

ATTACHMENT F-4

SENT BY CERTIFIED MAIL

September 18, 2009

Ms. Lesley McWhirter
NM/TX Branch Chief, Regulatory Division
Albuquerque District, U.S. Army Corps of Engineers
4101 Jefferson Plaza NE
Albuquerque, NM 87109

RE: Concurrence Request for Wetlands Jurisdictional Determination; Property in
Luna County, New Mexico

Dear Ms. McWhirter:

By this letter, Sapphire Energy Company (Sapphire) requests appropriate persons in the Army Corps of Engineers review the enclosed biological survey report for a property our company is attempting to develop in Luna County, New Mexico and concur with the findings reported on the "Preliminary Jurisdictional Determination Form." This form, along with the "Wetland Determination Data Form," are included in Appendix B of the attached document.

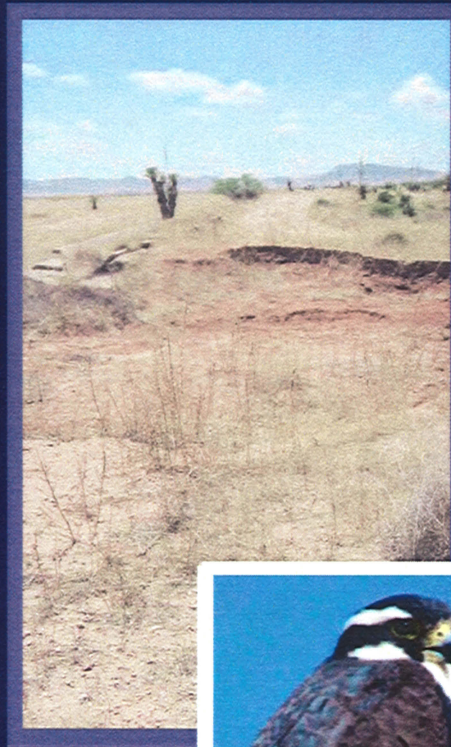
We would appreciate your timely response to this request.

Regards,

Name
Title
Sapphire Energy Company

Enc.

**Biological and
Wetland Field
Survey Report
Proposed IABR Project
Cooper Ranch Property
Luna County,
New Mexico**



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AMEC Geomatrix

**BIOLOGICAL AND WETLAND FIELD SURVEY REPORT
PROPOSED IABR PROJECT
COOPER RANCH PROPERTY
LUNA COUNTY, NEW MEXICO**

Prepared for:

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AMEC Geomatrix

September 2009

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- APPENDIX A – Photographs of Project Area
- APPENDIX B – Wetland Determination Data Forms

1.0 INTRODUCTION

Sapphire Energy Company (Sapphire) proposes to construct and operate an Integrated Algal Biorefinery Facility (IABR) to produce oil from algae, ultimately refining the oil into various types of transportation fuels. The proposed project is located in Luna County, New Mexico, southwest of the village of Columbus (Sections 8 and 9, Township 29 North, Range 9 West) (**Figure I**). As part of environmental compliance, Sapphire contracted with AMEC Geomatrix Inc (AMEC Geomatrix) to conduct biological field surveys and wetland surveys of the project area. AMEC Geomatrix biologists conducted reconnaissance studies of the proposed project area (the Property) in March, 2009 and field surveys on June 2 through 5 and September 9 through 11, 2009 to:

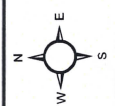
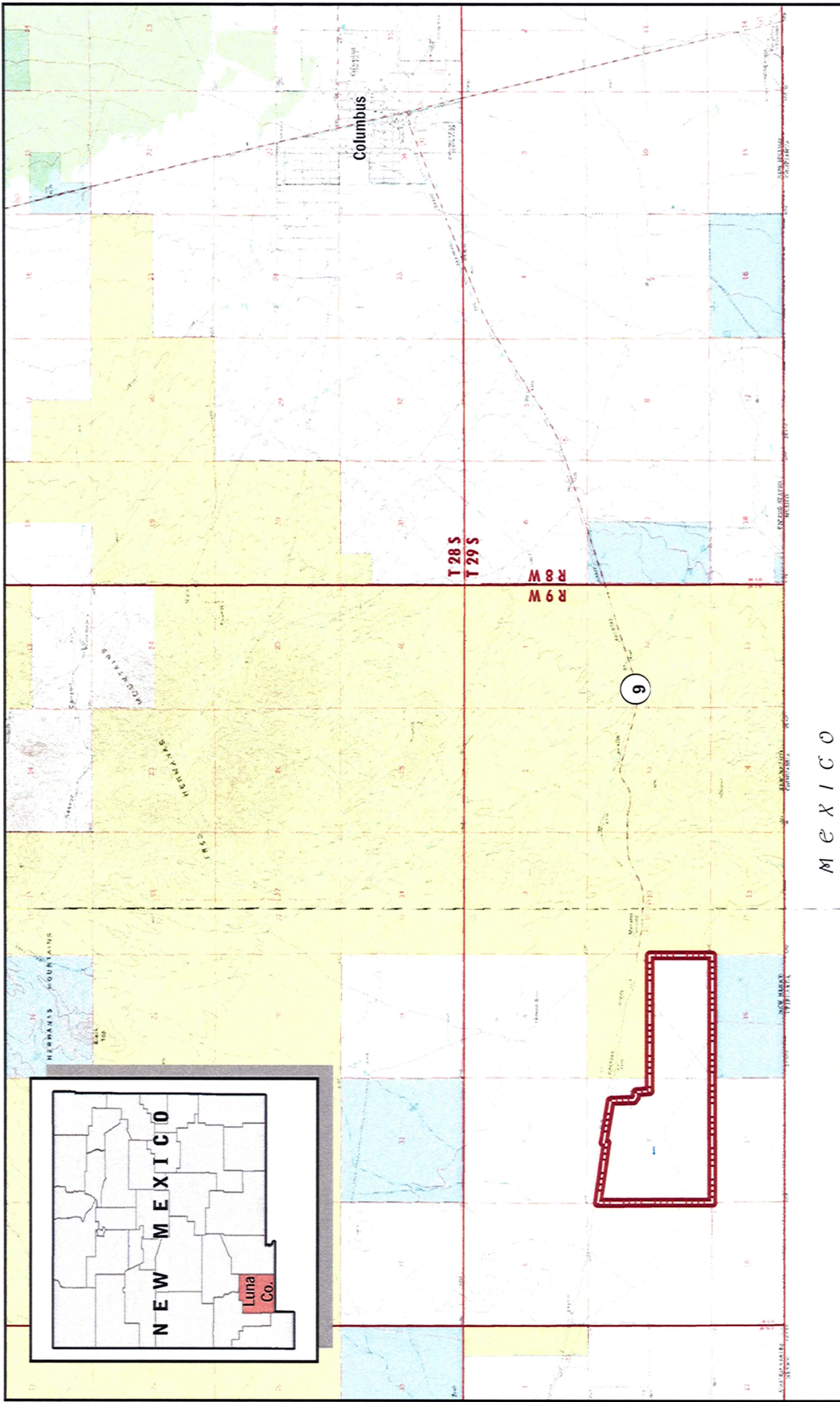
- Assess species of birds and other wildlife on and near the Property;
- Evaluate potential foraging and nesting habitat for the Aplomado falcon and other species protected under the Endangered Species Act of 1973;
- Assess habitat suitability for plant and animal species of conservation concern to the state of New Mexico;
- Conduct a survey for plant species of concern and identify dominant plant species; and,
- Identify and map wetlands and other waters of the United States that may be present on the Property.

This report presents findings from the June and September 2009 field surveys. The data presented herein and information reported in the scientific literature will be used as the basis for preparing portions of permit applications and environmental assessments related to the potential development of the Property as an IABR. Also included in this report are descriptions of agency consultations likely to be needed to fill data gaps to support the needs of various agency requirements for the possible development of the Property.





1.1 PROJECT AREA DESCRIPTION

The proposed project area lies within the Basin and Range physiographic province, which is characterized by low parallel mountain ranges separated by flat desert plains. The general terrain exhibits low relief with drainage flowing to the southeast. The site occurs within the Chihuahuan Desert Ecoregion and habitat is ecotonal between Chihuahuan semi-desert grassland and Chihuahuan desertscrub.

Ecological conditions of the part of the Property proposed for development have been altered by past land uses that have removed the original cover of native vegetation from the site. All of the property south of the east-west paved highway was used to produce irrigated crops until 1971, when farming was



AMEC Geomatrix

-  Cooper Property
-  Bureau of Land Management
-  State of New Mexico
-  Private

Location Map
 Sapphire Energy
 Cooper Property
 Luna County, New Mexico
FIGURE 1

discontinued and the site was allowed to colonize with invasive plants typical of soil that has been tilled. Much of the property contains dense stands of invasive species with low densities of native plants (**Photographs 1 and 2, Appendix A**). The species composition and canopy structure of vegetation on the property differs from native plant communities on adjacent state and federally managed public land (**Photograph 3 and 4, Appendix A**). Native vegetation on adjacent land is typical of the Semidesert Grassland and Chihuahuan Desertscrub (Brown 1982).

1.2 METHODS

1.2.1 Wildlife Observations

Observations of wildlife or their sign (e.g., tracks, scats, skeletal remains, and carcasses) including small mammals, and herps (amphibians and reptiles) were made while conducting avian surveys, vegetation surveys, walking transects, driving between sampling points, and during other phases of baseline data collection.

1.2.2 Avian Point Counts

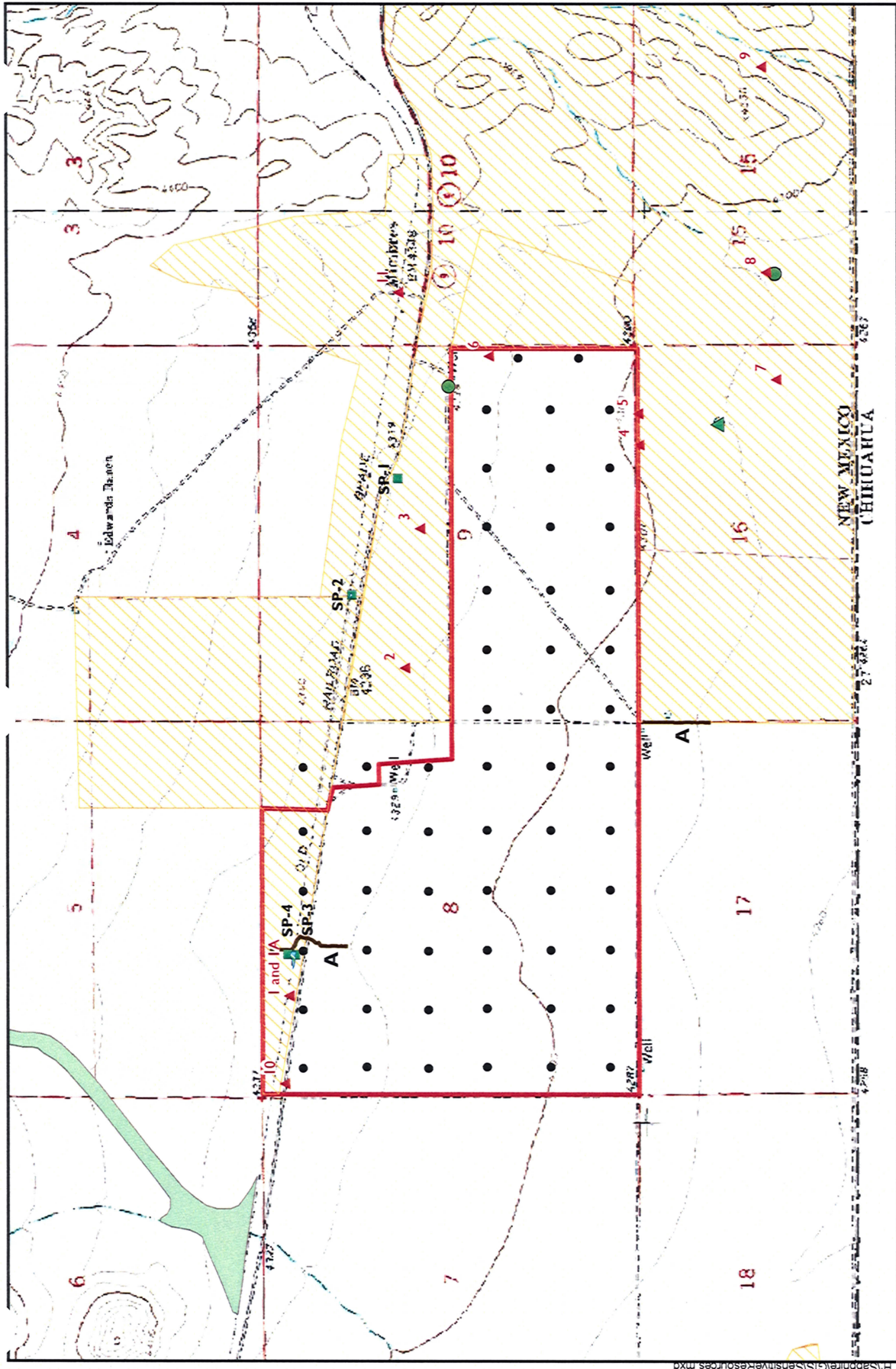
Avian surveys were conducted in June 2009 utilizing standard point-count methods. Sampling locations were spaced 250 meters apart, 125 meters from the Property fence line. All species observed visually or aurally within a 125-meter radius were recorded, along with the bird's distance from the observer and the bird's activity. Surveys were conducted for five minutes at each sampling station following a one minute listening period to allow birds to acclimate to the surveyor's presence. Surveys were conducted within the first three to four hours following sunrise; a total of 56 sampling points were used in completing the survey (**Figure 2**).

1.2.3 Vegetation Surveys

Surveys for New Mexico state-listed plant species potentially occurring on the Property were conducted using survey transects spaced at approximately 100 meters. Wetlands, other waters of the U.S., and wildlife habitat were also evaluated during these surveys. Dominant and subdominant vegetation was noted and infrequent plants were identified to determine if plant species of conservation concern are present on the Property. Taxonomic references included the Flora of Arizona (Kearney and Peebles 1960), A Flora of New Mexico (Martin and Hutchens 1980) the Flora of North America (http://www.efloras.org/flora_page.aspx?flora_id=1). Taxonomic nomenclature follows USDA Plants (<http://plants.usda.gov/checklist.html>).

1.2.4 Wetland Surveys

Potential wetlands and other waters of the U.S. were surveyed along 100-meter transects within the Property boundaries. Special attention was directed towards drainages and low spots on topographic maps or indicated as a National Wetland Inventory (NWI) wetland. Potential wetlands were evaluated by following the methodology for the on-site determination outlined in the U.S. Army Corps of



Sensitive Resources Map
Sapphire Energy
Cooper Property
Luna County, New Mexico
FIGURE 2

Cooper Property
 Wetlands
 100 Year Floodplain
 Aplomado Suitable Falcon Habitat

Wetlands (As mapped by National Wetland Inventory)
 Palustrine Flat Wetland
 Palustrine Open Water Wetland
 100 Year Floodplain
 Aplomado Suitable Falcon Habitat

Wetland Sample Point (SP-1)
 Avian Point-Count Survey Locations
 Potential Aplomado Falcon Nest Sites
 Erosional Feature

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Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2) (Environmental Laboratory 2008). These methods require an area to have positive indicators of hydrophytic vegetation, hydric soils, and wetland hydrology to satisfy the criteria for jurisdictional wetlands regulated under the Section 404 of the Clean Water Act.

1.2.5 Wetland Vegetation

The U.S. Fish and Wildlife Service classified vegetation according to its frequency of occurrence in wetlands (Reed 1988). Plant species have been given wetland indicator status of either obligate wetland (OBL), facultative wetlands (FACW), facultative (FAC), facultative upland (FACU), or upland (UPL) based on probabilities of occurring in wetlands. Definitions of wetland indicator status of plants are shown in **Table I**. The Natural Resources Conservation Service (NRCS) has also compiled a list of plants and their wetland indicator status for Region 7. The NRCS list for Region 7 was used to determine wetland indicator status for plants at sites evaluated on the Property for jurisdictional wetlands.

Table I: Plant Indicator Definitions

Indicator Symbol	Indicator Status	Definition
OBL	Obligate	Species that occur almost always (probability >99 %) in wetlands under natural conditions.
FACW	Facultative wetland	Species that usually occur in wetlands (probability 67 to 99 %), but occasionally found in non-wetlands
FAC	Facultative	Species that are equally likely to occur in wetlands and non-wetlands (probability 33 to 66 %).
FACU	Facultative upland	Species that usually occur in non-wetlands (probability 67 to 99 %), but occasionally found in wetlands
UPL	Upland	Species that occur almost always in non-wetlands under normal conditions (probability >99 %).
NI	No indicator	Species for which insufficient information was available to determine indicator status

1.2.6 Soils

Soils in the project area were evaluated for hydric conditions by digging holes 20-inches deep and recording soil colors based on Munsell Color Chart comparisons and observing soil textural and hydrological features (saturation depth).

1.2.7 Hydrology

Criteria for wetland hydrology require that jurisdictional wetlands have permanent or periodic inundation or soil saturation for a significant period of the growing season. Wetland hydrology may be supplied by surface water, groundwater, and direct precipitation

1.2.8 Significant Nexus Determinations

Significant nexus determinations were made for drainage features to determine if they have a surface connection to traditionally navigable waters of the United States. Significant nexus determinations were made by examining the topography and spatial extent of erosional features (ephemeral drainages) and plant communities adjacent to the wetlands. Information in the U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Handbook was reviewed to assist in nexus determinations.

2.0 WILDLIFE AND VEGETATION

2.1 SPECIES OBSERVED IN PROJECT AREA

Species diversity of wildlife within the Property is low, reflecting habitat conditions with limited breeding and foraging capacity for many species. Wildlife or their sign encountered during the site visit includes the striped skunk (*Mephitis mephitis*), deer (unknown species, tracks only), the banner-tailed kangaroo rat (*Dipodomys spectabilis*), roundtail horned lizard (*Phrynosoma modestum*), Texas horned lizard (*Phrynosoma cornutum*), coyote (*Canis latrans*), green cicada (*Sphecius grandis*), tarantula wasp (*Pepsis* sp.), grasshoppers, harvester ants, prairie rattlesnake (*Crotalus viridis*), black-tailed jackrabbit (*Lepus californicus*), northern earless lizard (*Holbrookia maculata maculata*), and tarantulas (*Aphonopelma* sp.).

2.2 FEDERAL AND STATE SPECIES OF CONSERVATION CONCERN

No plant species protected under the Endangered Species Act are likely to inhabit the Project Area and federally designated critical habitat does not occur on the Property. **Table 2** lists federal and state species of conservation concern known or with the potential to be present in the Mimbres Basin.

According to the New Mexico Rare Plant Technical Council (NMRPTC), five special status species are known to occur within the project vicinity. Three of these species are considered Species of Concern by the USFWS and the State of New Mexico. Species that have been confirmed to be present in the northeast portion of the Mimbres Basin by NMRPTC are the grayish-white giant hyssop (*Agastache cana*), Orcutt pincushion cactus (*Escobaria orcuttii*), Chihuahua scurf pea (*Pediomelum pentaphyllum*), and Griffith's saltbush (*Atriplex griffithsii*). The dune prickly pear (*Opuntia arenaria*) and night-blooming cereus (*Peniocereus greggii* var. *greggii*), have documented occurrences near the Project Area and are considered Species of Concern by the USFWS and Endangered by the State of New Mexico.