacts as a result of the project.

There is several notable intermittent wash that crosses the property owned by UNS Electric, Inc.; however it is our intent to select a final site that is level and where intermittent washes are small in number and size. The large wash will be avoided. The attached map has been marked (highlighted - pink) to show notable intermittent washes that will be avoided.

List any reports that have been prepared to describe the habitat that will be affected by the proposed project (e.g. habitat reconnaissance surveys, wetland delineation, etc.)

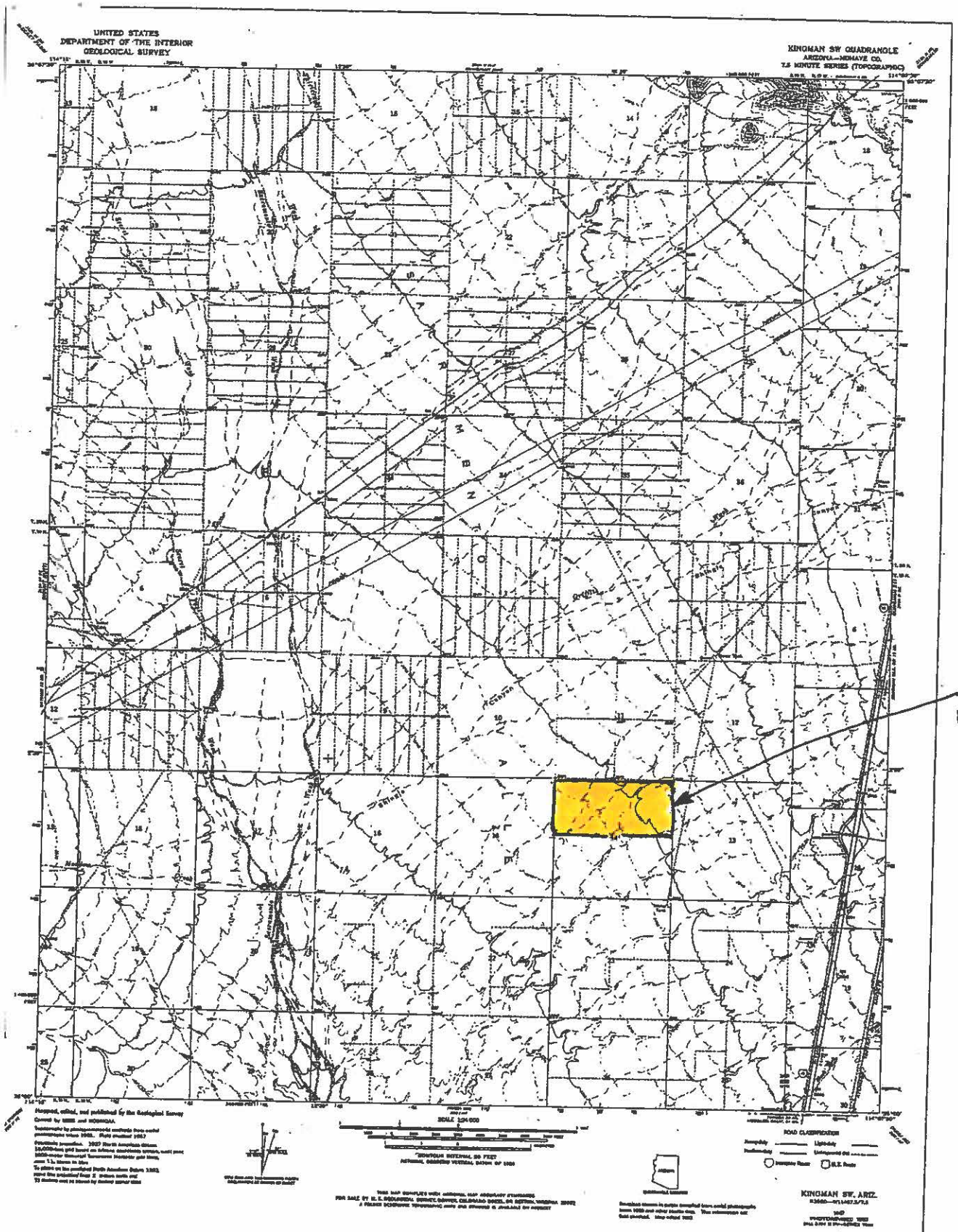
No reports for this site. However, a similar site nearby (approximately 1 mile) was considered in the past. This similar site was surveyed by a terrestrial ecologist familiar with western, desert ecology. The site survey was performed during the week of February 24, 1992. The site survey did not identify the presence of any special status species.

List any other resources or reviews that relate to the proposed project (correspondence, other phases of the project, other alternatives, etc.)

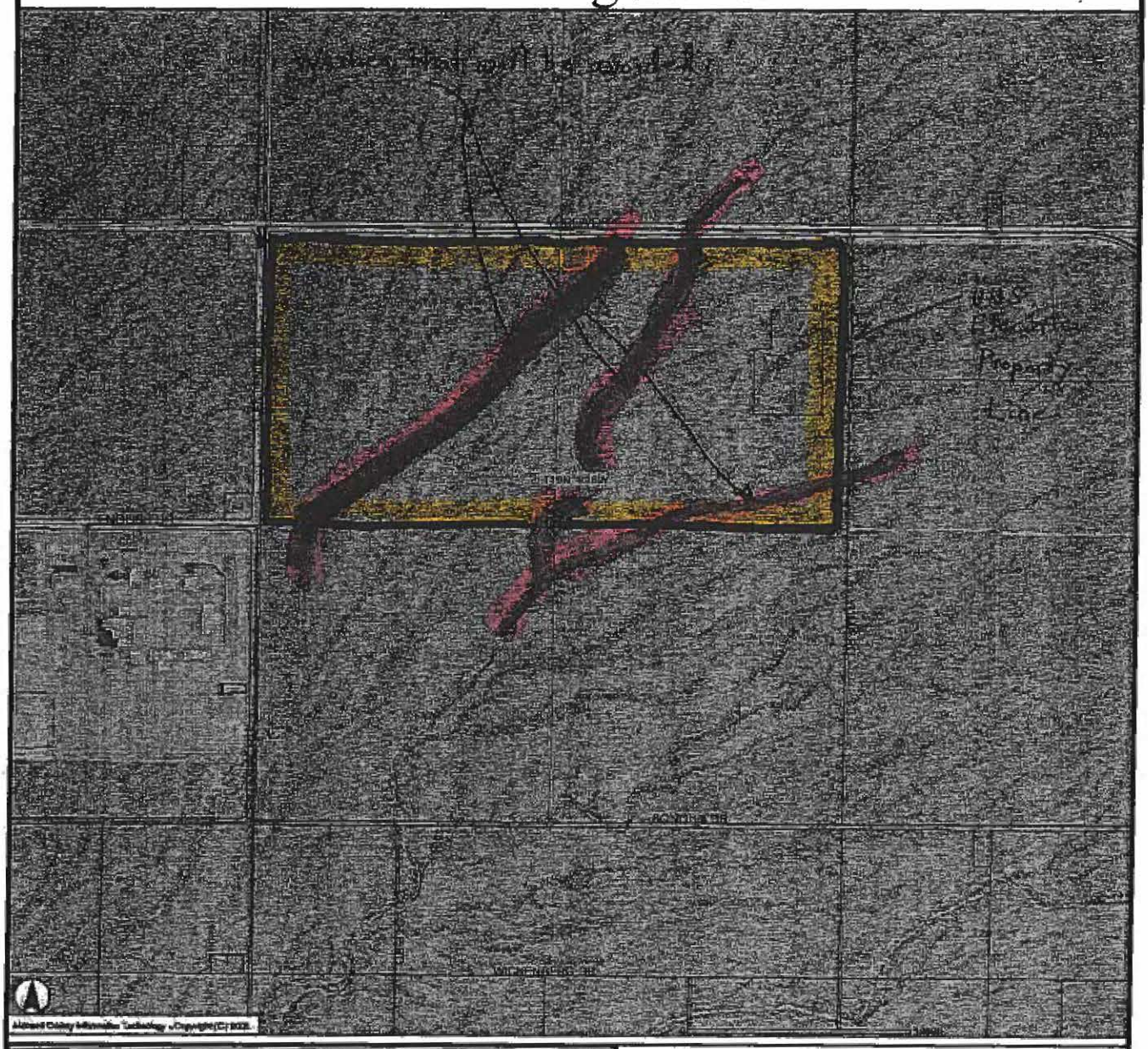
No other site alternatives are being considered.

List any permits, licenses, or regulatory approvals you have or plan on applying for, or have already received as part of this project.
The following permits will be applied for if needed:
Title V Operating Permit (air permit)- needed
Acid Rain Permit - needed
Aquifer Protection Permit (ponds and septic) - potentially needed
Notice of intent for coverage under the AZPDES Construction General Permit - needed
Notice of intent to clear private land from Arizona Department of Agriculture - needed
A Corp of Army Engineers Nationwide permit may be required dependent on final site selection - potential
Cultural resource study will be done for SHPO.
Mohave County Ordinances - site plan review, building permits, occupancy, dark sky ordinance, others
Notification of Regulated Waste Activities - potentially needed
AZPDES Storm Water Runoff - potentially needed
Biological Survey - potentially needed
Others will be obtained as needed if determined to be needed

Return as hard copy to AZ Game & Fish Dept., Project Evaluation Program-Habitat Branch, 2221 West Greenway Road, Phoenix, AZ 85023-4312 or via email to pep@azgfd.gov or fax 602-789-3928


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
KINGMAN SW QUADRANGLE
ARIZONA—MOHAVE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
UNS Electric Property Line
KINGMAN SW, ARIZ.

UNS Electric, Inc. - Proposed Sacramento Generating Station



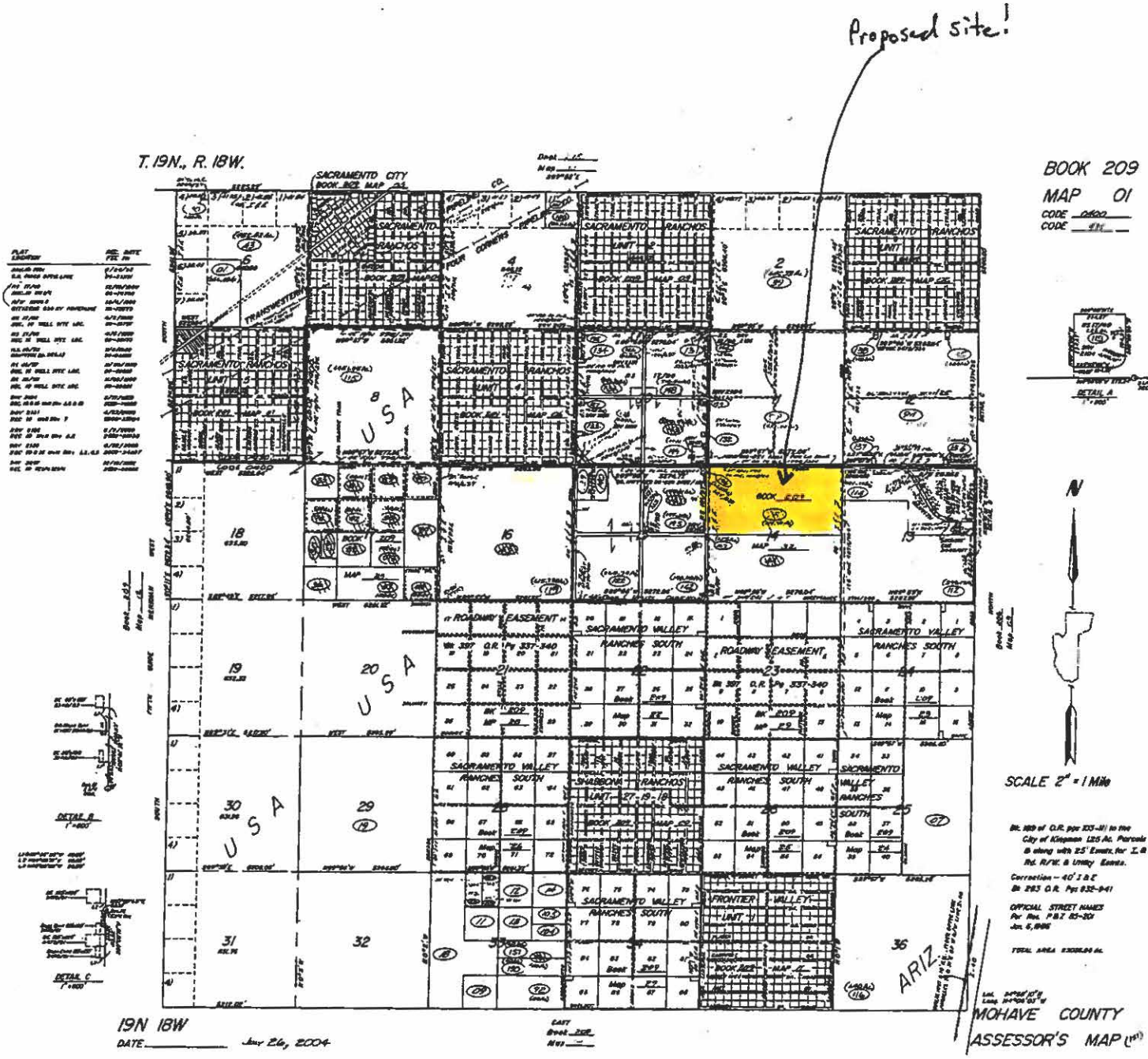
Legend

US Highway		Other	
State Highway		Maintained	
County Road		Parcel	
Arterial		City Boundary	
Other Paved		Township/Range	

UNS Electric, Inc. - Proposed Sacramento Generating Station

Legend

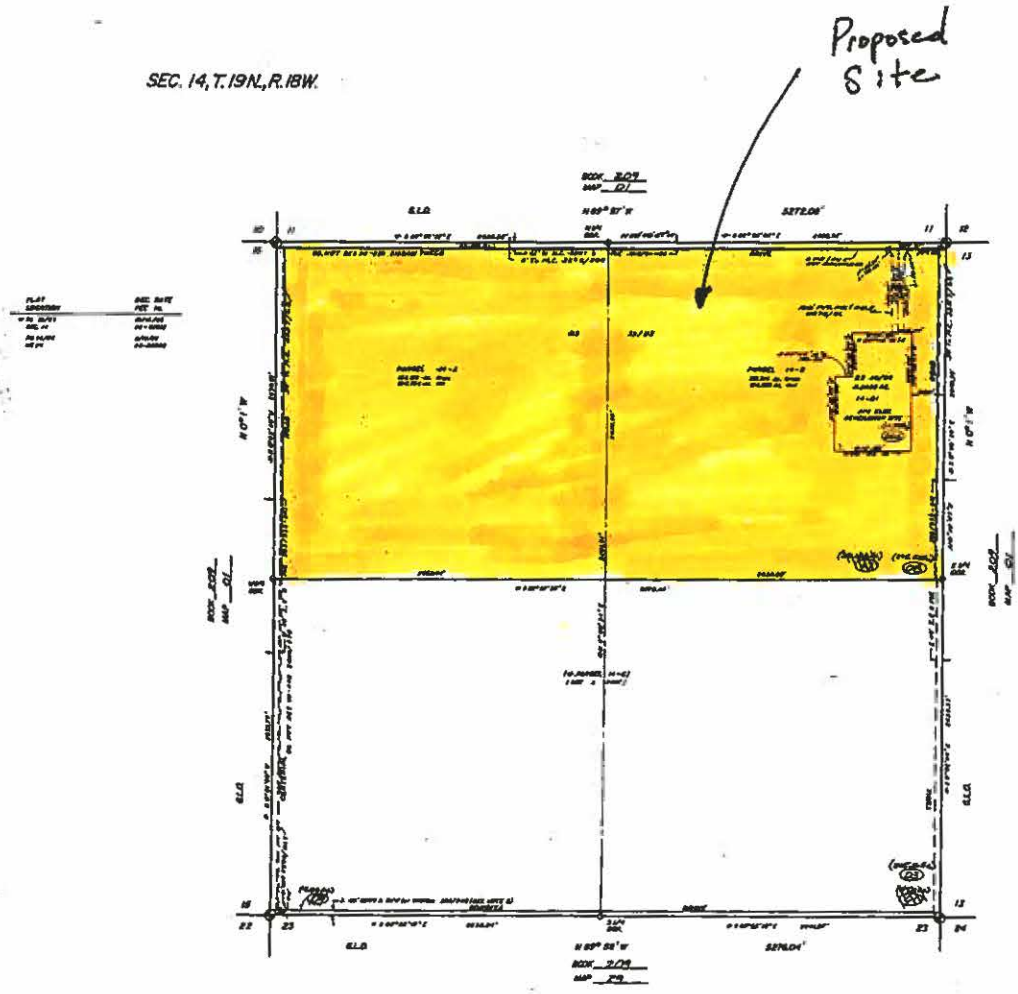
US Highway		Other	
State Highway		Maintained	
County Road		Parcel	
Arterial		City Boundary	
Other Paved		Township/Range	


Proposed site!
T. 19N., R. 18W.
BOOK 209
MAP 01
CODE 0600
SACRAMENTO CITY
BOOK 202 MAP 33
SACRAMENTO RANCHOS UNIT
SACRAMENTO RANCHOS
SACRAMENTO VALLEY RANCHES SOUTH
SHARBONA RANCHOS UNIT 17-19-18
FRONTIER VALLEY UNIT
ROADWAY EASEMENT
TRANSWESTERN
USA
ARIZ
DETAIL A
DETAIL B
DETAIL C
N
SCALE 2" = 1 Mile
OFFICIAL STREET NAMES
19N 18W
DATE July 26, 2004
MOHAVE COUNTY
ASSESSOR'S MAP

SEC. 14, T. 19N., R. 18W.

Proposed Site

BOOK 209
MAP 32
Code 0400



N

SCALE: 1" = 600'

19N, 18W, 14
Date Nov. 13, 2001

MOHAVE COUNTY
ASSESSOR'S MAP

ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PDSCR1L070
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Penstemon albomarginatus*
COMMON NAME: White-margined penstemon
SYNONYMS:
FAMILY: Scrophulariaceae

AUTHOR, PLACE OF PUBLICATION: M.E. Jones, Contributions to Western Botany. 12: 61. 1908.

TYPE LOCALITY: Near Yucca, Mohave Co., Arizona.

TYPE SPECIMEN: HT: POM. M.E. Jones, 29 April 1905.

TAXONOMIC UNIQUENESS: Thirty-eight species of Penstemon found in Arizona (Kearney and Peebles, 1951).

DESCRIPTION: Low growing herbaceous perennial between 6-12 in (15.0–30.5 cm). Entire plant pallid, glaucescent and glabrous. Many stems arise from a 12-48 in (30.5-122.0 cm) long taproot that is sunk deep into the soil with the crown just above soil level. Leaves green with very thin line of white around margin, 1.0-3.0 cm (0.4-1.2 in.) wide; leaves of rosettes entire, leaves of inflorescence slightly serrate giving wavy appearance. Petioles 6.4 mm long, 3.2 mm wide. Bracts similar in shape to leaf, becoming smaller near top. Sepals 6.4 mm long and 1.6 mm wide with acuminate tips. Corolla pink-lavender, ventrally white, with purple guidelines, 1.27 cm (0.5 in.) long, 6.4 mm wide; light golden hairs on lower lip. Capsule about 7.0 mm long (McDougall 1973).

AIDS TO IDENTIFICATION: Only *Penstemon* with white lines on leaf. Purple anthers and small size when blooming, 6 inches, are distinguishing characters (MacDougall 1973).

ILLUSTRATIONS: Color photo (Hesselberg, Date unknown)
Line drawing (Falk et al. 2001)
Color photo (Anderson *In* Falk et al. 2001)

TOTAL RANGE: Southeastern California, southern Nevada, and northwestern Arizona.

RANGE WITHIN ARIZONA: Dutch Flat and Sacramento Valley areas, southeast of Yucca, Mohave County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous perennial.

PHENOLOGY: Late March-early April. It is believed that flowering does not always appear to be dependent on the amount of rainfall. Established plants may bloom even in dry years by utilizing food and water resources in the large taproot. However, rainfall probably affects seedling germination and survival. This species dies back to the ground after spring and positive identification of occupied habitat is no longer possible for much of the year.

BIOLOGY: Several insects, including small carabid beetles, large flies, and vespid wasps, visit the showy flowers.

HABITAT: Coarse sandy and silty soil in Mohave Desertscrub communities. Sometimes found in the open, but often near creosote bushes, Joshua trees, or other large shrubs (AGFD/HDMS).

ELEVATION: Approximately 1,500 - 3,000 ft. (457-914 m).

EXPOSURE:

SUBSTRATE: Volcanic derived soils and coarse sand with high amounts of silt. In Arizona, it occurs in sandy loam uplands and sandy washes in a broad alluvial plain, but gravelly areas alternating with and interspersed with the sandy places do not support this species.

PLANT COMMUNITY: Mohave Desertscrub communities; often with *Larrea tridentata* and *Ambrosia* sp.; sometimes with *Yucca brevifolia* (Beatley 1976).

POPULATION TRENDS: Arizona's population is the largest known, but no total population estimate is available. This population lies within 100 square miles of an alluvial valley, west of the Hualapai Mountains. The upper reaches of this valley, with the highest white-margined beardtongue densities, are being purchased by the BLM. Nevada has twelve recently discovered populations in addition to the three that were previously known. Many of these populations have thousands of plants.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)

[Category 2, USDI, FWS 1990]

STATE STATUS: Salvage Restricted (ARS, ANPL 1999)
[Salvage Restricted (ARS ANPL 1993)]

OTHER STATUS: None (USDA, FS Region 3, 1999)
[Forest Service Sensitive, USDA FS Region 3, 1990]
Bureau of Land Management Sensitive (USDI, BLM AZ 2000, 2005)

MANAGEMENT FACTORS: Recreational activities such as OHV's can have an affect on this species. Also for some populations, future mining activities may have an affect. If the land in Arizona that contains the largest population is purchased by the BLM then some lower density habitat will be privately owned, but even though the BLM will have fewer acres containing the plant they will control the higher density populations.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Status and distribution surveys every year or two will help to indicate population health and fluctuation, establish the importance of effects of weather conditions on population size, and may help indicate if management strategies are successful. More propagation studies should be carried out to determine if seedlings, cuttings or transplanted plants could be used for mitigation efforts.

LAND MANAGEMENT/OWNERSHIP: BLM - Kingman Field Office; State Land Department; Private. Department of Defense (?).

SOURCES OF FURTHER INFORMATION

REFERENCES:

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USDI, Bureau of Land Management. 2005. Arizona BLM Sensitive Species List.

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USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants: Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species; Notice of Review. Federal Register 61(40): 7596-7613.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

John Anderson - Bureau of Land Management, Phoenix, Arizona.

Betty Davenport - Yuma, Arizona.

Wendy Hodgson - Desert Botanical Garden, Phoenix, Arizona.

Peter Warren – Tucson, Arizona.

ADDITIONAL INFORMATION:

This species is known from only four sites in California; two have not been seen in many years (Skinner and Pavlik 1994).

Revised: 1990-03-21 (SST)
1994-11-02 (DBI)
1998-12-17 (DJG)
2003-11-30 (AMS)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX **(= year of last revision as indicated at end of abstract)**. X...X **(= taxon of animal or plant)**. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.

Exhibit D

UniSourceEnergy
SERVICES

PO Box 711, Mail Stop OH127
Tucson, Arizona 85702

FEDERAL EXPRESS

January 8, 2007

Ms. Carol Chancey
Arizona Department of Agriculture
Licensing & Registration Section
1688 W. Adams
Phoenix, AZ 85007

RE: Notice of Intent to Clear Private Land of Protected Native Plants

Dear Ms. Chancey:

UNS Electric, Inc., pursuant to A.R.S. § 3-904, is hereby submitting a "Notice of Intent to Clear approximately 18.4 acres of Land" for the future construction of the proposed Black Mountain Generating Station (BMGS). The BMGS will consist of two simple-cycle combustion turbine-generators, each capable of producing approximately 48 Mw. These two simple-cycle combustion turbine-generators will be located on land owned by UNS Electric, Inc. The future BMGS will be located approximately 10 miles south of Kingman and 1.5 miles west of I-40 in Mohave County, Arizona. This project is being proposed to increase the reliability of the area's electrical distribution system by supplying peaking power, backup power and voltage stabilization for the Mohave County service area.

During October 3 and 4 of 2006, a biological evaluation and assessment of 320 acres (including the 18.4 acres to be cleared) of land owned by UNS Electric, Inc. was done for the North ½ of Section 14, Township 19 North, Range 18 West, Mohave County, Arizona. The assessment identified dominant plant species in the project area including *Larrea tridentate* (Creosote) and *Acacia greggii* (Catclaw Acacia). Dominant shrub and understory plant species include *Ambrosia dumosa* (White Bursage), *Krameria grayi* (White Ratany), and *Salazaria mexicana* (Bladder Sage). Cacti include *Ferocactus acanthoides* (Red Barrel), *Opuntia basilaris* (Beavertail Cactus), and *Opuntia ramosissima* (Diamond Cholla). Significant native plants will be transferred by the owner to adjacent property owned by UNS Electric, Inc. and remaining plants will not be salvaged.

Please find attached a Notice of Intent to Clear Land, several maps showing the location of the proposed BMGS, and a list of Native Plants identified in the general project area.

Please direct any questions regarding this matter to me at (520) 745-3148 or Cosimo DeMasi at (520) 745-3476.

Sincerely,

Charles W. Komadina
Director, Corporate Environmental
Compliance & Permits

T. McKenna, w/o encl.
D. Gin, w/encl.
T. Ferry, w/encl.
M. Gibelyou, w/encl.
C. DeMasi, w/encl.
M. Jerden, w/o encl.

Arizona Department of Agriculture (ADA)
Licensing and Registration Section
1688 West Adams, Phoenix, Arizona 85007
Phone: (602) 364-0935
Fax: (602) 542-0466

CONFIRMED JAN 09 2007
JAN 09 2007
ARIZONA DEPARTMENT OF AGRICULTURE

Notice of Intent to Clear Land

ARS § 3-904

Pursuant to A.R.S. § 3-904 the undersigned, as Owner of the Property described herein, gives this Notice of Intent to Clear Land of protected native plants.

1. **Owner/landowner's agent.** The owner or landowner's agent of the Property upon which protected native plants will be affected:

   Owner's Name UNS Electric, Inc. Phone (928) 681-8901

   Address 2498 Airway Avenue, Kingman, AZ 86401

   Agent's Name Charles Komadina Phone (520) 745-3148

   Address 3950 E. Irvington Road, Mail Stop OH 127, Tucson, AZ 85714-2114

2. **Property.** The description and location of the Property upon which protected native plants will be affected:

   County Mohave

   Name of Property/Project Yuma Road / Black Mountain Generating Station

   Address None

   Physical Location (attach map) 10 miles south of Kingman and 1.5 miles west of I-40 in Mohave County, Arizona

   (Note: Map must also show surrounding land for 1/2 mile in each direction)

   Tax Parcel ID Nos. 14-B

   Legal Description (or attach copy) Northeast 1/4 of section 14, T19N, R18W, Mohave County, AZ

   Number of Acres to be Cleared 18.4

3. **Owner's Intent.** Landowner's intentions when clearing private land of protected native plants.

   ☐ Owner intends to allow salvage of the plants, and agrees to be contacted by native plant salvagers.

   ☐ Owner intends to transplant the plants onto the same property, or to another property he also owns.

   ☐ Owner has already arranged for salvage of the plants.

   ☐ Owner does not intend to allow salvage of the plants.

   ☒ Other Owner intends to transplant significant plants onto same property, or to another property he also owns. Owner does not intend to salvage all plants.

4. **Approximate starting date.** 3/1/2007
   (See notice period listed on reverse side)

The information contained in this application is true and accurate to the best of my knowledge. I understand that providing false information is a felony in Arizona.

Signature Charles W. Komadina **Date** 1-8-07

Notice to salvagers: Consent of the landowner is required before entering any lands described in this notice.

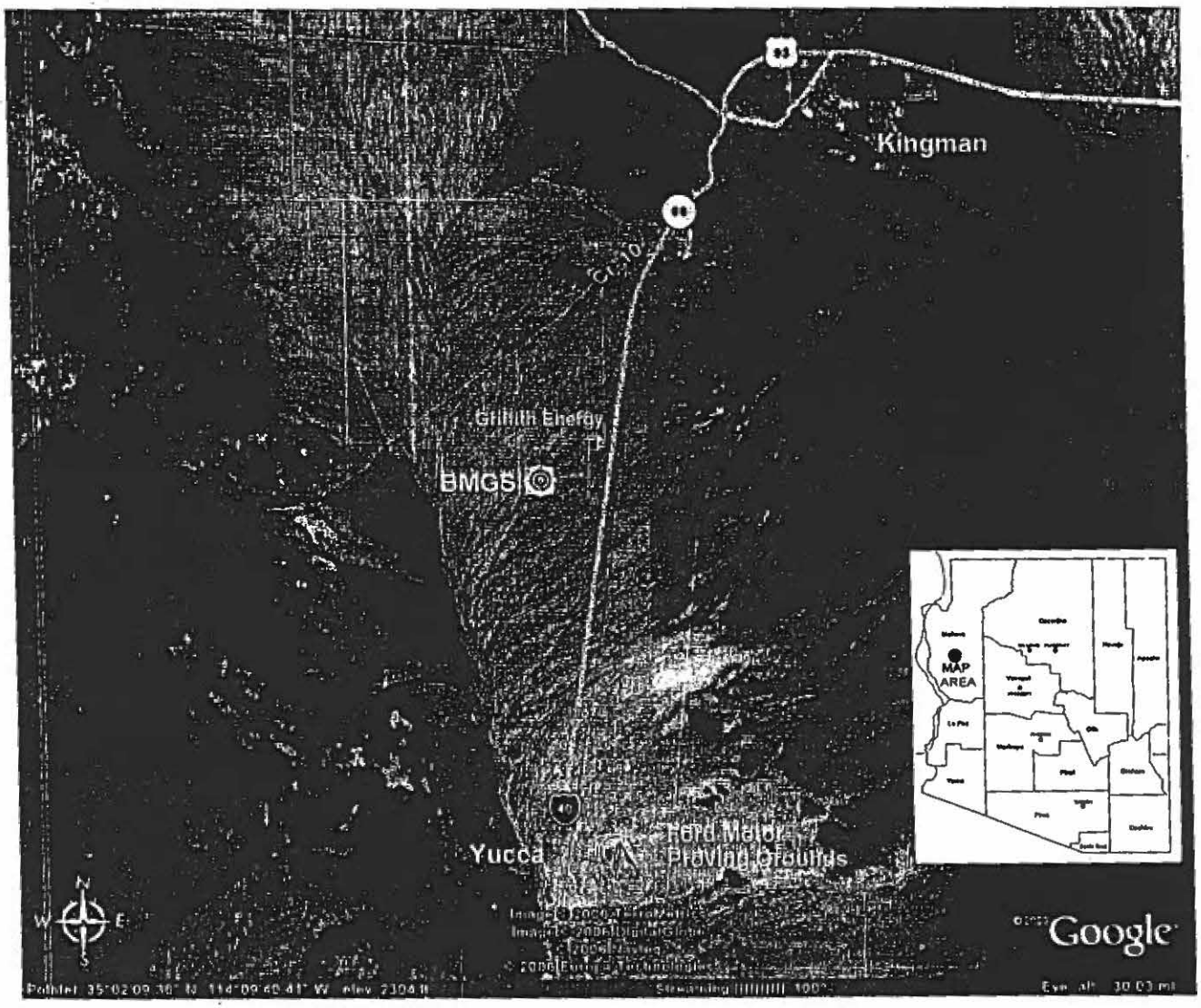


Figure A.1.1 General location map showing the Black Mountain Generating Station location near Kingman, Arizona.

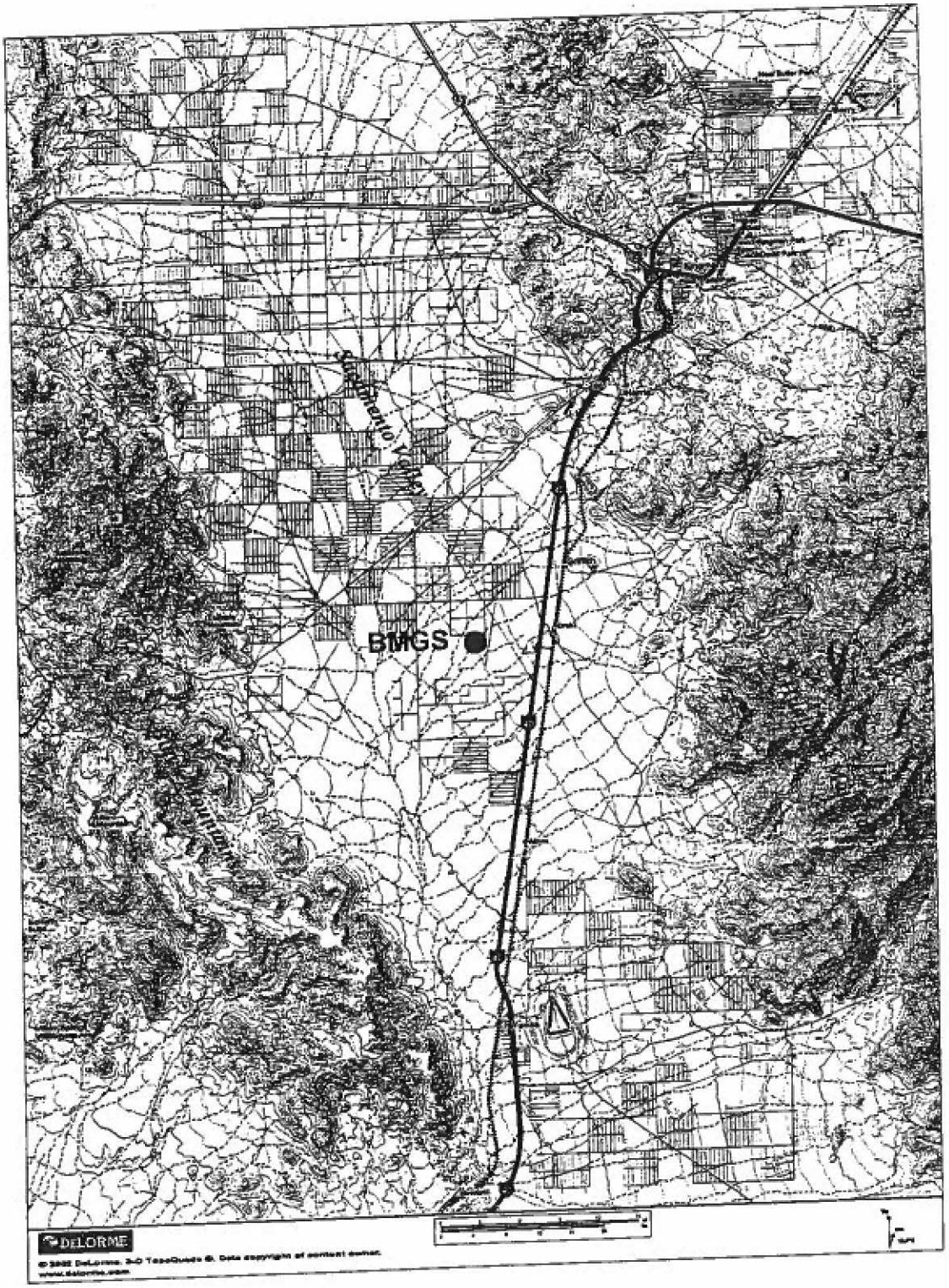
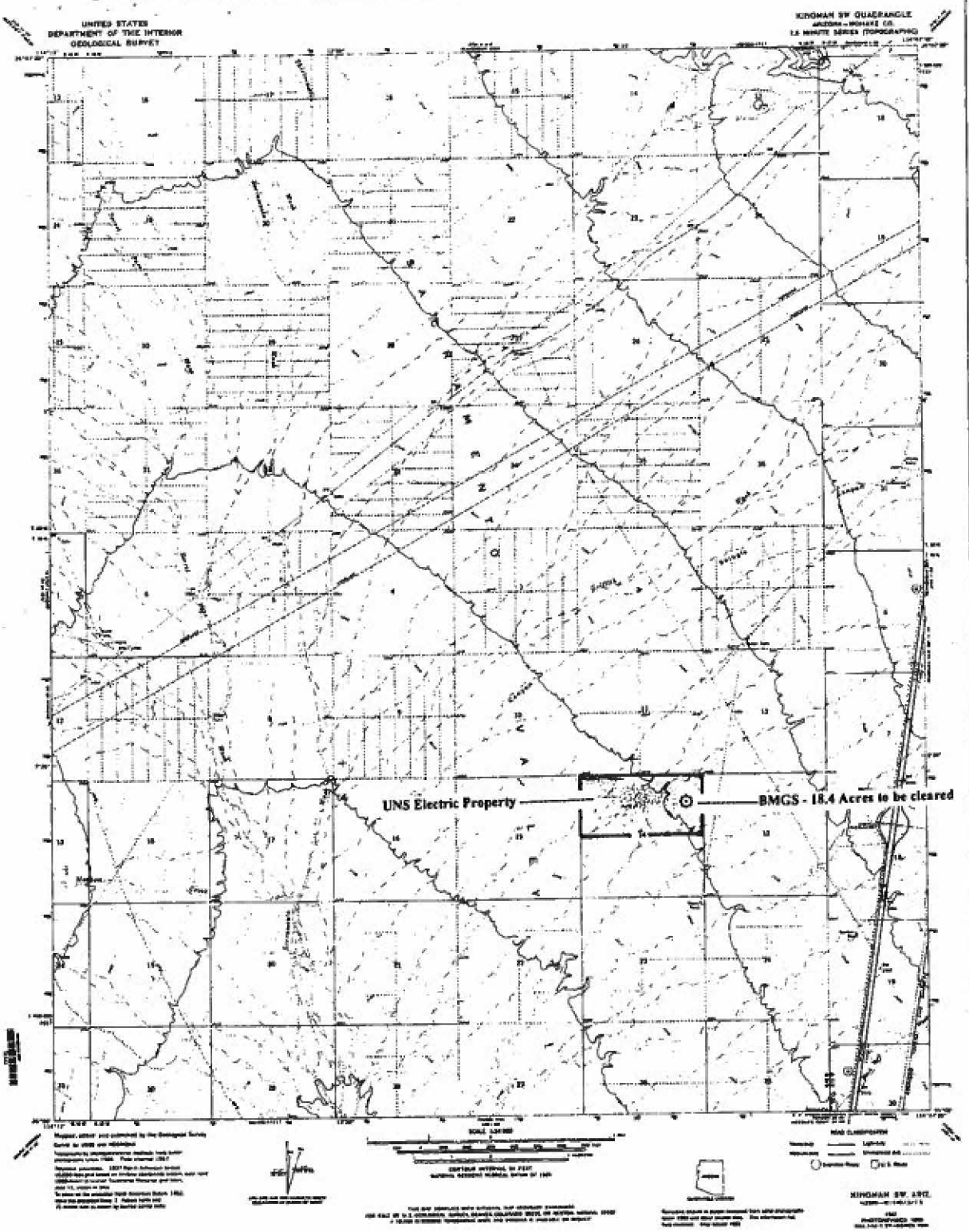
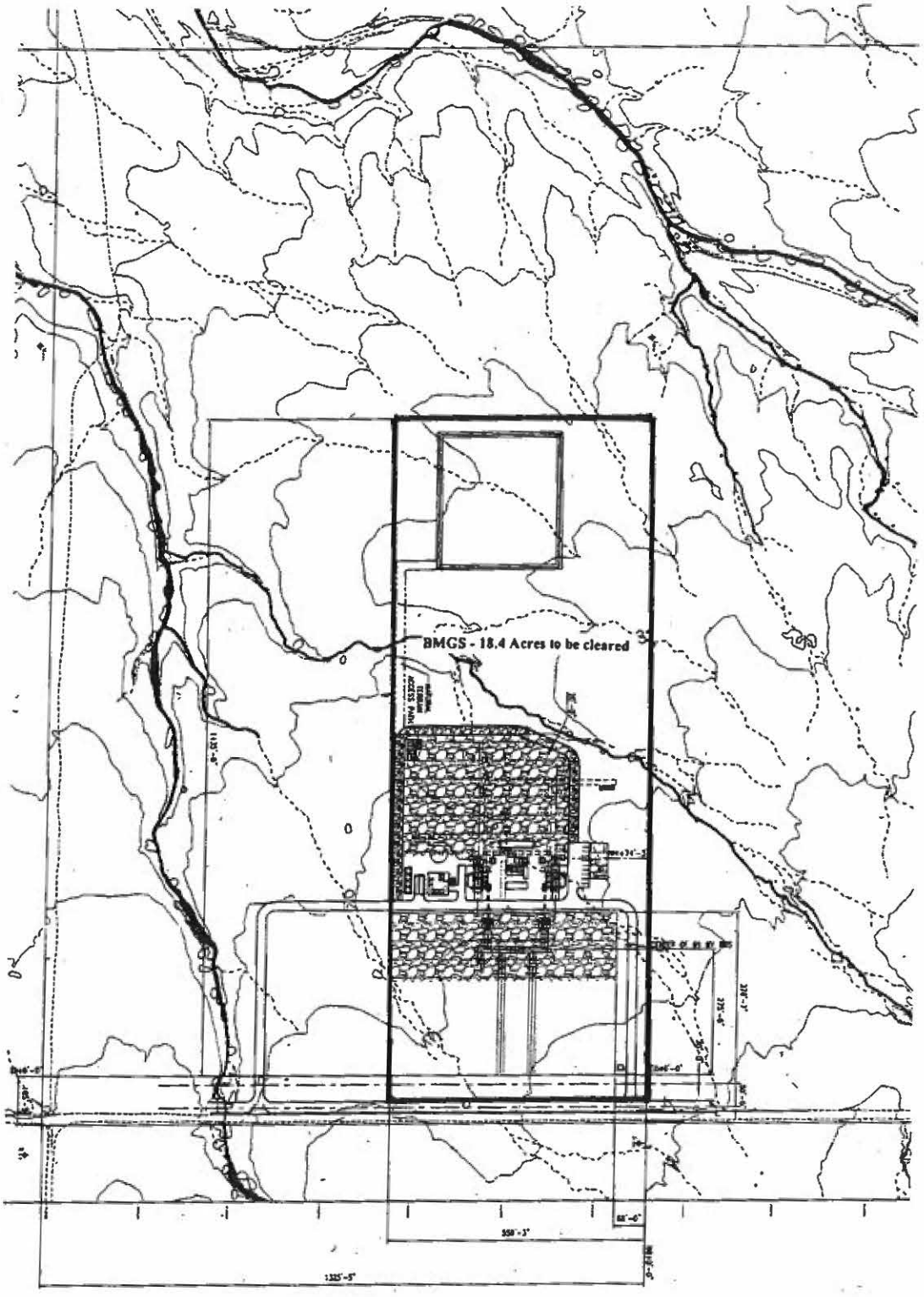


Figure A.4.1 Regional topography surrounding the proposed BMGS near Kingman, Arizona.





WOOD GROUP

WOOD GROUP POWER SOLUTIONS, INC

SITE PLOT PLAN - PHASE I
UNISOURCE ENERGY DEVELOPMENT
BLACK MOUNTAIN GENERATING STATION

JOB NO.	DOC. NO.	SH. NO.	REV.
TD8160A	10-001	2	D

APPENDIX A – Native Plants Identified in the General Project Area

Scientific Name	Common Name
Acacia greggii	Catclaw Acacia
Acourtia wrightii	Desert Holly
Ambrosia dumosa	White Bursage
Baccharis sarothroides	Desert Broom
Baileya multiradiata	Desert Marigold
Boerhavia coccinea	Red Spiderling
Chenopodium sp.	Goosefoot
Cucurbita palmata	Coyote Melon
Datura wrightii	Jimsonweed
Ephedra sp.	Ephedra
Eriogonum inflatum	Desert Trumpet
Eriogonum sp.	Buckwheat
Ferocactus acanthoides	Red Barrel
Fouquieria splendens	Ocotillo
Hilaria sp.	Galleta
Ipomea sp.	Morning Glory
Krameria grayi	White Ratany
Larrea tridentata	Creosote
Lycium sp.	Wolfberry
Mirabilis bigelovii	Wishbone Bush
Nama demissum	Purple Mat
Opuntia basilaris	Beavertail Cactus
Opuntia ramosissima	Diamond Cholla
Pectis angustifolia	Limoncilla
Phacelia sp.	Phacelia
Probiscidea parviflora	Devil's Claw
Psilostrophe cooperi	Paper Daisy
Salazaria mexicana	Bladder Sage
Salsola kali	Russian Thistle
Sarcostemma cynanchoides	Climbing Milkweed
Senecio flaccidus	Three-leaf Groundsel
Sphaeralcea sp.	Globemallow
Tidestromia lanuginosa	Wooly Tidestromia
Ziziphus obtusifolia	Graythorn

Arizona Department of Agriculture (ADA)
Licensing and Registration Section
1688 West Adams, Phoenix, Arizona 85007
Phone: (602) 364-0935
Fax: (602) 542-0466

Notice of Intent to Clear Land — ARS § 3-904

Pursuant to A.R.S. § 3-904 the undersigned, as Owner of the Property described herein, gives this Notice of Intent to Clear Land of protected native plants.

1. **Owner/landowner's agent.** The owner or landowner's agent of the Property upon which protected native plants will be affected:

   Owner's Name UNS Electric, Inc. Phone (928) 681-8901

   Address 2498 Airway Avenue, Kingman, AZ 86401

   Agent's Name Charles Komadina Phone (520) 745-3148

   Address 3950 E. Irvington Road, Mail Stop OH 127, Tucson, AZ 85714-2114

2. **Property.** The description and location of the Property upon which protected native plants will be affected:

   County Mohave

   Name of Property/Project Yuma Road / Black Mountain Generating Station

   Address None

   Physical Location (attach map) 10 miles south of Kingman and 1.5 miles west of I-40 in Mohave County, Arizona

   (Note: Map must also show surrounding land for 1/2 mile in each direction)

   Tax Parcel ID Nos. 14-B

   Legal Description (or attach copy) Northeast 1/4 of section 14, T19N, R18W, Mohave County, AZ

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   ☐ Owner intends to allow salvage of the plants, and agrees to be contacted by native plant salvagers.

   ☐ Owner intends to transplant the plants onto the same property, or to another property he also owns.

   ☐ Owner has already arranged for salvage of the plants.

   ☐ Owner does not intend to allow salvage of the plants.

   ☒ Other Owner intends to transplant significant plants onto same property, or to another property he also owns. Owner does not intend to salvage all plants.

4. **Approximate starting date.** 3/1/2007
   (See notice period listed on reverse side)

The information contained in this application is true and accurate to the best of my knowledge. I understand that providing false information is a felony in Arizona.

Signature Charles W. Komadina **Date** 1-8-07

Notice to salvagers: Consent of the landowner is required before entering any lands described in this notice.

Komadina, Chuck

From: Ferry, Tom
Sent: Friday, December 22, 2006 4:15 PM
To: Komadina, Chuck; Gin, Don
Cc: Demasi, Cosimo; Greer, Monette; McKenna, Thomas; Pinnas, Laura; Gibelyou, Mike
Subject: RE: Information Request

Let us know what we can do to assist. Tom

-----Original Message-----
From: Komadina, Chuck
Sent: Friday, December 22, 2006 9:11 AM
To: Gin, Don
Cc: Demasi, Cosimo; Greer, Monette; McKenna, Thomas; Ferry, Tom; Pinnas, Laura; Ferry, Tom; Gibelyou, Mike
Subject: Information Request

Don,

After the holiday break I would like to submit the Notice of Intent to Clear Land of protected native plants. In order to complete the form I will need a few pieces of information and a couple of question answered. Once the form is submitted the Arizona Department of Agriculture (ADA) will respond in writing within 30 days if less than 40 acres is to be cleared. We can not begin destruction of native plants until we receive confirmation form ADA and the 30 days expires. If more than 40 acres is to be disturbed then the time period is 60 days.

1. I will need a legal description for the land to be cleared.
2. I will need a map highlighting the areas to be cleared.
3. I will need the acreage of the area to be cleared.
4. The address of the property if we now have it.
5. I am assuming that for liability reasons that we would not allow salvage of native plants by others and that we do not intend on salvaging native plants. Is this true?
6. Who should sign and date the Notice of Intent to clear? Tom Ferry?
7. What date should be used as the estimated date to begin clearing land of native plants?
8. I need to know the acreage of Navigable waters expected to be disturbed.

Remember this is just one step prior to clearing land. Other steps include the development of the Storm Water Pollution Prevention Plan, submitting a Notice of Intent for coverage under the AZPDES Construction General Permit, County Approvals, and coverage under COAE Nationwide Permit #39.

Don maybe we should get together as a group after the first of the year (a BIG MEETING).

Chuck Komadina
Tucson Electric Power
Corporate Environmental Services
Phone (520) 745-3148
Fax - (520) 571-4140

Arizona Department of Agriculture (ADA)
Licensing and Registration Section
1688 West Adams, Phoenix, Arizona 85007
Phone: (602) 364-0935
Fax: (602) 542-0466

Notice of Intent to Clear Land

ARS § 3-904

Pursuant to A.R.S. § 3-904 the undersigned, as Owner of the Property described herein, gives this Notice of Intent to Clear Land of protected native plants.

1. **Owner/landowner's agent.** The owner or landowner's agent of the Property upon which protected native plants will be affected:

   Owner's Name _____ Phone _____

   Address _____

   Agent's Name _____ Phone _____

   Address _____

2. **Property.** The description and location of the Property upon which protected native plants will be affected:

   County

   Name of Property/Project _____

   Address _____

   Physical Location (attach map) _____

   (Note: Map must also show surrounding land for 1/2 mile in each direction)

   Tax Parcel ID Nos. _____

   Legal Description (or attach copy) _____

   Number of Acres to be Cleared _____

3. **Owner's Intent.** Landowner's intentions when clearing private land of protected native plants.

   ☐ Owner intends to allow salvage of the plants, and agrees to be contacted by native plant salvagers.

   ☐ Owner intends to transplant the plants onto the same property, or to another property he also owns.

   ☐ Owner has already arranged for salvage of the plants.

   ☐ Owner does not intend to allow salvage of the plants.

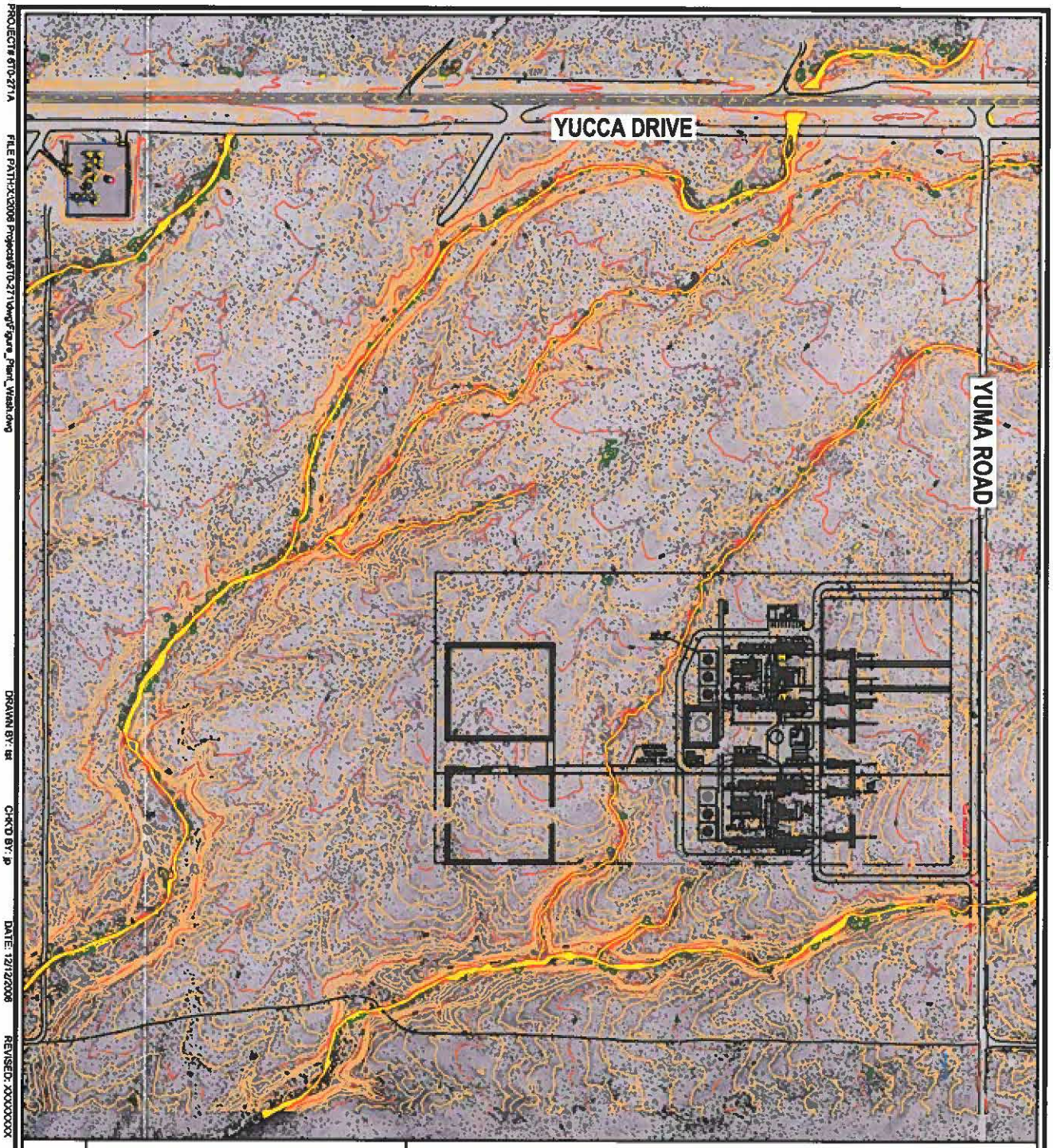
   ☐ Other _____

4. **Approximate starting date.** _____
   (See notice period listed on reverse side)

The information contained in this application is true and accurate to the best of my knowledge. I understand that providing false information is a felony in Arizona

Signature _____ **Date** _____

Notice to salvagers: Consent of the landowner is required before entering any lands described in this notice.



N

0' 200' 400' 600'

Jurisdictional Water Of The US

Black Mountain Generating Station

Project: 6T0-271A

UniSourceEnergy SERVICES
Energizing Arizona

Tierra
Right of Way Services

Black Mountain Generating Station Location.

PROJECT#: 6T0-271A
FILE PATH: X:\2008 Projects\6T0-271A\dwg\Figure_Plant_Wash.dwg
DRAWN BY: tst
CHKD BY: jp
DATE: 12/12/2008
REVISED: XXXXXXXX

Explanation Of This Form

1. **Notice of Intent to Clear Land.**
   The majority of the desert plants fall into one of five groups specially protected from theft, vandalism or unnecessary destruction. They include all of the cacti, the unique plants like Ocotillo, and trees like Ironwood, Palo Verde and Mesquite. In most cases the destruction of these protected plants may be avoided if the private landowner gives prior notice to the Arizona Department of Agriculture.

2. **Notice Period.**
   When properly completed, this form is to be sent to the Department within the time periods described below. Landowners/ developers are encouraged to salvage protected native plants whenever possible.

3. **Information to Interested Parties.**
   The information in this notice will be posted in the applicable county office of the Department and mailed to those parties (salvage operators, revegetation experts) who have an interest in these plants and may approach the landowner with the possibility of saving the plant(s) from unnecessary destruction.

Notice to Landowner:

1. The owner may not begin destruction of protected native plants until he receives confirmation from the Arizona Department of Agriculture and the time prescribed below has elapsed. The "Confirmed" stamp only verifies that the Notice has been filed.

Size of area over which the Destruction of Plants will occur	Length of Notice Period
Less than one acre	20 days, oral or written
One acre or more, but less than 40 acres	30 days, written
40 acres or more	60 days, written

2. If you are clearing land over an area of less than one acre, oral notice may be given by calling the applicable county office at the telephone number given below.
3. If the land clearing or plant salvage does not occur within one year, a new Notice is required.
4. This Notice must be sent to the applicable district office of the Department of Agriculture at the address given below:

Phoenix Office
1688 W. Adams
Phoenix, AZ 85007
(602) 364 - 0935

Tucson Office
400 W. Congress Ste. 124
Tucson, AZ 85701
(520) 628-6317
M-F 8a.m. - 11:30 a.m.

Notice to salvagers: Consent of the landowner is required before entering any lands described in this notice.

18.4 → February

B. Salvage Restricted Protected Native Plants

The following list includes those species of native plants that are not included in the highly safeguarded category but are subject to damage by theft or vandalism. In addition to the plants listed under Agavaceae, Cactaceae, Liliaceae, and Orchidaceae, all other species in these families are salvage restricted protected native plants.

AGAVACEAE Agave Family (including Nolinaceae)

Agave chrysantha Peebles

Agave deserti Engelm. ssp. simplex Gentry-Desert agave

Agave mckelveyana Gentry

Agave palmeri Engelm.

Agave parryi Engelm. var. couseii (Engelm. ex Trel.) Kearney & Peebles

Agave parryi Engelm. var. huachucensis (Baker) Little ex L. Benson Syn.: Agave huachucensis Baker

Agave parryi Engelm. var. parryi

Agave schottii Engelm. var. schottii - Shindigger

Agave toumeyana Trel. ssp. bella (Breitung) Gentry

Agave toumeyana Trel. ssp. toumeyana

Agave utahensis Engelm. spp. kaibabensis (McKelvey) Gentry Syn.: Agave kaibabensis McKelvey

Agave utahensis Engelm. var. utahensis

Dasylirion wheeleri Wats.-Sotol, desert spoon

Nolina bigelovii (Torr.)Wats.-Bigelow's nolina

Nolina microcarpa Wats.-Beargrass, sacahuista

Nolina parryi Wats.-Parry's nolina

Nolina texana Wats. var. compacta (Trel.) Johnst.-Bunchgrass

Yucca angustissima Engelm. var. angustissima

Yucca angustissima Engelm. var. kanabensis (McKelvey) Reveal Syn.: Yucca kanabensis McKelvey

Yucca arizonica McKelvey

Yucca baccata Torr. var. baccata-Banana yucca

Yucca baccata Torr. var. vespertina McKelvey

Yucca baileyi Woot. & Standl. var. intermedia (McKelvey) Reveal Syn.: Yucca navajoa Webber

Yucca brevifolia Engelm. var. brevifolia-Joshua tree

Yucca brevifolia Engelm. var. jaegeriana McKelvey

Yucca elata Engelm. var. elata-Soaptree yucca, palmilla

Yucca elata Engelm var. utahensis (McKelvey) Reveal Syn.: Yucca utahensis McKelvey

Yucca elata Engelm. var. verdiensis (McKelvey) Reveal Syn.: Yucca verdiensis McKelvey

Yucca harrimaniae Trel.

Yucca schidigera Roezl.-Mohave yucca, Spanish dagger

Yucca schottii Engelm.-Hairy yucca

Yucca thornberi McKelvey

Yucca whipplei Torr. var. whipplei-Our Lord's candle Syn.: Yucca newberryi McKelvey

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AMARYLLIDACEAE Amaryllis Family

Zephyranthes longifolia Hemsl.-Plains Rain Lily

ANACARDIACEAE Sumac Family

Rhus kearneyi Barkley-Kearney Sumac

ARECACEAE Palm Family [=Palmae]

Washingtonia filifera (Linden ex Andre) H. Wendl-California fan palm

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ASTERACEAE Sunflower Family [=Compositae]

Cirsium parryi (Gray) Petrak ssp. mogollonicum Schaak

Cirsium virginensis Welsh-Virgin thistle

Erigeron kuschei Eastw.-Chiricahua fleabane

Erigeron piscaticus Nesom-Fish Creek fleabane

Flaveria macdougalii Theroux, Pinkava & Keil

Perityle ajoensis Todson-Ajo rock daisy

Perityle cochisensis (Niles) Powell-Chiricahua rock daisy

Senecio quaerens Greene-Gila groundsel

BURSERACEAE Torch-Wood Family

Bursera microphylla Gray-Elephant tree, torote

CACTACEAE Cactus Family

Carnegiea gigantea (Engelm.) Britt. & Rose-Saguaro Syn.: Cereus giganteus Engelm.

Coryphantha missouriensis (Sweet) Britt. & Rose

Coryphantha missouriensis (Sweet) Britt. & Rose var. marstonii (Clover) L. Benson

Coryphantha scheeri (Kuntze) L. Benson var. valida (Engelm.) L. Benson

Coryphantha strobiliformis (Poselger) var. orcuttii (Rose) L. Benson

Coryphantha strobiliformis (Poselger) var. strobiliformis

Coryphantha vivipara (Nutt.) Britt. & Rose var. alversonii (Coult.) L. Benson

Coryphantha vivipara (Nutt.) Britt. & Rose var. arizonica (Engelm.) W. T. Marshall Syn.: Mammillaria arizonica Engelm.

Coryphantha vivipara (Nutt.) Britt. & Rose var. bisbeeana (Orcutt) L. Benson

Coryphantha vivipara (Nutt.) Britt. & Rose var. deserti (Engelm.) W. T. Marshall Syn.: Mammillaria chlorantha Engelm.

Coryphantha vivipara (Nutt.) Britt. & Rose var. rosea (Clokey) L. Benson

Echinocactus polycephalus Engelm. & Bigel. var. polycephalus

Echinocactus polycephalus Engelm. & Bigel. var. xeranthemoides Engelm. ex Coult. Syn.: Echinocactus xeranthemoides Engelm. ex Coult.

Echinocereus engelmannii (Parry ex Engelm.) Lemaire var. acicularis L. Benson

Echinocereus engelmannii (Parry ex Engelm.) Lemaire var. armatus L. Benson

Echinocereus engelmannii (Parry ex Engelm.) Lemaire var. chrysocentrus L. Benson

Echinocereus engelmannii (Parry ex. Engelm.) Lemaire var. engelmannii

Echinocereus engelmannii (Parry) Lemaire var. variegatus (Engelm.) Engelm. ex Rümpler

Echinocereus fasciculatus (Engelm. ex B. D. Jackson) L. Benson var. fasciculatus Syn.: Echinocereus fendleri (Engelm.) Rümpler var. fasciculatus (Engelm. ex B. D. Jackson) N. P. Taylor, Echinocereus fendleri (Engelm.) Rümpler var. robusta L. Benson; Mammillaria fasciculata Engelm.

Echinocereus fasciculatus (Engelm. ex B. D. Jackson) L. Benson var. bonkerae (Thornber & Bonker) L. Benson. Syn.: Echinocereus boyce-thompsonii Orcutt var. bonkerae Peebles; Echinocereus fendleri (Engelm.) Rümpler var. bonkerae (Thornber & Bonker) L. Benson

Echinocereus fasciculatus (Engelm. ex B. D. Jackson) L. Benson var. boyce-thompsonii (Orcutt) L. Benson Syn.: Echinocereus boyce-thompsonii Orcutt

Echinocereus fendleri (Engelm.) Rümpler var. boyce-thompsonii (Orcutt) L.

Benson

Echinocereus fendleri (Engelm.) Rümpler var. fendleri

Echinocereus fendleri (Engelm.) Rümpler var. rectispinus (Peebles) L. Benson

Echinocereus ledingii Peebles

Echinocereus nicholii (L. Benson) Parfitt. Syn.: Echinocereus engelmannii (Parry ex Engelm.) Lemaire var. nicholii L. Benson

Echinocereus pectinatus (Scheidw.) Engelm. var. dasyacanthus (Engelm.) N. P. Taylor Syn.: Echinocereus pectinatus (Scheidw.) Engelm. var. neomexicanus (Coult.) L. Benson

Echinocereus polyacanthus Engelm. (1848) var. polyacanthus

Echinocereus pseudopectinatus (N. P. Taylor) N. P. Taylor Syn.: Echinocereus bristolii W. T. Marshall var. pseudopectinatus N. P. Taylor, Echinocereus pectinatus (Scheidw.) Engelm. var. pectinatus sensu Kearney and Peebles, Arizona Flora, and L. Benson, The Cacti of Arizona and The Cacti of the United States and Canada.

Echinocereus rigidissimus (Engelm.) Hort. F. A. Haage. Syn.: Echinocereus pectinatus (Scheidw.) Engelm. var. rigidissimus (Engelm.) Engelm. ex Rümpler-Rainbow cactus

Echinocereus triglochidiatus Engelm. var. gonacanthus (Engelm. & Bigel.) Boiss.

Echinocereus triglochidiatus Engelm. var. melanacanthus (Engelm.) L. Benson Syn.: Mammillaria aggregata Engelm.

Echinocereus triglochidiatus Engelm. var. mojavensis (Engelm.) L. Benson

Echinocereus triglochidiatus Engelm. var. neomexicanus (Standl.) Standl. ex W. T. Marshall. Syn.: Echinocereus triglochidiatus Engelm. var. polyacanthus (Engelm. 1859 non 1848) L. Benson

Echinocereus triglochidiatus Engelm. var. triglochidiatus

Echinomastus erectocentrus (Coult.) Britt. & Rose var. erectocentrus Syn.: Neolloydia erectocentra (Coult.) L. Benson var. erectocentra

Echinomastus intertextus (Engelm.) Britt. & Rose Syn.: Neolloydia intertexta (Engelg.) L. Benson

Echinomastus johnsonii (Parry) Baxter-Beehive cactus Syn.: Neolloydia johnsonii (Parry) L. Benson

Epithelantha micromeris (Engelm.) Weber ex Britt. & Rose

Ferocactus cylindraceus (Engelm.) Orcutt var. cylindraceus-Barrel cactus Syn.: Ferocactus acanthodes (Lemaire) Britt. & Rose var. acanthodes

Ferocactus cylindraceus (Engelm.) Orcutt var. eastwoodiae (Engelm.) N. P. Taylor Syn.: Ferocactus acanthodes (Lemaire) Britt. & Rose var. eastwoodiae L. Benson; Ferocactus eastwoodiae (L. Benson) L. Benson

Ferocactus cylindraceus (Engelm.) Orcutt. var. lecontei (Engelm.) H. Bravo Syn.: Ferocactus acanthodes (Lemaire) Britt. & Rose var. leconti (Engelm.) Lindsay; Ferocactus lecontei (Engelm.) Britt. & Rose

Ferocactus emoryi (Engelm.) Orcutt-Barrel cactus Syn.: Ferocactus covillei Britt. & Rose

Ferocactus wislizenii (Engelm.) Britt. & Rose-Barrel cactus

Lophocereus schottii (Engelm.) Britt. & Rose-Senita

Mammillaria grahamii Engelm. var. grahamii

Mammillaria grahamii Engelm. var. oliviae (Orcutt) L. Benson Syn.: Mammillaria oliviae Orcutt

Mammillaria heyderi Mühlenpf. var. heyderi Syn.: Mammillaria gummifera Engelm. var. applanata (Engelm.) L. Benson

Mammillaria heyderi Mühlenpf. var. macdougalii (Rose) L. Benson Syn.: Mammillaria gummifera Engelm. var. macdougalii (Rose) L. Benson; Mammillaria macdougalii Rose

Mammillaria heyderi Mühlenpf. var. meiacantha (Engelm.) L. Benson Syn.: Mammillaria gummifera Engelm. var. meiacantha (Engelm.) L. Benson

Mammillaria lasiacantha Engelm.

Mammillaria mainiae K. Brand.

Mammillaria microcarpa Engelm.

Mammillaria tetrancistra Engelm.

Mammillaria thornberi Orcutt

Mammillaria viridiflora (Britt. & Rose) Bödeker. Syn.: Mammillaria orestra L. Benson

Mammillaria wrightii Engelm. var. wilcoxii (Toumey ex K. Schumann) W. T.

Marshall Syn.: Mammillaria wilcoxii Toumey

Mammillaria wrightii Engelm. var. wrightii

Opuntia acanthocarpa Engelm. & Bigel. var. acanthocarpa-Buckhorn cholla

Opuntia acanthocarpa Engelm. & Bigel. var. coloradensis L. Benson

Opuntia acanthocarpa Engelm. & Bigel. var. major L. Benson Syn.: Opuntia acanthocarpa Engelm. & Bigel var. ramosa Peebles

Opuntia acanthocarpa Engelm. & Bigel. var. thornberi (Thornber & Bonker) L. Benson Syn.: Opuntia thornberi Thornber & Bonker

Opuntia arbuscula Engelm.-Pencil cholla

Opuntia basilaris Engelm. & Bigel. var. aurea (Baxter) W. T. Marshall-Yellow beavertail Syn.: Opuntia aurea Baxter

Opuntia basilaris Engelm. & Bigel. var. basilaris-Beavertail cactus

Opuntia basilaris Engelm. & Bigel. var. longiareolata (Clover & Jotter) L. Benson

Opuntia basilaris Engelm. & Bigel. var. treleasei (Coult.) Toumey

Opuntia bigelovii Engelm.-Teddy-bear cholla

Opuntia campii ined.

Opuntia canada Griffiths (O. phaeacantha Engelm. var. laevis X major and O. gilvescens Griffiths).

Opuntia chlorotica Engelm. & Bigel.-Pancake prickly-pear

Opuntia clavata Engelm.-Club cholla

Opuntia curvospina Griffiths

Opuntia echinocarpa Engelm. & Bigel-Silver cholla

Opuntia emoryi Engelm.-Devil cholla Syn.: Opuntia stanlyi Engelm. ex B. D. Jackson var. stanlyi

Opuntia engelmannii Salm-Dyck ex Engelm. var. engelmannii-Engelmann's prickly-pear Syn.: Opuntia phaeacantha Engelm. var. discata (Griffiths) Benson & Walkington

Opuntia engelmannii Salm-Dyck ex Engelm. var. flavospina (L.Benson) Parfitt

& Pinkava Syn.: Opuntia phaeacantha Engelm. var. flavispina L. Benson

Opuntia erinacea Engelm. & Bigel. var. erinacea-Mohave prickly-pear

Opuntia erinacea Engelm. & Bigel. var. hystricina (Engelm. & Bigel.) L. Benson Syn.: Opuntia hystricina Engelm. & Bigel.

Opuntia erinacea Engelm. & Bigel. var. ursina (Weber) Parish-Grizzly bear prickly-pear Syn.: Opuntia ursina Weber

Opuntia erinacea Engelm. & Bigel. var. utahensis (Engelm.) L. Benson Syn.: Opuntia rhodantha Schum.

Opuntia fragilis Nutt. var. brachyarthra (Engelm. & Bigel.) Coult.

Opuntia fragilis Nutt. var. fragilis-Little prickly-pear

Opuntia fulgida Engelm. var. fulgida-Jumping chain-fruit cholla

Opuntia fulgida Engelm. var. mammillata (Schott) Coult.

Opuntia imbricata (Haw.) DC.-Tree cholla

Opuntia X kelvinensis V. & K. Grant pro sp. Syn.: Opuntia kelvinensis V. & K. Grant

Opuntia kleiniae DC. var. tetracantha (Toumey) W. T. Marshall Syn.: Opuntia tetrancistra Toumey

Opuntia kunzei Rose. Syn.: Opuntia stanlyi Engelm. ex B. D. Jackson var. kunzei (Rose) L. Benson; Opuntia kunzei Rose var. wrightiana (E. M. Baxter) Peebles; Opuntia wrightiana E. M. Baxter

Opuntia leptocaulis DC.-Desert Christmas cactus, Pencil cholla

Opuntia littoralis (Engelm.) Cockl. var. vaseyi (Coult.) Benson & Walkington

Opuntia macrocentra Engelm.-Purple prickly-pear Syn.: Opuntia violacea Engelm. ex B. D. Jackson var. macrocentra (Engelm.) L. Benson; Opuntia violacea Engelm. ex B. D. Jackson var. violacea

Opuntia macrorhiza Engelm. var. macrorhiza-Plains prickly-pear Syn.: Opuntia plumbea Rose

Opuntia macrorhiza Engelm. var. pottsii (Salm-Dyck) L. Benson

Opuntia martiniana (L. Benson) Parfitt Syn.: Opuntia littoralis (Engelm.) Cockerell var. martiniana (L. Benson) L. Benson; Opuntia macrocentra Engelm. var. martiniana L. Benson

Opuntia nicholii L. Benson-Navajo Bridge prickly-pear

Opuntia parishii Orcutt. Syn.: Opuntia stanlyi Engelm. ex B. D. Jackson var. parishii (Orcutt) L. Benson

Opuntia phaeacantha Engelm. var. laevis (Coult.) L. Benson Syn.: Opuntia laevis Coult.

Opuntia phaeacantha Engelm. var. major Engelm.

Opuntia phaeacantha Engelm. var. phaeacantha

Opuntia phaeacantha Engelm. var. superbospina (Griffiths) L. Benson

Opuntia polyacantha Haw. var. juniperina (Engelm.) L. Benson

Opuntia polyacantha Haw. var. rufispina (Engelm.) L. Benson

Opuntia polyacantha Haw. var. trichophora (Engelm. & Bigel.) L. Benson

Opuntia pulchella Engelm.-Sand cholla

Opuntia ramosissima Engelm.-Diamond cholla

Opuntia santa-rita (Griffiths & Hare) Rose-Santa Rita prickly-pear Syn.: Opuntia violacea Engelm. ex B. D. Jackson var. santa-rita (Griffiths & Hare) L. Benson

Opuntia spinosior (Engelm.) Toumey-Cane cholla

Opuntia versicolor Engelm.-Staghorn cholla

Opuntia vivipara Engelm

Opuntia whipplei Engelm. & Bigel. var. multigeniculata (Clokey) L. Benson

Opuntia whipplei Engelm. & Bigel. var. whipplei-Whipple cholla

Opuntia wigginsii L. Benson

Pediocactus papyracanthus (Engelm.) L. Benson Grama grass cactus Syn.: Toumeya papyracanthus (Engelm.) Britt. & Rose

Pediocactus simpsonii (Engelm.) Britt & Rose var. simpsonii

Peniocereus greggii (Engelm.) Britt. & Rose var. greggii-Night-blooming cereus Syn.: Cereus greggii Engelm.

Peniocereus greggii (Engelm.) Britt & Rose var. transmontanus-Queen-of-the-

Night

Peniocereus striatus (Brandegee) Buxbaum. Syn.: Neoevansia striata (Brandegee) Sanchez-Mejorada; Cereus striatus Brandegee; Wilcoxia diguetii (Webber) Peebles

Sclerocactus parviflorus Clover & Jotter var. intermedius (Peebles) Woodruff & L. Benson Syn.: Sclerocactus intermedius Peebles

Sclerocactus parviflorus Clover & Jotter var. parviflorus Syn.: Sclerocactus whipplei (Engelm. & Bigel.) Britt. & Rose var. roseus (Clover) L. Benson

Sclerocactus pubispinus (Engelm.) L. Peebles

Sclerocactus spinosior (Engelm.) Woodruff & L. Benson Syn.: Sclerocactus pubispinus (Engelm.) L. Benson var. sileri L. Benson

Sclerocactus whipplei (Engelm. & Bigel.) Britt. & Rose

Stenocereus thurberi (Engelm.) F. Buxbaum-Organ pipe cactus Syn.: Cereus thurberi Engelm.; Lemairocereus thurberi (Engelm.) Britt. & Rose

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CAMPANULACEAE Bellflower Family

Lobelia cardinalis L. ssp. graminea (Lam.) McVaugh-Cardinal flower

Lobelia fenestralis Cav.-Leafy lobelia

Lobelia laxiflora H. B. K. var. angustifolia A. DC.

CAPPARACEAE Cappar Family [=Capparidaceae]

Cleome multicaulis DC.-Playa spiderflower

CHENOPODIACEAE Goosefoot Family

Atriplex hymenelytra (Torr.) Wats.

CRASSULACEAE Stonecrop Family

Dudleya arizonica (Nutt.) Britt. & Rose Syn.: Echeveria pulverulenta Nutt. ssp. arizonica (Rose) Clokey

Dudleya saxosa (M.E. Jones) Britt. & Rose ssp. collomiae (Rose) Moran Syn.: Echeveria collomiae (Rose) Kearney & Peebles

Graptopetalum bartramii Rose Syn.: Echevaria bartramii (Rose) K. & P.

Graptopetalum bartramii Rose-Bartram's stonecrop, Bartram's live-forever Syn.: Echeveria bartramii (Rose) Kearney & Peebles

Graptopetalum rusbyi (Greene) Rose Syn.: Echeveria rusbyi (Greene) Nels. & Macbr.

Sedum cockerellii Britt.

Sedum griffithsii Rose

Sedum lanceolatum Torr. Syn.: Sedum stenopetalum Pursh

Sedum rhodanthum Gray

Sedum stelliforme Wats.

CROSSOSOMATACEAE Crossosoma Family

Apacheria chiricahuensis C. T. Mason-Chiricahua rock flower

CUCURBITACEAE Gourd Family

Tumamoca macdougalii Rose-Tumamoc globeberry

EUPHORBIACEAE Spurge Family

Euphorbia plummerae Wats.-Woodland spurge

Sapium biloculare (Wats.) Pax-Mexican jumping-bean

FABACEAE Pea Family [=Leguminosae]

Astragalus corbrensis Gray var. maguirei Kearney

Astragalus cremnophylax Barneby var. myriorraphis Barneby-Cliff milk-vetch

Astragalus hypoxylus Wats.-Huachuca milk-vetch

Astragalus nutriosensis Sanderson-Nutrioso milk-vetch

Astragalus xiphoides (Barneby) Barneby-Gladiator milk-vetch

Cercis occidentalis Torr.-California redbud

Errazurizia rotundata (Woot.) Barneby Syn.: Parryella rotundata Woot.

Lysiloma microphylla Benth. var. thornberi (Britt. & Rose) Isely-Feather bush Syn.: Lysiloma thornberi Britt. & Rose

Phaseolus supinus Wiggins & Rollins

FOUQUIERIACEAE Ocotillo Family

Fouquieria splendens Engelm.-Ocotillo, coach-whip, monkey-tail

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GENTIANACEAE Gentian Family

Gentianella wislizenii (Engelm.) J. Gillett Syn.: Gentiana wislizenii Engelm.

LAMIACEAE Mint Family

Hedeoma diffusum Green-Flagstaff pennyroyal

Salvia dorrii ssp. mearnsii

Trichostema micranthum Gray

LILIACEAE Lily Family

Allium acuminatum Hook.

Allium bigelovii Wats.

Allium biseptrum Wats. var. palmeri (Wats.) Cronq. Syn.: Allium palmeri Wats.

Allium cernuum Roth. var. neomexicanum (Rydb.) Macbr.-Nodding onion

Allium cernuum Roth. var. obtusum Ckll.

Allium geyeri Wats. var. geyeri

Allium geyeri Wats. var. tenerum Jones

Allium kunthii Don

Allium macropetalum Rydb.

Allium nevadense Wats. var. cristatum (Wats.) Ownbey

Allium nevadense Wats. var. nevadense

Allium parishii Wats.

Allium plummerae Wats.

Allium rhizomatum Woot. & Standl. Incl.: Allium glandulosum Link & Otto sensu Kearney & Peebles

Androstephium breviflorum Wats.-Funnel-lily

Calochortus ambiguus (Jones) Ownbey

Calochortus aureus Wats. Syn.: Calochortus nuttallii Torr. & Gray var. aureus (Wats.) Ownbey

Calochortus flexuosus Wats.-Straggling mariposa

Calochortus gunnisonii Wats.

Calochortus kennedyi Porter var. kennedyi-Desert mariposa

Calochortus kennedyi Porter var. munzii Jeps.

Dichelostemma pulchellum (Salisbi) Heller var. pauciflorum (Torr.) Hoover

Disporum trachycarpum (Wats.) Benth. & Hook. var. subglabrum Kelso

Disporum trachycarpum (Wats.) Benth. & Hook. var. trachycarpum

Echeandia flavescens (Schultes & Schultes) Cruden Syn.: Anthericum torreyi Baker

Eremocrinum albomarginatum Jones

Fritillaria atropurpurea Nutt.

Hesperocallis undulata Gray-Ajo lily

Lilium parryi Wats.-Lemon lily

Lilium umbellatum Pursh

Maianthemum racemosum (L.) Link. ssp. amplexicaule (Nutt.) LaFrankie Syn.: Smilacina racemosa (L.) Desf. var. amplexicaulis (Nutt.) Wats.

Maianthemum racemosum (L.) Link ssp. racemosum-False Solomon's seal Syn.: Smilacina racemosa (L.) Desf. var. racemosa; Smilacina racemosa (L.) Desf. var. cylindrata Fern.

Maianthemum stellatum (L.) Link Syn.: Smilacina stellata (L.) Desf.-Starflower

Milla biflora Cav.-Mexican star

Nothoscordum texanum Jones

Polygonatum cobrense (Woot. & Standl.) Gates

Streptopus amplexifolius (L.) DC.-Twisted stalk

Triteleia lemmonae (Wats.) Greene

Triteleiopsis palmeri (Wats.) Hoover

Veratrum californicum Durand.-False hellebore

Zephyranthes longifolia Hemsl.-Plains rain lily

Zigadenus elegans Pursh-White camas, alkali-grass

Zigadenus paniculatus (Nutt.) Wats.-Sand-corn

Zigadenus virescens (H. B. K.) Macbr.

MALVACEAE Mallow Family

Abutilon parishii Wats.-Tucson Indian mallow

Abutilon thurberi Gray-Baboquivari Indian mallow

ONAGRACEAE Evening Primrose Family

Camissonia exilis (Raven) Raven

ORCHIDACEAE Orchid Family

Calypso bulbosa (L.) Oakes var. americana (R. Br.) Luer

Coeloglossum viride (L.) Hartmann var. virescens (Muhl.) Luer Syn.: Habenaria viridis (L.) R. Br. var. bracteata (Muhl.) Gray

Corallorhiza maculata Raf.-Spotted coral root

Corallorhiza striata Lindl.-Striped coral root

Corallorhiza wisteriana Conrad-Spring coral root

Epipactis gigantea Douglas ex Hook.-Giant helleborine

Goodyera oblongifolia Raf.

Goodyera repens (L.) R. Br.

Hexalectris spicata (Walt.) Barnhart-Crested coral root

Listera convallarioides (Swartz) Nutt.-Broad-leaved twayblade

Malaxis corymbosa (S. Wats.) Kuntze

Malaxis ehrenbergii (Reichb. f.) Kuntze

Malaxis macrostachya (Lexarza) Kuntze-Mountain malaxia Syn.: Malaxis soulei L. O. Williams

Malaxis tenuis (S. Wats.) Ames

Platanthera hyperborea (L.) Lindley var. gracilis (Lindley) Luer Syn.: Habenaria sparsiflora Wats. var. laxiflora (Rydb.) Correll

Platanthera hyperborea (L.) Lindley var. hyperborea-Northern green orchid Syn.: Habenaria hyperborea (L.) R. Br.

Platanthera limosa Lindl.-Thurber's bog orchid Syn.: Habenaria limosa (Lindley) Hemsley

Platanthera sparsiflora (Wats.) Schlechter var. ensifolia (Rydb.) Luer

Platanthera sparsiflora (Wats.) var. laxiflora (Rydb.) Correll

Platanthera sparsiflora (Wats.) Schlechter var. sparsiflora-Sparsely-flowered bog orchid Syn.: Habenaria sparsiflora Wats.

Platanthera stricta Lindl.-Slender bog orchid Syn.: Habenaria saccata Greene; Platanthera saccata (Greene) Hulten

Platanthera viridis (L.) R. Br. var. bracteata (Muhl.) Gray-Long-bracted habenaria

Spiranthes michaucana (La Llave & Lex.) Hemsl.

Spiranthes parasitica A. Rich. & Gal.

Spiranthes romanzoffiana Cham.-Hooded ladies tresses

PAPAVERACEAE Poppy Family

Arctomecon californica Torr. & Frém.-Golden-bear poppy, Yellow-flowered desert poppy

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PINACEAE Pine Family

Pinus aristata Engelm.-Bristlecone pine

POLYGONACEAE Buckwheat Family

Eriogonum apachense Reveal

Eriogonum capillare Small

Eriogonum mortonianum Reveal-Morton's buckwheat

Eriogonum ripleyi J. T. Howell-Ripley's wild buckwheat, Frazier's Well buckwheat

Eriogonum thompsonae Wats. var. atwoodii Reveal-Atwood's buckwheat

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PORTULACEAE Purslane Family

Talinum humile Greene-Pinos Altos flame flower

Talinum marginatum Greene

Talinum validulum Greene-Tusayan flame flower

PRIMULACEAE Primrose Family

Dodecatheon alpinum (Gray) Greene ssp. majus H. J. Thompson

Dodecatheon dentatum Hook. ssp. ellisiae (Standl.) H. J. Thompson

Dodecatheon pulchellum (Raf.) Merrill

Primula hunnewellii Fern.

Primula rusbyi Greene

Primula specuicola Rydb.

RANUNCULACEAE Buttercup Family

Aquilegia caerulea James ssp. pinetorum (Tidest.) Payson-Rocky Mountain Columbine

Aquilegia chrysantha Gray

Aquilegia desertorum (Jones) Ckll.-Desert columbine, Mogollon columbine

Aquilegia elegantula Greene

Aquilegia longissima Gray-Long Spur Columbine

Aquilegia micrantha Eastw.

Aquilegia triternata Payson

ROSACEAE Rose Family

Rosa stellata Woot.-ssp. abyssa A. Phillips Grand Canyon rose

Vauquelinia californica (Torr.) Sarg. ssp. pauciflora (Standl.) Hess & Henrickson-Few-flowered Arizona rosewood

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SCROPHULARIACEAE Figwort Family

Castilleja mogollonica Pennell

Penstemon albomarginatus Jones

Penstemon bicolor (Brandeg.) Clokey & Keck ssp. roseus Clokey & Keck

Penstemon clutei A. Nels.

Penstemon distans N. Holmgren-Mt. Trumbull beardtongue

Penstemon linarioides spp. maguirei

SIMAROUBACEAE Simarouba Family

Castela emoryi (Gray) Moran & Felger-Crucifixion thorn

Syn.: Holacantha emoryi Gray

STERCULIACEAE Cacao Family

Fremontodendron californicum (Torr.) Coville-Flannel bush

Exhibit E

A CLASS III CULTURAL RESOURCES SURVEY OF 320 ACRES OF PRIVATE LAND IN THE NORTH ½ OF SECTION 14, TOWNSHIP 19 NORTH, RANGE 18 WEST, MOHAVE COUNTY, ARIZONA

Prepared by:
Mary Charlotte Thurtle

Submitted to:
UniSource Energy Services
Proposed Black Mountain Generating Station
4250 West Yucca Drive
Mohave County, Arizona

Submitted by:
Tierra Right of Way Services, Ltd.
1575 East River Road, Suite 201
Tucson, Arizona 85718

Tierra Archaeological Report No. 2006-117
November 9, 2006

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ABSTRACT

PROJECT TITLE:	A Class III Cultural Resources Survey of 320 Acres of Private Land in the North ½ of Section 14, Township 19 North, Range 18 East, Mohave County, Arizona
LAND STATUS:	Private
PROJECT DESCRIPTION:	A Class III cultural resources survey of 320 acres south of Kingman, Arizona, was conducted in advance of siting a new generating station
TIERRA PROJECT NO.:	6T0-271A
TIERRA REPORT NO.:	2006-117
PERMIT NO.:	Arizona State Museum Blanket Permit No. 2006-023bl
FIELDWORK DATES:	October 17 and 18, 2006
PROJECT LOCATION:	The N1/2 of Section 14, Township 19 North, Range 18 East, Gila and Salt River Baseline and Meridian (G&SRB&M)
NO. OF ACRES SURVEYED:	320
NO. OF NRHP-ELIGIBLE SITES:	0
NO. OF SITES RECOMMENED TO BE INELLIGIBLE FOR THE NRHP:	1
NUMBER OF ISOLATED OCCURRENCES:	2
MANAGEMENT RECOMMENDATIONS:	One archaeological site and two isolated occurrences were identified during the survey. The site, AZ F:16:89(ASM), is a surface scatter of flaked stone. Tierra recommends that the cultural resources survey has adequately sampled the site, and little research potential remains. Therefore, we recommend that the site does not meet National Register of Historic Places listing eligibility. Because no significant archaeological sites were identified during the survey, we also recommend that siting the proposed generating station anywhere within the parcel will not impact significant cultural resources and

that the proposed undertaking be allowed to proceed without any further archaeological work.

Pursuant to Arizona Revised Statue §41-865, if human remains are encountered anywhere in the project area during ground-disturbing activities, all activity shall cease in the area of the discovery and the Director of the Arizona State Museum shall be immediately notified. All ground-disturbing activities in the immediate vicinity of the discovery shall cease until a qualified archaeologist assesses the significance of the remains. Work in and around the area shall not resume until so directed by ASM personnel.

INTRODUCTION

On October 17 and 18, 2006, archaeologists Annick Lascaux, Marie-Blanche Roudaut, Mary Charlotte Thurtle, and April Whitaker, of Tierra Right of Way Services, Ltd. (Tierra), performed a Class III (100 percent) cultural resources survey of a 320-acre parcel, south of Kingman, Mohave County, Arizona. The survey was performed at the request of UniSource Energy Services (UES) in order to identify any cultural resources that may be on the parcel prior to siting a new generating station. Work was conducted under the authority of Arizona Antiquities Act Blanket Permit No. 2006-023bl, issued by the Arizona State Museum (ASM).

THE PROJECT AREA

The area surveyed by Tierra is the North ½ of Section 14, Township 19 North, Range 18 East, Gila and Salt River Baseline and Meridian (G&SRB&M), in Mohave County, Arizona. The surveyed area (Figure 1) consists of a 320-acre parcel approximately 10 miles south of Kingman, Arizona. The project area is bounded on the north by Yucca Street, on the east by Yuma Avenue, and on the west by South Sacramento Road. The south boundary of the project area is an unnamed two-track dirt road. A small portion of this half-section (approximately 0.8 acres) was not surveyed, as it is currently occupied by a walled electric substation. Elevation in the project area is 689 to 707 meters (2,260 to 2,320 ft) above mean sea level (AMSL), with a slope that runs from northeast to southwest. The project area is dissected by drainages, the deepest of which is four meters (13.1 ft) below the adjacent terrace.

Surface sediments in the project area consist of patches of cobbles and gravel of volcanic material in alluvial sandy silt. Some of the patches of stones are well consolidated and slightly varnished, approaching what can be labeled desert pavement. Vegetation in the project area is typical of the Creosote Series of the Mohave Desertscrub biome as described by Brown (1994). As the name suggests, the dominant flora is creosote bush. Within the project area, acacia is abundant in and adjacent to the washes. Pencil cholla, bursage, ratany, and a few yuccas are also present.

CULTURAL BACKGROUND

Discussions of the prehistory of the Kingman/Las Vegas area are generally structured around a sequence developed by archaeologist Malcolm Rogers of the San Diego Museum of Man, based on work he performed along the lower Colorado River in the 1920s and 1930s (Rogers 1939, 1945). Archaeologists had, by that time, already arrived at a generalized sequence of periods for the occupation of North America. The sequence begins with a Paleoindian Period, during which time people relied heavily on hunting for subsistence. It is followed by an Archaic Period, during which migratory peoples exploited a broader base of resources. Next is the Formative Period, during which time people settled into fixed communities, relying on agriculture for subsistence.

Rogers' sequence conformed to this broader sequence: he referred to the Paleoindian manifestation in the region as the San Dieguito complex, the Archaic manifestation as the Amargosa complex, and the Formative manifestation as the Yuman complex. Each of these complexes was subdivided into three phases, designated, in each case, I, II, and III.

Some scholars have chosen to discuss the Archaic manifestation in terms of Early, Middle, and Late Archaic phases, a sequence laid out by Bruce Huckell for the Tucson Basin in the 1980s (Huckell

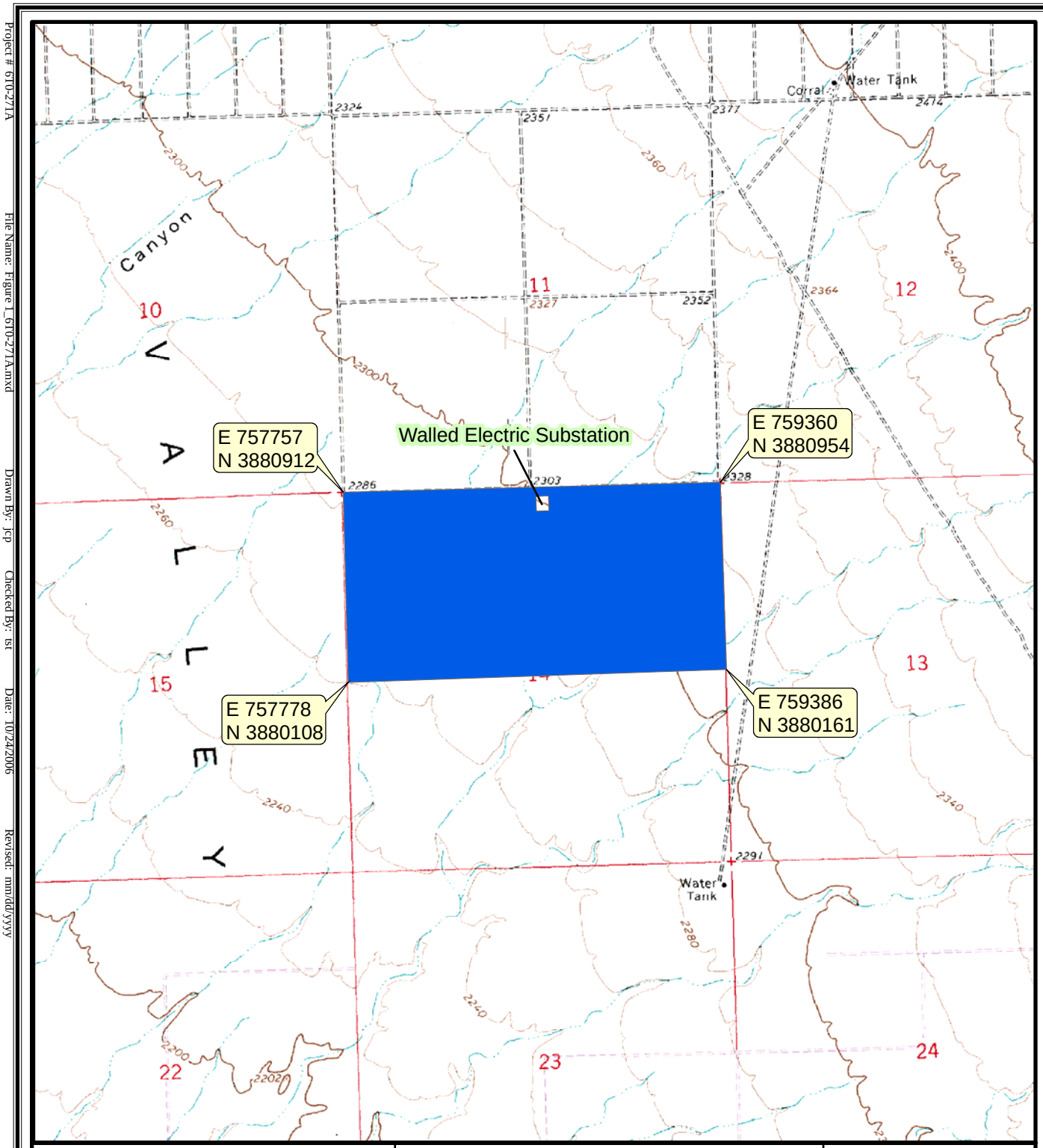

Figure 1. Project location.

1984). In general, because little work has been done in the Colorado River region (relative to other parts of the southwest) and the site types found in the region are not conducive to absolute dating techniques such as radiocarbon, Rogers' overall chronology is still used as the basis for discussion of cultural sequences.

All of the San Dieguito (ca. 12,000 B.P.–7000 B.P.) traditions associated with this region share a number of traits. Sites are commonly identified on desert-paved terraces, with common feature types being trails, trail markers, cleared circles, rock art, and intaglios (Hayden 1976; McGuire 1982; Ahlstrom and Lyon 2000). Artifacts common to all these periods are scrapers and choppers.

San Dieguito I sites are generally noted for the absence of the sort of large, finely worked projectile point most often associated with Paleoindian tool kits. Several researchers (Hayden 1976; McGuire 1982) have noted that the San Dieguito I tool kit appears better adapted to woodworking than to hunting. A possible exception can be found in the assemblage from Ventana Cave, 50 miles west of Tucson (Haury 1950). Here, tools strongly resembling those found at San Dieguito I sites are intermingled with items that Haury initially identified as "Folsomoid:" This includes one fluted point, which Haury later (Haury and Hayden 1975) reinterpreted as more Clovis-like. Later, bifacial projectile points appear at San Dieguito II sites, and leaf-shaped points have been found at San Dieguito III sites. The presence of woodworking tools in the San Dieguito tool kit has been taken as evidence that areas of the western desert occupied by the San Dieguito peoples were more heavily vegetated than present.

Evidence of San Dieguito food-gathering activities has remained surprisingly limited. Grinding implements are lacking at San Dieguito sites, so it is believed that seeds were not an important part of the San Dieguito diet (Warren 1967). Differences between the three San Dieguito phases are found mainly in the details of the tool kit, which became more refined over time; San Dieguito I and II kits relied on a biface technology, while San Dieguito III kits began to include pressure-flaked tools, including the fine projectile points mentioned above.

The Amargosa complex (7000 B.P.–1250 B.P.) is more typical of the Archaic Period than the San Dieguito complex is of the Paleoindian Period. Amargosa peoples utilized a wide range of plant and animal resources. Their sites have yielded baskets, sandals, rabbit-fur robes, and food remains, including small-animal bones, grass seeds, and piñon nuts (McClellan et al. 1980). Amargosa tool kits incorporated finely worked atlatl dart points and grinding implements, emphasizing the ability to procure and process a wide assortment of materials.

Ethnographic models based on the Paiute of southern Utah and northern Arizona (cf. Steward 1938) have proven useful in explaining the distribution of Amargosa sites (Thomas 1973). Based on these ethnographic analogies, it has been inferred that the Amargosa peoples, like the Paiute, most likely traveled in small bands, relying on gathering and the hunting of small animals (such as rabbits) for food. They most likely lived in shelters made of perishable materials which would not be well preserved in the archaeological record (McClellan et al. 1980). The Amargosa complex was superseded on the north bank of the Colorado River by the Virgin Anasazi culture around 2000 B.P. and later, around 1250 B.P., by a more (though not completely) sedentary Formative lifeway on the south bank.

The intellectual history of Rogers' Formative-period "Yuman complex" has followed a rather circuitous course. Rogers proposed the term in the 1920s, and Gladwin (1934) accepted a Yuman

"root" as part of his taxonomic system. However, Harold Colton (1939) rejected the use of the term because it implied—in his mind, improperly—a connection between the prehistoric peoples under consideration and modern Yuman peoples. Colton used the term "Patayan" instead. In most discussions since the 1940s, Formative-period peoples of this area have been referred to as Patayan.

In the 1990s, coming full circle, leaders of Yuman nations along the Colorado River began to express dissatisfaction with this term, suggesting that "Ancestral Yuman" be used instead, precisely *because* of the continuity such a term implies between prehistoric and modern peoples. Without commenting further on the significance of this term, we will use the term preferred by modern Yuman peoples in this discussion.

The Ancestral Yuman group relevant to the immediate vicinity of the project area is generally discussed, in its earliest manifestations, as the Cerbat Branch. The Cerbat Branch first appeared in desert regions not far from the current project area around A.D. 750 (McClellan et al. 1980:60). Later, around A.D. 1150, Cerbat peoples spread eastward onto the Colorado Plateau, displacing sedentary peoples and practicing a semi-sedentary lifeway, using agriculture as a supplement to hunting and gathering rather than as a substitute.

Farming was done around springs, while both desert and upland areas were used seasonally for hunting and gathering. Euler (1958) established a cultural continuity between the Cerbat peoples and the Hualapai and Havasupai peoples, who continue to live in the area today and historically (prior to their confinement to reservations in the late 1860s) practiced a lifeway similar to that inferred for their Cerbat-branch antecedents..

Although it took until the nineteenth century for Euro-American peoples to establish a permanent presence in this part of the world, Europeans began to explore the area which now comprises southern Mohave County at a relatively early date. Spanish explorers visited Grand Canyon country as early as 1540 when Francisco Vásquez de Coronado, passing through the Zuni region, dispatched a party to the west that reached the canyon before turning back.

Juan de Oñate, founder of the first Spanish colony in New Mexico, went farther, traveling out of Santa Fe to explore the Lower Colorado region in 1604–1605. However, this expedition did not lead to any sustained Spanish presence in the area. More than a century later, in 1775–1776, a Franciscan, Francisco Garcés, revisited this area, traveling by ship to the mouth of the Colorado River. He then followed the river north to the vicinity of present-day Needles, California. Turning west, he followed native trails to Mission San Gabriel, in California, and back. He then continued east as far as the Hopi Mesas before being turned back by the hostility of the inhabitants (Weber 1992).

The portion of this route west of the Colorado would later be incorporated, along with a stretch skirting around the north end of Hopi country, into what would become known as the Old Spanish Trail, joining Santa Fe with California. This trail was the route by which the first Anglo-American trappers came to the area in 1826 (McClellan et al. 1980:67), and, in 1830, the route by which a Mexican trader, Antonio Armijo, came to the spring, which marks the site of present-day Las Vegas, Nevada.

With the passage of the area into American hands in 1848, the pace of exploration increased. In the 1840s and 1850s, several U.S. Army expeditions passed through the area. This first was John C. Frémont's 1844 expedition, which followed along the Old Spanish Trail. Lieutenant Lorenzo

Sitgreaves' 1851 expedition was an attempt to explore the viability of navigating the Upper Colorado River and its tributaries. His route is the approximate route of the historic Route 66 through this area. Third was Lieutenant Amiel W. Whipple's expedition in 1853, assigned to pioneer and survey a route for a rail line through the region. The fourth expedition, led by Lieutenant Joseph C. Ives in 1858, involved steaming (and, in the upper reaches of the river, paddling) up the Colorado River, as far as Las Vegas Wash, again to explore the viability of navigation. Finally, there were Lieutenant Edward F. Beale's several expeditions between 1857 and 1860 that pioneered, and later built and improved, what became known as Beale's Wagon Road.

Once again, Beale's expedition followed the approximate route of the historic Route 66 (Goetzmann 1959). During the same period, Mormons were also exploring the area, and a Mormon settlement was established in Las Vegas in 1855. In the wake of subsequent explorations—made with an eye toward establishing communications with the outside world via the Colorado—a short-lived river port, Callville, was established near the mouth of Las Vegas Wash in the mid-1860s. Most of the earliest settlements in the area were located near the river. The first two county seats, Hardyville (at the site of present-day Bullhead City) and Mohave City, were both river ports.

Historically, the principal occupation of southern Mohave County residents was mining. Lieutenant Sitgreaves reported the presence of prospectors along the Colorado River in 1851, but reports state that the Cerbat Mountains were being prospected earlier than that. The area was the scene of increased prospecting activity during and after the Civil War, and the assembly of the newly created Arizona Territory created Mohave County in 1864. The influx of people to the area contributed to conflict with the Havasupai and Hualapai peoples, bringing about a small-scale war that lasted from 1866 through 1869 and led to the confinement of those peoples to their present reservations.

During this war, Beale's Spring, set up as a quasi-permanent encampment in 1859, became a major base for army operations. Initially, settlement within the country was concentrated near the Colorado River, but Chloride, in the foothills of the Cerbat Mountains, became a center of activity in early 1860s. With the construction of the Atlantic and Pacific (later Santa Fe) Railroad, a new town, Kingman, was established as a siding on the line near Beale's Spring. The county seat, having been relocated several times, settled on Kingman in 1887.

Kingman's prosperity grew with the development of the automobile and the nation's highway system. U.S. Highway 66, formally established in 1927, passed through the town, and Kingman became one of the main stopping points along the Chicago-to-Los Angeles highway, a role it has retained to this day. Later, when Boulder (now Hoover) Dam was built in the 1930s, a second major artery, U.S. Highway 93/466, was built. Initially (as Arizona Highway 69), it was a service road for hauling materials from the railhead at Kingman to the construction site. Later, it developed into the principal highway joining Phoenix with Las Vegas.

PREVIOUS RESEARCH

Prior to the pedestrian survey, a Class I archaeological records check was performed at the Site File Office of the Arizona State Museum and its affiliated on-line database, AZSITE. The purpose of this research was to determine whether any previous surveys had covered areas included in or near (within a mile of) the current project area, and whether any archaeological sites had previously been recorded within the same. Two surveys had been conducted within a one-mile radius of the project area (Figure 2; Table 1).

Project # 6T0-271A | File Name: Figure 2_6T0-271A.mxd | Drawn By: jcp | Checked By: tsr | Date: 10/24/2006 | Revised: mm/dd/yyyy

Project: 6T0-271A

Sec. 14 T19N R18W
G&SRB&M

0 0.25 0.5 0.75 Miles
0 0.25 0.5 0.75 1 Kilometers

Key

Project Area

One Mile Buffer

Previous surveys

2003-246.ASM

2000-246.ASM

Kingman SW, AZ (1983 PR)
USGS 1:24,000
7.5' Quadrangle
Projection: NAD27 UTM Z11

Figure 2. Previous research within one mile of the project area.

Table 1. Previous Surveys within One Mile of the Current Project Area

ASM Project No.	Institution	Report Reference	Description
2000-246	None listed on registration form	Christenson 2000	Archaeological survey for a corrections facility and sewer treatment plant.
2003-246	Soil Systems, Inc.	Foster et al. 1993	Survey for a fiber optic line from Las Vegas, Nevada to Phoenix, Arizona.

RESOURCE EVALUATION CRITERIA

Cultural properties identified during the survey were evaluated in accordance with standards established by ASM for state-administered land. These standards require a property to be at least 50 years old. If, in addition, the property includes at least 30 artifacts of a single type (i.e., ceramics or lithics), representing the remains of more than a single episode of activity (i.e., the dropping of a single pot, or the reduction of a single core into lithic artifacts); or at least 20 artifacts, when two or more artifact types are present; or a single fixed feature, with any number of artifacts in association; or more than one fixed feature, with or without artifacts in association, then the property must be recorded as an archaeological *site*. A property of sufficient age that does not meet with any of these additional criteria may be recorded as an *isolated occurrence* (IO), although, if such a property is considered to be of particular interest for some other reason, it may be recorded as a site as well, at the discretion of the recorder.

Cultural properties were further evaluated with regard to significance, which is assessed largely in terms of a property's eligibility for inclusion on the National Register of Historic Places (NRHP). The NRHP website defines the Register as "the Nation's official list of cultural resources worthy of preservation." It goes on to explain the criteria by which properties are evaluated:

> The National Register's standards for evaluating the significance of properties were developed to recognize the accomplishments of all peoples who have made a significant contribution to our country's history and heritage. The criteria are designed to guide State and local governments, Federal agencies, and others in evaluating potential entries in the National Register. . . .
>
> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> **A.** That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> **B.** That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded or may be likely to yield, information important in prehistory or history. (National Register 2005)

In other words, a site's significance is dependent on its *integrity*—its retention of its essential form and construction, and its continued presence in the setting it was intended to occupy—and on its *cultural significance*, whether readily apparent or hidden in its potential to yield information. Note that isolated occurrences are generally considered ineligible for inclusion on the NRHP, as any IO that possessed enough significance to qualify would also possess enough to justify its being recorded as a site.

SURVEY METHODS

The survey was conducted in accordance with standards established by ASM for pedestrian surveys. According to these standards, 100 percent coverage of an area can be claimed if the entire area is surveyed by a crew walking transects spaced no more than 20 meters (66 ft) apart. Transects were marked with biodegradable flagging to ensure complete coverage of the surveyed area. Transects were walked in a north-south direction to minimize glare from the sun.

The one site identified during this survey was marked in the field using a datum that consists of an 18-inch piece of rebar firmly planted in the ground and topped with an orange-colored plastic cap. The position of the datum was recorded using a hand-held Global Positioning System (GPS) receiver. The site was mapped using the compass and pace method. Photographs of the site were taken in both 35-mm black and white and digital color formats. The crew recorded information about the site on Tierra's standard survey forms. Because of the limited nature of the site, Tierra's flaked stone analyst Marie-Blanche Roudaut conducted an inventory of all artifacts found on the surface.

The location of isolated occurrences was recorded using a hand-held GPS receiver. IOs numbers reflect the number assigned to the point by the GPS receiver.

SURVEY RESULTS

One archaeological site and two isolated occurrences were identified during the survey (Figure 3).

AZ F:16:89(ASM)

UTM Coordinates: [redacted]
Site Type: Flaked stone artifact scatters
Inferred Function: Resource processing and stone tool manufacture
Inferred Age: Unknown

AZ F:16:89(ASM) consists of a scatter of 29 pieces of flaked stone found concentrated in a 5.75 by 4.0 meter (18.9 by 13.1 ft) area. One additional piece of flaked stone is found outside of the concentration approximately 1.75 meters (5.7 ft) to the southeast. The site is on a low colluvial ridge that trends from the northeast to the southwest that borders an unnamed abraded drainage to the south (Figure 4). The primary vegetation on the site is creosote bush, however, acacia, pencil

pencil cholla, and annual grasses are found along the drainage to the south. Surface sediments are unconsolidated colluvium of small to medium cobbles, pebbles, gravel, and silty sand. No evidence of erosion or aggradation is present, suggesting a stable surface.

An inventory of the flaked stone found at the site by material and type is found in Table 2. All but two of the specimens are rhyolite, with a red colored and a purplish colored, both with phinocrysts, present. All rhyolite is extremely fine grained, indicating that it is very good quality flaking material. The other material type is a white quartzite. Sixteen (53 percent) of the flakes exhibit use wear, with four of the flakes exhibiting steep edges that are good for scraping. The size for complete specimens ranges from two to nine centimeters.

Table 2. Flaked Stone at AZ F:16:89(ASM)

Material/type	Non-cortical	Cortical	Total
Rhyolite angular debris	3	4	7
Rhyolite flake fragments	4	4	8
Rhyolite complete flakes	10	3	13
Quartzite complete flakes	2	-	2
Total	**19**	**11**	**30**

The site is in good condition, with all the pieces of flaked stone likely in or near the original area where they were discarded. The presence of flakes with use wear along with debitage indicates that both resource processing and flake stone tool manufacture took place at the site. None of the artifacts are diagnostic, however, and we are unable to accurately assign a temporal phase or period to the site. This type of site, found on a stable surface, indicates that there is no depth and additional buried cultural deposits are extremely unlikely.

Isolated Occurrences

Two isolated occurrences (IO) where identified during the survey. IO 7 is a butterscotch-colored chert core with battered edges, indicating that the core was spent. The core was found on a colluvial ridge overlooking an unnamed drainage to the south at [redacted] Other pieces of butterscotch colored chert that had not been flaked were found along this same wash. However, these pieces contain quartz inclusions making it undesirable for stone tool manufacture.

IO 8 is a small rock ring found along the east side of Sacramento Road at [redacted]. The ring is constructed of 31 basalt cobbles that are 10 to 20 centimeters in length. The ring has an internal diameter of 37 centimeters, and an external diameter of 60 centimeters. All rocks are embedded in the surface. No artifacts, charcoal, ash, or other sediment discoloration were found in association with this feature. The size and shape of the rock ring, and its presence near the dirt road which marks the edge of a section, suggest that it may have been a survey marker. Although the rocks of the ring are embedded in the surface, it is found in an area of sheetwash (silty sand with few small pieces of gravel) suggesting the rock ring may be modern.

SUMMARY AND RECOMMENDATIONS

One archaeological site and two isolated occurrences were identified during the survey. The site, AZ F:16:89(ASM), is a surface scatter of flaked stone. Tierra recommends that the cultural resource survey has adequately sampled the site, and little research potential remains. Therefore, we also recommend that the site does not meet National Register of Historic Places listing eligibility. Because no significant archaeological sites were identified during the survey, the siting of the proposed generating station anywhere within the parcel will not impact significant cultural resources. Therefore, we recommend that the proposed undertaking be allowed to proceed without any further archaeological work.

Pursuant to Arizona Revised Statue §41-865, if human remains are encountered anywhere in the project area during ground-disturbing activities, all activity shall cease in the area of the discovery and the Director of the Arizona State Museum shall be immediately notified. All ground-disturbing activities in the immediate vicinity of the discovery shall cease until a qualified archaeologist assesses the significance of the remains. Work in and around the area shall not resume until so directed by ASM personnel.

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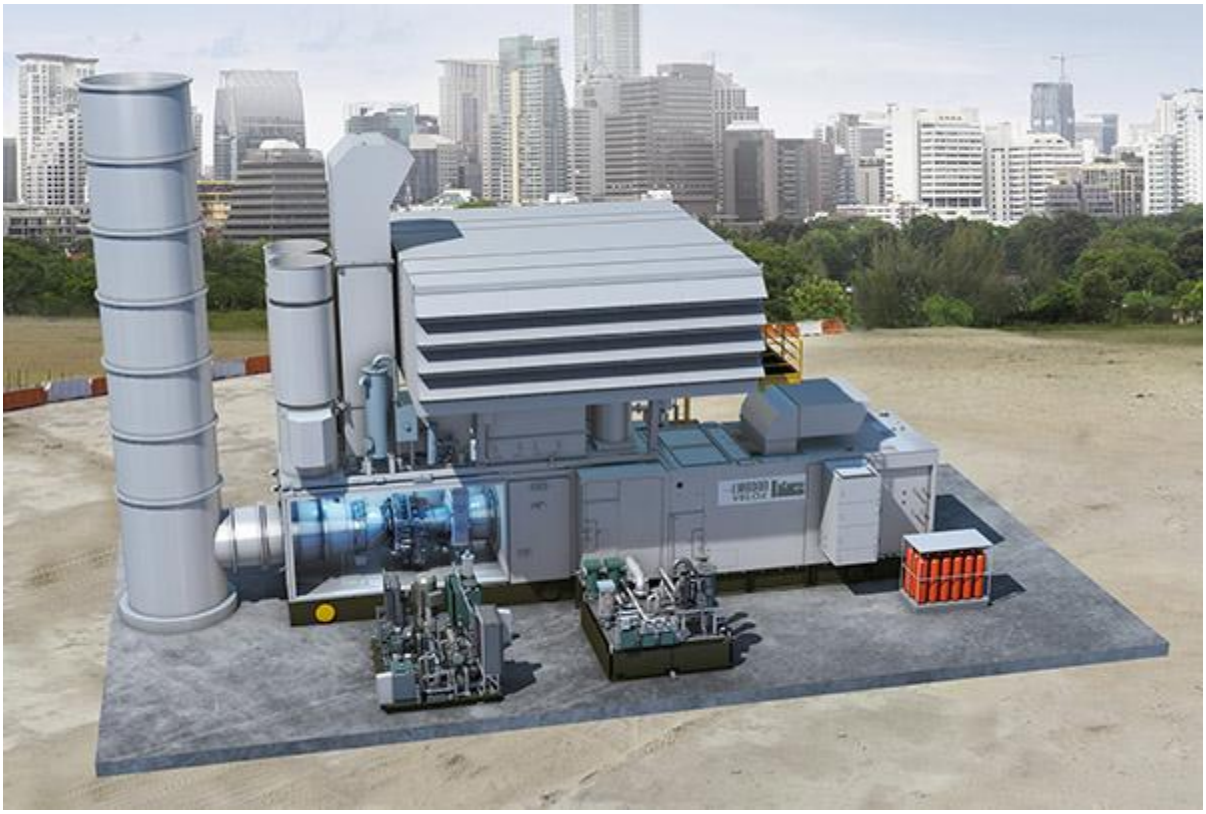
Exhibit F

To be provided with subsequent CEC application, if needed.

Exhibit G



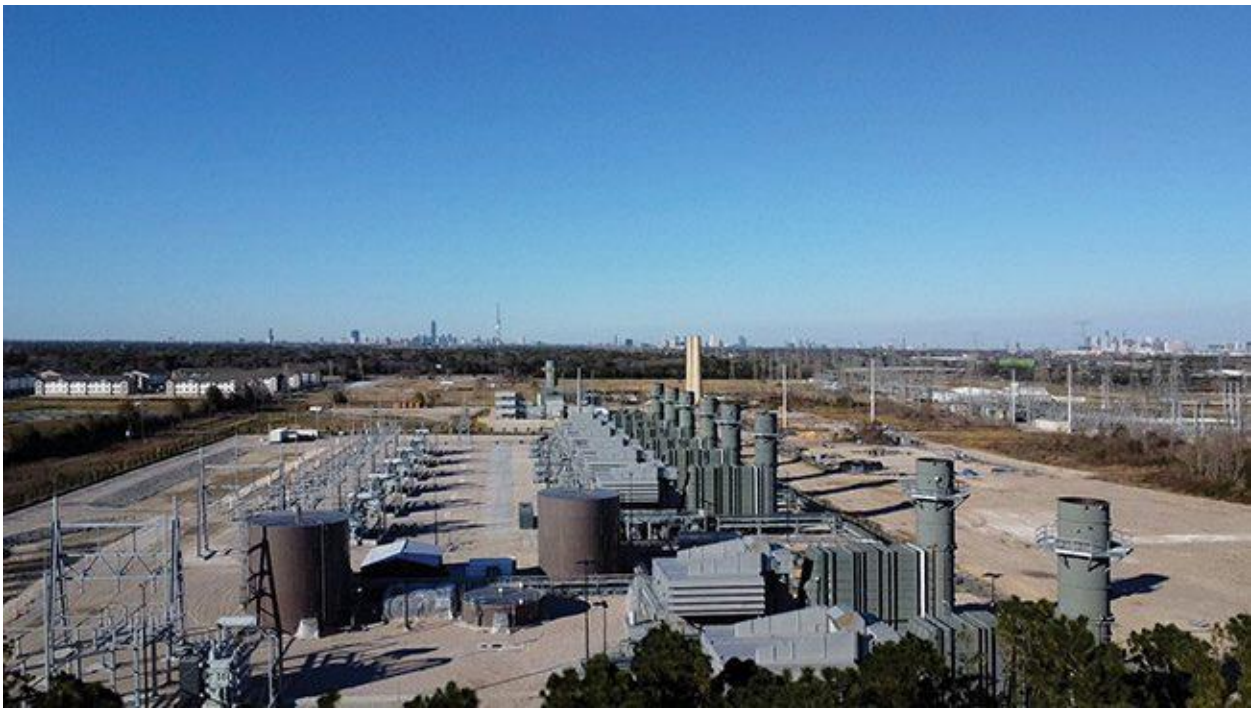


Exhibit H

To be provided with subsequent CEC application, if needed.

Exhibit I

To be provided with subsequent CEC application, if needed.

Exhibit J

To be provided with subsequent CEC application, if needed.