

APPENDIX E DESERT TORTOISE SURVEY REPORT

Survey Report

Mojave Desert Tortoise Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project

March 2007

**Mojave Desert Tortoise
Survey Report**

Lincoln County Land Act
Groundwater Development and
Utility Right-of-Way Project

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U.S. Fish and Wildlife Service

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1. Introduction

The Nevada State Office of the Bureau of Land Management (BLM) is preparing an Environmental Impact Statement (EIS) in response to a right-of-way application submitted by the Lincoln County Water District (LCWD or Applicant) to construct and operate a system of regional water facilities known as the Lincoln County Land Act (LCLA) Groundwater Development Project (Project). The Project would authorize LCWD to construct infrastructure required to pump and convey groundwater resources approved for pumping by the Nevada State Engineer and located in Lincoln County to help meet anticipated future water needs in southern Lincoln County.

This desert tortoise survey report is being prepared in support of the EIS and Biological Assessment (BA) that are being prepared for the LCLA Project. The U.S. Fish and Wildlife Service (USFWS) requests, but does not require, that surveys for the desert tortoise be conducted for this Project (USFWS 2006).

Following the review of this report and the BA, the USFWS will issue a Biological Opinion (BO) that will conclude whether the Project would jeopardize the continued existence of any species listed or proposed for listing as threatened or endangered under the Endangered Species Act (ESA).

1.1 Background

Threatened, endangered, and proposed species are protected by the ESA of 1973, as amended. "Endangered" species are defined in the ESA as species that are in danger of extinction throughout all or a significant portion of their range. "Threatened" species are those species likely to become endangered within the foreseeable future throughout all or a significant portion of their range due to disease, predation, habitat loss, or other factors. The BLM is charged with ensuring that any action authorized, funded, or carried out by that agency is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of habitat which is determined by the Secretary of the Interior as critical to such species. Section 7 of the ESA establishes a consultation procedure to implement the substantive obligations of the Act. The BLM is required to consult with the USFWS when an action may affect a threatened or endangered species or its habitat.

The desert tortoise is a federally listed threatened species (USFWS 1990). The southern portion of the project area is located within desert tortoise habitat, and

portions are within designated critical habitat. As such, only the southern portion of the project area will be described in this document.

1.2 Consultation History

Consultation with the USFWS was initiated for the LCLA Project by the BLM in a letter dated April 10, 2006. A meeting was then held on April 17, 2006 in Reno to discuss the project. Meeting participants included the USFWS staff, BLM staff, the Applicant, and ARCADIS biologists. The USFWS indicated during this meeting that a desert tortoise survey would likely be needed. ARCADIS submitted a DRAFT Desert Tortoise Survey Proposal (DRAFT Proposal) for the LCLA Project on August 28, 2006. The DRAFT Proposal was reviewed by the USFWS, and a conference call with all interested parties was held on September 13, 2006 to discuss revisions. Greystone-ARCADIS then submitted a FINAL Desert Tortoise Survey Proposal (**Appendix A**) and received an email approval from the USFWS on September 26, 2006 to proceed with the surveys.

2. Project Description

The LCLA Project would include up to 15 production water wells to be located in the previously permitted Toquop Energy Project proposed well field area located in the Tule Desert hydrographic basin and up to 15 production water wells to be located in the Clover Valley hydrographic basin. Collectively, wells in the Tule Desert basin would pump up to 9,344 acre-feet of groundwater per year. Wells in the Clover Valley would pump up to 14,480 acre-feet of groundwater per year. A system of pipelines would collect pumped water for conveyance through a main transmission pipeline southeast to the Lincoln County Land Act development area, north of Mesquite, Nevada following, in part, a utility corridor designated by the Lincoln County Conservation, Recreation and Development Act of 2004 (Public Law 108-424). The pipeline and ancillary facilities for the LCLA Project would be located in a 60-foot-wide permanent easement (60- to 100-foot-wide temporary easement) located mostly along existing roads. Overall distance of the pipeline would be approximately 75 miles.

Associated ancillary facilities would include distribution/transmission power lines and communication lines to be placed in the utility easement to provide power and communication for the project facilities. In addition, a natural gas pipeline would parallel the water pipeline from the existing Kern River Natural Gas pipeline south to the Lincoln County Land Act area.

Project facilities would be located, in part, within the 2,640-foot-wide utility corridor established by LCCRDA. Areas of approximately 100 feet by 200 feet (0.46 acre) will be needed during construction for equipment storage and materials lay-down but the exact locations of these areas are currently undetermined. The term of the right-of-way for all other features of the project would be 30 years. The project would operate year-round.

3. Project Area Description

The proposed LCLA Project is located in southeastern Lincoln County, Nevada on public lands managed by the BLM Ely Field Office. The project area extends south out of the Clover Mountains through the Tule Desert. It terminates near the Lincoln County line.

3.1 Topography

The LCLA Project is located in the southern part of the Great Basin, in the northernmost sub-province of the Basin and Range Physiographic Province. The Basin and Range province is characterized by north- to northwest-trending mountain ranges separated by valley basins that have been filled with sediments derived from erosion of the adjacent mountains. The southern end of the project area near the Lincoln County Land Act development area is located approximately 6 miles north of Mesquite. At this point, the surface elevation is about 2,000 feet. From this point, the study area runs north along the east side of the Mormon Mountains and continues north to the Clover Mountains. The Mormon Mountains run north-south, and the elevation of the tallest peak, Mt. Ella, is 7,411 feet.

The project area is bordered to the west by the Mormon and Clover Mountains and to the east by the Tule Springs Hills. The project area crosses the Tule Desert and the Virgin River Valley.

3.2 Vegetation

The southern portion of the project area is located in the Mojave Desert biome. Vegetation communities within this biome, and represented in the project area, can be further characterized as Mojave Creosote Bush Scrub and Desert Wash Scrub. Mojave Creosote Bush Scrub communities occur in areas less than 4,000 feet in elevation. Non-native grassland is also a component of this community type. Mojave Desert Wash Scrub occurs in elevations less than 5,000 feet in sandy arroyos and washes.

3.2.1 Mojave Creosote Bush Scrub

This vegetation class includes Mojave mixed scrub and creosote-bursage vegetation. Dominant species associated with this vegetation community include desert thorn (*Lycium* spp.), shadscale (*Atriplex confertifolia*), hopsage (*Grayia spinosa*), blackbrush (*Coleogyne ramosissima*), brittlebrush (*Encelia farinosa*), creosote (*Larrea tridentata*), bursage (*Ambrosia dumosa*), and desert saltbush (*Atriplex polycarpa*) that occur on lower slopes and in washes. Associate species also include Joshua tree (*Yucca brevifolia*), Mojave yucca (*Yucca schidigera*), Mormon tea (*Ephedra nevadensis*), range ratany (*Krameria parvifolia*), desert trumpet (*Eriogonum inflatum*), big galleta (*Hilaria rigida*), and Indian ricegrass (*Oryzopsis hymenoides*).

Non-native grassland is also a component of this community. There are no areas mapped for this vegetation community, as it is often an understory community within shrublands. Dominant species in this community are primarily red brome (*Bromus rubens*) and Mediterranean grass (*Schismus barbatus*). These species increase fire hazards, and controlling their spread is essential to fire management. This community typically gains dominance in burned areas perpetuating the burn cycle.

3.2.2 Mojave Desert Wash Scrub

The Mojave Desert Wash Scrub community consists of low, scrubby vegetation in sandy arroyos. Dominant species of the community include cat claw (*Acacia greggii*), desert willow (*Chilopsis lineris* ssp. *Arcuata*), Mormon tea (*Ephedra nevadensis*), and indigo bush (*Psoralea fremontii*). Desert willow and cat claw were sparse within the project area. Other species that occur in Mojave Desert Wash Scrub include desert broom (*Baccharis sarathroides*) and big galleta (*Pleuraphis rigida*). Most of the surface area within this community was bare ground.

4. Species Description

The desert tortoise species (*Gopherus agassizii*) is divided into two distinct populations: the Sonoran and Mojave. The Sonoran population occurs south and east of the Colorado River in Arizona and Mexico, and the Mojave population occupies those portions of the Mojave and Colorado Deserts north and west of the Colorado River in southwestern Utah, northwestern Arizona, southern Nevada, and southern California.

In response to the dramatic decrease in numbers of the Mojave population of the desert tortoise throughout its entire range, the USFWS emergency-listed the species as endangered on August 4, 1989 (54 FR 32326). The Mojave population was then proposed under normal listing procedures on October 13, 1989 (54 FR 42270), and was subsequently listed as threatened on April 2, 1990 (55 FR 12178).

4.1 Distribution and Population Trend

The Mojave population of desert tortoise is divided into two subpopulations: western and eastern. The western Mojave subpopulation is distributed throughout the western Mojave Desert, west of Death Valley. The eastern Mojave subpopulation is distributed throughout the Mojave Desert in eastern California, southern Nevada, extreme northwestern Arizona (north of the Grand Canyon), and the Beaver Dam Slope and Virgin River Basin of southwestern Utah (USFWS 1990). The desert tortoise ranges from northern Sinaloa, Mexico north across Sonora, Mexico; and much of Arizona to southern Nevada; southwestern Utah; and southeastern California (Ernst et al. 1994).

Desert tortoise populations in the eastern Mojave Desert appear to be stable. Studies have indicated that tortoise populations in the eastern Mojave were stable or increased during the 1980s and are stable today. Additionally, the number of juveniles reported during surveys conducted in the eastern Mojave appeared to decline at a few study sites, but do not represent a major decline in numbers (BLM 2000).

4.2 Habitat and Behavior

The desert tortoise is most commonly found within the desert scrub vegetation type where creosote bush scrub occurs, but may also be found in association with succulent scrub, cheesebush scrub, blackbrush scrub, hopsage scrub, shadscale scrub, microphyll woodland, Mojave saltbush-allscale scrub, and scrub-steppe vegetation types of the desert and semidesert grassland complex (USFWS 1994). Desert tortoise

are completely terrestrial and typically occur in habitats that include suitable substrates for digging burrows and nest sites or that provide other coversites, such as rock crevices, for shelter. Throughout the Mojave Region, desert tortoises occur on flats and bajadas with soils ranging from sand to sandy gravel, and they occur on rocky terrain and slopes (USFWS 1994).

Activity patterns of the desert tortoise are closely related to ambient temperatures and forage availability. They spend much of their lives in burrows and emerge in late winter and early spring to feed and mate. This species remains active through the spring and may emerge again after summer storms. While aboveground, the desert tortoise feeds on herbaceous vegetation, which typically consists of grasses and annual flowers (USFWS 1994).

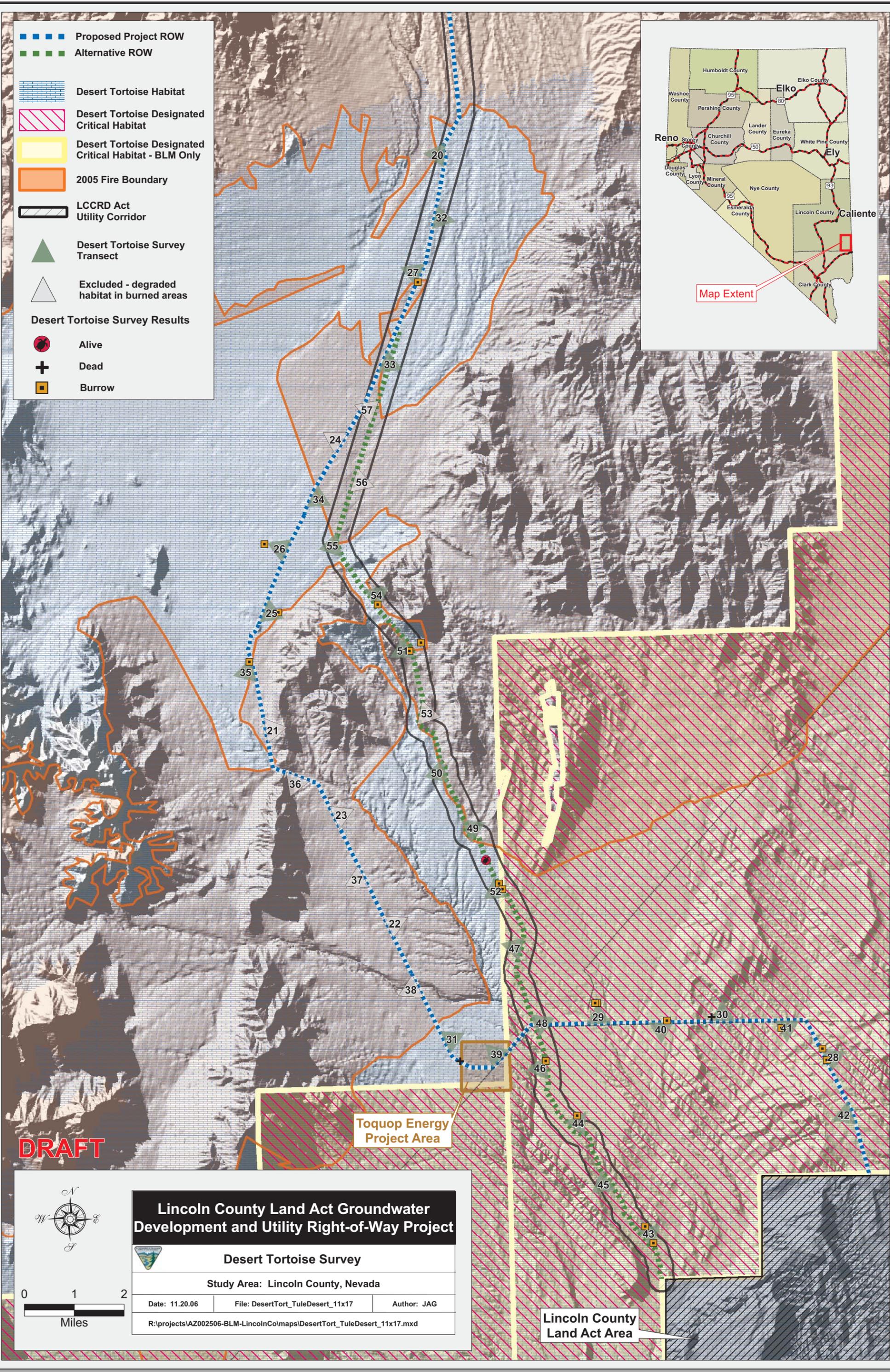
Approximately 6.4 million acres of critical habitat for the Mojave population of the desert tortoise were designated by the USFWS in 1994. Critical habitat is defined in Section 3 of the ESA as “those areas that have biological or physical features that are essential to the conservation of the species.” In Lincoln County, there are 244,900 acres of designated critical habitat for the desert tortoise.

The proposed right-of-way for the LCLA Project traverses approximately 32.5 miles of suitable desert tortoise habitat, of which approximately 9.5 miles are designated critical habitat. Of the 32.5 miles of suitable habitat, approximately 12.5 miles are within the area that burned in 2005. Almost the entire corridor is directly adjacent to existing roads that support light traffic. Approximately 10 miles of the corridor are not adjacent to existing roads.

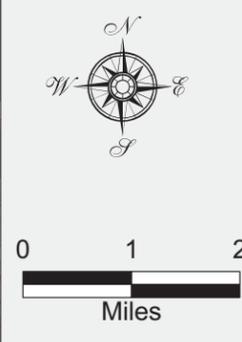
The alternative that follows the Lincoln County Conservation, Recreation, Development Act (LCCRDA) designated utility corridor deviates to the south from the proposed right-of-way near monitoring well 2 (MW2). It traverses approximately 21.5 miles of suitable desert tortoise habitat, of which approximately 9 miles are designated critical habitat. Of the 29 miles of suitable habitat, approximately 7 miles are within the area that burned in 2005. Almost the entire corridor is directly adjacent to existing roads that support light traffic. Approximately 6 miles of the corridor are not adjacent to existing roads.

Figure 1 shows desert tortoise habitat and designated critical habitat in the project area.

- ■ ■ ■ Proposed Project ROW
- ■ ■ ■ Alternative ROW
- Desert Tortoise Habitat
- Desert Tortoise Designated Critical Habitat
- Desert Tortoise Designated Critical Habitat - BLM Only
- 2005 Fire Boundary
- LCCRD Act Utility Corridor
- Desert Tortoise Survey Transect
- Excluded - degraded habitat in burned areas
- Desert Tortoise Survey Results**
- Alive
- Dead
- Burrow



DRAFT



Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project		
Desert Tortoise Survey		
Study Area: Lincoln County, Nevada		
Date: 11.20.06	File: DesertTort_TuleDesert_11x17	Author: JAG
R:\projects\IAZ002506-BLM-LincolnCo\maps\DesertTort_TuleDesert_11x17.mxd		

Lincoln County Land Act Area

Toquop Energy Project Area

4.3 Threats

Threats to the Mojave desert tortoise include disease, habitat destruction, and increased human access into desert tortoise habitat (USFWS 1994). Over the last decade, Upper Respiratory Tract Disease has spread across the Mojave Desert and, in part, led to the emergency listing of the desert tortoise in 1989. The loss of desert tortoise habitat from increased traffic and access, mineral development, anthropogenic fire, spread of noxious weeds, and livestock use represent significant threats to desert tortoise in the Mojave Desert. Predation, particularly from ravens, can also be implicated in population declines of the desert tortoise. Raven populations in the Mojave Desert have increased by more than 1,000 percent between 1968 and 1992 (Boarman and Berry 1995). Ravens are known to prey on juvenile tortoises.

4.4 Existing Conditions

Suitable habitat for the desert tortoise is present in and around the LCLA Project area. On June 28, 1994, the USFWS approved the Final Desert Tortoise (Mojave Population) Recovery Plan (Recovery Plan) (USFWS 1994). The Recovery Plan divides the range of the desert tortoise into six recovery units and recommends establishment of 14 Desert Wildlife Management Areas (DWMAs) throughout the recovery units. DWMAs, as identified in the Recovery Plan and the associated critical habitat, have been designated by the BLM Ely Field Office as desert tortoise ACECs (USFWS 1994) through development or modification of their land use plan.

The proposed project crosses the Beaver Dam Slope and Mormon Mesa Areas of Critical Environmental Concern (ACEC) (BLM 2000). The proposed action also crosses the Beaver Dam Slope Unit of designated critical habitat (USFWS 1994).

5. Methods

Three methods of data collection have typically been used to estimate desert tortoise population densities, including strip transects, belt transects, and permanent study plots. Baseline data collection and consultation with the USFWS determined that strip transects would be most appropriate for the LCLA Project.

5.1 Baseline Data Collection

A variety of information sources were used to gather baseline data for the project area. Primary data sources reviewed and incorporated into this document include biological surveys and reports conducted by the following government agencies and consultants:

- Geographical Information System (GIS) data from the USFWS on federally designated critical habitat for listed species,
- Proposed and final rules for the federal listing of species from the Federal Register,
- USFWS recovery plans for listed species,
- Personal communication with local species experts
- Toquop FEIS (BLM 2003) Surveys,
- Toquop Biological Opinion (USFWS 2003)
- Karl (1980) Survey,
- Kern River Gas Pipeline Surveys, and
- Sand Hollow Permanent Study Plots.

5.2 Field Surveys

Desert tortoise surveys for the LCLA Project were conducted by two ARCADIS biologists between October 19 and October 23, 2006. Surveyor qualifications are provided in **Appendix B**.

The strip-transect method was used to sample distribution and relative abundance of tortoise sign throughout the LCLA Project area. Transects were 1.5 miles long by 10 yards wide and were walked in an equilateral triangle 0.5 mile to a side. Prior to the field surveys, the project area was mapped in a GIS and uploaded to a Panasonic Toughbook (field grade laptop computer). The Toughbooks are equipped with an on-board Global Positioning System (GPS) accurate to within 10 meters. The GPS was then used in the field to navigate transects and mark observations.

ARCADIS proposed to conduct 38 triangular strip transects on the southern portion of the LCLA proposed right-of-way and alternative. Transects were located along the entire right-of-way approximately 1.0 mile apart in alternating directions (**Figure 1**). Transects were not randomly located, and spacing resulted in an even distribution throughout the project area.

Fires in Mojave desert scrub degrade or eliminate habitat for desert tortoises. Because the 2005 fire burned a significant portion of desert tortoise habitat within the LCLA project area, it was assumed that densities are severely depressed in the burned areas and there are not likely higher density pockets in these areas (USFWS 2006). On-site evaluation resulted in the elimination of eight transects in the burned areas. Numerous transects were surveyed in the burn areas, and no live tortoise or sign was found; therefore, the remaining transects located in burned areas were excluded. URS also completed numerous transects in this area during the summer of 2006 and found very low densities.

Transects were surveyed for live or dead desert tortoise and any tortoise sign including burrows, scat, tracks, and water scrapes. Observational data were collected for all tortoise presence and sign, and GPS points and photographs were taken. Observational data included a determination of its relevance (definite or possible) and its condition (good, deteriorated, fresh, fresh but not this year's, good but not active). Sex and size were noted for live and dead tortoise observations. Additionally, habitat notes, including dominant and co-dominant vegetation, percent cover, and topography, were recorded for each transect. Major communities were also photographed. Representative photos are provided in **Appendix C**.

6. Survey Results

In order to estimate tortoise densities from sign counts, the relationship between the numbers of sign observed and the estimated tortoise numbers was determined using the “total corrected sign” methodology (Berry and Nicholson 1984).

Transect data were standardized for all transects by determining the total corrected sign (CS) observed on each transect. Multiple sign produced by a single tortoise or obviously associated with a single tortoise were reduced to one sign. CS counts were regressed on total counts (TC). This resulted in the following regression equation:

$$CS = (1.1921 * TC + (-0.0345))$$

The correlation coefficient was 0.93.

The following equation was used to express tortoise density as number per square mile.

$$\text{Number per square mile} = 4 [(CS - 1.1921)/-0.0345]$$

Table 1 provides corrected sign counts and the correlated estimates for desert tortoise densities using the regression equation. It also provides these numbers per square mile.

Table 1. Sign Counts and Estimates of Desert Tortoise Densities		
	Estimates of tortoise density	
Corrected Sign Count	Regression equation	Number per square mile
0	-0.03	0.12
1	1.16	3.47
2	2.35	6.83
3	3.54	10.18
4	4.73	13.54
5	5.93	16.89
6	7.12	20.25
7	8.31	23.60
8	9.50	26.96

Table 1. Sign Counts and Estimates of Desert Tortoise Densities		
Corrected Sign Count	Estimates of tortoise density	
	Regression equation	Number per square mile
9	10.69	30.31
10	11.89	33.67

6.1 Transect Data

Data from strip-transect surveys indicate that the estimated desert tortoise density in the LCLA Project area range between 0 and 10 tortoise per square mile (**Table 2**). Excluding the burned areas, tortoise observations were distributed relatively evenly along the right-of-way, with slightly higher densities occurring in the southern part of the survey area (**Figure 1**). Nearly all sign were inferred (burrows and water scrapes). One live tortoise was found along the right-of-way between Transects 49 and 52. During the rare plant surveys conducted for the project, a whole shell was found along the right-of-way, and a live tortoise was found outside the project area (15 miles to the southwest). Their locations are included for observational purposes; however, because they were not observed on a transect, they were not included in the density estimates.

The highest densities in the LCLA Project area occurred on Transect 28 (10 per square mile). Transect 28 was located in a green field along the preferred right-of-way. The topography consisted of rolling hills, and the vegetation was dominated by creosote and bursage. Joshua trees were the co-dominant species. Most of the sign was found in sandy washes.

Transects 29, 43, 51, and 52 exhibited tortoise densities of 7per square mile each. All of these transects, excluding 29, were along the alternative right-of-way. The remainder of transects yielded densities of 3 per square mile or less. Only two tortoise sign were found in any of the burned areas along the LCLA Project right-of-way (one on Transect 51 and one on Transect 27).

Table 2. Desert Tortoise Survey Data for Lincoln County Project Area

Transect Number	Tortoise Sign Observed	Corrected Sign Counts	Number per Square Mile*	Dominant Vegetation Species	Associate Vegetation Species	Topography
20	None	0	0	<i>Yucca brevifolia</i> <i>Coleogyne ramosissima</i>	<i>Ephedra nevadensis</i> <i>Opuntia echinocarpa</i>	Valley
21	Excluded	NA	NA	NA	NA	NA
22	Excluded	NA	NA	NA	NA	NA
23	Excluded	NA	NA	NA	NA	NA
24	Excluded	NA	NA	NA	NA	NA
25	Burrow	1		<i>Ephedra nevadensis</i>		Flat
	Total	1	3	<i>Larrea tridentata</i>		
26	Burrow	1		<i>Ambrosia dumosa</i>	<i>Ephedra nevadensis</i>	Flat
	Total	1	3			
27	Burrow	1		<i>Larrea tridentata</i>	<i>Opuntia spp.</i>	Rolling Hills
	Total	1	3	<i>Yucca brevifolia</i>		
28	Burrow	1		<i>Ambrosia dumosa</i>	<i>Yucca brevifolia</i>	Rolling Hills
	Burrow	1				
	Burrow	1		<i>Larrea tridentata</i>		
	Total	3	10			

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 Table 2. Desert Tortoise Survey Data for Lincoln County Project Area						
Transect Number	Tortoise Sign Observed	Corrected Sign Counts	Number per Square Mile*	Dominant Vegetation Species	Associate Vegetation Species	Topography
29	Burrow	1		<i>Larrea tridentata</i> <i>Ambrosia dumosa</i>	<i>Yucca brevifolia</i>	Flat
	Burrow	1				
	Scat	1				
	Total	2	7			
30	Burrow	1		<i>Ambrosia dumosa</i>	<i>Yucca brevifolia</i>	Rolling Hills
	Total	1	3	<i>Larrea tridentata</i>	<i>Opuntia spp.</i>	
31	None	0	0	<i>Ambrosia dumosa</i> <i>Larrea tridentata</i>	<i>Opuntia echinocarpa</i>	Flat
32	None	0	0	<i>Coleogyne ramosissima</i> <i>Yucca brevifolia</i>	<i>Larrea tridentata</i> <i>Opuntia echinocarpa</i>	Rolling Hills
33	None	0	0	<i>Coleogyne ramosissima</i> <i>Larrea tridentata</i>	<i>Yucca brevifolia</i>	Flat
34	None	0	0	<i>Coleogyne ramosissima</i> <i>Yucca brevifolia</i>	<i>Larrea tridentata</i>	Rolling Hills

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Transect Number	Tortoise Sign Observed	Corrected Sign Counts	Number per Square Mile*	Dominant Vegetation Species	Associate Vegetation Species	Topography
35	Burrow	1		<i>Bromus rubens</i>	<i>Opuntia echinocarpa</i>	Flat
	Total	1	3		<i>Ephedra nevadensis</i>	
36	Excluded	NA	NA	NA	NA	NA
37	Excluded	NA	NA	NA	NA	NA
38	Excluded	NA	NA	NA	NA	NA
39	None	0	0	<i>Ambrosia dumosa</i> <i>Larrea tridentata</i>	<i>Ferocactus acanthodes</i>	Flat
40	Burrow	1		<i>Larrea tridentata</i>	<i>Ambrosia dumosa</i>	Flat
	Total	1	3		<i>Bromus rubens</i>	
41	Burrow	1		<i>Ambrosia dumosa</i>	<i>Larrea tridentata</i>	Rolling Hills
	Total	1	3		<i>Yucca brevifolia</i>	
42	None	0	0	<i>Ambrosia dumosa</i> <i>Larrea tridentata</i>	<i>Yucca brevifolia</i>	Rolling Hills

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 Table 2. Desert Tortoise Survey Data for Lincoln County Project Area						
Transect Number	Tortoise Sign Observed	Corrected Sign Counts	Number per Square Mile*	Dominant Vegetation Species	Associate Vegetation Species	Topography
43	Burrow			<i>Larrea tridentata</i>	<i>Opuntia spp.</i>	Valley
	Scat	1		<i>Ambrosia dumosa</i>		
	Burrow	1				
	Total	2	7			
44	Burrow	1		<i>Larrea tridentata</i>	<i>Ambrosia dumosa</i>	Flat
	Total	1	3			
45	None	0	0	<i>Ambrosia dumosa</i> <i>Larrea tridentata</i>	<i>Yucca brevifolia</i>	Rolling Hills
46	Burrow	1		<i>Larrea tridentata</i>	<i>Ambrosia dumosa</i>	Flat
	Total	1	3			
47	None	0	0	<i>Ambrosia dumosa</i> <i>Ephedra nevadensis</i>	<i>Yucca brevifolia</i> <i>Acacia greggii</i>	Flat
48	None	0	0	<i>Larrea tridentata</i>	<i>Ambrosia dumosa</i>	Flat
					<i>Bromus rubens</i>	
49	None	0	0	<i>Ambrosia dumosa</i> <i>Larrea tridentata</i>	<i>Yucca brevifolia</i>	Rolling Hills

 Table 2. Desert Tortoise Survey Data for Lincoln County Project Area						
Transect Number	Tortoise Sign Observed	Corrected Sign Counts	Number per Square Mile*	Dominant Vegetation Species	Associate Vegetation Species	Topography
50	None	0	0	<i>Coleogyne ramosissima</i> <i>Larrea tridentata</i>	<i>Yucca brevifolia</i>	Rolling Hills
51	Burrow			<i>Ambrosia dumosa</i> <i>Larrea tridentata</i>	<i>Yucca brevifolia</i>	Rolling Hills
	Scat	1				
	Burrow	1				
	Total	2	7			
52	Burrow	1		<i>Larrea tridentata</i>	<i>Ambrosia dumosa</i>	Flat
	Burrow	1				
	Total	2	7			
53	Excluded	NA	NA	NA	NA	NA
54	Burrow	1		<i>Coleogyne ramosissima</i>	<i>Ambrosia dumosa</i> <i>Yucca brevifolia</i>	Steep Slopes
	Total	1	3			
55	None	0	0	<i>Larrea tridentata</i>	<i>Ephedra nevadensis</i> <i>Hilaria rigida</i>	Rolling Hills
56	Excluded	NA	NA	NA	NA	NA
57	Excluded	NA	NA	NA	NA	NA

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 Table 2. Desert Tortoise Survey Data for Lincoln County Project Area						
Transect Number	Tortoise Sign Observed	Corrected Sign Counts	Number per Square Mile*	Dominant Vegetation Species	Associate Vegetation Species	Topography
ROW ¹	Live Tortoise	x	x			
ROW ²	Shell	x	x			
Outside Project Area ³	Live Tortoise	x	x			



6.2 Other Data Sources

Results of past strip-transect surveys in the nearby Lincoln County Land Act Groundwater Development and Right-of-Way project area show a low-density desert tortoise population. The Toquop Energy Project EIS estimates low population densities for desert tortoise in the LCLA project area; less than 1 individual per 100 acres (BLM 2006). The Meadow Valley Wash area exhibited slightly higher density estimated at fewer than 5 individuals per 100 acres. Transect surveys found only three live tortoises and one carcass. Sixty-six tortoise burrows were found within the Toquop EIS project area; however, only eight of these showed signs of recent activity. Scat groupings were also found scattered throughout the project area in close proximity to burrows. Triangular surveys found the same trend in density, with transects near the northern section of the project area exhibiting more sign than the southern portions (BLM 2006).

In 1994, desert tortoise populations in the Beaver Dam Slope and Mormon Mesa critical habitat units were estimated to be from 5 to 60 and 40 to 90 adults per square mile, respectively (USFWS 1994). A recent analysis of the results of distance sampling data from 2004 depicted very low encounter rates for these areas, as only 15 live desert tortoises were encountered in approximately 297 miles of transects within the Mormon Mesa critical habitat unit, and no live tortoises were encountered in approximately 62 miles of transects within the Beaver Dam Slope critical habitat unit (Averill-Murray et al. 2006).

Strip transects walked by Karl (1980) in and adjacent to the project area indicated that tortoise population densities were very low (fewer than 10 tortoises per square mile) (in BLM 2003). Belt transects walked in 1990 in the current right-of-way of the Kern River Gas Pipeline also recorded low sign counts with corresponding estimates of low densities of tortoises in the Toquop Wash area of the proposed LCLA Project. Estimated densities along the Kern River Gas Pipeline were in the low range (10 to 45 tortoises per square mile) between mileposts 420 and 423, and in the very low range (0 to 10 tortoises per square mile) between mileposts 423 and 424 (BLM 2003).

The Sand Hollow permanent study plot is located approximately 5 to 6 miles east of the LCLA area. Two samples of this study plot indicated a low density of desert tortoise. The plot was sampled in 1989 and again in 1994 with estimates of 8 and 15 tortoises per square mile, respectively.

7. Summary

The LCLA Project occurs partially in desert tortoise habitat. As such, the USFWS recommended that surveys be conducted for the project. ARCADIS biologists conducted strip-transects surveys in October, 2006. Results of the surveys showed that desert tortoise populations are distributed relatively evenly along the LCLA project right-of-way. However, nearly all sign were inferred (burrows and water scrapes). Only one live tortoise was found along the right-of-way during the survey and it was not found in a transect. Transect densities ranged from 0 per square mile to 10 per square mile. The highest densities were found in creosote bursage community in a green field area along the preferred right-of-way. Only two tortoise sign were found in any of the burned areas along the LCLA Project right-of-way. During the rare plant surveys conducted for the project, a whole shell was found along the right-of-way, and a live tortoise was found outside the project area.

Results from this survey supplement existing data. Previous survey results in the LCLA Project area show low desert tortoise densities.

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ARCADIS

Appendix A

USFWS Approved Desert
Tortoise Survey Proposal

DRAFT
Desert Tortoise Survey Proposal for the
Lincoln County Land Act Groundwater Development and Utility Right-
of-Way Project

Introduction

This memo serves as a proposal to conduct limited desert tortoise (*Gopherus agassizii*) surveys in support of the Environmental Impact Statement (EIS) and Biological Assessment (BA) that are being prepared for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project (LCLA Project). The U.S. Fish and Wildlife Service (FWS) requested, but is not requiring, that surveys for the desert tortoise be conducted for this project (FWS 2006). This memo presents the study design proposed by Greystone-ARCADIS to conduct those surveys.

The project area is located within desert tortoise habitat and portions are within designated critical habitat (see attached map). The project area occurs within occupied desert tortoise habitat.

Status, Habitat, and Threats

The desert tortoise is a federally listed threatened species (FWS 1990). It is completely terrestrial and typically occurs in habitats that include suitable substrates for digging burrows and nest sites or that provide other coversites, such as rock crevices for shelter. Throughout the Mojave Region, desert tortoises occur on flats and bajadas with soils ranging from sand to sandy-gravel, and they occur on rocky terrain and slopes (FWS 1994). Suitable habitats also include plant species that provide appropriate forage and cover. Vegetation is usually scattered shrubs and abundant inter-shrub space for growth of herbaceous plants. The most common plant associated with desert tortoise habitat is creosote bush. Desert tortoises are primarily herbivores, foraging on grasses, forbs, cacti, and the flowers of annual plants. Suitable habitat within the project area is shown on the attached map.

The typical life span of the desert tortoise is 30 to 100 years, with sexual maturity between 12 to 30 years (Woodbury and Hardy 1948). Females lay an average of 4.2 eggs per clutch inside the burrow and have an average of 1.9 clutches per year (Turner and Berry 1984). Desert tortoise variable reproductive success is positively correlated with environmental conditions (FWS 1994).

Activity patterns of the desert tortoise are closely tied to ambient temperatures and forage availability. Desert tortoises spend much of their lives in burrows, emerging to feed and mate during late winter and early spring. They remain active through the spring and portions of the summer through late fall. Their active season is typically defined as being from March 1 through October 31.

Threats to this species include direct and indirect human-caused mortality. Impacts such as destruction, degradation, and fragmentation of their habitat from urbanization, agricultural development, livestock grazing, mining, roads, vehicle-oriented recreational use, and losses from human take and disease have contributed to population declines (FWS 1994).

Roads can be both detrimental and beneficial to tortoise populations. Roads fragment tortoise habitats; however, tortoise will cross roads to access habitats on the other side. Tortoise are often killed while crossing roads. Large roads where high volumes of vehicles travel at high speeds pose the highest risk to tortoise. Smaller roads with less traffic and lower speeds pose a smaller risk. Tortoise are known to use roads occasionally to breed and will drink from them after large storm events (Burrows 2006).

Designated Critical Habitat

Critical habitat has been designated for the desert tortoise (FWS 1994). The designation of critical habitat is used to identify areas where federal agencies need to exercise special care to avoid damage to a species' habitat. These areas are considered to be essential to the long-term survival and recovery of a species. Critical habitat does not preclude all modification of habitat in the designated area.

On February 8, 1994, the FWS designated approximately 6.4 million acres of critical habitat for the Mojave population of the desert tortoise in portions of California, Nevada, Arizona, and Utah (59 FR 5820), which became effective on March 10, 1994. Critical habitat is designated by the FWS to identify the key biological and physical needs of the species and key areas for recovery, and focuses conservation actions on those areas.

Designated critical habitat includes specific geographic areas that contain the primary constituent elements of critical habitat, consisting of the biological and physical attributes essential to the species' conservation within those areas, such as space, food, water, nutrition, cover, shelter, reproductive sites, and special habitats. The specific primary constituent elements of desert tortoise critical habitat are: sufficient space to support viable populations within each of six recovery units (RUs), and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality. Designated critical habitat within the project area is shown on the attached map.

Habitat Relating to the LCLA Project

The project area occurs in Mojave desert scrub and is dominated by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*).

The proposed right-of-way for the LCLA project traverses approximately 32.5 miles of suitable desert tortoise habitat, of which approximately 9.5 miles are designated critical habitat. Of the 32.5 miles of suitable habitat, approximately 12.5 miles are within the area that burned in 2005. Almost the entire corridor is directly adjacent to existing roads that support light traffic. Approximately 10 miles of the corridor are not adjacent to existing roads.

The alternative that follows the Lincoln County Conservation, Recreation, Development Act (LCCRDA) designated utility corridor deviates to the south from the proposed right-of-way near monitoring well 2 (MW2). It traverses approximately 21.5 miles of suitable desert tortoise habitat of which approximately 9 miles are designated critical habitat. Of the 29 miles of suitable habitat, approximately 7 miles are within the area that burned in 2005. Almost the entire corridor is directly adjacent to existing roads that support light traffic. Approximately 6 miles of the corridor are not adjacent to existing roads.

The LCLA map shows desert tortoise habitat and designated critical habitat in the project area.

Survey Methods

Three methods of data collection have typically been used to estimate tortoise population densities, including strip transects, belt transects, and permanent study plots. The strip transect method involves walking pre-determined transects that are typically 1.5 miles long and configured as an equilateral triangle. All observed tortoise sign is mapped and recorded. Sign includes scat, burrows, live tortoises, carcasses, shell fragments, eggshells, tracks, courtship rings, and drinking depressions. This sign count information is then used as a measure of relative abundance of tortoises in the study area. This method assumes that the frequency of observed tortoise sign is related to the abundance of tortoises in the surrounding area.

Another method that is commonly used to survey for desert tortoise on linear projects is the belt transect method. Rights-of-way for linear projects can be surveyed using parallel, 30-foot-wide belt transects. In areas where few or no desert tortoise surveys have been conducted, zone of influence transects can also be surveyed on both sides of the right-of-way at 100, 300, 600, 1,200, and 2,400 feet from the outer edge of the right-of-way. On belt transects, all tortoise sign (e.g., individuals, dens, burrows, scat, tracks, pellets, skeletal remains) are mapped and recorded.

Permanent study plots are sampled using a mark-recapture method and are typically sampled every 4 years and take up to 60 days to sample.

Existing Condition and Proposed Survey Methods

BLM provided data that illustrate the locations of strip transect plots near the project area (see attached map). Based on results of past strip transect surveys in the LCLA project area, the project area supports a low-density desert tortoise population. The Toquop FEIS

estimates low population densities for desert tortoise in the LCLA project area (BLM 2003). Strip transects walked by Karl (1980) in and adjacent to the project areas indicated tortoise population densities were very low (less than 10 tortoises per square mile) (in BLM 2003). Belt transects walked in 1990 in the current right-of-way of the Kern River Gas Pipeline also recorded low sign counts with corresponding estimates of low densities of tortoises in the Toquop Wash area of the proposed LCLA project. Estimated densities along the Kern River Gas Pipeline were in the low range (10 to 45 tortoises per square mile) between mileposts 420 and 423, and in the very low range (zero to 10 tortoises per square mile) between mileposts 423 and 424 (BLM 2003).

The Sand Hollow permanent study plot is located approximately 5 to 6 miles east of the LCLA project area. Two samples of this study plot indicated a low density of desert tortoise. The plot was sampled in 1989 and again in 1994 with estimates of 8 and 15 tortoises per square mile, respectively. Based on all data collection efforts in the project area, an estimate of 11 tortoises per square mile is reasonable (BLM 2003).

Additionally, the BLM has received funding to conduct desert tortoise density surveys in the spring of 2007. This data should be available for incorporation into the EIS and BA.

The objective of this survey would be to estimate the relative abundance of tortoise because the existing density data is relatively old and FWS does not think it is current enough to use for this project. We propose to conduct triangle transect surveys to estimate tortoise density along the proposed right-of-way and alternative.

We propose to conduct 38 triangular transects on portions of the LCLA proposed right-of-way and alternative (see attached map).

The project will be constructed as close to existing roads as possible and within disturbed ROW's where possible. However, the roads in the project area are lightly used and tortoise likely cross them and occupy habitats immediately adjacent to disturbed areas. Because of this, we are proposing to survey areas immediately adjacent to roads unless the FWS believes this would not provide beneficial data.

Fires in Mojave desert scrub degrade or eliminate habitat for desert tortoises. Because the 2005 fire burned a significant portion of desert tortoise habitat within the LCLA project area, we assume that densities are severely depressed in the burned areas and there are not likely higher density pockets in these areas (FWS 2006). Conducting additional surveys in those areas may not contribute to the recovery of the species; however, we propose to conduct triangular transect surveys in these areas. If no tortoise sign is found along these transects, Greystone may determine that conducting surveys on all of the proposed transects in the burn area is not necessary.

We request that 1) FWS review the maps we have provided and provide long-term monitoring data for the plots that are near the proposed project, and 2) FWS concur with our proposed survey method.

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Appendix B

Surveyor Qualifications

**DESERT TORTOISE MONITOR AND BIOLOGIST
RESPONSIBILITIES AND QUALIFICATIONS**

DESERT TORTOISE MONITOR -- Approved by the Fish and Wildlife Service to monitor project activities within desert tortoise habitat, ensure proper implementation of protective measures, and record and report desert tortoise and sign observations in accordance with approved protocol, report incidents of noncompliance in accordance with a biological opinion or permit, move desert tortoises from harm's way when desert tortoises enter project sites and place these animals in "safe areas" pre-selected by Authorized Biologists or maintain the desert tortoises in their immediate possession until an Authorized Biologist assumes care of the animal. Monitors assist Authorized Biologists during surveys and often serve as "apprentices" to acquire experience. Monitors are not authorized to conduct presence/absence or clearance surveys unless directly supervised by an Authorized Biologist; "directly supervised" means the Authorized Biologist is direct voice and sight contact with the Monitor.

AUTHORIZED BIOLOGIST -- Approved by the Fish and Wildlife Service to conduct all activities described in the previous section for Desert Tortoise Monitors, and to locate desert tortoises and their sign (i.e., conduct presence/absence and clearance surveys) and ensure that the effects of the project on the desert tortoise and its habitat are minimized in accordance with a biological opinion incidental take permit. Authorized Biologists must keep current with the latest information on U.S. Fish and Wildlife Service protocols and guidelines. An Authorized Biologist must have thorough and current knowledge of desert tortoise behavior, natural history, and ecology, physiology, and demonstrated substantial field experience and training to safely and successfully:

- handle and temporarily hold desert tortoises
- excavate burrows to locate desert tortoise or eggs
- relocate/translocate desert tortoises
- reconstruct desert tortoise burrows
- unearth and relocate desert tortoise eggs
- locate, identify, and record all forms of desert tortoise sign

GENERAL DESERT TORTOISE BIOLOGIST/MONITOR QUALIFICATIONS STATEMENT

This form should be used to provide your qualifications to agency officials if you intend to handle or survey desert tortoises during construction or other projects authorized under Sections 7 or 10 (HCPs) 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>. Supplemental information for the recovery permit application should be provided with the form, *Statement of Skills and Experience with Specialized Desert Tortoise Procedures*, which is available from a U.S. Fish and Wildlife Service Field Office.

1. Contact Information:

Name	Patrick Golden
Address	630 Plaza Drive, Suite 100
City, State, Zip Code	Highlands Ranch, CO 81029
Phone Number(s)	(303) 471-3444
Email Address	pgolden@arcadis-us.com

2. **Date of Statement:** 10/03/06

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

California Nevada Utah Arizona

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

USFWS BO or HCP Number	None (Draft EIS stage)	Date: 10/03/06
Project Name	Lincoln County Land Act Groundwater Development Project/Kane Springs Valley Groundwater Development Project	
Federal Agency	BLM	
Proponent or Contractor	Lincoln County Water District and Vidler (Proponents); ARCADIS (NEPA Contractor)	

5. **Specify project and/or activities anticipated that require authorization (e.g. capture/release, weigh, measure, attach and remove telemetry devices and other hardware, etc.). Specifically reference the relevant document and page numbers with authorizing statements (e.g., BO, page 19, terms and conditions 6, 7, and 8):**

We are conducting triangular transect surveys for both projects as proposed by ARCADIS in Desert Tortoise Survey Proposal KSV (09-25-06) and Desert Tortoise Survey Proposal LCLA (09-25-06) and approved by Laurie Averill-Murray, Jeri Krueger, and Michael Burrows on 09/26/06. We will be recording sign, tortoise, and habitat characteristics to estimate density along the proposed ROWs. I do not anticipate handling, capturing, weighing, measuring, etc. any live tortoises.

6. **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

7. **Education (provide up to three, listing most recent first):**

Institution	Dates attended	Major/Minor	Degree received
1. University of Colorado	09/92 – 05/96	Environmental, Population, Organismic Biology	BA
2.			
3.			

8. Desert Tortoise Training. Include numbers of animals handled under the Experience section (No. 9 below).			
Name/Type of Training	Dates (From/To)	Location	Instructor/Sponsor
1. Chocolate Mountains/Field Survey	05/25/00 - 06/09/00	Chocolate Mountains from Salton Sea (Niland) to Blythe	Cannot remember
Blue Diamond/Field Survey	07/09/01 - 07/13/01	Clark County, NV	None
2. Blythe to Palm Springs/Field Survey I	04/23/00 - 05/04/00	Blythe, CA to Palm Springs, CA	Alice Karl
Blythe to Palm Springs/Field Survey II	06/09/02 - 06/28/02	Blythe, CA to Palm Springs, CA	Alice Karl
3. Big Sandy/Field Survey	05/10/01 - 05/19/01	Wikiup, AZ Kingman, AZ	None
Montezuma Power Plant Field Survey	04/10/03 - 04/13/03	Maricopa County, AZ	None
4. Desert Tortoise Council Field Trip	03/18/01	Tucson, Arizona	Roy Averill-Murray

9. Experience – Complete for each position held, attach additional sheets as necessary. Include only those positions relevant to the requested work with desert tortoises. Distinguish between 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.

General Field Experience:		
Project Name, Biological Opinion or Permit No. & Job Title	Dates (From/To)	Job Duties & Responsibilities/ Skills Used or Acquired
1. Montezuma Power Plant Field Survey	04/10/03 - 04/13/03	Crew leader. Surveyed potential power plant site for presence/absence of Sonoran desert tortoise. (0 tortoises encountered). Surveyed low quality Sonoran desert tortoise habitat.
2. Blythe to Palm Springs II	06/09/02 - 06/28/02	Crew member under Alice Karl. Surveyed proposed transmission line ROW and Zone of Influence for Mojave desert tortoise. (4 tortoises encountered). Implemented survey techniques, DT habitats on bajadas, desert flats, mountains, and washes, ID scat, tracks, burrows, sex, and carapices.

Blue Diamond	07/09/01 – 07/13/01	Crew leader. Surveyed proposed pipeline ROW for Mojave desert tortoise, gila monster, and chuckwalla. (3 tortoises encountered). Implemented survey techniques in flat, bajada, and mountainous habitats. ID scat, tracks, burrows, and carapices.
Big Sandy	05/10/01 – 05/19/01	Crew leader. Surveyed proposed pipeline ROW for Sonoran desert tortoise. (3 tortoises encountered). Implemented survey techniques in suitable Sonoran desert habitats.
Desert Tortoise Council Field Trip	03/18/01	Conference attendee. Went to long-term study plot north of Tucson to look at burrows and Sonoran desert tortoise. (5 tortoises encountered). Learned about long-term survey design and differences between Sonoran and Mojave populations.
3. Chocolate Mountains/Field Survey	05/25/00 – 06/09/00	Crew leader. Surveyed proposed transmission ROW and ZOI for Mojave desert tortoise. (3 tortoises encountered). Implemented survey techniques in flat, bajada, and mountainous habitats. ID scat, tracks, burrows, and carapices.
4. Blythe to Palm Springs/Field Survey I	04/23/00 – 05/04/00	Crew member under Alice Karl. Surveyed proposed transmission line ROW and Zone of Influence for Mojave desert tortoise. (2 tortoises encountered). Learned survey techniques, DT habitats on bajadas, desert flats, mountains, and washes, ID scat, tracks, burrows, sex, and carapices.

Specific Desert Tortoise Field Experience Continued:					
<p>i. Number of blood samples that you personally collected from <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category). <u>Specify species or if captive desert tortoises:</u> <u>Specify type of procedure:</u></p>					
<100 mm: <u>Zero</u>	<10	10-50	50-100	100-200	>200
≥100 mm: <u>Zero</u>	<10	10-50	50-100	100-200	>200
<p>j. Experience conducting other procedures on <u>wild, free-ranging</u> desert tortoises (circle one for each size category). <u>Specify type of procedure:</u></p>					
<100 mm: <u>Zero</u>	<10	10-50	50-100	100-200	>200
≥100 mm: <u>Zero</u>	<10	10-50	50-100	100-200	>200
<p>k. Experience conducting other procedures on <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category). <u>Specify species or if captive desert tortoises:</u> <u>Specify type of procedure:</u></p>					
<100 mm: <u>Zero</u>	<10	10-50	50-100	100-200	>200
≥100 mm: <u>Zero</u>	<10	10-50	50-100	100-200	>200
<p>l. Prior authorizations for desert tortoise under Biological Opinions or Habitat Conservation Plans (specify number, date, project name and location). <u>Do not reiterate "general field experience" information:</u> None.</p>					

10. Provide at least 3 references that can verify your field qualifications and skills:

Name	Employer/Position	Address/Location	Phone Number	Email
1. Steve Faulk	ARCADIS/Senior Biologist	630 Plaza Drive, Suite 100 Highlands Ranch, CO 80129	303-471-3415	sfaulk@arcadis-us.com
2. Paul Franks	Self Employed/Desert Biologist	Moab, Utah	Cannot locate	Cannot locate
3. Alice Karl	Alice Karl, Ph.D. and Associates/Principal	P.O. Box 74006 Davis, CA 95617	530-666-9567	

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: Paul F. Stan

Date: 10/4/06

**DESERT TORTOISE MONITOR AND BIOLOGIST
RESPONSIBILITIES AND QUALIFICATIONS**

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- handle and temporarily hold desert tortoises
- excavate burrows to locate desert tortoise or eggs
- relocate/translocate desert tortoises
- reconstruct desert tortoise burrows
- unearth and relocate desert tortoise eggs
- locate, identify, and record all forms of desert tortoise sign

GENERAL DESERT TORTOISE BIOLOGIST/MONITOR QUALIFICATIONS STATEMENT

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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>. Supplemental information for the recovery permit application should be provided with the form, *Statement of Skills and Experience with Specialized Desert Tortoise Procedures*, which is available from a U.S. Fish and Wildlife Service Field Office.

1. Contact Information:

Name	Selina Koler
Address	2960 Center Green Court, Suite 202
City, State, Zip Code	Boulder, CO 80301
Phone Number(s)	(303) 544-0043 ext. 309
Email Address	skoler@arcadis-us.com

2. **Date of Statement:** 11/28/06

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

California Nevada Utah Arizona

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

USFWS BO or HCP Number	None (Draft EIS stage)	Date: 10/03/06
Project Name	Lincoln County Land Act Groundwater Development Project/Kane Springs Valley Groundwater Development Project	
Federal Agency	BLM	
Proponent or Contractor	Lincoln County Water District and Vidler (Proponents); ARCADIS (NEPA Contractor)	

5. **Specify project and/or activities anticipated that require authorization (e.g. capture/release, weigh, measure, attach and remove telemetry devices and other hardware, etc.). Specifically reference the relevant document and page numbers with authorizing statements (e.g., BO, page 19, terms and conditions 6, 7, and 8):**

We are conducting triangular transect surveys for both projects as proposed by ARCADIS in Desert Tortoise Survey Proposal KSV (09-25-06) and Desert Tortoise Survey Proposal LCLA (09-25-06) and approved by Laurie Averill-Murray, Jeri Krueger, and Michael Burrows on 09/26/06. We will be recording sign, tortoise, and habitat characteristics to estimate density along the proposed ROWs. I do not anticipate handling, capturing, weighing, measuring, etc. any live tortoises.

6. **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

7. **Education (provide up to three, listing most recent first):**

Institution	Dates attended	Major/Minor	Degree received
1. Colorado State University	2001-2003	Restoration Ecology	M.S.
2. Colorado State University	1997-2001	Natural Resources Managment	B.S.
3.			

8. Desert Tortoise Training. Include numbers of animals handled under the Experience section (No. 9 below).

Name/Type of Training	Dates (From/To)	Location	Instructor/Sponsor
1 Palm Springs/Field Survey	04/25/05 – 04/28/05	Palm Springs, CA	Art Davenport
2. Blythe to Palm Springs/Field Survey	05/16/05-05/23/05	Blythe to Palm Springs, CA	Art Davenport

9. Experience – Complete for each position held, attach additional sheets as necessary. Include only those positions relevant to the requested work with desert tortoises. Distinguish between 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.

General Field Experience:

Project Name, Biological Opinion or Permit No. & Job Title	Dates (From/To)	Job Duties & Responsibilities/ Skills Used or Acquired
1. Palm Springs/Field Survey	04/25/05 – 04/28/05	Crew member under Art Davenport. Surveyed proposed transmission line ROW and Zone of Influence for Mojave desert tortoise. (1 tortoise encountered). Learned survey techniques, DT habitats on bajadas, desert flats, mountains, and washes, ID scat, tracks, burrows, sex, and carapices.
2. Blythe to Palm Springs/Field Survey	05/16/05 – 05/23/05	Crew member under Art Davenport. Surveyed proposed transmission line ROW and Zone of Influence for Mojave desert tortoise. (12 tortoises encountered). Implemented survey techniques, DT habitats on bajadas, desert flats, mountains, and washes, ID scat, tracks, burrows, sex, and carapices.

Specific Desert Tortoise Field Experience Continued:						
<p>i. Number of blood samples that you personally collected from <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category). <u>Specify species or if captive desert tortoises:</u> <u>Specify type of procedure:</u></p>						
<100 mm:	<u>Zero</u>	<10	10-50	50-100	100-200	>200
≥100 mm:	<u>Zero</u>	<10	10-50	50-100	100-200	>200
<p>j. Experience conducting other procedures on <u>wild, free-ranging</u> desert tortoises (circle one for each size category). <u>Specify type of procedure:</u></p>						
<100 mm:	<u>Zero</u>	<10	10-50	50-100	100-200	>200
≥100 mm:	<u>Zero</u>	<10	10-50	50-100	100-200	>200
<p>k. Experience conducting other procedures on <u>other relevant species</u> or <u>captive</u> desert tortoises (circle one for each size category). <u>Specify species or if captive desert tortoises:</u> <u>Specify type of procedure:</u></p>						
<100 mm:	<u>Zero</u>	<10	10-50	50-100	100-200	>200
≥100 mm:	<u>Zero</u>	<10	10-50	50-100	100-200	>200
<p>l. Prior authorizations for desert tortoise under Biological Opinions or Habitat Conservation Plans (specify number, date, project name and location). <u>Do not reiterate "general field experience" information:</u> None.</p>						

10. Provide at least 3 references that can verify your field qualifications and skills:

Name	Employer/Position	Address/Location	Phone Number	Email
1. Pat Golden	ARCADIS/Senior Biologist	630 Plaza Drive, Suite 100 Highlands Ranch, CO 80129	303-471-3444	pgolden@arcadis-us.com
2. Matt Kizlinski	ARCADIS/Senior Biologist	630 Plaza Drive, Suite 100 Highlands Ranch, CO 80129	303-471-3442	mkizlinski@arcadis-us.com
3. Art Davenport	Davenport Biological Services/Desert Tortoise Biologist	P.O. Box 1692 Barstow, CA 92312	619-729-4242	artdavenport@aol.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.

Selina Kole

Signed: _____ Date: _____ 11/28/06 _____

ARCADIS

Appendix C

Photos

Photo 1. Creosote-bursage community dominant in the LCLA Project area.



Photo 2. Creosote-bursage community with large yucca component.



Photo 3. Creosote-bursage community with large black brush and Joshua tree components.



Photo 4. Toquop Wash in the LCLA Project area.



Photo 5. Burned areas in the LCLA Project area.



Photo 6. Burned areas in the LCLA Project area.



Photo 7. Representative burrow found in the LCLA Project area.



Photo 8. Live tortoise found along the right-of-way during the LCLA strip-transect surveys.

