

**DESERT TORTOISE, WESTERN BURROWING OWL, DESERT KIT  
FOX, AND AMERICAN BADGER PRESENCE/ABSENCE SURVEY  
FOR THE ACE PHOENIX PROJECT  
SAN BERNARDINO COUNTY, CALIFORNIA**

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## 1.0 INTRODUCTION

AECOM performed a wildlife presence/absence survey for ACE Cogeneration – Trona Operating Partners, who is preparing an Application for Certification (AFC) with the California Energy Commission (CEC) for the proposed ACE Phoenix Project (Project). The proposed Project would consist of a new natural-gas-fired power plant on the current ACE Cogeneration’s site (approximately 25 acres), with 60 acres of the remaining plant property and approximately 190 acres of Searles Valley Minerals (SVM) land to the west and north of the ACE site to be potentially used as a solar field. The repowering project would replace the existing coal-fired generation facility with a natural gas-fired combined-cycle power plant and up to 40 megawatts (MW) of solar power (using a technology yet to be determined).

An approximately 3.6-mile-long natural gas pipeline would also be associated with the Project. AECOM also performed a wildlife presence/absence survey on behalf of the Pacific Gas and Electric Company (PG&E) along the pipeline route. This and other environmental work will be used by Trona Operating Partners in the permitting of the power plant and all related facilities and by PG&E in any permits required for upgrading the natural gas pipeline.

## 2.0 SITE DESCRIPTION

The proposed Project will be located approximately 18 miles northeast of Ridgecrest along the State Route 178 (SR-178) corridor near the towns of Argus and Trona, San Bernardino County, California (Figure 1; all figures can be found in Attachment 1). The proposed Project is located in the Searles Valley, and Searles Lake is located immediately to the southeast. Searles Valley and Searles Lake are bounded by the Argus Mountain Range to the west and Slate Mountain Range to the east (Figure 1).

The potential power plant portions of the proposed Project, including proposed solar field, are located just north of SR-178 and are divided up into nine areas (Figure 2). These nine areas collectively make up the power plant site for the Project and are referred to as the “Plant Site” in this report. These areas are located on private land owned by ACE Cogeneration or SVM.

The northern end of the proposed natural gas pipeline corridor begins at the Trona District Regulator Station just northeast of the intersection of First Street and SR-178 in Argus, California (Figure 2). The proposed pipeline corridor runs parallel to the Trona Railway and SR-178 until reaching the Westend Primary Regulator Station at the southern end in Westend, California (Figure 2). The proposed pipeline corridor is within a Pacific Gas and Electric right-

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of-way (ROW) that runs through private property, the Trona Railway ROW, and small portions of Bureau of Land Management (BLM) land.

The proposed Project is also located within BLM's West Mojave (WEMO) Plan area; specifically, it is within the North Searles Subregion (BLM 2005). The WEMO Plan is an amendment to the California Desert Conservation Area (CDCA) Plan (BLM 2005). The goal of the WEMO Plan is to protect and conserve natural resources while simultaneously balancing human uses of the California portion of the Mojave Desert ecosystem (BLM 2005). Under the Federal Land and Policy Management Act, BLM is required to develop resource management plans (BLM 2005). The CDCA Plan, as amended by the WEMO Plan, is the resource management plan for any portions of the proposed Project that overlap with BLM land. Project activities proposed on public land must be consistent with the WEMO Plan. As currently planned, the Project does not intend to develop on any lands under BLM jurisdiction.

### **3.0 ENVIRONMENTAL SETTING**

The topography of the proposed Project Area is relatively flat as a result of its location in the valley. The elevation within the proposed Project Area ranges from approximately 1,650 to 1,800 feet above mean sea level. This region has an arid climate, with cool winters and hot summers. Average annual maximum and minimum temperatures are 81.4 and 52.0 degrees Fahrenheit (°F), respectively (WRCC 2012). Average maximum and minimum temperatures range from 105.5°F and 73.3°F in July to 58.2°F and 32.9°F in January (WRCC 2012). Average annual precipitation is 3.94 inches and there is an average of 18 days annually with measurable precipitation (WRCC 2012). Approximately 75% of the rainfall occurs November through March (WRCC 2012).

Land use within and immediately south, southeast, and east of the Plant Site for the proposed Project consists of industrial development in the form of the ACE Cogeneration power plant and the SVM chemical plant. Open space generally occurs to the west and north of these areas, but has been disturbed by mineral extraction and off-road-vehicle activities. Land use within and immediately adjacent to the pipeline corridor consists of residential and/or industrial development, Trona Railway, SR-178, and disturbed open space.

A general biological site assessment was conducted on May 21, 2012, by AECOM (AECOM 2012). Based on that assessment, the proposed Project Area consists of fairly flat terrain with highly saline soils. Vegetation communities and cover types within the proposed Project Area include desert saltbush scrub, disturbed habitat, and urban/developed land (Table 1 and Figure 3). The 173 acres of desert saltbush scrub habitat is the only habitat within the Project Area that

is considered suitable habitat for wildlife species. There is very low diversity and coverage of annual plant species throughout the desert saltbush scrub community and the proposed Project Area as a whole.

**Table 1**  
**Vegetation Communities Occurring within the**  
**Proposed ACE Phoenix Project Areas and Gas Pipeline (Acres)**

Vegetation Communities and Other Cover Types	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Gas Pipeline	Total <sup>1</sup>
<b>Uplands</b>											
Desert Saltbush Scrub	-	-	-	-	34.91	32.07	7.50	30.89	33.99	33.66	173.01
<b>Other Cover Types</b>											
Disturbed Habitat	-	-	59.13	39.46	-	3.90	18.80	2.24	1.72	0.81	126.05
Urban/Developed	12.64	17.93	-	-	2.95	-	-	-	1.42	9.64	44.57
Total <sup>1</sup>	12.64	17.93	59.13	39.46	37.86	35.97	26.30	33.13	37.14	44.11	343.67

<sup>1</sup> Numbers may not sum due to rounding after summation.

#### 4.0 SPECIES BACKGROUND INFORMATION

Subsequent to a literature review and the habitat assessment conducted by AECOM (AECOM 2012), four special-status wildlife species, each with a low potential for occurrence on-site, were further evaluated to assess presence/absence within the Project Area<sup>1</sup> and associated buffers. These species are as follows:

##### Federal or State-Listed (Federal or California Endangered Species Act [ESA or CESA])

- Desert tortoise (*Gopherus agassizii*; DT) – ESA and CESA threatened

##### California Department of Fish and Game (CDFG) Species of Special Concern (SSC), California Code of Regulations, or BLM Sensitive

- Western burrowing owl (*Athene cunicularia*; WBO) – CDFG SSC, BLM Sensitive
- American badger (*Taxidea taxus*; AB) – CDFG SSC
- Desert kit fox (*Vulpes macrotis arsipus*; DKF) – State Protected Furbearing Mammal (PFM) (per California Code of Regulations [CCR] 460)

<sup>1</sup> The Power Plant Site consists of the potential nine areas that will contain the natural gas-fired power plant and the solar field. The Project Area consists of the Power Plant Site and Pipeline Route.

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Each of these species is discussed further below. Mohave ground squirrel (*Xerospermophilus mohavensis*) also has a moderate potential to occur within the Project Area; however, this species was not part of the presence/absence surveys conducted as part of this study. It will be addressed separately by the Applicant for the Project.

#### **4.1 Desert Tortoise**

DT is listed as threatened under ESA, with critical habitat designated by the U.S. Fish and Wildlife Service (USFWS) (1994a). The listing was initially made on August 4, 1989, by emergency rule (USFWS 1989 and 1990) and by final rule on April 2, 1990 (USFWS 1989 and 1990). This listing status applies to the entire population of DT except in Arizona south and east of the Colorado River, and in Mexico. An approved recovery plan was published by USFWS (1994b) with the publication of the Revised Recovery Plan of the Mojave Population of the Desert Tortoise (*Gopherus agassizii*) (USFWS 2011). DT was listed as threatened under CESA on June 22, 1989 (CFGC 1989). The Project Area is within the USFWS designated Western Mojave Recovery Unit (USFWS 2011). No federally designated critical habitat for DT occurs within the Survey Area, and the nearest critical habitat unit (CHU) is the Superior-Cronese CHU, approximately 21 miles to the south of the Project Area (Figure 4) (USFWS 2011). The Project area is not within a Desert Wildlife Management Area (DWMA) (USFWS 2011). The nearest DWMA, which corresponds with the Superior-Cronese CHU, is located approximately 21 miles to the south of the Project Area (Figure 4).

DT is widely distributed in the deserts of California, southern Nevada, extreme southwestern Utah, western and southern Arizona, and throughout most of Sonora, Mexico. However, populations began declining in the late 1960s and early 1970s over approximately 50% of its U.S. range (30% of its overall range) (USFWS 1989 and 1990, 1994b, 2011). Declines in DT abundance are mainly due to habitat destruction due to urbanization, large-scale energy projects, military operations, livestock grazing, agriculture, off-road vehicle use, disease (mainly upper respiratory tract disease), increase in wildfire frequency due to increases in nonnative plants, illegal collection by humans, climate change, and human-induced increase in raven populations as ravens can prey on young DT (USFWS 1994a, 2011).

DT occurs in a broad range of habitats, climates, and elevations. Perennial shrub cover can vary widely and can include such species as creosote bush scrub (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), blackbrush scrub (*Coleogyne ramosissima*), juniper woodland, Sinaloan thornscrub, and saltbush scrub (USFWS 2011). DT can be found on flats, slight slopes, or steep

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areas, as well as in sandy-gravel soils or on rocky outcrops. Generally, firm ground is required for the construction of burrows, but rock shelters, overhangs, deep caves, or caliche caves can also provide shelter for DT (Bury et al. 1994; Stebbins 2003). DT occurs from below sea level to elevations of 7,300 feet (Luckenbach 1982). Typical habitat for DT in the Mojave Desert is creosote bush scrub at elevations below 5,500 feet where annual precipitation ranges from 2 to 8 inches, with a high production of ephemeral plant species and a high diversity of perennial plants (Bury et al. 1994; Germano et al. 1994; Luckenbach 1982; Turner 1982; Turner and Brown 1982). DT forage on herbaceous plants (mainly winter annuals, but also perennial grasses, woody perennials, and cacti), so the habitat must have a shrub layer open enough for the establishment of ephemeral plant species for forage (Germano et al. 1994; USFWS 1994a). A high level of recent disturbance (e.g., grazing) may reduce the biomass and quality of ephemeral plant forage for DT.

DT home range varies with locality, year, resource availability, and social interactions (Berry 1986; O'Connor et al. 1994). Male DT home range (0.04–0.31 square mile) is estimated to be twice the size as that for females (Berry 1986; Burge 1977). DT uses multiple dens throughout individual home ranges, and appears to migrate to steeper, rockier slopes in the winter (Barrett 1990).

#### **4.2 Western Burrowing Owl**

WBO is designated as a species of special concern (Priority 2 Bird Species of Special Concern) by CDFG due to rapid habitat loss and degradation from urbanization; it is also designated as sensitive by BLM. WBO habitat consists of annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation (CBOC 1993; Haug et al. 1993; Zarn 1974). Suitable WBO habitat may also include trees and shrubs if the canopy covers less than 30% of the ground surface (DeSante et al. 1996). Burrows are the essential component of WBO habitat, and both natural and artificial burrows provide protection, shelter, and nests. WBO typically use burrows made by mammals such as kit foxes, ground squirrels, or badgers, but also may use human-made structures such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement (Collins and Landry 1977; Trulio 1994). Where the ranges of WBO and DT overlap, WBO also use DT burrows. Small, scattered populations of WBO occur in the Mojave Desert. Although the WBO population in the southern desert region is primarily resident (i.e., present year-round), some migration from northern populations to this area occurs during winter (Center for Biological Diversity et al. 2003, citing Garrett and Dunn 1981). Seasonal non-migration movements and shifts in burrow use by juveniles and adults

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within a region also occur. Population density seems to be correlated with prey availability, particularly small mammals (Klute et al. 2003).

### **4.3 Desert Kit Fox**

DKF is a protected furbearing mammal. Suitable habitat for this fossorial mammal consists of arid open areas, shrub grassland, and desert ecosystems. DKF diet consists mostly of small rodents, especially kangaroo rat. DKF will also eat rabbits, lizards, insects, and berries. It digs large burrows in open, level areas, typically in sandy and loamy soils. DKF are primarily nocturnal, with home ranges ranging between 1.0 to 2.0 square miles (Morrell 1972). DKF use multiples dens throughout the year, and may move between dens on a nightly basis during the nonbreeding season. Dens have multiple entrances, and entrances are up to 8 inches wide and often keyhole-shaped. Litters of three to five young are born in February or March (Egoscue 1962; McGrew 1979).

### **4.4 American Badger**

AB, a California species of special concern, is a carnivore in the family Mustelidae (weasels). AB range is throughout California, except for the humid forested regions in the state's extreme northwest (Larsen 1987). AB spends much of its time underground, where it preys primarily on ground squirrels (*Spermophilus* spp.) and pocket gophers (*Thomomys* spp.), although it may also eat other rodents, reptiles, birds, eggs, insects, and carrion (Williams 1986). The front legs of AB have large claws adapted for digging after prey in underground burrows, and it may dig extensively within levees, fields, and other areas with high concentrations of fossorial rodents (Jameson and Peeters 2004). AB is active year-round, although it tends to have smaller home ranges in winter than in other seasons (Zeiner et al. 1990). Mating takes place in late summer, and one to four young are born in spring within a burrow complex, usually in areas of sparse overstory cover (Jameson and Peeters 2004; Zeiner et al. 1990).

## **5.0 SURVEY METHODOLOGY**

AECOM conducted a literature review and a habitat assessment in May 2012 to evaluate biological resources within the Project Area, including the potential for special-status species (AECOM 2012). The information in the preliminary habitat assessment was used to further define the need for additional surveys within the Project Area. Following discussions with the resource agencies, including CEC, CDFG and USFWS, additional studies were proposed to further evaluate the potential for special-status species on-site, including an initial presence/absence survey for DT, WBO, DKF, and AB to be conducted as soon as possible per discussions with the USFWS (Guigliano 2012).

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Per the USFWS 2010 DT protocol, if the action area is larger than 40 acres, or if the project could affect more than two to three DTs, surveys for DT should occur during the DT active period (April through May or September through October), and surveys should be conducted when air temperatures are below 104°F (USFWS 2010). In situations where only presence/absence needs to be determined, surveys can be conducted outside of these periods with approval from the local USFWS. Surveys should be conducted using transects spaced no farther than 10 meters apart for the entire project site (100% coverage). If no DT are observed within the project area, then the USFWS protocol requires that three additional transects (spaced no greater than 10 meters apart) and transects at 200, 400, and 600 meters from the perimeter of the project site should be surveyed (USFWS 2010).

The presence/absence survey for the Project was conducted in July 2012 and was focused on sign for all four species, such as burrows, scat, tracks, and bones, in addition to live observations. Because this survey was conducted outside of the protocol survey windows for DT, AECOM consulted with the CEC, CDFG, and USFWS to identify an appropriate modified approach for assessing presence/absence of DT, WBO, DKF, and AB (Guigliano 2012). Surveys for biological resources were conducted within the Project Site and 500-foot buffer area, as well as a 525-foot buffer<sup>2</sup> of the pipeline corridor. The Project Site and associated buffer were surveyed with 100% survey coverage by spacing transects 10 meters apart along a north/south orientation within the Project Site or along transects parallel to the Project Site within the associated buffer area. In addition, the pipeline corridor was surveyed according to a modified protocol, with 100% survey coverage within the pipeline corridor and by spacing transects within the pipeline buffer at 20 meters apart parallel to the pipeline alignment. This modification to the survey protocol for the target species was agreed upon by the USFWS, CDFG and CEC prior to survey initiation (Guigliano 2012). Presence/absence surveys were completed between July 2 and July 6, 2012. The maximum range of survey temperatures ranged from 73°F to 110°F during survey hours, though on most days did not exceed 104°F during survey hours (only one day reached 110°F at 3:30 pm). Project biologists were Shelly Dayman, Gregg Lukasek, Mike Ireland, and Ron Spears (for surveyor resumes, please see Attachment 2). Although all biologists searched for any sign within the Survey Area, each surveyor provided particular strengths regarding target species to provide confidence in the detection and classification of sign.

The survey was conducted by slowly and systematically walking linear transects while surveyors visually searched for wildlife sign. Particular emphasis was placed on searching around the bases

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<sup>2</sup> This survey boundary extends to 525 feet (160 meters), which includes the 20-meter transect centered at 492 feet (150 meters).

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of shrubs and along the banks of shallow washes. When any sign was located, all four surveyors convened on the location to evaluate the finding. All types of sign were recorded using a Global Positioning System (GPS) unit. Surveys were conducted throughout the day. Photographs of unusual sign were taken. For DT, sign was classified using the Information Index for Desert Tortoise Sign in the USFWS protocol (USFWS 1992) (Attachment 3). Field datasheets are provided as Attachment 4.

The 10-meter transects in the Plant Site and associated buffer adhere to protocol spacing for DT, WBO, DKF, and AB. Surveys within the Plant Site buffer consisted of 10-meter transects out to 500 feet, which is a more thorough search of the buffer than required by the USFWS DT protocol. The survey of the pipeline corridor buffer was conducted at 20-meter transects out to 525 feet, which is also a more thorough search of the pipeline corridor buffer than required by the DT protocol. The DT survey was in conformance with the USFWS DT survey requirements, with the exception of survey timing. As noted above, the local USFWS has the authority to allow surveys outside of the active period for DT for presence/absence surveys. Because the surveys were conducted outside of the DT active season, the surveyors also conducted a site reconnaissance at a property within the region with known presence of DT. The purpose of this reconnaissance was to define a reference site to assess the activity level of DT during the survey period. The reference site was located on public lands in the vicinity of Ridgecrest, California. During the site reconnaissance at the reference site on July 6, 2012, two adult DT were located within known burrow locations and found to be active during surveyor observations.

## **6.0 RESULTS**

During habitat assessments in May 2012, it was determined that the portion of the proposed Survey Area (Project Area and associated buffers) that contains desert salt bush scrub habitat may be suitable habitat for DT, WBO, DKF, and AB, although there would be a low potential for these species to occur within the Survey Area. The existing coal-fired cogeneration Plant Site, adjacent mineral processing facility, developed lands in the communities of Trona and Argus, much of the ash landfills and the Searles Lake bed do not contain suitable habitat. DT abundance within this region (Searles Valley) is generally considered to be low compared to DT abundance within other areas of the Mojave Desert. The Searles Valley is at the edge of the northwestern extent of the DT range. DT suitable habitat as defined by CDFG extends approximately 100 miles to the northeast of the Project area and about 50 miles to the northwest (Figure 4). The Project Site provides suitable habitat and prey items for DKF and AB. Further, WBO typically use burrows made by DKF and AB, and also may use human-made structures such as cement culverts or openings beneath cement or asphalt pavement, all of which may occur within the

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Project site and associated buffer, and the pipeline corridor. WBO may also opportunistically use portions of the disturbed habitat if appropriate conditions exist (e.g., unprotected pipes and culverts for shelter). A summary of the observations of target species sign and burrow or den complex observations occurs below, in Table 2, and in Figures 5 and 6.

## **6.1 Desert Tortoise**

No live DT, DT remains, scat, or tracks were observed during the presence/absence surveys. No potential DT burrows were identified within the Plant Site or along the natural gas pipeline ROW. Two Class 4 potential DT burrows<sup>3</sup> and one Class 4 potential DT pallet were observed within the buffers of the pipeline and the Plant Site (Table 2; Figures 5 and 6). In addition, three potentially active DKF den complexes and two mammal burrows that may be suitable for DT were observed. However, the Class 4 potential DT burrows and pallet are in deteriorated condition and are merely the correct size and shape for DT. One of the potential DT burrows has soil from above the burrow collapsed in front of the burrow, but the entrance is still accessible. The other potential DT burrow contains caustic mined material. The potential DT pallet is a sinkhole perched on an earthen shelf adjacent to SR-178. It is possible for DT to access the three potentially active DKF den complexes and two large mammal burrows, but there was no sign indicating that this occurred.

## **6.2 Western Burrowing Owl**

No live WBO or WBO remains, wash, pellets, or feathers were observed during the presence/absence surveys. Three potentially suitable WBO burrows were detected: two within the Plant Site and one within the pipeline corridor (Figures 5 and 6); however, there was no sign indicating use by WBO. In addition, the two Class 4 potential DT burrows and three potentially active DKF den complexes may be suitable for WBO occupation; however, there is no sign indicating presence. The two large mammal burrows detected were not considered suitable for WBO due to the size of the entrance.

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<sup>3</sup> Generally, under this classification system, burrows and pallets coded by the observer as Class 4 have the potential to be DT burrows/pallets but cannot be confirmed as DT. The DT burrow classification system requires that observers determine if the burrows/pallets have been recently used and are, therefore, active burrows (there is DT sign present such as scat, tracks, etc.); if the burrows/pallets can be classed as definitely or possibly DT; and if the burrows are in good condition (i.e., could be used by a DT in the current condition) or deteriorated condition (i.e., would need modification by a DT to be used). Height, width, and depth (estimated) measurements of DT burrows/pallets were taken.

**Table 2  
Presence/Absence Survey Observations**

Burrow Type	Label	Description	Burrow Suitable For				Wildlife Sign Present				
			DT	WBO	DKF	AB	DT	WBO	DKF	AB	
Desert Tortoise Burrow (Class 4) <sup>1</sup>	TDBMI001	Class 4 DT burrow (deteriorated condition, possibly DT); shape and size correct for DT but no DT sign present; soil on top of burrow collapsed in front of burrow (entrance still accessible); not recommended for scoping <sup>2</sup> ; burrow within buffer.	yes	yes	no	no	no	no	no	no	no
Desert Tortoise Burrow (Class 4) <sup>1</sup>	TDBSD004	Class 4 DT burrow (possible DT burrow, deteriorated condition); burrow within caustic mined material (white no potash?); correct size and shape for DT but only sign within burrow and adjacent is woodrat sign; no DT sign; no further investigation of burrow <sup>2</sup> ; potential for DT extremely low.	yes	yes	no	no	no	no	no	no	no
Desert Tortoise Pallet (Class 4) <sup>1</sup>	TMASD001	Class 4 DT burrow (deteriorated condition, possibly DT); sink hole, large shelf; not a suitable burrow for WBO, AB, DKF or DT; only suitable as a pallet for DT but no sign of DT present; no sign of any species but woodrat; 48 x 48 x 24 inches.	yes	no	no	no	no	no	no	no	no
Potentially Active DKF Den Complex	TKBGL001	Unknown if burrow present; large granitic boulder with deep dark area that may contain burrow(s); lots of fresh DKF scat at base of boulder; suitable for WBO, AB, DKF (potentially active if burrow present), and DT; unknown burrow dimensions.	yes	yes	yes	yes	no	no	no	yes	no
Potentially Active DKF Den Complex	TKBRS001	Old DKF complex; only one burrow currently intact; fresh DKF scat but burrow doesn't appear well maintained; 10 x 12 inches x unknown depth; suitable for WBO, DKF (potentially active) and DT.	yes	yes	yes	no	no	no	no	yes	no
Potentially Active DKF Den Complex	TKBRS002	Fresh DKF scat; one burrow could be an active DKF burrow; two other intact burrows and two filled in burrows; potentially active complex for DKF; suitable for AB, WBO, and DT; potentially active burrow 12 x 10 inches x unknown depth.	yes	yes	yes	yes	no	no	no	yes	no
Burrowing Owl Burrow (Suitable)	TMARS001	Collapsed hole; no sign; woodrat scat; only suitable for WBO; 16 x 16 inches x unknown depth.	no	yes	no	no	no	no	no	no	no
Burrowing Owl Burrow (Suitable)	TMASD002	No WBO sign; woodrat scat; suitable for WBO only but no sign of use by WBO; under concrete; 12 x 15 inches x unknown depth.	no	yes	no	no	no	no	no	no	no
Burrowing Owl Burrow (Suitable)	TMASD003	Under granitic outcrop; no sign; suitable for WBO; 10 x 14 inches x unknown depth.	no	yes	no	no	no	no	no	no	no
Large Mammal Burrow	TMAGL001	Mammal burrow, probably coyote den; not a DT burrow but suitable for DT, AB, and DKF; not suitable for WBO (entrance very large); no sign present; 24 x 20 inches x unknown depth.	yes	no	yes	yes	no	no	no	no	no
Large Mammal Burrow	TMAGL002	Collapsed area; potential for DT, DKF, AB, or coyote, but no sign; not likely currently used; 24 x 24 inches x unknown depth.	yes	no	yes	yes	no	no	no	no	no

<sup>1</sup> Classified using the Information Index for Desert Tortoise burrows as in the USFWS Protocol (USFWS 1992) (Attachment 3).

<sup>2</sup> Burrows were not scoped due to burrow age and condition (Class 4) and lack of any sign or evidence of use.

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### **6.3 Desert Kit Fox**

No live DKF or DKF remains were observed during the presence/absence surveys. However, fresh scat was observed at three potential den complex locations within or adjacent to the Plant Site (Table 2; Figure 5). In addition, the two large mammal burrows observed during surveys are suitable for DKF (Table 2; Figure 6). The first of the potentially active DKF den complexes (TKBGL001) features a large granitic boulder with a large amount of fresh scat and a large, deep area that may contain burrows. The second potentially active DKF den complex (TKBRS001) is an old den complex with one active burrow and a large amount of fresh scat. The burrow is not well maintained and this location may be used as a resting location while DKF forage each day. The third potentially active DKF den complex (TKBRS002) features three intact burrows, two collapsed burrows, and some fresh scat. It is possible for DKF to access the two large mammal burrows, but there was no sign indicating presence at these two locations.

### **6.4 American Badger**

No live AB or AB remains, scat, or tracks were observed during the presence/absence surveys. Two of the three potentially active DKF den complexes and the two large mammal burrows observed during surveys are suitable for AB (Table 2). While these four locations are suitable for AB occupation, there is no sign indicating presence.

## **7.0 DISCUSSION**

### **7.1 Desert Tortoise**

Habitat suitability for DT is determined by several variables (Nussear et al. 2009): landscape attributes (slope, aspect, elevation), soil (depth, rockiness, bulk density), biotic variables (annual plant and perennial plant cover), and climate (winter precipitation, summer precipitation, and variance of precipitation).

DT in the Mojave Desert is generally found at elevations below 5,500 feet. The elevation within the proposed Project Area ranges from approximately 1,650 to 1,800 feet. The slopes and aspect of the Survey Area do not differ from areas with high DT abundance in the Mojave Desert. These variables, therefore, cannot explain the lack of DT within the Project Area and associated buffer, or the pipeline corridor.

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DT requires soils that can support burrows but also allow for excavation (Anderson et al. 2000). In some cases, DT takes advantage of existing natural shelters such as rock formations or exposed caliche soils horizons (Nussear et al. 2009). The soils within the Survey Area are suitable for burrowing. Therefore, there are no soils on-site that would limit the distribution of DT. However, no DT burrows were detected within the Plant Site, and only two disturbed, low-quality Class 4 (potential DT) burrows were detected within the buffers to the Plant Site and pipeline route. A lack of friable soils, therefore, cannot be used to explain the lack of DT within the Survey Area.

Presence of ephemeral plant species is an indicator of habitat suitability for DT because ephemeral plants are the primary components of the DT diet (Avery 1998; Esque 1994; Jennings 1997). Generally, DT habitat features a high diversity and cover of perennial plant species and high productivity of ephemeral plants. The perennial plant cover within the Project Area consists of desert saltbush scrub. The perennial plant cover is of a low density, and most shrubs observed were in poor condition, were relatively low, and did not provide as much cover as more established perennial shrub communities. Minimal ephemeral plant species for foraging were observed. Because these surveys were conducted during the summer season, it was expected that most ephemeral plants would be dried and appear to be less abundant than would be observed after the rainy season. Ephemeral plant productivity appeared to be lower than this seasonal variability would predict. While perennial plant cover of the type observed could support DT, the lack of robustness of the perennial cover and presence of a reduced ephemeral plant base could be factors contributing to the lack of DT observed within the Survey Area.

Climate is another variable that contributes to the habitat potential for DT. Average rainfall in Trona, California (1920 to June 2012) is 3.94 inches with peak rainfall in the winter (November through March). Temperatures in Trona peak in July (73.3°F to 105.5°F) and August (71.8°F to 103.3°F) (WRCC 2012a). For comparison, in Ridgecrest, California the average rainfall is 4.28 inches, with peak temperatures in July (66.1°F to 101.7°F) and August (66.1°F to 101.3°F) and peak rainfall in the winter (November through March) (WRCC 2012b). As noted above, during recent surveys in the Ridgecrest area DT were present, although DT populations at that location were determined to be 8.1 adult DT per square kilometer, considered to be a low density for DT (Karl 2010). While the average rainfall, rainfall patterns, and temperature suggest that the Project area may be similar in terms of climate to a site where DT are present, other factors related to rainfall or climate (e.g., the predictability of rainfall from year to year) may be vastly different between the two areas. However, based on information available, rainfall abundance and patterns do not appear to be contributing factors to the absence of DT in the Survey Area.

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Other factors that may contribute to lack of observation of DT in the Project Area and associated buffer include the constraints to movement to the northeast, east, and south. No suitable DT habitat exists within these areas due to residential and industrial uses. SR-178 is also a barrier to dispersal. While it is possible that a transient DT may occasionally occur in the vicinity of the Project Area, the closest documented DT occurrence is approximately 17 miles<sup>4</sup> to the south (CDFG 2012). Although soils in the area are suitable for DT burrow excavation, no DT or DT sign was observed within the Project Area. DT was found to be absent from the Project Area and associated buffer during presence/absence surveys. DT is likely absent due mainly to anthropomorphic barriers, the low-quality perennial plant community, the lack of a substantial amount of ephemeral plant biomass, and a possible low DT density within the region due to the proximity to the northern extent of the range of DT.

A recent model was created by the U.S. Geological Survey (USGS) to predict whether or not habitat would be suitable for DT based on the above mentioned variables. A predicted habitat potential index value within the range of DT in the southwestern United States based on location was created (see Figure 7 in Nussear et al. 2009). The model is limited in that the data used to create the model consists of existing survey data that is not random, consistent, or complete. The model can provide some insight into DT habitat potential; however, the accuracy of the model is based upon the adequacy of data for the area being considered or evaluated. The USGS model of DT habitat (Nussear et al. 2009) provides predicted habitat potential index values for DT with scores that range from 0.0 to 1.0, with a higher model score indicating a higher DT habitat potential. The USGS model was applied to the Project Area and it was determined that the model score varied from 0.2 to 0.9 within the Plant Site and from 0.2 to 0.7 within the pipeline corridor (Figure 7). These model score ranges are inconsistent with the survey results and inconsistent with current land uses within the Survey Area and surrounding lands. Specifically, the model scores the land that houses both the existing ACE Cogeneration Company coal-fired cogeneration power plant, the SVM mineral processing plant, and associated potash waste burial pits is 0.9. Further, in the pipeline corridor, the developed community of Argus and SVM plant at the south end of the Searles Valley are scored 0.7 while the area featuring the highest quality DT habitat (though no habitat within the Survey Area was of moderate or high quality) and rocky outcrops is scored 0.5. The model results do not represent actual conditions in the Survey Area.

While the presence/absence survey was conducted outside of the active season for DT, the surveys provided 100% coverage of the potential project disturbance area and the defined buffer area, and did not result in the detection of sign that would indicate the presence of DT within the

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<sup>4</sup> The closest recorded DT polygon, which is an estimated population area and does not include an actual confirmed DT siting, is approximately seven miles from the survey area.

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Project Area. In addition, the site reconnaissance conducted at an appropriate reference site indicated that DT is currently still active in the region, further suggesting that if DT were present, DT or at least some recent sign should have been detected during the survey effort. Based on presence of only two Class 4 DT burrows and one potential Class 4 DT pallet, all located in the buffer areas and outside of the anticipated disturbance area, and the lack of DT sign within the Survey Area, the site is considered to be absent of DT and no further surveys should be required for this species.

## **7.2 Western Burrowing Owl**

Small, scattered populations of WBO occur in the Mojave Desert. The West Mojave Plan documents 53 records of WBO in the east Mojave Desert (Campbell 2004), only five of which are confirmed breeding pairs. Population density seems to be correlated with prey availability, particularly small mammals (Klute et al. 2003). Within the Survey Area, there are few potential burrows for WBO to use. The habitat is open enough for WBO, but lacks the presence of burrows to support breeding WBO and winter shelter, and there is little evidence of suitable prey availability. Although suitable locations for WBO exist, no definitive sign for this species was observed; the closest documented WBO occurrence is approximately 13 miles to the southwest (CDFG 2012).

Presence/absence surveys provided 100% coverage of suitable habitat within the potential Project Area and the defined buffer area, and did not result in the detection of sign that would indicate the presence of WBO within the Project Area. Based on presence of only three potential WBO burrow and lack of WBO sign within the Survey Area, no further surveys are proposed for WBO. However, it is recommended that preconstruction clearance surveys be conducted to verify that no WBO are present on-site that would require passive relocation and associated compensatory mitigation.

## **7.3 Desert Kit Fox**

DKF habitat generally consists of arid open areas, shrub grassland, and desert ecosystems. The desert saltbush scrub habitat present throughout the Survey Area is considered suitable habitat. With three potentially active DKF den complexes observed with fresh scat at each location, it is likely DKF is foraging on and occupying the Survey Area. DKF diet consists mostly of small rodents, especially kangaroo rat. DKF will also eat rabbits, lizards, and insects. This limited prey base makes it likely that the number of DKF or DKF pairs occupying the Survey Area and vicinity is small.

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Presence/absence surveys provided 100% coverage of the potential Project Area and the defined buffer area. Potentially active DKF complexes were detected within and adjacent to the Plant Site. No further surveys are proposed; however, it is recommended that preconstruction clearance surveys be conducted to determine if DKF are present on-site that would require passive relocation. A DKF Management and Monitoring Plan should be prepared prior to a preconstruction clearance survey that identifies the methods to be used for preconstruction surveys, den complex classification, monitoring, and passive relocation.

#### **7.4 American Badger**

Within the Survey Area, there are few potential burrows for AB to use. Further, no evidence of burrows showing predation events (e.g., claw marks or excavation) was observed, and prey species for AB are scarce in the Survey Area (rabbits, kangaroo rats, mice). Although suitable burrow locations for AB exist, no definitive sign for this species was observed; the closest documented AB occurrence is approximately 23 miles to the southwest (CDFG 2012), and AB are unlikely to be present within the Project Area.

Presence/absence surveys provided 100% coverage of the potential Project Area and the defined buffer area, and no sign of AB were observed. No further AB surveys are proposed. Preconstruction clearance surveys for WBO and DKF would also identify AB, if present on-site. AB could be added to the DKF Management and Monitoring Plan to facilitate appropriate relocation and monitoring measures, if necessary.

### **8.0 CONCLUSION**

Presence/absence surveys were conducted in July 2012 to evaluate the presence of four target species: DT, WBO, DKF, and AB. The presence/absence surveys provided 100% coverage of the Survey Area, including the Project Area as well as a 500-foot buffer.. The transect surveys were conducted by biologists with appropriate experience in conducting surveys for DT, WBO, DKF, and/or AB. All sign detected was verified by all four biologists for appropriate species classification.

All sign detected during transect surveys was identified and recorded. Only 11 sightings of sign for all species were detected within the Survey Area, consisting of nine suitable burrows for DT, WBO, DKF, or AB; one Class 4 DT pallet; and recent DKF scat, as noted in Table 2. Outside of a few generally poor-quality suitable burrows, no sign for DT, WBO, or AB was detected within

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the Survey Area. Based on survey findings, the potential for DT, WBO, or AB to occur on-site is considered very low, and they are currently considered absent from the Project Area. Although no live DKF were observed, recent sign suggests that this species is potentially present.

Based on species survey requirements, historical sightings of target species, the very low potential for occurrence, the level of survey coverage during the presence/absence survey, and the lack of detection of sign for the target species, no further surveys are proposed, with the exception of preconstruction clearance surveys for WBO, DFK and AB, as identified above.

## **9.0 CERTIFICATION STATEMENT**

Qualified AECOM biologists who conducted DT, WBO, DFK, and AB surveys for the ACE Phoenix Project certify that the information in this survey report fully and accurately represents the work performed by AECOM biologists. The results of presence/absence surveys for listed species are typically considered valid for 1 year by the resource agencies. Please see Attachment 2 for biologist resumes.

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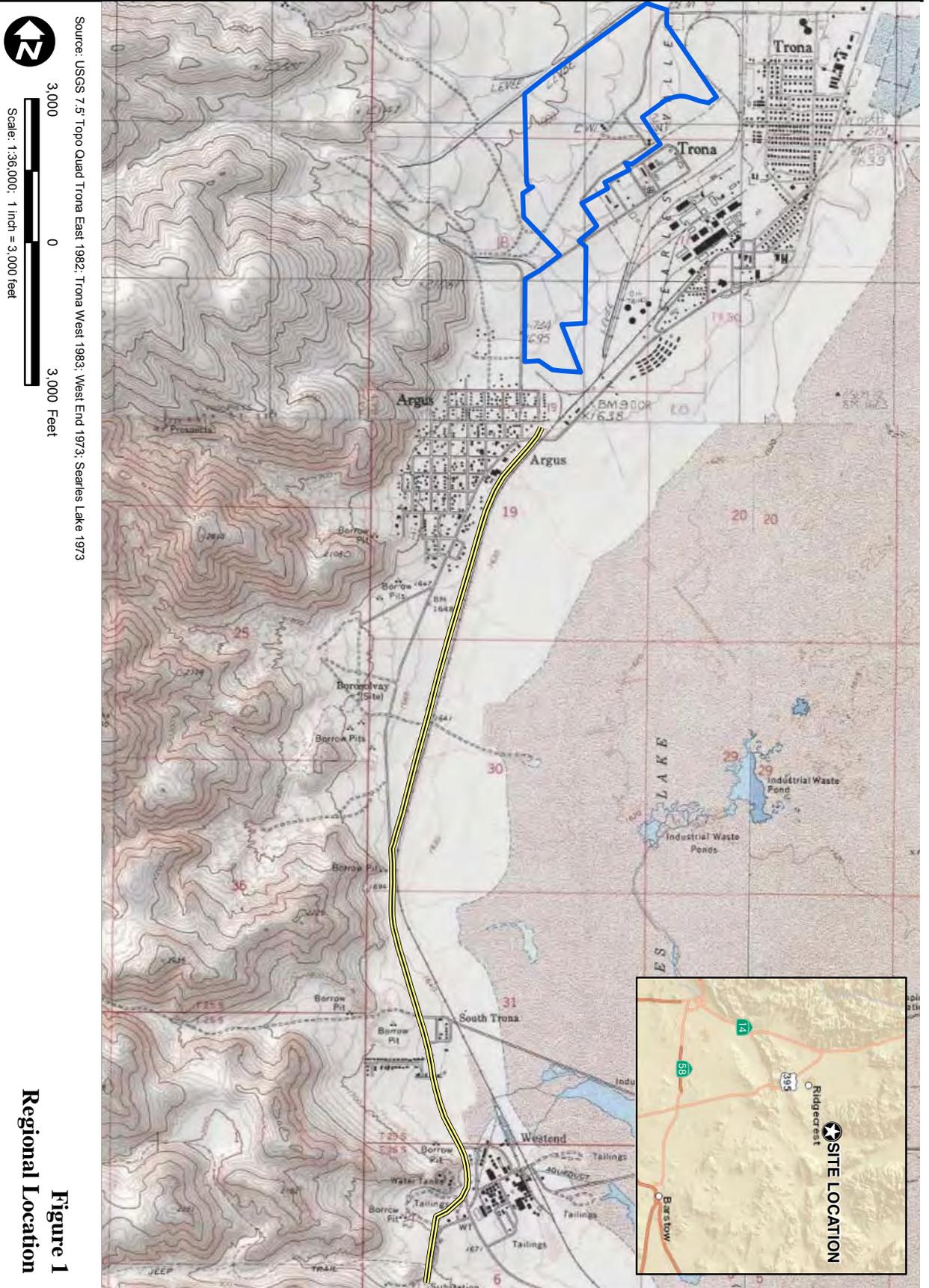
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**ATTACHMENT 1**

**FIGURES**





**Figure 1**  
**Regional Location**



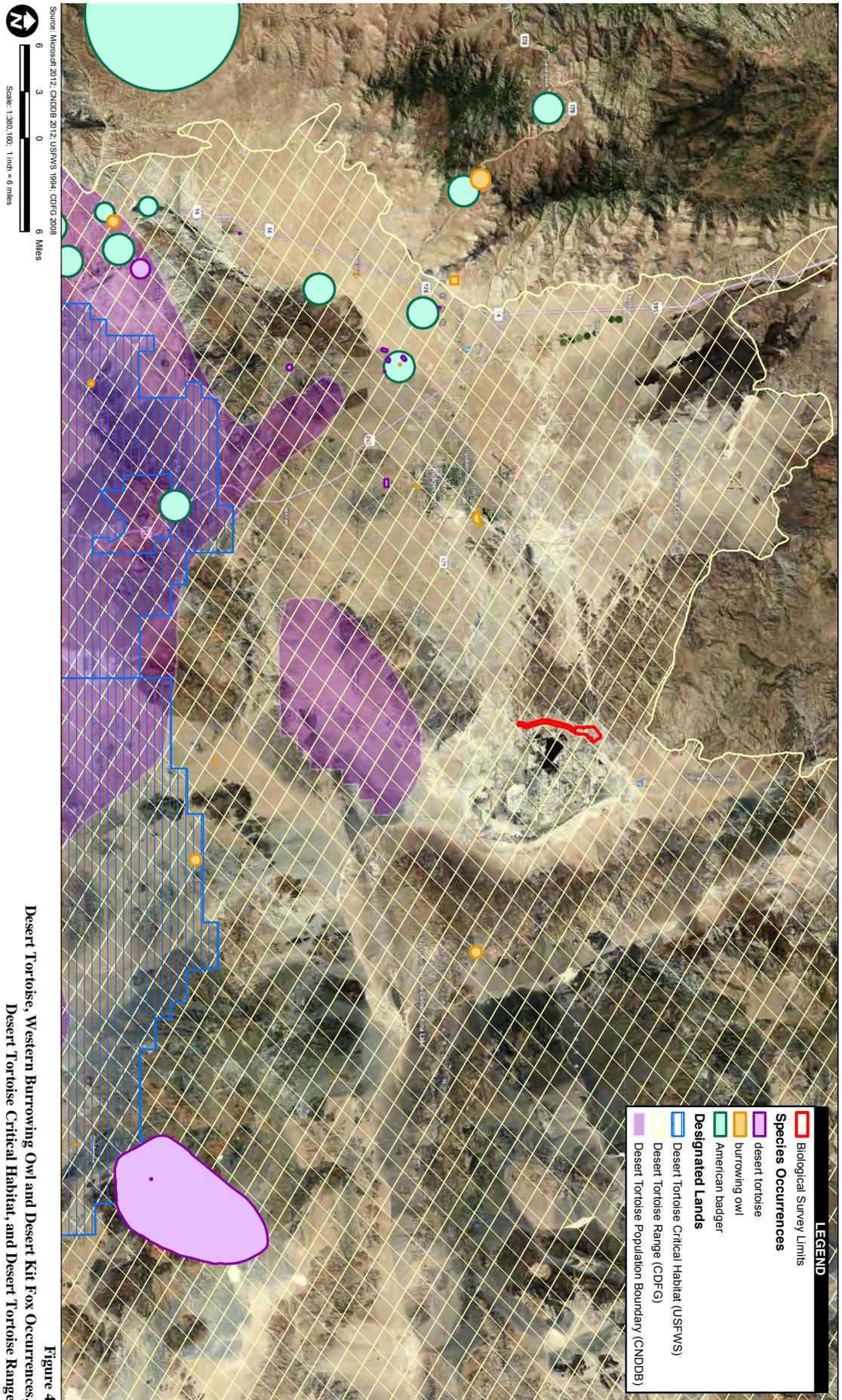
Figure 2  
Survey Area

ACE Phoenix Project – Presence/Absence Surveys Report

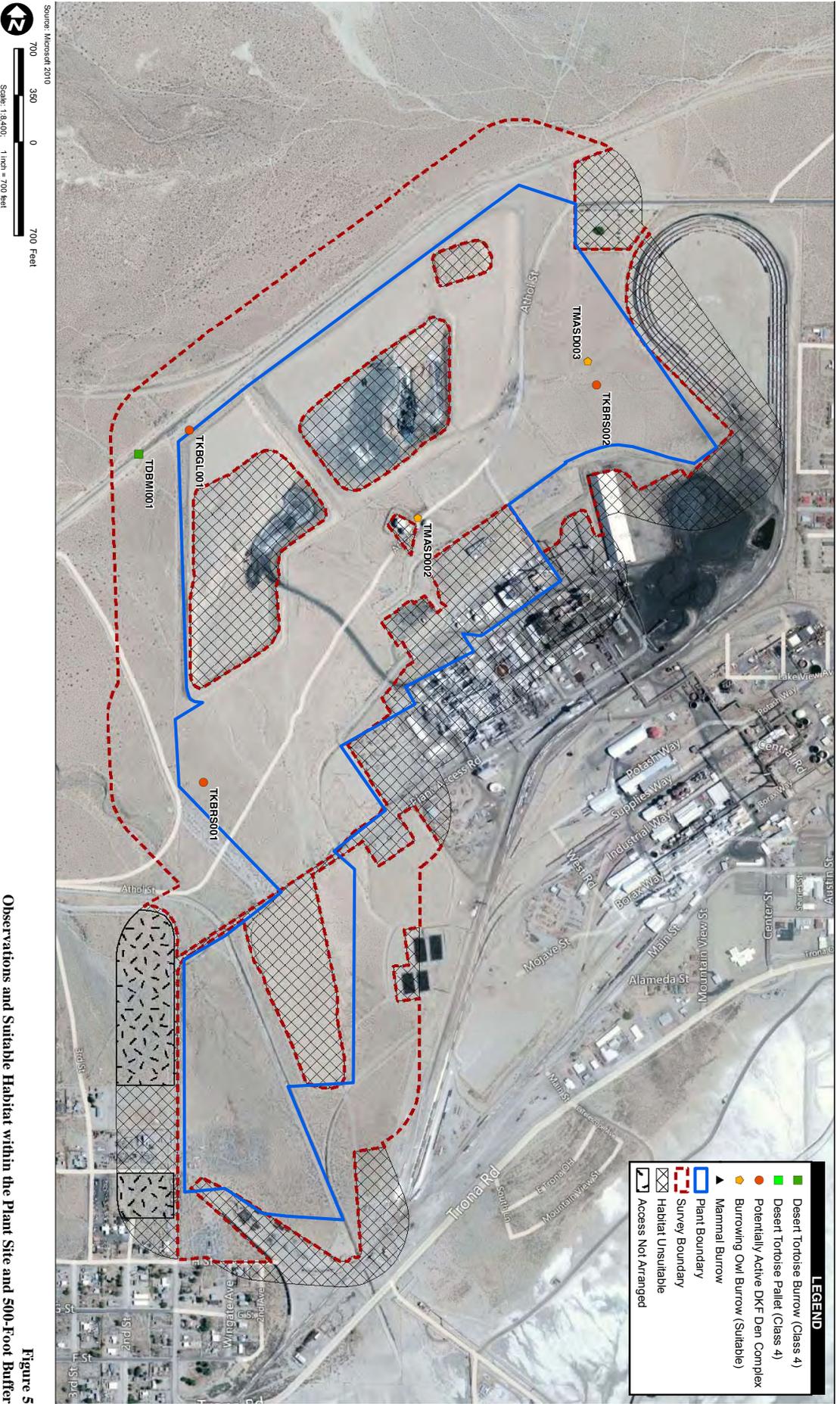
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Source: Microsoft 2010  
 2,000 1,000 0 2,000 Feet  
 Scale: 1:24,000 1 inch = 2,000 feet





**Figure 4**  
 Desert Tortoise, Western Burrowing Owl and Desert Kit Fox Occurrences,  
 Desert Tortoise Critical Habitat, and Desert Tortoise Range



**Figure 5**  
Observations and Suitable Habitat within the Plant Site and 500-Foot Buffer



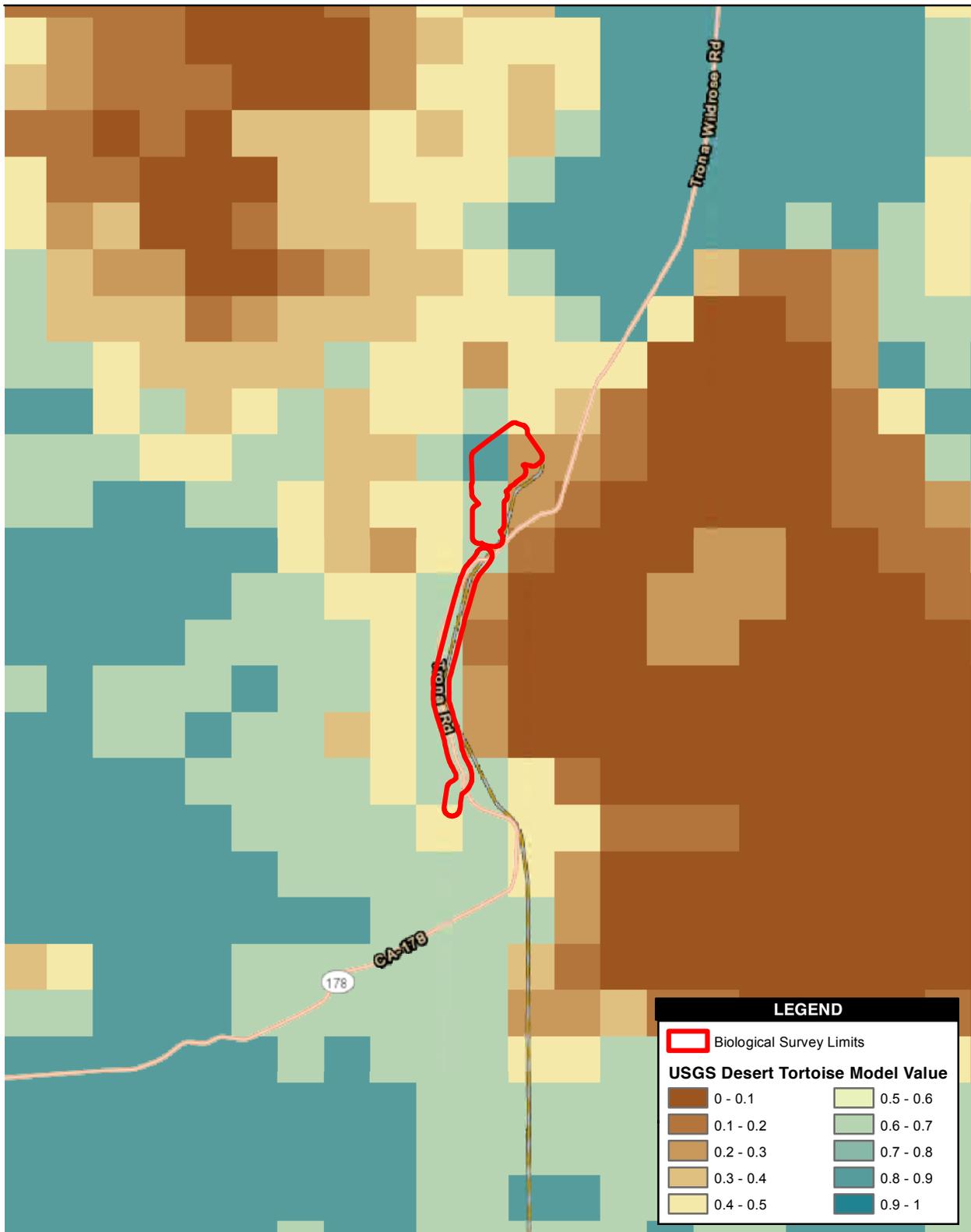
- LEGEND**
- Desert Tortoise Burrow (Class 4)
  - Desert Tortoise Pallet (Class 4)
  - Potentially Active DKF Den Complex
  - ▲ Burrowing Owl Burrow (Suitable)
  - ▲ Mammal Burrow
  - Approximate 3.6-mile PG&E Gas Line
  - - - Survey Boundary
  - ▨ Habitat Unsuitable

Figure 6  
Observations and Suitable Habitat within the Pipeline Corridor

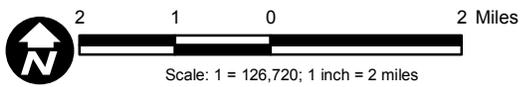
Source: Microsoft 2010  
 Scale: 1:18,000 1 inch = 1,500 feet



ACE Phoenix Project – Presence/Absence Surveys Report  
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Source: Microsoft 2012; USGS 2008



**Figure 7**  
**USGS Desert Tortoise Habitat Model**



**ATTACHMENT 2**

**BIOLOGIST RESUMES**



## Shelly Dayman

### Wildlife Biologist

**Contact Information:**

619-820-0768 (cell)

[Shelly.dayman@aecom.com](mailto:Shelly.dayman@aecom.com)

**Education**

BS, Biology, Ecology Major, University of Calgary, 1994

**Certifications**

FERC Environmental Compliance, May 2003

California Department of Fish and Game Scientific Collecting Permit, SC-11397

**Trainings**

Flat tailed Horned Lizard Biomonitoring Training, May 2011

Bat Ecology and Field Techniques Workshop, April 2011

Desert Tortoise Handling Workshop, 2004 and 2009

Mohave Ground Squirrel Workshop, 2005

California Burrowing Owl Symposium, November 2003

**Affiliations**

Member, The Wildlife Society

Shelly Dayman has over ten years of experience conducting biological surveys including wildlife surveys; construction monitoring; and vegetation mapping in southwestern United States. Ms. Dayman is familiar with U.S. Fish and Wildlife Service (USFWS) Biological Opinions, Biological Resources Reports, Environmental Assessment/Initial Studies, Mitigated Negative Declarations, California Energy Commission Conditions of Certification and the biological sections of Environmental Impact Reports and Statements as well as the western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).

Ms. Dayman has experience in the identification of fauna and flora in the desert of the southwestern United States, in coastal areas of San Diego and in western Riverside County. Recent survey work has included presence/absence and clearance surveys for desert tortoise; presence/absence surveys for burrowing owl, desert kit fox, and American badger; surveys in flat tailed horned lizard and Mojave fringe-toed lizard habitat; and small mammal trapping and handling. Ms. Dayman also has considerable experience with biological monitoring of construction and ensuring compliance with required permits. Ms. Dayman often functions as the field lead for large survey efforts.

## Project Experience

### California Broadband Cooperative's (CBC) Digital 395 Middle Mile Project, BO 8-8-12-F-7

#### Desert Tortoise Authorized Biologist

Project to be initiated after the completion of all permitting. Biological monitoring for a linear project within desert tortoise habitat.  
[permits pending]

### Confidential Project, El Centro, Imperial County, CA Wildlife Biologist

Conducted burrowing owl protocol surveys according to revised 2012 guidelines. Observed over 100 burrowing owls and active burrowing owl burrows.  
[04/2012-06/2012]

### Los Angeles Department of Water and Power, Confidential Project, Adelanto, San Bernardino County, CA Wildlife Biologist

Conducted desert tortoise clearance surveys and burrowing owl preconstruction surveys. Coordinated field crew. Primary author on biological memo.  
[11/2011-12/2011]

### NAVFAC Southwest, Marine Corps Base (MCB) Camp Pendleton Grow the Force Wildlife Biologist

AECOM is proving MCB with assistance with mitigation requirements. Assistance with preparation of documents for the Grow the Force and Basewide Utilities Infrastructure Projects.  
[10/2011-11/2011]

### San Diego Gas & Electric- Sunrise Powerlink- Restoration Services, San Diego County, CA

SDG&E has retained AECOM to provide mitigation, including habitat restoration for temporary impacts to sensitive vegetation communities and temporary and permanent impacts to special status plants, sensitive wildlife habitats, and jurisdictional wetlands and waters (including dry washes) associated with construction of the Sunrise Powerlink project, a 117-mile, 500 kilovolt transmission corridor. Assisted with the preparation of restoration plans.  
[11/2011-01/2012]

### NextEra Energy, Genesis Solar Power Project, Riverside County, CA

#### Biological Monitor

Monitored daily construction activities according to the California Energy Commission Conditions of Certification and USFWS

Biological Opinion under the supervision of the Designated Biologist. Ensured compliance with existing regulatory conditions. Monitored active desert kit fox dens with wildlife camera and tracking medium. Telemetry of radio collared desert kit fox. Conducted preconstruction wildlife surveys and completed daily biological monitoring logs.  
[08/2011-ongoing]

### Solar Millennium Blythe Biological Monitor/Wildlife Biologist

Conducted desert tortoise clearance surveys within the project footprint under the supervision of an authorized biologist. Conducted surveys for burrowing owl, desert kit fox, American badger and nesting birds.  
[03/2011 – ongoing]

### Imperial Irrigation District, Transmission Line Surveys, Riverside County, CA

#### Lead Field Biologist, Desert Tortoise Surveys

AECOM is providing California Environmental Policy Act (CEQA) and National Environmental Policy Act (NEPA) compliance, biological survey, and archaeological survey services for this proposed transmission line upgrade project. The proposed project would replace or upgrade existing steel transmission line poles in 41 locations along an existing 55-mile-long transmission line. The project is located on IID right-of-way through Bureau of Land Management (BLM) land and other (nonfederal) land. AECOM is managing the development of a joint Mitigated Negative Declaration (MND)/ Environmental Assessment (EA) document, with IID as the lead CEQA agency and the BLM El Centro Field Office as the lead NEPA agency.

Conducted desert tortoise protocol focused surveys along a linear transmission line within habitat also suitable for burrowing owl, desert kit fox, flat tailed horned lizard, Coachella valley fringe-toed lizard and American badger. Responsible for field crew coordination, data management and reporting. [04/2011- 03/2012]

### Imperial Irrigation District, Burrowing Owl Population Sampling Project, Imperial County, CA

#### Wildlife Biologist

Assisted with the planning and survey development of the burrowing owl survey protocol. Coordinated field crews and mobilization.  
[04/2011]

### Abengoa Solar, Mojave Solar Power Project, San Bernardino County, CA

#### Biological Monitor/Wildlife Biologist

Conducted biological monitoring of installation of desert tortoise exclusion fencing along the project perimeter. Ensure compliance of construction activities with California Energy Commission Conditions of Certification. Conduct protocol surveys for burrowing owl. Set up wildlife cameras at potential desert kit fox and American badger dens. Assisted with nesting bird surveys. Primary author of desert tortoise survey report. Assist with other ongoing reporting requirements.  
[01/2011 – ongoing]

**Confidential Project, Twentynine Palms, CA  
Wildlife Biologist**

Under the supervision of an authorized biologist, scoped potential desert tortoise burrows and handled a desert tortoise while assisting in transmitter application.  
[04/2011]

**Solar Millennium Blythe/Palen/Ridgecrest Application for Certification and Engineering Support, Riverside and Kern Counties, CA**

**Lead Field Biologist, Desert Tortoise Surveys**

Conducted biological reconnaissance surveys to determine suitability of habitat for sensitive and/or listed wildlife species. Performed focused desert tortoise and burrowing owl protocol focused surveys for three solar array project, two near Blythe, California and one near Ridgecrest, California. Surveyed for desert kit fox, American badger and Mojave fringe-toed lizard. Coordinated biological monitoring of geotechnical investigations. Assisted with mitigation efforts. Conducted desert tortoise clearance surveys under the supervision of an authorized biologist. Responsible for project planning, survey coordination, and writing of technical documents. Field lead for desert tortoise surveys and primary author of desert tortoise survey reports for Blythe, Palen and Ridgecrest. [01/2009-2011]

**San Diego Gas and Electric, San Diego County, CA  
Biological Monitor**

Conducted biological monitoring of tree trimming activities within a state park.  
[09/2010]

**Proposed Olivenhain Municipal Water District Unit AA 2010 Raw Water Pipeline Project from the Second San Diego Aqueduct to the David C. McCollom Water Treatment Plant, San Diego County, California  
Wildlife Biologist**

This project involved construction of a new underground 48-inch-diameter pipeline extending approximately 3 miles from the Second San Diego Aqueduct to the David C. McCollom Water Treatment

Plant. Assisted with biological surveys and was the primary author of wildlife sections of the biological technical report.  
[10/2009 – 12/2009]

**Los Angeles Department of Water & Power, Niland Solar Energy Survey, Niland, CA  
Wildlife Biologist**

Conducted protocol burrowing owl surveys in Imperial County. Biological resources were assessed and appropriate mitigation measures for resources observed were recommended. Primary author of burrowing owl report. [04/2009]

**T.Y. Lin, Western Bypass Street Bridge Environmental Permitting, Temecula, CA  
Wildlife Biologist**

The project is the construction of a bridge to replace a dip-crossing in a streambed and construction of a new bridge. Conducted burrowing owl focused surveys and habitat mapping. Documented projects consistency with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Primary author of the burrowing owl report. [01/2009 – Ongoing]

**San Diego County Department of Public Works, Wildcat Canyon Road Enhancement Project, Before-After-Control-Impact Study, San Diego County, CA  
Wildlife Biologist**

Assisted with wildlife movement study for the Wildcat Canyon Project. Methods included conducting unbaited tracking station (identification of tracks), camera station, tracking transect, and roadkill surveys.  
[01/2009 – 08/2009]

**Cal Energy, Black Rock Survey, Calipatria, CA  
Wildlife Biologist**

Conducted a burrowing owl survey in Imperial County. Described biological resources on-site and appropriate mitigation measures. Primary author of burrowing owl report. [10/2008 – 12/2008]

**NextEra Energy, Beacon Solar Power Project, Kern County, CA  
Wildlife Biologist**

Conducted focused desert tortoise protocol surveys. Mapped sign of other special status wildlife species. Assisted with reporting.  
[04/2008 – 12/2009]

**Confidential Project, Kern and San Bernardino Counties, CA  
Wildlife Biologist**

Conducted biological reconnaissance surveys throughout the Mojave desert to determine suitability of habitat for sensitive and/or listed species. Assisted client in assessing sites for suitability for development.

[08/2008 – 09/2008]

**Abengoa Solar, Mojave Solar Power Project, San Bernardino County, CA**

**Wildlife Biologist**

Conducted focused Desert tortoise and burrowing owl protocol focused surveys for a solar array project. Primary author of desert tortoise survey report.

[04/2008 – 08/2008]

**Bureau of Land Management(BLM)**

**Sloan Canyon Trail Project, Henderson, NV**

**Wildlife Biologist**

Conducted focused desert tortoise surveys on BLM land for a proposed trail project. Trained other wildlife biologists regarding desert tortoise sign.

[06/2008 – 07/2008]

**San Diego Association of Governments (SANDAG) and California Department of Transportation (Caltrans) District 7, State Route 76 Tracking and Road Kill Surveys, Oceanside, CA**

**Wildlife Biologist**

Assisted in a movement study to determine wildlife corridors. Study involved roadkill, wildlife tracking stations, and transect surveys of mammal and herpetological movement. [05/2008 – 05/2010]

**City of Murrieta, Guava Street Natural Environment Study and MSHCP Consistency, Murrieta, CA**

**Wildlife Biologist**

Conducted a focused burrowing owl survey for a project involving the removal and replacement of an existing bridge. Assisted in the preparation of an NES with compliance with the western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).

[04/2008 – 04/2011]

**City of Murrieta, Main Street Natural Environment Study and MSHCP Consistency, Temecula, CA**

**Wildlife Biologist**

Conducted a focused burrowing owl survey for a project involving the removal and replacement of an existing bridge. Assisted in the preparation of an NES with compliance with the western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).

[04/2008 – 04/2011]

**Greystone Environmental, Riverside County, CA**

**Wildlife Biologist**

Conducted desert tortoise presence/absence surveys along a proposed linear transmission line between Indio, California and Blythe, California. Found one adult desert tortoise.

[Prior to AECOM]

**Various Projects, Riverside, CA**

**Wildlife Biologist**

Conducted habitat assessments for those species not adequately conserved by the western Riverside County MSHCP including mammals, rare plants, herpetofauna, birds (riparian species, burrowing owl etc.), and vernal pool brachiopods. Conducted focused burrowing owl surveys in suitable habitat. Determined if proposed projects were consistent with the MSHCP.

[Prior to AECOM]

**County of Riverside, Proposed Projects, Riverside, CA**

**Ecologist**

Reviewed proposed projects to determine if they were consistent with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Attempted to establish an "active relocation" program for burrowing owls in Western Riverside County. Reviewed environmental documents, including EIRs, biological surveys, and archaeological surveys. [Prior to AECOM]

**Kern River Gas Transmission Company, Pipeline Project, Barstow, CA**

**Biological Monitor**

Conducted right-of-way and buffer surveys for special-status species (primarily the threatened desert tortoise). Documented daily construction and biological activities. Worked with the construction contractor, environmental inspectors, the lead biologist, and other biological monitors to identify and eliminate potential environmental issues. Complied with the US Fish and Wildlife Federal Biological Opinion, the California Department of Fish and Game 2081 Permit, the Memorandum of Understanding and FERC requirements and guidelines. [Prior to AECOM]

**The University of Arizona, Research Studies, Tucson, AZ**

**Wildlife Biologist**

Evaluated biological communities including plant, invertebrate and small mammal communities. Determined percent cover, biomass and plant species diversity. Captured and processed small mammals, made species identifications, and recorded body measurements. Identified pitfall trapped invertebrates to functional taxonomic groups. Used radio-telemetry to determine the effects of roads on mortality in western box turtles. [Prior to AECOM]

**References**

Arthur Davenport  
Davenport Biological Services  
P.O. Box 1692  
Barstow, CA 92312  
Telephone: 619-729-4242  
[artdavenpo@aol.com](mailto:artdavenpo@aol.com)

Charles German  
Lead Biologist on Kern River Pipeline  
P.O. Box 3351  
Wrightwood, CA 92397  
Telephone: 805-895-9842  
[eric\\_german@yahoo.com](mailto:eric_german@yahoo.com)

Milo Rivera  
Wildlife Biologist, County of San Bernardino  
2405 Falling Oak Dr.  
Riverside, CA 92506  
Telephone: 951-310-8325  
[sierraazuel@sbcglobal.net](mailto:sierraazuel@sbcglobal.net)

## DESERT TORTOISE AUTHORIZED BIOLOGIST REQUEST FORM

This form should be used to provide your qualifications to agency officials if you wish to undertake the duties of an authorized biologist with regard to desert tortoises during construction or other projects authorized under Sections 7 (Biological Opinions) or 10(a)(1) (B) (i.e. Habitat Conservation Plans) of the Endangered Species Act.

(If you seek approval to attach/remove/insert any devices or equipment to/into desert tortoises, withdraw blood, or conduct other procedures on desert tortoises, a recovery permit or similar authorization may be required. Application for a recovery permit requires completion of Form 3-200-55, which can be downloaded at <http://www.fws.gov/forms/3-200-55.pdf>.)

**1. Contact Information:**

<b>Name</b>	Shelly Dayman
<b>Address</b>	1420 Kettner Blvd., Suite 500
<b>City, State, Zip Code</b>	San Diego, CA 92101
<b>Phone Number(s)</b>	619-820-0768 (cell)
<b>Email Address</b>	shelly.dayman@aecom.com

**2. Date:** 9/14/2011

**3. Areas in which authorization is requested (check all that apply):**

- San Bernardino, Kern, Inyo and Los Angeles Counties, California (Ventura office)  
 Riverside, San Diego, and Imperial Counties, California (Carlsbad office)  
 Nevada     Utah     Arizona

**4. Please provide information on the project:**

<b>USFWS Biological Opinion or HCP No. When Applicable</b>	1-6-95-F-30	<b>Date:</b> November 27, 1995
<b>Project Name</b>	Mesquite Regional Landfill Project	
<b>Federal Agency (If Applicable)</b>		
<b>Proponent or Contractor</b>		

5. If you hold, or have held, any relevant state or federal wildlife permits provide the following:

Species	Dates	State (specify) or Federal Permit Number	Authorized Activities
Desert Tortoise	6/14/2011 - 6/14/2013	Scientific Collecting Permit SC-11397	Capture, release and mark of desert tortoise

6. **Education:** Provide up to three schools, listing most recent first:

Institution	Dates attended	Major/Minor	Degree received
University of Calgary, Calgary, Canada	1990-1994	Ecology	B.S.

7. **Desert Tortoise Training.**

Name/Type of Training	Dates (From/To)	Location	Instructor/Sponsor
1. Classes Tortoise Survey/Monitor/Handling	11/2009	Ridgecrest, CA	Desert Tortoise Council
2. Field Training			
3. Translocation			
4. Tortoise Survey/Monitor/Handling	11/2004	Ridgecrest, CA	Desert Tortoise Council

**8. Experience** - Include only those positions relevant to the requested work with desert tortoises. Distinguish between wild Mojave desert tortoise and other experience. Include only your experience, not information for the project you worked on (e.g., if 100 tortoises were handled on a project and you handled 5 of those tortoises, include only those 5. List most recent experience first. Handling a Mojave desert tortoise must be authorized by a Biological Opinion or other permit and reported to the USFWS. Information provided in this section will be used by the USFWS to track the numbers of tortoises affected by previous projects (baseline). **Be sure to include a project supervisor or other contact that can verify your skills and experience in relation to your job performance.** Attach additional sheets as necessary. Please use numbers in each column; do not use "X's" to indicate participation in the activity. If your experience is limited to **less than three desert tortoise positions**, please include additional job experience and references in the section below (pg. 5).

### Experience by project and activity:

Please include: Project Name Job Title Dates of Employment	Supervisor / Project Contact Name Phone Email address	Conduct Clearance Surveys (Hrs/Days)	Excavate DT burrows (No.)	Locate DT No. < 100mm ≥ 100mm	Handled for Relocation DTs (No.)	Excavate, and relocate DT nests (No.)
1. Los Angeles Department of Water and Power [AECOM] Lead Biologist November, 2011	Art Popp 949-660-8044 Arthur.Popp@aecom.com	13 Hrs				
2. Genesis Solar Power Project, NextEra Energy FWS-ERIV-08B0060-10F0878 August 2011 - ongoing	Charles German, Designated Biologist, eric_german@yahoo.com, 805-895-9842,					
3. Solar Millennium, Blythe [AECOM] FWS-ERIV-09B0186-10F0880 Biologist, Clearance Surveys March 2011, July 2011	Tina Poole, AB, 480-600-5720; tina.poole@cox.net, Millo Rivera, AB, 951-310-8325, sierraazuel@yahoo.com, Ray Romero (DB) 714-264-6174, raymond.romera@aecom.com	70 Hrs	1			
4. Mojave Solar, Barstow, CA [AECOM] 8-8-11-F-3 Biological Monitor January - December 2011	Tim Skousen, Authorized Biologist, C: 971-506-1217; tim_skousen@hotmail.com, Brooks Hart, AB, C: 858-922-3264, brooks_hart@hotmail.com	50 Hrs				
5. Imperial Irrigation District, CA [AECOM] Biologist, Presence/Absence Tortoise Surveys April - May 2011	Lyndon Quon, 619-233-1454, lyndon.quon@aecom.com; Charles German, eric_german@yahoo.com, 805-895-9842, Millo Rivera, 951-310-8325	100 Hrs				
6. Twentynine Palms, [Davenport Biological] Biologist, Transmitering of Tortoise, Handling April 2011 TE# 802450-6	Arthur Davenport Lead Biologist C:619-729-4242 artdavenport@aol.com	12 Hrs	7		1	
7. Solar Millennium, Blythe, Ridgecrest and Palen [AECOM], Presence/Absence Tortoise Surveys, Lead Field Biologist February 2010 - May 2010	Julie Ogilvie, 619-764-6822, julie.ogilvie@aecom.com, Charles German 805-895-9842, Millo Rivera, 951-310-8325	400 Hrs		2		1

**Experience by project and activity:**

Please include: Project Name Job Title Dates of Employment		Supervisor / Project Contact Name Phone Email address	Conduct Clearance Surveys (Hrs/Days)	Excavate DT burrows (No.)	Locate DT No. <100mm ≥ 100mm	Handled for Relocation DTs (No.)	Excavate, and relocate DT nests (No.)
<b>1</b>	Solar Millennium, Blythe, Ridgecrest and Palen [AECOM], Presence/Absence (DT), Lead Field Biologist February 2009 - May 2009, Sept - Oct 2009	Erin Riley, 619-764-6889 erin.riley@aecom.com Charles German 805-895-9842 Milo Rivera 951-310-8325	Presence/Absence 740 0	>=100 mm 3	0	0	
<b>2</b>	Edison Mission Energy, Kern, San Bernardino, Riverside Counties [AECOM], Habitat Assessment, Biologist August 2008	Lyndon Quon, 619-233-1454 lyndon.quon@aecom.com	Habitat Assess 20 0	>=100 mm 1	0	0	
<b>3</b>	Sloan Canyon Trail Project, BLM, Nevada [AECOM] Presence Absence (DT) Biologist, June - July 2008	John Ko, SWCA Environmental 970-232-5720 jko@swca.com	Presence/Absence 150 0	>=100 mm 3	0	0	
<b>4</b>	Beacon Solar Project, California City, CA [AECOM], Presence/Absence (DT) Biologist May 2008	Lyndon Quon, 619-233-1454 lyndon.quon@aecom.com	Presence/Absence 50 0	>=100 mm 1	0	0	
<b>5</b>	Mojave Solar Project, Barstow, CA [AECOM] Presence/Absence (DT) Biologist April - May 2008	Lyndon Quon, 619-233-1454 lyndon.quon@aecom.com	Presence/Absence 200 0	>=100 mm 5	0	0	
<b>6</b>	Greystone Environmental, Blythe to Palm Springs, CA [through Davenport Biological Services], Presence/Absence (DT) May 2005	Arthur Davenport, 619-729-4242 artdavenport@aol.com	Presence/Absence 60 0	>=100 mm 1	0	0	
<b>7</b>	Kern River Pipeline, California Spreads (Mojave to Daggett), Biological Monitor December 2002 - April 2003	Charles German Lead Biologist 805-895-9842 eric_german@yahoo.com	Presence/Absence 720 0	>=100mm 3	0	0	

**Experience by project and activity (continued):** Each project number should correspond with the project listed on the previous page

Project Name (Number should correspond to previous page)	Construct Artificial Burrows (No.)	Monitor project equipment and activities (Hrs/Days)	Oversee project compliance (Hrs/ Days)	Supervise DT field staff (Hrs/Days) and No. staff supervised	DT fence Installation and inspection (Hrs/Days)	Present DT Awareness Training (No.)
1. Los Angeles Department of Water and Power	0	0	0	13 Hrs 3 Staff	0	0
2. Genesis Solar Power Project	0	60 Hrs	60 Hrs		10 Hrs	0
3. Solar Millennium, Blythe	0	0	40 Hrs	0	10 Hrs	
4. Mojave Solar	0	50 Hrs	250 Hrs	0	50 Hrs	0
5. Imperial Irrigation District	0	0	0	100 Hrs 3 Staff	0	0
6. Twentynine Palms	0	0	0	0	0	0
7. Solar Millennium Blythe, Ridgecrest and Palen	0	0	0	400 Hrs 18 Staff	0	0X 7

**Experience by project and activity (continued):** Each project number should correspond with the project listed on the previous page

Project Name (Number should correspond to previous page)	Construct Artificial Burrows (No.)	Monitor project equipment and activities (Hrs/Days)	Oversee project compliance (Hrs/Days)	Supervise DT field staff (Hrs/Days) and No. staff supervised	DT fence installation and inspection (Hrs/Days)	Present DT Awareness Training (No.)
8 Solar Millennium, Blythe, Ridgecrest and Palen	0	5 Hrs	60 Hrs	740 Hrs 28 Staff	0	7
2 Edison Mission Energy	0	0	0	0	0	1
30 Sloan Canyon Trail Project, BLM	0	0	0	150 Hrs 2 Staff	0	0
41 Beacon Solar Project	0	0	0	0	0	0
52 Mojave Solar Project	0	0	0	0	0	0
63 Greystone Environmental	0	0	0	0	0	0
74 Kern River Pipeline	0	720 Hrs	720 Hrs	0	40 Hrs	4

**Summary of experience:**

Total time spent for all desert tortoise-related field activities (referenced above):

Specify total number of hours:

OR total number of 8-hour days: 340

Total number of miles/kilometers walked conducting survey transects:

1,500+ miles

Total number of wild, free-ranging desert tortoises you personally handled:

<100 mm: \_\_\_\_\_

≥100 mm: 2

Additional supervisory experience other than with desert tortoise work

Project	Hours	Staff (No.)
Salt Creek Burrowing Owl Surveys	100	10

Additional references for individuals whom have held **less than three** positions working with desert tortoise

Project Name Job Title Dates of employment	Supervisor / Project Contact Name Phone Email address

I certify that the information submitted in this form is complete and accurate to the best of my knowledge and belief.

I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. Ch.47, Sec. 1001.

Signed: 

Date: 7/12/12

## Michael Ireland, GISP

### Field Scientist & GIS Specialist

#### Education

Geographic Information Systems Certificate, San Francisco State University, CA. 2003

M.A., Political Science, University of California at Davis, CA. 2000

Quantitative Methods of Social Science Research Program, University of Michigan at Ann Arbor, MI 1998

B.A., Political Science, University of California at Davis, CA. 1997

#### Professional Certifications + Permits

Certified Geographic Information Systems Professional (GISP), #00059720

CDFG Scientific Collecting Permit #6518

CDFG and NOAA Certified Caulerpa Surveyor

Professional Association of Diving Instructors (PADI), #230025

Divers Alert Network Instructor (DAN), #12694

Professional Scuba Inspectors (PSI), #20279

#### Specialized Training

Desert Tortoise Handling Workshop, Desert Tortoise Council

Rare pond species survey techniques workshop: California red-legged frog, California

tiger salamander & western pond turtle. Laguna de Santa Rosa Foundation

Western Pond Turtle Workshop - Elkhorn Slough Coastal Training Program

CEQA Basics Workshop, Association of Environmental Professionals

Legal and Regulatory Foundations for Managing Aquatic Ecosystems, UC Berkeley

Extension

Project Manager Bootcamp I - PSMJ

AutoDesk Map 3D Workshop

#### Affiliations

American Academy of Underwater Sciences

Society for Conservation GIS

URISA Southern California Chapter

Mr. Ireland combines an academic background in Geographic Information Systems and field data collection with eight years of experience working as a field scientist including nearly 1,800 hours working with Western burrowing owl. He has extensive experience conducting Phase I, II, and III protocol-level surveys and has participated in exclusion efforts (passive relocations) for western burrowing owl. Mr. Ireland has spent significant time working with Western burrowing owls in the Mojave, Colorado, and Sonoran Deserts, California Central Valley, and San Francisco Bay Area. Mr. Ireland has also worked in the Mojave, Colorado, and Sonoran Deserts conducting surveys for nesting birds, Desert kit fox, and American badger.

#### Western Burrowing Owl, Kit Fox, American Badger, Raptor, Nesting Bird, and Desert Tortoise Project Experience

##### Genesis Solar Power Project, Colorado Desert, CA

As biological monitor, monitors the project for construction compliance with conditions of certification pertaining to the desert tortoise, Mojave fringe-toed lizard, western burrowing owl, American badger, desert kit fox, Couch's spadefoot toad, and nesting birds. During the pre-construction phase of the project, Mr. Ireland conducted clearance surveys for Desert Kit Fox, American Badger, Western Burrowing owl, and nesting birds. Mr. Ireland conducted monitoring of occupied Desert Kit Fox burrows using tracking medium and wildlife cameral stations. In addition, Mr. Ireland used radio telemetry equipment to track Desert Kit Fox radio-collared by resource agency scientists monitoring Desert Kit Fox movement in the region surrounding the project. Further, Mr. Ireland constructed one-way doors and participated in the passive relocation of several Desert Kit Fox and hand-excavation of unoccupied den complexes. During the project, Mr. Ireland observed numerous live Desert Kit Fox and assisted in the collection and packaging of several dead Desert Kit Fox collected by resource agency representatives for further investigation. Mr. Ireland also prepared a draft of the Desert Kit Fox Management Plan for the project.

### **Blythe and Palen Solar Power Projects, Sonoran Desert, CA**

In support of two solar thermal power projects in Southern California, Mr. Ireland conducted western burrowing owl Phase I, II, and III protocol-level surveys at the Palen and Blythe project sites. Several breeding pairs (with fledglings) of western burrowing owl were observed during surveys. Mr. Ireland observed Desert tortoise and desert tortoise sign during those surveys. During the implementation phase of the project, Mr. Ireland conducted clearance surveys for Desert Kit Fox, American Badger, Western Burrowing owl, and nesting birds. Mr. Ireland conducted monitoring of occupied Desert Kit Fox and American Badger burrows using tracking medium and wildlife camera stations. Further, Mr. Ireland constructed one-way doors and participated in the passive relocation of several Desert Kit Fox and hand-excavation of unoccupied den complexes. One Western burrowing owl, several Desert kit fox, and numerous nesting bird pairs were observed during this phase. Mr. Ireland also prepared drafts of the Burrowing Owl Management Plan and Raven Control Monitoring Management Plan for the implementation phase of the project.

### **Mojave Solar Power Project, San Bernardino County, CA**

In support of this solar array project, Mr. Ireland participated in clearance surveys for Western burrowing owl and nesting birds. Also, under direct supervision, Mr. Ireland assisted in the installation and monitoring of wildlife cameras at potential Desert kit fox burrows. Mr. Ireland also observed Desert Tortoise sign during those surveys.

### **Beacon Solar Energy Project, Kern County, CA**

AECOM has supported NextEra Energy Resources at the proposed Beacon Solar Energy Project in the Mojave Desert of Southern California. Mr. Ireland's responsibilities include assisting in the preparation of technical documents (habitat conservation plan, special-status species studies, Raven Control Monitoring Management Plan), preparation of responses to public comments for the AFC, and protocol surveys for Western burrowing owl at the project site. Mr. Ireland also observed Desert Tortoise sign during those surveys.

### **Contra Costa Water District – Contra Costa Canal Fish Screen Project, Contra Costa County, CA**

AECOM conducted extensive biological surveys and provided permitting compliance services for the Contra Costa Canal Fish Screen project near Oakley. Mr. Ireland conducted pre-construction surveys for species including burrowing owl and San Joaquin kit fox. Mr. Ireland also participated in construction monitoring visits focused on issues including ground squirrel and burrowing owl activity and protocol-level focused surveys for Swainson's hawk.

One pair of western burrowing owl with fledglings was observed during these surveys.

### **Imperial Irrigation District – Western Burrowing Owl Surveys, Imperial County, CA**

In support of this project, Mr. Ireland conducted windshield surveys for WBO along IID irrigation ditches to estimate the owl population in District right-of-ways.

### **Santa Clara Valley Water District, California.**

AECOM conducted a habitat assessment, burrow mapping study, and standardized protocol surveys in multiple seasons for western burrowing owl along approximately 45 miles of waterways in 18 watersheds managed by the District. In support of this project, Mr. Ireland managed the effort and conducted protocol-level burrowing owl surveys (Phase I, II, and III). Mr. Ireland also participated in development of the survey and mapping approach in coordination with the District and AECOM biology and GIS team. Several burrowing owl were observed during surveys, including breeding pairs with fledglings.

### **Creekside Memorial Park, Tassajara Valley, CA**

AECOM provided biological and permitting services for the Corrie Development Corporation property. **In support of the project**, Mr. Ireland conducted protocol-level focused surveys for species including San Joaquin kit fox and western burrowing owl. Mr. Ireland assisted in the placement of track boards and camera stations for the San Joaquin kit fox on site. Two California red-legged frogs and one burrowing owl were identified on site.

### **References**

Shelly Dayman, **AECOM**

[Shelly.dayman@aecom.com](mailto:Shelly.dayman@aecom.com), (619) 820-0768

Raymond Romero, **AECOM**

[raymond.romero@aecom.com](mailto:raymond.romero@aecom.com), (714) 264-6174

Jimmy McMorran, **AECOM**

[James.mcmorran@aecom.com](mailto:James.mcmorran@aecom.com), (361) 443-4603

Don Arnold, Santa Clara Valley Water District

[DArnold@valleywater.org](mailto:DArnold@valleywater.org), (408) 265-2607

## Ronald E. Spears

### Education

M.S., Ecology, Georgia Southern University, 1995

### Professional Registrations

Certified Senior Ecologist, Ecological Society of America

### Licenses / Registrations / Permits

USFWS Endangered Species Recovery Permit (TE108990-0), Gray Bat, Indiana Bat Teaching Certificate, Secondary Science Education, 1999  
Georgia Licensed Pesticide Applicator (#12831). Four Categories: Forestry, Ornamental and Turf, Regulatory, and Plant Agriculture.

### Professional Memberships

Member, Ecological Society of America  
Member, Society for Ecological Restoration  
Member, the Wildlife Society  
Western Bat Working Group  
Colorado Bat Working Group

### Training

American Wind Energy Association Transmission Workshop, 2011  
NEPA, CEQ Regulations, and Agency Regulations - EIA Campus, 2011  
Impact Study, Planning and Scheduling - EIA Campus, 2011  
Integrating a Public Scoping Program with an Agency Scoping Process - EIA Campus, 2011  
Methodologies for an Environmental Impact Assessment - EIA Campus, 2011  
Identification and Evaluation of Alternatives - EIA Campus, 2011  
Adaptive Management, Fundamental Aspects of Planning - EIA Campus, 2011  
American Wind Energy Association Wind Farm Siting Workshop, 2010  
BLM Riparian Proper Functioning Condition Assessment. Bureau of Land Management, Denver, CO 2009  
PEPC Step 7 Training. National Park Service, 2009  
Stream Restoration Construction Training, North Carolina State University, Brevard, NC, 2006  
Intermittent and Perennial Stream Identification, NCSU, Raleigh and New Bern, NC, 2005  
River Morph Applications, RiverMorph Training Center, Louisville, KY, 2004  
River Assessment and Monitoring, Wildland Hydrology, Meadows of Dan, VA, 2002 - Dave Rosgen  
Natural Channel Design & River Restoration, Wildland Hydrology, Pagosa Springs, CO, 2002 - Dave Rosgen  
Restoring Forested Wetlands, University of Georgia, 2000  
Applied Fluvial Geomorphology, Wildland Hydrology, Pagosa Springs, CO, 2000 - Dave Rosgen  
River Morphology and Application, Wildland Hydrology, Pagosa Springs, CO, 2000 - Dave Rosgen  
Worker Protection and Safety (FIFRA) Instructor Course, Environmental Protection Agency and Georgia Department of Agriculture. 1997.  
Raptor Ecology, Northeastern University. 1992.

### Professional Presentations

Spears, R.E. Wind Farms and Wildlife. Avian and Bat Issues. July 2011. Fort Collins, Colorado. Wind Senators Workshop. (Invited).  
Spears, R.E. Compensatory Mitigation: Moving Beyond Compliance. June 2008. Denver, Colorado. *Joint Services Environmental Management Conference (JSEM)*. (Invited)

Spears, R.E. and Steve Jones. Implementation of Natural Channel Design on an Urban Stream Restoration Project in Fulton County, Georgia. *Proceedings of the 2005 Georgia Water Resources Conference*. April 2005. University of Georgia, Athens, Georgia.  
Katherine J. Hatcher, editor. Institute of Ecology. The University of Georgia, Athens.  
Spears, R.E. Ecology and Behaviour of Ectoparasitic Arthropods Associated with the Brazilian Free-tailed Bat in Jenkins County, Georgia. *ASAB*, April 13, 1996.

- Sigma Xi, Georgia Southern University, 1996
- Georgia Entomological Society, 1995
- Georgia Academy of Science, Augusta, Ga., 1995

Spears, R.E. Ecology of Bats of the Coastal Plain of Georgia. National Symposium for Bat Research. Ixtapa, Mexico. 1994.  
Spears, R.E. Captive Behavior of the Golden Mantled Fruit Bat, *Pteropus pumilus*. National Symposium for Bat Research. Gainesville, FL., October 19, 1993.  
Spears, R.E. and Timothy F. Breen. Preference and Use of Tree Snags on Mud-flats in Southeast Alaska by the American Bald Eagle, *Haliaeetus leucocephalus*. Juneau, Alaska School for Field Studies and U.S. Fish and Wildlife Service, 1992.

### Publications

Ronald E. Spears, Daniel V. Hagan, and Lance A. Durden. 1999. Ectoparasites of Brazilian Free-Tailed Bats with Emphasis on Anatomical Site Preferences for *Chiroptonyssus robustipes* (Acari: Macronyssidae). *J. Med. Entomol.* 36(4): 481-485.  
Spears, R.E. and Steve Jones. Implementation of Natural Channel Design on an Urban Stream Restoration Project in Fulton County, Georgia. *Proceedings of the 2005 Georgia Water Resources Conference*. April 2005. University of Georgia, Athens, Georgia.  
Katherine J. Hatcher, editor. Institute of Ecology. The University of Georgia, Athens.

Ronald Spears has over 19 years of multidisciplinary experience in conducting environmental surveys and preparing environmental impact assessments in more than 27 states located throughout the country. He has been responsible for designing, staffing, and conducting innovative environmental studies for projects nationwide. These included third-party federal and state EISs, environmental assessments, federal and state agency coordination, and permit applications for a wide variety of infrastructure, industrial, and energy development projects. He has prepared environmental reports for more than 300 private and public funded projects including wetland delineation and Section 404 permitting of over 15,000 acres of jurisdictional wetlands, restoration design and monitoring of over 30 miles of natural stream channel, permitted numerous mitigation banks in multiple USACE districts, and conducted wildlife surveys for a variety of federal and state listed species including bats. Responsibilities have included project and line management, program design, project staffing, field investigations, and impact assessment and mitigation design. Studies included regional screening, alternative site selection, and development of mitigation programs, risk management, and long-term monitoring of impacts.

Mr. Spears, in addition to providing expertise in bat ecology, specializes in the characterization, classification, design, management, and installation of urban and rural stream restoration projects. He has had advanced training, recognized nationally, in stream restoration, including Rosgen Levels I-IV training with Wildland Hydrology.

### Project Experience

#### Atlantic Richfield

##### **Rico-Argentine Mine, CERCLA Removal Action for Pond Stabilization. Rico, Colorado.**

Consulted with USACE to develop a Letter of Notification for a CERCLA Time-sensitive Removal Action to stabilize wastewater settling ponds identified with the 100-year floodplain of the Dolores River by re-construction and stabilization of the dyke wall adjacent to the river.

#### United States Fish and Wildlife Service

##### **Lesser Long-nosed Bat and Mexican Long-nosed Bat Roost Locating, Monitoring, and Protection Assessment in Arizona and New Mexico.**

Project Manager for an intensive three year study to locate unknown roosts and document habitat use patterns for two endangered bat species. Studies conducted include surveys of abandoned mines and caves, mist-net capture, radio-tagging and telemetry. Project is funded by Homeland Security.

#### Bureau of Land Management

**Stream and Riparian Assessment Surveys of Maggie Creek Watershed, Bureau of Land Management, Elko, Nevada.** As Project Technical Lead, responsible for technical oversight and field work associated with a stream assessment of about 37 miles of Maggie Creek and associated tributaries located on land managed by Newmont Mining Company. Completed more than 100 stream and riparian assessments using the BLM Proper Functioning Condition (PFC) and geomorphological assessment methods (Rosgen 1996). [Prior to AECOM]

#### Department of Defense

##### **Peterson Air Force Base**

**Environmental Assessment – Colorado Springs, Colorado.** Responsible for preparation of an EA for the PAFB General Plan Five Year Development Component. Tasks included agency scoping, coordination with military and civilian project engineers, and federal and state regulatory agencies. [Prior to AECOM]

#### Department of Defense

#### United States Army

**Fort Campbell Watershed Assessment and Indiana Bat Habitat Surveys.** Provided project management to a watershed study in support of Indiana bat habitat studies. Provided technical scoping and review to determine the extent of riparian habitat restoration potential for nearly 27 miles of stream corridor within the Cumberland River Basin. [Prior to AECOM]

#### Department of Defense

##### **United States Army**

##### **Fort Benning Red-cockaded Woodpecker and Wildlife**

**Assessment.** Conducted surveys for RCWs and other sensitive or listed species including gopher tortoise, bats, Eastern indigo snake, and plant species.

#### Constellation Energy/Unistar Nuclear Energy

##### **Calvert Cliffs Nuclear Power Plant Unit 3, Chesapeake Bay, Maryland.**

Provided technical review and scoping for wetland and stream mitigation services for power plant expansion activities. Assisted in the development of a long-term mitigation program and conceptual stream and wetlands restoration designs. Provided technical review of data analysis and report development for Section 404 permit application package. [Prior to AECOM]

#### Denver Rural Transportation District

**RTD Fast Tracks Light Rail Corridors, Denver, Colorado.** Project technical lead and natural resources technical lead for the North Metro Corridor Draft Environmental Impact Statement. As field work coordinator, performed functional assessments, managed subcontractors, and was responsible for all NEPA documentation (including Section 404 permitting), EAs and EISs along three corridors, totaling 71 miles in the Denver metro area. The project also required coordination with the USFWS and Colorado Department of Wildlife for informal consultation concerning potential protected wildlife and plant species, including burrowing owls, preble's meadow jumping mouse, and Ute Ladies' tresses orchid. Developed a conceptual mitigation planning and monitoring programs for project impacts that were eventually approved by the Omaha District USACE. [Prior to AECOM]

#### British Petroleum / Entrix

##### **Mississippi Canyon 252 (MC252) Natural Resource Damage Assessment/Emergency Response (BP Oil Spill), Florida, Alabama, Louisiana and Texas.**

Provided technical oversight and review to USFWS contractors on the collection of data related to the Gulf oil spill. Observed data collection, wildlife capture, prepared reports, provided chain-of-custody duties, and provided consultation on capture and data collection techniques for

nonbreeding shorebird surveys, great egret and brown pelican capture teams. [Prior to AECOM]

#### **National Park Service**

**Pre- and Post-Closure Bat Surveys of Abandoned Mines in Death Valley National Park, California.** Conducted bat survey assessments for the National Park Service (NPS) of over 100 abandoned mine sites in Death Valley National Park. Mr. Spears was responsible for all aspects of planning, execution and oversight, including field work, data collection and analyses, closure recommendations, and reporting. Conducted wildlife assessment surveys of abandoned mine features (including internal surveys, shaft/winze surveys, external and exit surveys) using a variety of techniques (including closed-circuit, downhole video cameras, Sony Nightshot® cameras with supplemental IR lights) and by physical and visual inspections of all mine openings to determine significance as bat roost habitat and provide mine closure recommendations to the NPS. A final report was completed containing habitat descriptions for each abandoned mine site, all appropriate images, the number and identification of bat species observed, type of roosts, and likelihood of future use (based on habitat and internal variables). Conducted presence absence surveys for desert tortoise to comply with NPS NEPA plan and to ensure no "take" while conducting bat surveys. [Prior to AECOM]

#### **National Park Service**

**Pre- and Post-Closure Bat Surveys of Abandoned Mines, Joshua Tree National Park, California.** Conducted bat survey assessments for the National Park Service (NPS) of 205 abandoned mine sites. Mr. Spears was responsible for all aspects of planning, execution and oversight, including field work, data collection, and analyses, closure recommendations, and reporting. Conducted wildlife assessment surveys of abandoned mine features (including internal surveys, shaft/winze surveys, external and exit surveys) using a variety of techniques. Developed final report outlining habitat descriptions for each abandoned mine site, all appropriate images, the number and identification of bat species observed, type of roosts, and likelihood of future use (based on habitat and internal variables). Conducted presence absence surveys for desert tortoise to comply with NPS NEPA plan and to ensure no "take" while conducting bat surveys. [Prior to AECOM]

#### **Constellation Energy / Unistar Nuclear Energy**

**Bell Bend Nuclear Power Plant, Pennsylvania.** Provided technical responses to a request for additional information (RAI) regarding USACE and SRBC permit compliance for mitigation impacts for wetland and other waters of the U.S. In addition, provided response regarding surface water withdrawal and consumptive use mitigation for power plant expansion activities at the Bell Bend Nuclear Power

Plant along the Susquehanna River in Pennsylvania. Provided technical review of data analysis and report development for Section 404 permit application package. [Prior to AECOM]

#### **National Park Service**

**Bat Surveys of Abandoned Mines, Mojave National Preserve, California.** Conducted bat survey assessments for the National Park Service (NPS) of 205 abandoned mine sites in the Mojave National Preserve. Mr. Spears was responsible for all aspects of planning, execution and oversight, including field work, data collection and analyses, closure recommendations, and reporting. Conducted wildlife assessment surveys of abandoned mine features (including internal surveys, shaft/winze surveys, external and exit surveys) using a variety of techniques (including closed-circuit, downhole video cameras, Sony Nightshot® cameras with supplemental IR lights) and by physical and visual inspections of all mine openings to determine significance as bat roost habitat and provide mine closure recommendations to the NPS. A final report was completed containing habitat descriptions for each abandoned mine site, all appropriate images, the number and identification of bat species observed, type of roosts, and likelihood of future use. Conducted presence absence surveys for desert tortoise to comply with NPS NEPA plan and to ensure no "take" while conducting bat surveys. (based on habitat and internal variables). [Prior to AECOM]

#### **El Paso Corporation**

**Ruby Gas Pipeline Stream Assessments and Conceptual Stream Mitigation Planning, Oregon, Nevada, Utah, and Wyoming,** As Senior Scientist, performed more than Rosgen stream classification and Proper Functioning Condition (BLM) assessments to more than 60 stream crossings to determine a recommended mitigation strategy to potentially impacted streams for the development and construction of the El Paso Ruby gas pipeline. [Prior to AECOM]

#### **City of Colorado Springs**

**Environmental Assessment for Woodmen Road Corridor, Colorado Springs, El Paso County, Colorado.** Principal Scientist and Environmental Task Leader. Conducted pre-planning and mitigation studies in support of an EA for transportation improvements proposed for the 11-mile Woodmen Road corridor from I-25 to U.S. Highway 24. Activities included client communication, coordination of agency scoping, resource-specific research and report writing, and coordination of staff and resources for project deliverable. Responsible for waters of the U.S. and threatened and endangered species evaluations (burrowing owl and Preble's meadow jumping mouse) and wetland compensatory mitigation analysis. Agency coordination involved communication with the USACE, USFWS, CDOW, SHPO, and other state and local agencies. [Prior to AECOM]

**Mesa Power LLP**

**Environmental Scoping for a Planned 4,000 MW Windfarm, Brownsville, Texas.** Developed a scope to conduct preliminary environmental studies for a fatal flaw analysis of a nearly 200,000 acre site to develop a windfarm in Texas. Primary focus of studies included wildlife surveys for bats, birds, and other species, vegetation and habitat cover, wetland and streams, and cultural resources.

**Idaho Power / Rocky Mountain Power****Gateway West Transmission Line Project, Wyoming and Idaho.**

Responsible for conducting natural resource surveys (including wetlands, wildlife and vegetation) along the proposed Gateway West Transmission Line Project. The project spans approximately 1,150 miles (including 10 segments) from the Windstar Substation east of Casper near Glenrock, Wyoming to the new Hemingway Substation southwest of Boise near Murphy, Idaho. As a team member, assisted Idaho Power and Rocky Mountain Power in filing NEPA documentation and regulatory permit applications with the Bureau of Land Management (BLM), US Forest Service (USFS), and other federal and state agencies for a right-of-way grant and special use permit, respectively, to construct, operate and maintain the Gateway West Transmission Line Project on federal lands. [Prior to AECOM]

**Colorado Department of Transportation****US 36 Environmental Impact Statement Studies, Colorado.**

Environmental lead for a Waters of the U.S. and ecological assessment along an 18-mile-long urban corridor between Denver and Boulder. The project likely would include expansion of the roadway through the addition of Express Lanes in which Bus Rapid Transit and High-Occupancy Vehicles would travel at no cost. These lanes would be "managed", allowing Single-Occupant Vehicles access for a fee based on the capacity available. In either alternative, 10 interchanges along the corridor would be improved, transit station improvements made, and a continuous bikeway provided. Environmental issues include consideration of preserved open space as Section 4(f) property, threatened and endangered species (Preble's meadow jumping mouse, burrowing owls), and wetlands impacts. The project is using the NEPA/404 merger process for Section 404 permitting as agreed to by CDOT, USACE, and FHWA. [Prior to AECOM]

**Bureau of Land Management**

**Anvil Points Facility, NEPA - Mitigation Plan for Sensitive Plant Species, Debeque Milkvetch, Rifle, Colorado.** Project Manager for a third-party EIS mitigation and habitat restoration study prior to

construction efforts for the reclamation of lands contaminated by spent oil-shale reserves. Provided technical assistance in development of a Mitigation Plan, Chesapeake Bay and provided support in agency scoping to achieve successful mitigation to remove, replant, and propagate up to 700 sensitive plants at the site. [Prior to AECOM]

**Petroleum Development Corporation**

**Colorado Oil and Gas Conservation Commission (COGCC), Wildlife and Vegetation Surveys, Rifle, Colorado.** Conducted vegetation and wildlife evaluations of potential oil and gas related construction and drilling sites. Participated in aerial site reconnaissance for sage grouse lek and raptor surveys (burrowing owls), and site selection evaluations of portions of the Roan Plateau and Colorado River near Rifle and Parachute, Colorado, consisting of approximately 70 square miles. [Prior to AECOM]

**Kinder Morgan Interstate Gas Transmission, LLC.**

**Nebraska Ethanol Expansion Project in Hall, Howard, Merrick, and Nance Counties, Nebraska.** Conducted biological and habitat assessments on approximately 24 miles of pipeline right-of-way, which included Waters of the U.S. determinations, wetland delineations, and threatened and endangered species habitat surveys for a number of species including badger, bald eagle, interior least tern, piping plover, and whooping crane. Collected GPS data points for wetland delineations and Waters of the U.S. Prepared biological components of the FERC Environmental Report. [Prior to AECOM]

**Noble Gas****COGCC, Wildlife Expert Witness Services, Parachute, Colorado.**

As project lead, completed a literature and research review in preparation to provide expert witness services on behalf of Noble Gas related to well development and environmental issues specific to the transmission of West Nile Virus from mosquitos to sage grouse. [Prior to AECOM]

**BP Alternative Energy**

**Feasibility (Fatal-Flaw) Studies for Solar Power Plants, Colorado, Texas, New Mexico, Arizona.** Conducted over 20 biological and habitat assessments on approximately 15,000 acres, which included Waters of the U.S. determinations, wetland delineations, and threatened and endangered species habitat surveys (desert tortoise, burrowing owls) for a fatal flaw analysis for the selection of a solar power plant site. Collected GPS data points for wetland delineations and Waters of the U.S. Prepared biological components of the feasibility report. [Prior to AECOM]

**Kinder Morgan Interstate Gas Transmission, LLC.**

**Ethanol Expansion Project in Hall, Howard, Merrick, and Nance Counties, Nebraska.** Conducted biological and habitat assessments on approximately 24 miles of pipeline right-of-way, which included Waters of the U.S. determinations, wetland delineations, and threatened and endangered species habitat surveys for badger, bald eagle, interior least tern, piping plover, and whooping crane. Collected GPS data points for wetland delineations and Waters of the U.S. Prepared biological components of the FERC Environmental Report. [Prior to AECOM]

**Southern Star Central Gas Pipeline, Inc. Pocasset Project, Grady County, Oklahoma.** Technical review of the habitat assessments, Waters of the U.S. determinations, and wetland delineations. Prepared FERC documentation for Resource Report 2 (Surface Water Resources: Wetlands and Other Water Feature sections) and Resource Report 3 (Vegetation and Wildlife). Produced technical memos for compliance with the Migratory Bird Treaty Act (MBTA) and specific protocol for the removal of potential Indiana bat trees according to following U.S. Fish and Wildlife Service and Nebraska Fish and Parks Department guidance. [Prior to AECOM]

**El Paso Natural Gas Sand Dune Lizard and Lesser Prairie Chicken, Section 7 Consultations and Mitigation Plan, Texas and New Mexico.** Technical lead for Section 7 consultation with the USFWS for two Species of Concern – Sand Dune Lizard and Lesser Prairie Chicken – and the development of an acceptable mitigation plan. [Prior to AECOM]

**El Paso Natural Gas Pecos Natural Gas Pipeline, Texas and New Mexico.** Technical lead for biological assessments and reporting for submission of a FERC permit. [Prior to AECOM]

**Union Pacific Railroad Multiple Sites: Texas, New Mexico, Louisiana, Arizona, and California.** Technical lead for biological assessments and reporting for Section 404 permit application packages. Coordination also involved USFWS and SHPO. [Prior to AECOM]

**Elachee Nature Center Upper Chattahoochee River Umbrella Mitigation Bank, Gainesville, Georgia.** Assisted in the development of the first umbrella mitigation bank permitted in the USACE Savannah District. Sites were selected and rated for mitigation potential prior to development of a mitigation prospectus and landowner negotiations. Wetland and stream sites were located in sub-watershed units of the Upper Chattahoochee River to develop this

unique banking instrument where multiple mitigation sites can be located in multiple watersheds. In total, UCUMB will provide for restoration and/or enhancement of approximately 352 acres and approximately 39,315 linear feet of stream and riparian buffer. Restoration will be conducted in seven phases and will generate a total of 225,853 stream credits. [Prior to AECOM]

**United States Department of Agriculture Buncombe County Emergency Watershed Protection, Stream Assessment and Design Plans, Asheville, North Carolina.** Assessed and developed plans and specifications for the restoration of 163 impacted stream sites using natural materials (including rock toes, j-hook vanes, w-weirs, rock cross-vanes) and bio-engineering techniques, such as riparian zone restoration and willow staking. [Prior to AECOM]

**United States Department of Agriculture Transylvania County Emergency Watershed Protection, Stream Assessment and Design Plans, Brevard, North Carolina.** Assessed and developed plans and specifications for the restoration of 13 impacted stream sites ranging from 300 linear feet to over 1,000 linear feet using natural materials (including rock toes, j-hook vanes, w-weirs, rock cross-vanes) and bio-engineering techniques, such as riparian zone restoration and willow staking. Additional duties included the identification of bankfull flow; development of channel width and depth, meander length, width, and radius; definition of flood prone area; and the preparation of design drawings. Perform construction oversight, preparation of the Section 404 and 401 permit applications, and coordinated with regulators. [Prior to AECOM]

**Providence Golf Club Unnamed Tributary to Beaver Dam Creek at Providence Golf Club, Stream Assessment and Design Plans, Monroe, Georgia.** Assessed and developed plans and specifications for the restoration of 2,300 linear feet of degraded stream channel using natural materials (including rock toes, j-hook vanes, rock cross-vanes) and bio-engineering techniques, such as riparian zone restoration and willow staking. The primary design purpose was to improve function and aesthetics for golf course use. [Prior to AECOM]

**Georgia Power and Light Livingston Creek, Stream Assessment and Design Plans, Greenville, South Carolina.** Assessed and developed a mitigation plan that called for the restoration of more than 450 linear feet of degraded stream channel using natural materials (including rock/log vanes, j-hook vanes, rock cross-vanes) and bio-engineering

techniques, such as riparian zone restoration and willow staking. [Prior to AECOM]

**Upper Chattahoochee River Consortium  
Unnamed Tributary to the Soque River, Stream Assessment and Design Plans, Habersham County, Georgia.** Provided stream assessment and developed design plans and specifications for the restoration of a 500 linear feet section of degraded stream channel using natural materials, including j-hook vanes, rock cross-vanes, riparian zone restoration, and willow staking. [Prior to AECOM]

**Elachee Nature Center  
Unnamed Tributary to Walnut Creek, Stream Assessment and Design Plans, Hall County, Georgia.** Developed a restoration plan for 600 linear feet of impacted stream located on the Elachee Nature Center in Gainesville, Georgia. Duties included the identification of bankfull flow; development of channel width and depth, meander length, width, and radius; definition of flood prone area; and preparation of design drawings. Performed construction oversight, preparation of the Section 404 permit applications, assisted in development of monitoring plan, and coordinated with regulators. Design measures included rock cross vanes, J-hook vanes, boulder clusters, riffles, channel shaping, and native riparian vegetation. [Prior to AECOM]

**Client: Fulton County, Georgia  
Unnamed Tributary to Morning Creek, Stream Assessment and Design Plans, Fulton County, Georgia.** Developed a restoration plan for 2,300 linear feet of impacted urban stream located in College Park, Georgia. Duties included the identification of bankfull flow; development of channel width and depth, meander length, width, and radius; definition of flood prone area; and the preparation of design drawings. Performed construction oversight, preparation of the Section 404 permit applications, assisted in development of monitoring plan, and coordinated with regulators and landowners. Design measures included rock cross vanes, J-hook vanes, boulder clusters, riffles, channel shaping, and native riparian vegetation. [Prior to AECOM]

**Macon County School Board  
Unnamed Tributary to Skeenah Creek, Stream Assessment and Design Plans, Macon County, North Carolina.** Developed a restoration plan for over 1,300 linear feet of impacted stream located adjacent to the Macon County Elementary School in Franklin, North Carolina. Duties included the identification of bankfull flow; development of channel width and depth, meander length, width, and radius; definition of flood prone area; and the preparation of design drawings. Performed construction oversight, preparation of the Section 404 and 401 permit applications, assisted

in development of monitoring plan, and coordinated with regulators. Design measures included rock cross vanes, J-hook vanes, boulder clusters, riffles, channel shaping, and native riparian vegetation. [Prior to AECOM]

**US Department of Agriculture, Natural Resource Conservation Service  
Stream Bank Stabilization at 11 Kentucky Locations, Six Cities throughout State, Kentucky.** Study, design and construction oversight for restoration of stream banks at 11 locations in six counties (Boyd, Lawrence, Montgomery, Morgan, Owsley and Rockcastle counties). Responsible for assisting with stream construction monitoring, field changes to restoration plan, and other natural resources activities. [Prior to AECOM]

**North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program  
Mountain Province Monitoring of Four Stream Sites, Four Stream Locations, North Carolina.** Physical and biological monitoring of four stream reaches covering 19,800 linear feet located in the Mountain Province of North Carolina. Monitoring effort designed to assess the success of stream restoration and enhancement efforts. Mr. Spears acted as the field supervisor and provided stream surveys (using a total station) and conducted vegetation assessments. Other duties included the collection of stream hydraulic data and analysis and final production of the annual monitoring report required by the USACE. Responsible for data collection, physical and biological data analyses, and report development. [Prior to AECOM]

**AmerenUE  
Taum Sauk Reservoir Breach Emergency Response and Restoration Services, Lesterville, Missouri.** Emergency response (within 48 hours) program management, environmental / natural resources restoration services, natural resources monitoring, debris removal, erosion control and master planning services in wake of reservoir breach during which 1.5 billion gallons of water and debris flooded river and valley below a pumped storage utility plant along a major river in Missouri. Responsible for providing field data collection or water samples and water quality testing in laboratory environment; provided observational monitoring of biological and physical characteristics of downstream East Fork Black River during systematic discharges from below AmerenUE dam. [Prior to AECOM]

**Thyssenkrupp Steel USA, LLC  
Project Compass Step III, Multiple Sites, Arkansas and Louisiana.** Performed a wetland assessment and delineation of two sites, including Arkansas and Louisiana, for the purpose of site selection for the construction of a steel mill. Provided a field mitigation

assessment of over 5,000 acres used to assist in the development of the wetland and stream mitigation plan, and prepared the wetland and stream mitigation plans for a 3,200-acre site and a 2,800-acre site in Alabama and Louisiana. Other duties included the identification of stream geomorphologic attributes, WRAP assessment of wetlands, assistance in the preparation of the Wetland Master Plan (WMP) and Ecological Assessment (EA), 404 permit preparation, and coordination with regulators and landowners. [Prior to AECOM]

#### **Black Development, LLC**

**McDowell County Lakes Project, Wetland Delineation and Preparation of CE Individual Permit Application (IP), McDowell County, North Carolina.** Assisted with conducting stream and wetland determinations and protected species review on approximately 1,900 acres for the development of a residential subdivision. Assisted project coordinator with preparation of an ACOE Individual Permit Application including an alternatives analysis, cumulative impact analysis, conceptual stream and wetland mitigation planning, client and agency coordination. [Prior to AECOM]

#### **Department of Defense United States Army**

##### **Fort Stewart Flatwood Salamander Habitat Assessment-**

As part of a research team using a variety of survey techniques, conducted surveys to more than 1,000 seasonal ponds at the 280,000-acre military facility in southeastern Georgia to determine use by the flatwoods salamander (*Ambystoma cingulatum*) habitat. [Prior to AECOM]

#### **Department of Defense**

##### **Air Force Research Laboratory (AFRL) – High Explosives Research and Development (HERD) at Eglin Air Force Base (AFB), Florida –**

Conducted field work and research for a wetland assessment and delineation, and a protected species survey (primarily the Gopher tortoise) as part of the information gathering effort for the preparation of a NEPA Environmental Assessment (EA) to ensure environmental compliance; sustainability for efficient use of resources and space; and for maintaining a safe and healthful working environment. The AFRL expansion of the existing HERD facilities at Eglin AFB to accommodate new lines of research and testing, with emphasis on the areas of energetic nano-materials that are explosive and potentially useful in new munitions. Collected field data to support the EA and also identified and marked in the field, wetlands located adjacent to Tom's Creek, a recognized surface water body inhabited by the endangered species, the Okaloosa darter (*Etheostoma okaloosae*). [Prior to AECOM]

#### **Georgia Power and Electric**

##### **Unammed Tributary to the Etowah River restoration design.**

Conducted a stream assessment and restoration design to restore and enhance a tributary to the Etowah River inhabited by the federally endangered fish species, Etowah darter (*Etheostoma etowahae*). Developed an acceptable restoration plan, Section 404 Nationwide Permit application package, Section 7 consultation, pre- and post-construction monitoring plan for darter presence in concert with the stream stability monitoring plan. [Prior to AECOM]

#### **Landfills**

##### **Allied Waste Services**

##### **Onyx-Cedar Hill Landfill, Ragland, Alabama.**

Responsible for the development of a site feasibility study, scoping, development of an environmental assessment (EA), development of a USACE Individual Permit Application, conceptual and final mitigation plan, wildlife and vegetation surveys, and stream restoration design plan for approximate 1,300 linear feet of natural stream channel. [Prior to AECOM]

##### **Waste Services, Inc.**

##### **Coffee County Landfill, Douglas, Georgia**

Responsible for the development of a site feasibility study, development of an environmental assessment (EA), development of a USACE Individual Permit Application, conceptual and final mitigation plan, wildlife and vegetation surveys, and biological monitoring for Section 404 permit compliance. [Prior to AECOM]

##### **Bartow County Department of Solid Waste**

##### **Bartow County Landfill, Georgia**

Responsible for the development of a site feasibility study, development of a USACE Individual Permit Application, conceptual and final mitigation plan, wildlife and vegetation surveys, and biological monitoring for Section 404 permit compliance. A formal threatened and endangered species survey was conducted for presence of the endangered Gray bat using mist nets. [Prior to AECOM]

#### **References**

Timothy Breen, Air Force Liaison  
U.S. Fish and Wildlife Service, Region 2  
AFCEE/TDNO  
2261 Hughes Ave., Suite 155  
Lackland AFB, TX 78236-9853  
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## **Gregg Lukasek**

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*Mr. Lukasek has conducted biological surveys in southern California for the past three years. He has conducted general wildlife reconnaissance surveys, focused surveys for desert tortoise, burrowing owl, desert kit fox and American badger and has worked as a biological monitor.*

### **EDUCATION**

#### **Bachelor of Science**

2002

University of Minnesota, *Minneapolis, Minnesota*

### **PROJECT EXPERIENCE**

*Peninsular Bighorn Sheep Surveys and Biological Monitoring, San Diego Gas and Electric*  
El Centro, CA to In-koh-pah, CA June 2011 – Dec 2011

- Surveyed for peninsular bighorn sheep for the Sunrise Powerlink Project compliance
- Monitored construction within peninsular bighorn sheep habitat to ensure compliance with all environmental permits relating to the species
- Maintained electronic data for monitoring effort

*Desert Tortoise Handling and Burrow Scoping, Davenport Biological Services*  
Twentynine Palms, CA April 2011

- Assisted with handling desert tortoise for transmitter, handled one adult female desert tortoise under the supervision of Arthur Davenport
- Conducted telemetry to locate tortoise with transmitter
- Scoped potential desert tortoise burrows under the supervision of Arthur Davenport

*Desert Tortoise Fence Installation, Biological Monitoring, Mojave Solar through AECOM*  
Barstow, CA March 2011

- Monitored installation of desert tortoise exclusion fencing
- Ensured compliance of construction activities with California Energy Commission Conditions of Certification and U.S. Fish and Wildlife (USFWS) Biological Opinion
- Found one adult desert tortoise in area adjacent to project
- Set up wildlife cameras for mammalian surveys (desert kit fox and American badger)
- Installed signage for environmentally sensitive areas

*Desert Tortoise Clearance Surveys, Solar Millennium through AECOM*  
Blythe, CA March 2011

- Desert tortoise clearance surveys according to USFWS protocol
- Mapping of desert tortoise, burrowing owl, American badger, desert kit fox, nesting birds and other special status species and sign

*Desert Tortoise Focused Surveys, Solar Millennium through AECOM*

Blythe and Ridgecrest, CA

Feb - May, Oct 2010

- Desert tortoise habitat assessment
- Focused desert tortoise surveys according to USFWS protocol
- Mapping of desert tortoise, burrowing owl and other special status species and sign

*Desert Tortoise Habitat Assessment, Solar Millennium through AECOM*

Barstow, CA

February 2010

- Desert tortoise habitat assessment
- Mapping of desert tortoise, burrowing owl and other special status species and sign

*Biological Monitoring of Geotechnical Work, Solar Millennium through AECOM*

Ridgecrest, CA

August 2009

- Construction monitoring
- Identification of special status species sign including desert tortoise and burrowing owl
- Preparation of daily reports

*Desert Tortoise Focused Surveys, Solar Millennium through AECOM*

Blythe and Ridgecrest, CA

February - June 2009

- Desert tortoise habitat assessment
- Focused desert tortoise surveys according to USFWS protocol
- Mapping of desert tortoise, burrowing owl and other special status species and sign

*Burrowing Owl Habitat Assessment*

Temecula, CA

November 2008

- General vegetation/habitat mapping
- Burrowing owl habitat assessment

**FIELD SKILLS**

- In excess of 1,400 field hours conducting protocol desert tortoise surveys. Personally found eight tortoises, one of which was less than 100 mm MCL as well as desert tortoise sign including burrows, scat, carcasses, bone fragments, and tracks.
- Strong herpetological identification skills for reptiles of the southern California deserts, including sensitive species such as: Mojave fringe-toed lizard; rosy boa; flat tailed horned lizard; and desert tortoise
- Identification of mammal sign including kit fox, coyote, badger, kangaroo rat, ground squirrel, deer, jackrabbit, cottontail etc.
- Proficient with Global Position System (GPS) devices, four wheel drive vehicles and off-road driving
- Experienced with snake handling

### PROFESSIONAL DEVELOPMENT

- Desert Tortoise Handling Workshop, The Desert Tortoise Council, November 2009, Ridgecrest, CA
- California Burrowing Owl Consortium General Meeting, February 2009, Escondido, CA
- Flat Tailed Horned Lizard Biomonitoring Training, May 2011, Hosted by Southwest Partners in Amphibian and Reptile Conservation (SWPARC)
- Member of the *Society for the Study of Reptiles and Amphibians*

### PROFESSIONAL REFERENCES

- Shelly Dayman, Biologist, AECOM  
619-820-0768  
[shelly.dayman@AECOM.com](mailto:shelly.dayman@AECOM.com)
- Arthur Davenport, Biologist, Davenport Biological Services  
619-729-4242  
[artdavenpo@aol.com](mailto:artdavenpo@aol.com)
- Mike Rathbun, Biologist, Rathbun Biological  
909-815-4140  
[phaino75@yahoo.com](mailto:phaino75@yahoo.com)

## DESERT TORTOISE AUTHORIZED BIOLOGIST REQUEST FORM

This form should be used to provide your qualifications to agency officials if you wish to undertake the duties of an authorized biologist with regard to desert tortoises during construction or other projects authorized under Sections 7 (Biological Opinions) or 10(a)(1) (B) (i.e. Habitat Conservation Plans) of the Endangered Species Act.

(If you seek approval to attach/remove/insert any devices or equipment to/into desert tortoises, withdraw blood, or conduct other procedures on desert tortoises, a recovery permit or similar authorization may be required. Application for a recovery permit requires completion of Form 3-200-55, which can be downloaded at <http://www.fws.gov/forms/3-200-55.pdf>.)

**1. Contact Information:**

<b>Name</b>	Gregg Lukasek
<b>Address</b>	4337 Via Tercero
<b>City, State, Zip Code</b>	Oceanside, CA 92056
<b>Phone Number(s)</b>	314-440-3220
<b>Email Address</b>	glukasek@gmail.com

**2. Date:** Feb 15 2011

**3. Areas in which authorization is requested (check all that apply):**

- San Bernardino, Kern, Inyo and Los Angeles Counties, California (Ventura office)
- Riverside, San Diego, and Imperial Counties, California (Carlsbad office)
- Nevada     Utah     Arizona

**4. Please provide information on the project:**

<b>USFWS Biological Opinion or HCP No. When Applicable</b>		<b>Date:</b>
<b>Project Name</b>		
<b>Federal Agency (If Applicable)</b>		
<b>Proponent or Contractor</b>		

5. If you hold, or have held, any relevant state or federal wildlife permits provide the following:

Species	Dates	State (specify) or Federal Permit Number	Authorized Activities

6. **Education:** Provide up to three schools, listing most recent first:

Institution	Dates attended	Major/Minor	Degree received
University of Minnesota	1999-2002		B.S.

7. **Desert Tortoise Training.**

Name/Type of Training	Dates (From/To)	Location	Instructor/Sponsor
1. Classes DTC Surveying, Handling Workshop	Nov/2009	Ridgecrest, CA	Desert Tortoise Council
2. Field Training			
3. Translocation			
4.			

**8. Experience** - Include only those positions relevant to the requested work with desert tortoises. Distinguish between wild Mojave desert tortoise and other experience. Include only your experience, not information for the project you worked on (e.g., if 100 tortoises were handled on a project and you handled 5 of those tortoises, include only those 5. List most recent experience first. Handling a Mojave desert tortoise must be authorized by a Biological Opinion or other permit and reported to the USFWS. Information provided in this section will be used by the USFWS to track the numbers of tortoises affected by previous projects (baseline). **Be sure to include a project supervisor or other contact that can verify your skills and experience in relation to your job performance.** Attach additional sheets as necessary. Please use numbers in each column; do not use "X's" to indicate participation in the activity. If your experience is limited to **less than three desert tortoise positions**, please include additional job experience and references in the section below (pg. 5).

**Experience by project and activity:**

Please include: Project Name Job Title Dates of Employment	Supervisor / Project Contact Name Phone Email address	Conduct Clearance Surveys (Hrs/Days)	Excavate DT burrows (No.)	Locate DT No. < 100mm ≥ 100mm	Handled for Relocation DTs (No.)	Excavate, and relocate DT nests (No.)
1. Solar Millennium Desert Tortoise Surveyor/Biologist February - May 2010	Shelly Dayman Lead Biologist DT Surveys, AECOM 619-820-0768 shelly.dayman@aecom.com	0	0	2 1 100mm	0	0
2. Solar Millennium Desert Tortoise Surveyor/Biologist February - June 2009	Shelly Dayman Lead Biologist DT Surveys, AECOM 619-820-0768 shelly.dayman@aecom.com	0	0	4	0	0
3.						
4.						
5.						
6.						
7.						

**Experience by project and activity (continued):** Each project number should correspond with the project listed on the previous page

Project Name (Number should correspond to previous page)	Construct Artificial Burrows (No.)	Monitor project equipment and activities (Hrs/Days)	Oversee project compliance (Hrs/ Days)	Supervise DT field staff (Hrs/Days) and No. staff supervised	DT fence Installation and inspection (Hrs/Days)	Present DT Awareness Training (No.)
1. Solar Millennium - Blythe, Palen and Ridgecrest	0	0				
2. Solar Millennium - Blythe, Palen and Ridgecrest	0	10				
3.						
4.						
5.						
6.						
7.						

**Summary of experience:**

Total time spent for all desert tortoise-related field activities (referenced above):

Specify total number of hours:

OR total number of 8-hour days: 175

Total number of miles/kilometers walked conducting survey transects:

1400 miles

Total number of wild, free-ranging desert tortoises you personally handled:

<100 mm: 0

≥100 mm: 0

Additional supervisory experience other than with desert tortoise work

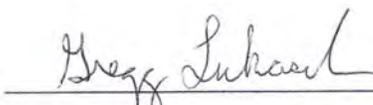
Project	Hours	Staff (No.)

Additional references for individuals whom have held **less than three** positions working with desert tortoise

Project Name Job Title Dates of employment	Supervisor / Project Contact Name Phone Email address
Solar Millennium Biologist	Art Davenport/Project Contact 619-729-4242 artdavenpo@aol.com
Solar Millennium Biologist	Shelly Dayman/Supervisor 619-820-0768 shelly.dayman@aecom.com
Solar Millennium Biologist	Mike Rathbun/Project Contact 909-815-4140 phaino75@yahoo.com

I certify that the information submitted in this form is complete and accurate to the best of my knowledge and belief.

I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. Ch.47, Sec. 1001.

Signed:  Date: 2/15/2011

**ATTACHMENT 3**

**INFORMATION INDEX FOR  
DESERT TORTOISE SIGN**



**INFORMATION INDEX FOR DESERT TORTOISE SIGN**  
**Burrows and Dens, Scats, and Shell Remains**

**From:** USFWS *Field Survey Protocol for any Non-Federal Action That May Occur within the Range of the Desert Tortoise* (protocol) (USFWS 1992).

- (1) Burrows and Dens:
1. currently active, with tortoise or recent tortoise sign
  2. good condition, definitely tortoise; no evidence of recent use
  3. deteriorated condition (please describe); definitely tortoise
  4. deteriorated condition; possibly tortoise (please describe)
  5. good condition; possibly tortoise (please describe)
- (2) Scats:
1. wet (not from rain or dew) or freshly dried; obvious odor
  2. dried with glaze; some odor; dark brown
  3. dried; no glaze or odor; signs of bleaching (light brown), tightly packed material
  4. dried; light brown to pale yellow, loose material; scaly appearance
  5. bleached, or consisting only of plant fiber
- (3) Shell Remains:
1. fresh or putrid
  2. normal color; scutes adhere to bone
  3. scutes peeling off bone
  4. shell bone is falling apart; growth rings on scutes are peeling
  5. disarticulated and scattered



**ATTACHMENT 4**

**FIELD DATA SHEETS**



WILDLIFE SURVEY DATA SHEET

Project: Ace Phoenix Location: Linear <sup>Southend</sup>

Date: 7/2/12

Page 1 of 1

GPS Unit	Surveyor(s)	GPS Unit	Surveyor(s)
No name	SDA	SM1	MIL
Personal	GLU		

Potential Burrows or Nests:

Start	Time	Temp (°F)	Wind (mph)	Precip.	Cloud Cover (%)
End	6:20am	73°F	8-6	None	0%
	2:57pm	103°F	3	None	0%
	Mudday 12:05pm	97°F	3	None	0%

Burrow or Nest ID (GPS IDENT Code <sup>1</sup> )	GPS Easting	GPS Northing	Species Present (Circle)	Burrow complex? <sup>1</sup>	Burrow Dimension H x W x D (in.)	Burrow Suitable for (Circle) and Status <sup>1</sup> (Circle):	Sign Present (Circle) WW=whitewash, Pell=Pellets, Feath=feathers, Claw=claw marks, Trk=tracks, Car=carcass, Oth=other	Description and Comments, **Note Class of any DT sign**	
									WBO
TUS50001	0464078	39 50749	WBO			WBO - A, PA, S, NS	WBO - WW, Pell, Feath, Trk, Oth	ground squirrel burrow (2) chip + 1 to WP	
			AB	Y	N	NA	AB - A, PA, S, NS		AB - Claw, Trk, Scat, Carc, Oth
			DKF				DKF - A, PA, S, NS		DKF - Claw, Trk, Scat, Carc, Oth
			DT				DT - A, PA, S, NS		DT - Trk, Scat, Car Egg shell, Oth
			Nest				Nest - A, PA, Inact		Nest - Eggs, Chicks, Oth
			None				N/A		None
			Other				Other		Other
			WBO				WBO - A, PA, S, NS		WBO - WW, Pell, Feath, Trk, Oth
			AB				AB - A, PA, S, NS		AB - Claw, Trk, Scat, Carc, Oth
			DKF				DKF - A, PA, S, NS		DKF - Claw, Trk, Scat, Carc, Oth
DT				DT - A, PA, S, NS	DT - Trk, Scat, Car Egg shell, Oth				
Nest				Nest - A, PA, Inact	Nest - Eggs, Chicks, Oth				
None				N/A	None				
Other				Other	Other				

Incidental Species Observations/Notes:

coyote, jacobson's woodrat, kit fox tracks, sideblotched lizard, mourning dove, gila's hummingbird, bat (unknown sps)

<sup>1</sup>IDENT Code: the unique 8-digit code that identifies the individual burrow or burrow complex within the project site (e.g., GBBSD001). See last page for nomenclature and codes.  
<sup>2</sup>Burrow Status: A = Active (occupancy is confirmed by visual detection of species or sign indicates recent use), PA = Potentially Active (species occupancy not confirmed, but sign indicates possible use), S = Suitable (no evidence of recent use by species, but burrow is suitable), NS = Not Suitable (burrow not suitable for this species), Inact = inactive nest present.

WILDLIFE SURVEY DATA SHEET

Project: Ace Phoenix Location: Linear

Date: 7/3/12

Page 1 of     

GPS Unit	Surveyor(s)	GPS Unit	Surveyor(s)
SM1	M. Reland	UNK	Shayman
pens	G. Weaver	UNK	Ron Spears

Time	Temp (°F)	Wind (mph)	Precip.	Cloud Cover (%)
Start 6:06 am	73	1-3	None	0
End 3:30 pm	110	3	None	0

Potential Burrows or Nests:

Burrow or Nest ID (GPS IDENT Code <sup>1</sup> )	GPS Easting	GPS Northing	Species Present (Circle)	Burrow complex? <sup>1</sup>	Burrow Dimension H x W x D (in.)	Burrow Suitable for (Circle) and Status <sup>1</sup> (Circle):	Sign Present (Circle) WW=whitewash, Pel=Pellets, Feath=feathers, Claw=claw marks, Trk=tracks, Car=carcass, Oth=other	Description and Comments, **Note Class of any DT sign**
TMA6L001	0463781	3953997	WBO AB DKF DT Nest None Other	Y (N) NA	24x20x UNKN	WBO - A, PA, S, NS AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk Scat Carc Oth DT - Trk Scat Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	Probably could be a DT could fit in burrow but not a DT burrow
TMA6S001	0463780	3954082	WBO AB DKF DT Nest None Other	Y (N) NA	16x16x UNK	WBO - A, PA, S, NS AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk Scat Carc Oth DT - Trk Scat Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	Woodrat pellets, collapsed hole, no sign
TMA6S001	0463759	3954072	WBO AB DKF DT Nest None Other	Y (N) NA	48x18x 24	WBO - A, PA, S, NS AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk Scat Carc Oth DT - Trk Scat Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	Single hole, large shell no animals but woodrat present, could be used as DT pellet but site currently collapsed and, probably for DIF, AB or could be for sign, not likely evidence of sign
TMA6L002	0463744	3953991	WBO AB DKF DT Nest None Other	Y (N) NA	24x24x UNK	WBO - A, PA, S, NS AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk Scat Carc Oth DT - Trk Scat Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	

Incidental Species Observations/Notes:

turkey vulture, jackrabbit, desert cottontail

<sup>1</sup>IDENT Code: the unique 8-digit code that identifies the individual burrow or burrow complex within the project site (e.g., GBBS0001). See last page for nomenclature and codes.  
<sup>2</sup>Burrow Status: A = Active (occupancy is confirmed by visual detection of species or sign indicates recent use), PA = Potentially Active (species occupancy not confirmed, but sign indicates possible), S = Suitable (no evidence of recent use by species, but burrow is suitable), NS = Not Suitable (burrow not suitable for this species), Inact = inactive nest present.

WILDLIFE SURVEY DATA SHEET

4910 4930 4940 4950 4960 4970 4980 4990  
 4910 4920 4930 4940 4950 4960 4970 4980 4990  
 4910 4920 4930 4940 4950 4960 4970 4980 4990

Date: 7/4/12

Page 1 of 1

Project: Ace Phoenix Location: Plant Site

GPS Unit	Surveyor(s)	GPS Unit	Surveyor(s)
UNK	SDayman	SMI	M Ireland
personal	Cluisard	UNK	R Spears

Start	Time	Temp (°F)	Wind (mph)	Precip.	Cloud Cover (%)
End	5:35am	74	1-3	None	20
	1:10pm	98	4	Slight	40

collected

Potential Burrows or Nests:

Burrow or Nest ID (GPS IDENT Code <sup>1</sup> )	GPS Easting	GPS Northing	Species Present (Circle)	Burrow complex? <sup>1</sup>	Burrow Dimension H x W x D (in.)	Burrow Suitable for (Circle) and Status <sup>1</sup> (Circle):	Sign Present (Circle) WW=Whitewash, Pell=Pellets, Feather=feathers, Claw=claw marks, Trk=tracks, Carc=carcass, Oth=other	Description and Comments, ***Note Class of any DT sign***
718R5001	0464584	3957594	WBO AB DKF DT Nest None Other	Y N NA (only one intact burrow)	18x12x UNK	WBO - A, PA, S, NS AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk, Scat, Carc Oth DT - Trk, Scat, Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	old DKF complex, only one burrow anymore, fresh DKF scat but burrow doesn't appear well maintained
			WBO AB DKF DT Nest None Other	Y N NA		WBO - A, PA, S, NS AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk, Scat, Carc Oth DT - Trk, Scat, Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	
			WBO AB DKF DT Nest None Other	Y N NA		WBO - A, PA, S, NS AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk, Scat, Carc Oth DT - Trk, Scat, Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	

Incidental Species Observations/Notes:

Sidewinder

Spotted leaf-nosed snake  
 long nosed lizard  
 Peregrine falcon (007) - Swellie's cks  
 least sand lizard

<sup>1</sup>IDENT Code: the unique 8-digit code that identifies the individual burrow or burrow complex within the project site (e.g., GBBSDD001). See last page for nomenclature and codes.  
<sup>2</sup>Burrow Status: A = Active (occupancy is confirmed by visual detection of species or sign indicates recent use), PA = Potentially Active (species occupancy not confirmed, but sign indicates possible use), S = Suitable (no evidence of recent use by species, but burrow is suitable), NS = Not Suitable (burrow not suitable for this species), Inact = inactive nest present.

WILDLIFE SURVEY DATA SHEET

Project: **Ace Phoenix** Location: Plant Site

Date: 7/5/12

Page 1 of     

GPS Unit	Surveyor(s)	GPS Unit	Surveyor(s)
<i>unk</i>	<i>S Dargman</i>	<i>SMI</i>	<i>M Zellman</i>
<i>pe stone</i>	<i>A Lebacke</i>	<i>unk</i>	<i>R Speare</i>

Start	Time	Temp (°F)	Wind (mph)	Precip.	Cloud Cover (%)
End	<i>2:35</i>	<i>77</i>	<i>7</i>	<i>none</i>	<i>0</i>
	<i>104</i>	<i>104</i>	<i>4</i>	<i>none</i>	<i>0</i>

Potential Burrows or Nests:

Burrow or Nest ID (GPS IDENT Code <sup>1</sup> )	GPS Easting	GPS Northing	Species Present (Circle)	Burrow complex? <sup>1</sup>	Burrow Dimension H x W x D (in.)	Burrow Suitable for (Circle) and Status (Circle):	Sign Present (Circle) WW=whitewash, Pell=Pellets, Feath=feathers, Claw=claw marks, Trk=tracks, Car=carcass, Oth=other	Description and Comments, **Note Class of any DT sign**
<i>TMASD002</i>	<i>0465071</i>	<i>3958198</i>	WBO AB DKF DT Nest <i>None</i> Other	Y <i>(N)</i> NA	<i>12x15x</i> <i>unk</i>	<i>(WBO-A, PA, S, NS)</i> AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk Scat Carc Oth DT - Trk Scat Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	<i>No WBO sign, woodrat scat, suitable but no sign of use by WBO under log can creek</i>
<i>TMASD003</i>	<i>465465</i>	<i>3958554</i>	WBO AB DKF DT Nest <i>None</i> Other	Y N NA	<i>10x14x</i> <i>unk</i>	<i>(WBO-A, PA, S, NS)</i> AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk Scat Carc Oth DT - Trk Scat Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	<i>Under granite outcrop, no sign</i>
<i>TKBR002</i>	<i>465465</i>	<i>3958449</i>	WBO AB DKF DT Nest <i>None</i> Other	Y N NA <i>sign</i>	<i>12x10x</i> <i>unk</i>	<i>(WBO-A, PA, S, NS)</i> AB - A, PA, S, NS DKF - A, PA, S, NS DT - A, PA, S, NS Nest - A, PA, Inact N/A Other	WBO - WW/ Pell Feath Trk Oth AB - Claw Trk, Scat, Carc, Oth DKF - Claw Trk Scat Carc Oth DT - Trk Scat Car Egg shell, Oth Nest - Eggs, Chicks, Oth None Other	<i>Fresh scat, one burrow could be active, two instead 2 filled in</i>

Incidental Species Observations/Notes:  
*n' wided hawk*

<sup>1</sup>-digit code that identifies the individual burrow or burrow complex within the project site (e.g., GBBSD001). See last page for nomenclature and codes.  
Occupancy is confirmed by visual detection of species or sign indicates recent use), PA = Potentially Active (species occupancy not confirmed, but sign indicates possible use), S = use by species, but burrow is suitable), NS = Not Suitable (burrow not suitable for this species), Inact = Inactive nest present.

WILDLIFE SURVEY DATA SHEET

Project: Ace Phoenix Location: Plant Site Buffer Date: 7/6/12

Page 1 of     

GPS Unit	Surveyor(s)	GPS Unit	Surveyor(s)
<u>Leica</u>	<u>Dejman</u>	<u>SM1</u>	<u>Mireland</u>
<u>pens.</u>	<u>Antkask</u>	<u>SM11</u>	<u>R. Spears</u>

Start	Time	Temp (°F)	Wind (mph)	Precip.	Cloud Cover (%)
<u>End</u>	<u>5:00 AM</u>	<u>77</u>	<u>1-3</u>	<u>None</u>	<u>0</u>

Potential Burrows or Nests:

Burrow or Nest ID (GPS IDENT Code <sup>1</sup> )	GPS Easting	GPS Northing	Species Present (Circle)	Burrow complex? <sup>1</sup>	Burrow Dimension H x W x D (in.)	Burrow Suitable for (Circle) and Status <sup>1</sup> (Circle)	Sign Present (Circle) WW=whitewash, Pell=Pellets, Feath=feathers, Claw=claw marks, Trk=tracks, Car=carcass, Oth=other	Description and Comments, **Note Class of any DT sign**
TKBGL001	0464558	3958398	WBO	Y <u>DN</u> NA	Unknown	WBO - A, PA, S, NS	WBO - WW Pell Feath Trk Oth	Unknown if burrow present, large granitic boulders with deep dark areas that may contain burrows, lot of grass in the scat
			AB			AB - A, PA, S, NS	AB - Claw Trk, Scat, Carc, Oth	
			DKF			DKF - A, PA, S, NS	DKF - Claw Trk, Scat, Carc, Oth	
			DT			DT - A, PA, S, NS	DT - Trk, Scat, Car Egg shell, Oth	
			Nest			Nest - A, PA, Inact	Nest - Eggs, Chicks, Oth	
			None			N/A	None	
			Other			Other	Other	
			WBO			WBO - A, PA, S, NS	WBO - WW Pell Feath Trk Oth	
			AB			AB - A, PA, S, NS	AB - Claw Trk, Scat, Carc, Oth	
			DKF			DKF - A, PA, S, NS	DKF - Claw Trk, Scat, Carc, Oth	
TDBM1001	0464443	3958344	WBO	Y <u>N</u> NA	Unknown	WBO - A, PA, S, NS	WBO - WW Pell Feath Trk Oth	Class 4, potential DT based on shape & size but no sign, soil on top in collapse in front, not recommended for scoring
			AB			AB - A, PA, S, NS	AB - Claw Trk, Scat, Carc, Oth	
			DKF			DKF - A, PA, S, NS	DKF - Claw Trk, Scat, Carc, Oth	
			DT			DT - A, PA, S, NS	DT - Trk, Scat, Car Egg shell, Oth	
			Nest			Nest - A, PA, Inact	Nest - Eggs, Chicks, Oth	
			None			N/A	None	
			Other			Other	Other	
			WBO			WBO - A, PA, S, NS	WBO - WW Pell Feath Trk Oth	
			AB			AB - A, PA, S, NS	AB - Claw Trk, Scat, Carc, Oth	
			DKF			DKF - A, PA, S, NS	DKF - Claw Trk, Scat, Carc, Oth	

Incidental Species Observations/Notes:

<sup>1</sup>IDENT Code: the unique 8-digit code that identifies the individual burrow or burrow complex within the project site (e.g., GBBSSD001). See last page for nomenclature and codes.  
<sup>2</sup>Burrow Status: A = Active (occupancy is confirmed by visual detection of species or sign indicates recent use), PA = Potentially Active (species occupancy not confirmed, but sign indicates possible use), S = Suitable (no evidence of recent use by species, but burrow is suitable), NS = Not Suitable (burrow not suitable for this species), Inact = inactive nest present.