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Project Title:	Willow Rock Energy Storage Center
TN #:	258310
Document Title:	Willow Rock Mohave Ground Squirrel Survey
Description:	N/A
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DIPODOMYS
ECOLOGICAL CONSULTING, LLC

July 24, 2024

Scott Crawford
WSP USA Environment and Infrastructure, Inc.
1845 Chicago Street
Riverside, CA 92507
Via email: scott.crawford@wsp.com

Subject: Results of Mohave Ground Squirrel Protocol Surveys for the 490-acre Hydrostor Willow Rock Energy Storage Center, Rosamond, Kern County, California

Dear Mr. Crawford:

The purpose of this report is to document the results of a California Department of Fish and Wildlife (CDFW) protocol survey for Mohave ground squirrel (*Xerospermophilus mohavensis*; MGS) conducted by Dipodomys Ecological Consulting LLC (DEC) for the approximately 490-acre Hydrostor Willow Rock Energy Storage Center (Project). Presented in this report are a description of the project, project background, project location and topography, biological setting of the site, MGS natural history, survey methodology, results of trapping efforts for MGS, and conclusions.

Project Description

The proposed project involves the development of the Willow Rock Energy Storage Center (WRESC) an energy storage facility (approximately 190 acres) and approximately 20 miles (300 acres) of gen-tie electrical transmission lines (gen-tie lines) connecting to the existing Southern California Edison Whirlwind Substation. The total area, including the energy storage facility, gen-tie lines, and their corridor (125-foot buffer), is approximately 490 acres and will be herein collectively referred to as the "project" or "project site" unless otherwise specified.

In general, GEM proposes to construct and operate a nominal 500-megawatt (MW) advanced compressed air energy storage (A-CAES) facility deploying Hydrostor's proprietary A-CAES technology. The Willow Rock Energy Storage Center (WRESC) project will be designed to store 500 MW for up to 14 hours and deliver up to 4,000 megawatt hours (MWh) over an 8-hour period when discharging.

Project Background

DEC conducted a Mohave ground squirrel habitat assessment in 2022 on an initial 4,460-acre footprint, which identified areas with vegetation communities suitable for MGS (Flores and Fairchild 2022). The habitat assessment was followed by MGS protocol surveys in 2023, conducted by Aardvark Biological Services, LLC on three properties associated with the project: the Willow Rock, Ansel, and Sierra Highway properties. Surveys took place across seven sampling grids and yielded negative findings (Stanfield 2023a, 2023b). In 2024, at the request of CEC and CDFW, an additional 113.72 acres were identified as areas for MGS surveys (**Figure 1**).

These 113.72-acres consisted of two disjunct potential work areas (46.39 acres and 9.96 acres, respectively) and 56.86-acres of transmission right of way (TROW). Of these 113.72 acres, 82.03 acres were determined suitable for MGS surveys. The areas determined unsuitable were designated as such due to high levels of disturbance, active illegal dumping, and proximity to hostile private landowners. This 82.03-acre area suitable for surveys will hereafter be referred to as the "MGS Study Area" (**Figure 2**).

Project Location and Topography

The project site is located on private property in and around the rural community of Ansel, just north of State Route (SR) 138, south of SR 58, east of Interstate 5, and west of Edwards Air Force Base.

The WRESC facility site is located entirely within the 7.5-minute Soledad Mountain, California, U.S. Geological Survey (USGS) topographic quadrangle. The gen-tie lines and variances are within the Soledad Mountain, Rosamond, Fairmont Butte, and Little Buttes topographic quadrangles. The project site (inclusive of WRESC facility site and gen-tie lines) is located within portions of Sections 31, 32, and 33 of Township 10 North and Range 12 West; portions of Sections 36 of Township 10 North and Range 13 West; portions of Sections 1, 2, 11, 14, 15, 16, 17, and 18 of Township 9 North and Range 13 West; portions of Sections 13, 14, 15, 16, 17, and 18 of Township 9 North and Range 14 West; and portions of Sections 13, 14, and 23 of Township 9 North and Range 15 West.

The 82.03-acre MGS study area is comprised of a 46.9-acre potential work area and a 2.4-mile TROW (35.13 acres). The 46.9-acre potential work area is located between Champagne Road and Dawn Road to the north and south, and State Route 14 (SR 14) and Sierra Highway to the west and east, respectively. The TROW straddles SR 14. The TROW west of SR 14 primarily parallels McConnel Avenue in the east-west direction between Howard Street and 25th Street West. The TROW east of SR 14 is located immediately south of the 46.9-acre potential work area in undeveloped desert land. Surrounding land use consists of undeveloped desert land with sparse residential developments to the south of the TROW. Areas show moderate levels of disturbance primarily from OHV use and illegal dumping. The MGS Study Area is located on the U.S. Geological Survey (USGS) 7.5-minute Soledad Mountain, California, topographic quadrangle within portions of Sections 31, 32, and 33 Township10 North and Range 12 West (**Figure 3**).

Topography in the project site slopes from northwest to southeast with flat areas in the southern portions and gently rolling hills in the central portion of the project site. Elevations range from approximately 2,580 feet (786 meters) to 2,707 feet (825 meters) above mean sea level (amsl) with soils consisting of cobble and gravel.

Biological Setting

Vegetation communities within the MGS study area consist of western Joshua tree Woodland Alliance (CDFW CA Code 33.170.00) and creosote bush-white bursage scrub (CDFW CA Code 33.140.00)

Species of perennial trees and shrubs encountered listed in descending order of dominance include: western Joshua tree (*Yucca brevifolia brevifolia*), California juniper (*Juniperus californica*), creosote bush (*Larrea tridentata*), Nevada jointfir (*Ephedra nevadensis*), California buckwheat (*Eriogonum fasciculatum*), white bursage (*Ambrosia dumosa*), winterfat (*Krascheninnikovia lanata*), Cooper's boxthorn (*Lycium cooperi*), spiny hopsage (*Grayia spinosa*), Anderson thornbush (*Lycium andersonii*), spiny horsebrush (*Tetradymia spinosa*), cheesebush (*Ambrosia salsola*), rubber rabbitbrush (*Ericameria*

nauseosa), Cooper's goldenbush (*Ericameria cooperi)*, wishbone bush (*Mirabilis laevis*), and silver cholla (*Cylindropuntia echinocarpa)*.

Perennial herbs observed blooming include common fiddleneck (*Amsinckia menziesii*), rusty popcorn flower (*Plagiobothrys nothofulvus*), Mojave Desert parsley (*Lomatium mohavense*), bristly fiddleneck (*Amsinckia tessellata*), western tansy mustard (*Descurainia pinnata*), desert dandelion (*Malacothrix glabrata*), lacy phacelia (*Phacelia tanacetifolia*), Fremont's phacelia (*Phacelia fremontii*), California goldfields (*Lasthenia californica*), Wallace's woolly daisy (*Eriophyllum wallacei*), Fremont's pincushion (*Chaenactis fremontii*), desert calico (*Loeseliastrum matthewsii*), scalebud (*Anisocoma acaulis*), tidytips (*Layia glandulosa*), and wire lettuce (*Stephanomeria pauciflora*). Non-native herbaceous plants present include cheatgrass (*Bromus tectorum*), red brome (*Bromus madritensis*), and Mediterranean grass (*Schismus barbatus)*.

Mohave Ground Squirrel Natural History

Mohave ground squirrels are medium-sized (210-230mm, 85-130g), diurnal squirrels. Their dorsal pelage is light gray to cinnamon-brown, while their ventral side is creamy. Unlike round-tailed ground squirrels, which occur sympatrically in the southeast portion of their range, MGS have a short, flat tail that is light-colored on its underside, and have brown cheeks instead of white.

MGS inhabit a small geographic area in the western Mojave Desert. This species ranges from Palmdale in the southwest, the Lucerne Valley in the southeast, Olancha in the northwest, and the Avawatz Mountains in the northeast (Gustafson 1993). Vegetation communities (as classified by the California Native Plant Society) typically associated with MGS include Mojave Creosote Scrub, Shadscale Scrub, Desert Saltbush Scrub, Desert Sink Scrub, and western Joshua Tree Woodland. MGS feed primarily on the leaves and seeds of forbs and shrubs. In the northern portion of their range, MGS have been found to feed on spiny hopsage (*Grayia spinosa*), winterfat, and saltbush (*Atriplex* sp.), especially in early spring when forbs are unavailable, during summer when forbs have dried out, and during drought conditions (Leitner and Leitner 1998). Recent studies have also indicated that MGS feed on the following forbs and shrubs: freckled milkvetch (*Astragalus lentiginosus*), Mojave lupine (*Lupinus odoratus*), buckwheat (*Eriogonum* sp.), white mallow (*Eremalche exilis*), fiddleneck, Russian thistle (*Salsola tragus*), desert pincushion (*Chaenactis* sp.), Cryptantha (*Cryptantha pterocarya*), Coreopsis (*Leptosyne bigelovii*), Valley lessingia (*Lessingia glandulifera*), desert dandelion (*Malacothrix glabrata*), Phacelia (*Phacelia* sp.), wire lettuce (*Stephanomeria* sp.) Anderson's thornbush, spiny horsebrush, and Joshua tree (Leitner and Leitner 2017).

MGS have adapted to live in hot desert environments by limiting their activity aboveground through estivation and hibernation. The timing of emergence from hibernation varies by location: in the northern portion of their range male MGS emerge mid-March (Leitner and Leitner 1998); however, in the southern portion of their range, MGS may emerge as early as mid-January (Recht 1977). Throughout their active period, MGS store fat in preparation for estivation, which typically occurs between July and September, but may occur as early as April or May during drought conditions (Leitner et al. 1995). MGS reproduction is dependent on fall and winter rains and individuals may forgo breeding entirely if low rainfall (<80mm) results in reduced herbaceous plants (Leitner and Leitner 2017).

Throughout the range of MGS, they may co-occur with antelope ground squirrels, round-tailed ground squirrels, and California ground squirrels. MGS may be misidentified with round-tailed ground squirrels, but this is unlikely to occur with antelope ground squirrels, because the latter species has white dorsal

stripes that makes them resemble a chipmunk more than an MGS. California ground squirrels are notably larger and are not typically confused with MGS.

MGS are classified as threatened and are protected under the California Endangered Species Act. Primary threats to MGS include limited distribution, low abundance, and habitat loss from by converting suitable habitat to urban, suburban, agricultural, and military land uses (Gustafson 1993, Leitner and Leitner 2017).

Methods

MGS protocol surveys were generally conducted in accordance with the 2023 MGS Survey Guidelines (CDFW 2023). However, two variances were requested from CDFW Region 4 (1) to change the configuration of the survey grids from the standard 10x10 and 4x25 grid configurations outlined in the survey guidelines and (2) to extend the first survey window until May 1st due to adverse weather conditions at the end of April (**Attachment C**). The variance request to change to the grid configuration was was reviewed by CDFW Region 4 and approved on April 24, 2024.

Aside from the changes to grid configuration and survey window extension, the remainder of the survey was conducted in accordance with the 2023 MGS survey guidelines and consisted of a visual survey, live trapping surveys and camera trapping surveys.

Visual Survey

An initial review of the California Natural Diversity Database (CNDDB) was conducted prior to the visual assessment to determine the historical recorded occurrences of MGS near the project site (**Figure 3**). The visual survey was conducted by Principal Investigator Dalton Stanfield (SC-220270002 Memorandum of Understanding (MOU) 22027-001) on April 9, 2024. The visual survey consisted of driving and walking throughout the project site to identify suitable habitat for MGS. This included identifying plants known to provide forage material for MGS such as spiny hopsage, winterfat, Cooper's boxthorn, Anderson's desert thorn, and western Joshua tree (Leitner 2022). Areas supporting suitable habitat for MGS where these plants are concentrated were recorded on an aerial map. Suitable soil types for burrowing and burrow densities were also noted.

Live Trapping

Live trapping surveys were conducted by Dalton Standfield and consisted of two 50-trap live trapping grids: Grid 1, located in the TROW, consisted of 50-traps arranged in a 2x25 configuration and Grid 2, located in the potential work area, consisted of 50-traps arranged in a 5x10 configuration (**Figure 2**). Coordinate locations for Grids 1 and 2 are listed in **Table 1**. Traps in each grid were spaced 35 meters apart and utilized XLK Sherman live-traps (3x3.75x12") with accompanying A-frame cardboard shade covers staked to the ground with metal tent stakes. All traps were baited with 4-way livestock feed and peanut butter powder and were opened within one hour of sunrise and were checked no more than every four hours. All traps were closed within one hour of sunset. Trapping was conducted when temperatures were between 50 degrees Fahrenheit and 90 degrees Fahrenheit, and inclement conditions (rain, thunderstorms) were not present. All animals captured were released at their capture location, and the following information recorded for each capture: species, weight, age, sex, and reproductive condition. Live-trapping surveys were conducted for a period of five days in each of the three survey windows

established by the MGS survey guidelines (1st: March 15-April 3; 2nd: May 1-31; 3rd: June 1-July 15). MGS live trapping efforts during survey windows 1 and 2 were conducted for a period of six days due to adverse weather conditions. Live trapping surveys during survey window 1 were extended due to high winds (above 30mph) which made it unsafe to continue live trapping and during survey window 2 due to high temperatures (above 90F) which made it unsafe to trap for a minimum of four hours as required by the 2023 updated protocol. Details for each survey period are presented in **Table 2.** MGS Survey and Trapping Forms, including weather details, are presented in **Attachment A**.

TABLE 1
UTM COORDINATES FOR CORNERS OF GRID 1 AND 2

Grid	Corner	Zone	Easting	Northing
1	SW	11	391755	3864670
1	NW	11	391755	3864705
1	SE	11	392580	3864670
1	NE	11	392580	3864705
2	SW	11	393985	3864345
2	NW	11	393985	3864485
2	SE	11	394300	3864345
2	NE	11	394300	3864485

*Datum: WGS 1984

TABLE 2
MOHAVE GROUND SQUIRREL SURVEY DATE AND TYPE

Session	Date	Survey Type	Surveyor (s)
1	April 26-May 1, 2024	LT/CT	Dalton Stanfield
2	May 26-31, 2024	LT/CT	Dalton Stanfield
3	July 1-July 5, 2024	LT/CT	Dalton Stanfield

LT: Live Trapping CT: Camera Trapping

Camera Trapping

As part of the 2023 MGS survey guidelines, camera trapping surveys are now required to supplement live-trapping efforts concurrent with live trapping. Camera trapping surveys consisted of setting up five camera trapping stations throughout the MGS Study Area (**Figure 2**). Each camera trap station consisted of a Bushnell Trophy Cam (Model 119874) secured to a 36-inch U-post facing a bait station. The bait station consisted of a feeding tube filled with 4-way livestock feed staked to the ground with a 12-inch railroad spike. Cameras operated 24 hours a day, concurrent with live-trapping surveys and were allowed to continue running for the duration of the survey window. Camera settings followed the programming specifications described in Appendix B of the MGS protocol (CDFW 2023). Coordinate locations for each camera trap station are listed below in **Table 3**. Batteries and SD cards were replaced at the beginning of each survey window.

Photos from the camera trap stations were downloaded and reviewed by the Principal Investigator after every survey window. A list of species detected at the camera trap stations is included in **Table**

TABLE 3
COORDINATE LOCATIONS FOR CAMERA TRAP STATIONS

Grid	Camera	Zone	Easting	Northing
1	1	11	391938	3864688
1	2	11	392252	3864709
1	3	11	392448	3864700
2	4	11	394041	3864403
2	5	11	394254	3864408

*Datum: WGS 1984

Results

Visual Survey

Based on the habitat data collected during the visual survey suitable MGS habitat is present on-site. MGS food plants such as winterfat and spiny hopsage are present on-site. Other plants known to be associated with MGS habitat including creosote bush, Anderson's thornbush, Cooper's boxthorn, western Joshua tree, fiddleneck, and red-stemmed filaree are also present. These additional plants were recently included in a list of primary food items consumed by MGS, based on microhistology and metabarcoding studies (Leitner 2022), and suggest MGS habitat is present on-site. Visual observations of burrows and burrow complexes showed that soil on-site is suitable for burrowing. However, no MGS or MGS vocalizations were detected during the visual survey.

Live Trapping

No Mohave ground squirrels were captured during the three live-trapping survey periods. Live-trapping captures consisted entirely of three non-target species: white-tailed antelope ground squirrels (*Ammospermophilus leucurus*), California ground squirrel (*Otospermophilus beecheyi*), and Great Basin whiptail (*Aspidoscelis tigris*). (**Table 4**).

TABLE 4
RESULTS OF MOHAVE GROUND SQUIRREL PROTOCOL SURVEYS

Common name	Scientific name	Grid 1				Grid 2		
		S1	S2	S3		S1	S2	S3
Mohave ground squirrel	*Xerospermophilus mohavense*	0	0	0		0	0	0
White-tailed antelope ground squirrel	*Ammospermophilus leucurus*	7	6	5		11	24	29
California ground squirrel	*Otospermophilus beecheyi*	0	0	0		2	1	0
Great Basin whiptail	*Aspidoscelis tigris*	2	1	0		5	3	0
	Total	**9**	**7**	**5**	**0**	**18**	**28**	**29**

Camera Trapping

No Mohave ground squirrels were detected in the images collected during the camera trapping surveys. Eight mammal species were recorded utilizing the camera trap stations including: white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), kangaroo rat *(Dipodomys* sp.), California ground squirrel (*Otospermophilus beecheyi*), spiny pocket mouse (*Chaetodipus s*p.), desert woodrat (*Neotoma lepida*), deer mouse (*Peromyscus maniculatus*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*). Other species captured at the camera stations included: California quail (*Callipepla californica*), cactus wren (*Campylorhynchus brunneicapillus*), common raven (*Corvus corax*), mourning dove (*Zenaida macroura*), ash-throated flycatcher (*Myiarchus cinerascens*), Great Basin whiptail (*Aspidoscelis tigris*), side blotched lizard (*Uta stansburiana*), desert spiny lizard (*Sceloporus magister*), red racer (*Masticophis flagellum testaceus*).

Conclusions

The Hydrostor Willow Rock Energy Storage Center is located within the southern portion of the MGS range where MGS population densities have historically been low, and entirely absent from the southwestern portion since at least the mid-1990s (Leitner 2021). Additionally, the project is located outside of the historical range for MGS and approximately 24 miles west from the closest core population area (Edwards Air Force Base Core Population), peripheral population areas and linkage areas described in the 2019 CDFW MGS Conservation Strategy.

A query of the California Natural Diversity Database (CNDDB) for the Soledad Mountain quadrangle and the surrounding eight quadrangles yielded only five MGS occurrences (**Figure 3**). The MGS occurrence closest to the Project was documented in 1973, approximately 3.1 miles southeast of the Project, and on the east side of SR 14. This area is now developed and is no longer suitable for MGS use. The most recent occurrence of an MGS on CNDDB was recorded in 2002 approximately 12 miles northeast of the project north of SR 58. Dispersal from this area is unlikely to occur given several barriers to dispersal including two major state highways and habitat fragmentation from energy developments. Additional MGS occurrences documented in the vicinity of this 2002 observation are documented in the minutes from the October 25, 2023 meeting of the MGS Technical Advisory Groug (TAG), which noted the presence of four MGS individuals during a pre-construction survey for the Bellefield Solar Project located approximately 10 miles from the project. Furthermore, protocol surveys conducted in 2024 in California City documented three reproductive individuals on both live traps and camera traps which is indicative of a persistent breeding population north of State Route 58 (draft Flores and Fairchild 2024) located approximately 20 miles northeast from the project. Collectively, these documented occurrences suggest that several reproductive populations remain north of State Route 58, and east of State Route 14, in the general vicinity of the project. However, dispersal to the Project from these populations is unlikely as juveniles would have to traverse these highways to reach the project through fragmented habitat.

Studies documenting MGS population trends and geographic distribution from 1998-2020 have generally concluded that MGS are no longer present in the southern portion of their range (Leitner 2008; 2015; 2021). The most recent of these studies covering the period of 2013-2020 found that while MGS continue to be detected in the four known core population areas (Coso Range-Olancha, Little Dixie Wash, Coolgardie Mesa-Superior Valley, and Edwards Air Force Base), the southern and southwestern portion

of the historical range of MGS remains unoccupied (Leitner 2021). Specifically, this study found that the western portion of EAFB core population area does not support an MGS population given that surveys conducted since 1998 have failed to detect MGS there (Leitner 2008; 2015; 2021).

Results of this 2021 study underscored previous conclusions that MGS are not only extirpated from the southern portion of the range but there is also no indication across the 22-year period studies that MGS are attempting to reoccupy this portion of the range.

This local extirpation of MGS in the southern portion of the range may be tied to low rainfall levels and climate change. Data collected at the Coso Study Area showed that MGS reproduction is sensitive to winter precipitation levels and MGS reproduction correlates with a minimum threshold of 65mm of winter precipitation. Records from the Coso study area showed that following a prolonged drought in the Mojave Desert from 1989-1991, MGS did not reproduce for 2 years.

Given that MGS detections in the southern portion of the range began to drop in 1991, it has been suggested that the local extirpation of MGS in this portion of the range may be linked to that particular drought event. This suggests that subsequent years with drought conditions exacerbated by climate change may have created conditions that are unsuitable to support an MGS population and may be inhibiting recolonization/re-occupancy by MGS (Leitner 2021).

Collectively, these trends and survey results suggest that MGS are unlikely to occupy the project during the next 1-5 years during its construction phase. Based on the results of this survey, CDFW survey guidelines indicate that the department will stipulate that no MGS occur on the project site. This stipulation will expire March 15, 2025.

I hereby certify that the information in this report is true, and that it conforms to accepted biological standards. Please feel free to contact Dalton Stanfield by phone at (316) 308-1225 or by email at daltonstanfield@meadowlarkeco.com or Karla Flores at (619) 972-4319 or by email at kflores@dipodomysecological.com with any questions regarding this report.

Sincerely,

Dalton Stanfield

Dalton Stanfield
Principal Investigator

Karla L. Flores
Principal Investigator

Figures and Attachments

Figure 1-Regional Location
Figure 2-MGS Study Area
Figure 3- Historical MGS Occurrences

Attachment A-2024 CDFW Mohave Ground Squirrel Survey and Trapping Form(s)
Attachment B MGS Data Sheet
Attachment C-Representative Photographs
Attachment D-CDFW Variance Request

References

California Department of Fish and Game. Mohave Ground Squirrel Survey Guidelines. October 2023.

California Department of Fish and Game. Mohave Ground Squirrel Survey Guidelines. July 2010.

California Department of Fish and Wildlife. California Natural Diversity Database Rarefind. March 14, 2022.

California Department of Fish and Wildlife (CDFW). 2019. A Conservation Strategy for the Mohave Ground Squirrel, *Xerospermophilus mohavensis*. Sacramento, CA, USA.

Delaney D.K., Leitner, P. and D. Hacker. 2017. Use of Cameras in Mohave ground Squirrel Studies.

Flores, K. and Fairchild, K. 2021. Hydrostor Mohave ground squirrel habitat assessment Report.

Flores, K. and Fairchild, K. 2024. Pygmy Blu Mohave Ground Squirrel Survey Report (DRAFT)

Gustafson, J.R. 1993. A Status Review of the Mohave Ground Squirrel (*Spermophilus mohavensis*). Department of Fish and Game. Nongame Bird and Mammal Report 93-9.

Leitner, P. and B.M. Leitner. 1998. Coso grazing exclosure monitoring study, Mohave ground squirrel study Coso Known Geothermal Resource Area, Major Findings 1988-1996. Final Report.

Leitner, P. 2008. Current status of the Mohave ground squirrel. Transactions of the Western Section of The Wildlife Society 44:11–29.

Leitner, P. 2015. Current status of the Mohave Ground Squirrel (*Xerospermophilus mohavensis*): A five-year update (2008–2012). Western Wildlife 2:9–22

Leitner, P. and B.M. Leitner. 2017. Diet of the Mohave ground squirrel (*Xerospermophilus mohavensis*) in relation to season and rainfall. *Western North American Naturalist*, 77(1), 1-13.

Leitner, P. Current Status of the Mohave ground squirrel: an update covering the period 2013-2020.California Fish and Wildlife Special CESA Issue: 300-316.

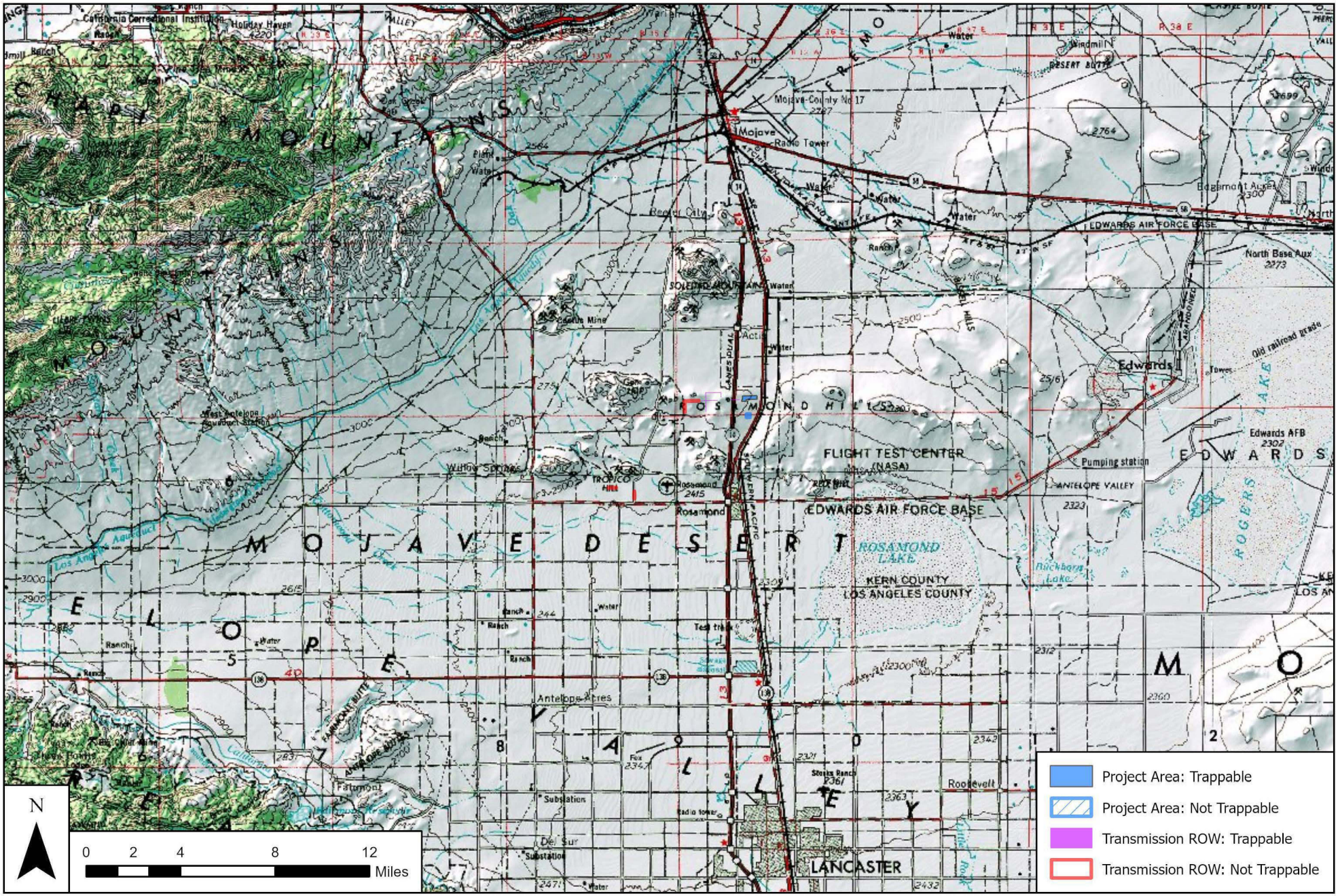
Leitner, B. 2022. Primary Food Items Consumed by Mohave Ground Squirrels based on visual observations of MGS and microhistology and metabarcoding of fecal pellets from 1988-2021.

Mohave Ground Squirrel Technical Advisory Group (MGS TAG) 2023. Item 4: New Results or Conclusions from 2023 Field Season". Minutes from the Mohave ground squirrel technical Advisory Group meeting 25 October 2023, Maturango Museum, Ridgecrest, California.

Recht, M.A. 1977. The biology of the Mohave ground squirrel, *Spermophilus mohavensis*. Ph.D. Dissertation, University of California, Los Angeles. 117 pp.

Stanfield, D. 2023a. Hydrostor Mohave Ground Squirrel Survey Report-Willow Rock Project, 1-27.

Stanfield, D. 2023b. Hydrostor Mohave Ground Squirrel Survey Report-Ansel Project, 1-27.



SOURCE: ESRI

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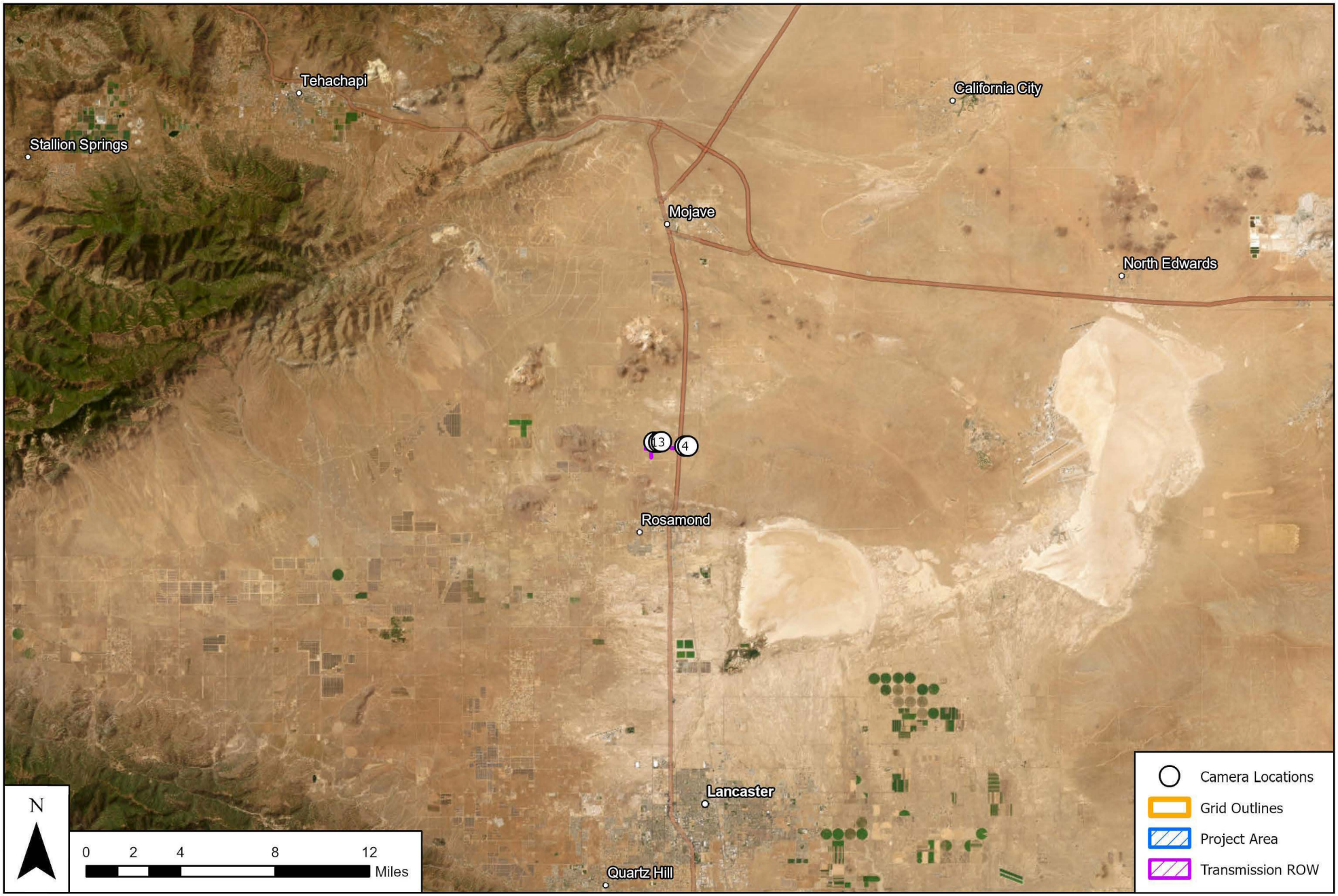
Figure 1

Regional Location



SOURCE: ESRI

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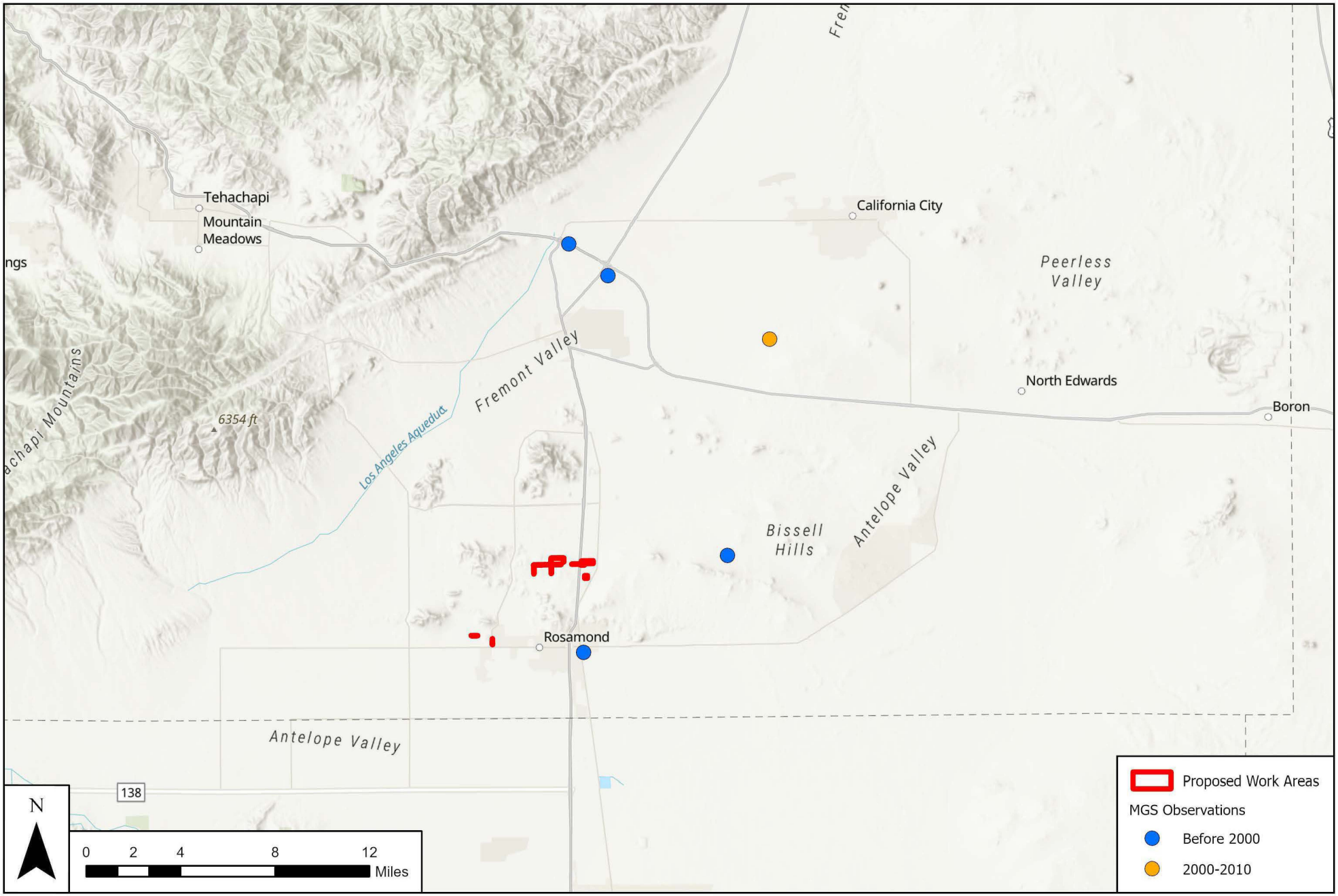
Figure 2

MGS Study Area



SOURCE: ESRI

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Figure 3

Historical MGS Occurrences

Attachment A

MOHAVE GROUND SQUIRREL SURVEYS - Site Characteristics Form

PI or Reporting Biologist: Dalton Stanfield

Affiliation: Meadowlark Ecological Consulting, LLC

PROJECT INFORMATION					
Project Name:	Hydrostore Project				
Topo Quad Name(s):	Soledad Mountain				
County:	Kern				
Project Site Area (acres):	113.72				
Area of Potential MGS Habitat (acres):	82.03				
Habitat Assessment Date(s):	April 9th 2024				
TRAP GRID INFORMATION	*Trap Grid 1*	*Trap Grid 2*	*Trap Grid 3*	*Trap Grid 4*	*Trap Grid 5*
Trap Grid Name (if applicable):					
Trap Grid Configuration	2 x 25	5 x10			
Latitude:	34.91872	34.91625			
Longitude:	-118.18034	-118.15823			
Datum:	WGS84	WGS84			
Elevation (feet):	2359				
Slope (%):	10-15%	0			
Aspect (degrees):	0-15	0			
Landforms:	Large hill	Flat area			
Substrate Types:	Arid soil with rock and sand.	Arid soil with rock and sand.			
Vegetation Alliance:	Yucca brevifolia woodland and Larrea tridentata – Ambrosia dumosa Shrubland Alliance	Yucca brevifolia woodland and Larrea tridentata – Ambrosia dumosa Shrubland Alliance			
Associated Perennial 1	*Yucca brevifolia*	*Yucca brevifolia*			
Associated Perennial 2	*Larrea tridentata*	*Larrea tridentata*			
Associated Perennial 3	*Eriogonum fasciculatum*	*Eriogonum fasciculatum*			
Associated Perennial 4	*Ambrosia Dumosa*	*Ambrosia Dumosa*			
Associated Perennial 5	*Krascheninnikovia lanata*	*Krascheninnikovia lanata*			
Annual 1	*Amsinckia menziesii*	*Amsinckia menziesii*			
Annual 2	*Plagiobothrys nothofulvus*	*Plagiobothrys nothofulvus*			
Annual 3	*Amsinckia tessellate*	*Amsinckia tessellate*			
Annual 4	*Malacothrix glabrata*	*Malacothrix glabrata*			
Annual 5	*Phacelia tanacetifolia*	*Phacelia tanacetifolia*			
Disturbance Impacts (Severe, Moderate, Minimal)	Moderate to severe	Moderate to severe			
Humans Present	Yes	Yes			
Trash	Yes	Yes			
Roads/OHV Use	Yes	Yes			
Livestock Present	No	No			
Livestock Sign	no	no			
Ravens	Yes	Yes			
Other					

MOHAVE GROUND SQUIRREL SURVEYS - Weather Summary Form
PI or Reporting Biologist: **Dalton Stanfield**
Project Name: **Hydrostore Project**

TRAP GRID INFORMATION	*Trap Grid 1*	*Trap Grid 2*	*Trap Grid 3*	*Trap Grid 4*	*Trap Grid 5*
Trap Grid Name (if applicable):					
Session 1 - Day 1					
Date, Time	4/27/2024 @ 1830				
Shade Temp (C)	18.5				
Percent Cloud Cover	0				
Wind Speed	4				
Day 2					
Date, Time	4/28/2024 @1830				
Shade Temp (C)	23				
Percent Cloud Cover	0				
Wind Speed	3				
Day 3					
Date, Time	4/29/2024 @1830				
Shade Temp (C)	24				
Percent Cloud Cover	0				
Wind Speed	5				
Day 4					
Date, Time	4/30/2024 @ 1830				
Shade Temp (C)	23				
Percent Cloud Cover	0				
Wind Speed	4				
Day 5					
Date, Time	5/01/24 @ 1810				
Shade Temp (C)	23				
Percent Cloud Cover	0				
Wind Speed	5				
Session 2 - Day 1					
Date, Time	5/27/2024 @1800				
Shade Temp (C)	26				
Percent Cloud Cover	0				
Wind Speed	4				
Day 2					
Date, Time	5/28/2024 @ 1815				
Shade Temp (C)	25.5				
Percent Cloud Cover	0				
Wind Speed	4				
Day 3					
Date, Time	5/29/2024 @ 1800				
Shade Temp (C)	27				
Percent Cloud Cover	0				
Wind Speed	5				
Day 4					
Date, Time	5/30/2024 @ 1145				
Shade Temp (C)	31				
Percent Cloud Cover	0				
Wind Speed	3				
Day 5					
Date, Time	5/31/2024 @ 1130				
Shade Temp (C)	32				
Percent Cloud Cover	0				
Wind Speed	3				
Session 3 - Day 1					
Date, Time	7/1/2024 @ 0930				
Shade Temp (C)	31				
Percent Cloud Cover	0				
Wind Speed	3				
Day 2					
Date, Time	7/2/2024 @ 0915				
Shade Temp (C)	29				
Percent Cloud Cover	0				
Wind Speed	2				
Day 3					
Date, Time	7/3/2024 @ 0915				
Shade Temp (C)	31				
Percent Cloud Cover	0				
Wind Speed	3				
Day 4					
Date, Time	7/4/2024 @ 0910				
Shade Temp (C)	32				
Percent Cloud Cover	0				
Wind Speed	3				
Day 5					
Date, Time	7/5/2024 @ 0910				
Shade Temp (C)	32				
Percent Cloud Cover	0				
Wind Speed	3				

MOHAVE GROUND SQUIRREL SURVEYS - Live trapping Results Form

PI or Reporting Biologist: **Dalton Stanfield**

Project Name: **Hydrostor Project**

Grid Name or Number	Trap Session	Start Date	End Date	Trap-days	Number of MGS	Number of AGS	Notes/Comments
Hydrostor Grid 1	1	4/26/2024	5/1/2024	6	0	7	First day of trapping high winds, shut traps after 3 hours, added sixth day (5/1/24)
Hydrostor Grid 1	2	5/27/2024	5/31/2024	5	0	6	
Hydrostor Grid 1	3	7/1/2024	7/5/2024	5	0	5	
Hydrostor Grid 2	1	4/26/2024	5/1/2024	6	0	11	First day of trapping high winds, shut traps after 3 hours, added sixth day (5/1/24)
Hydrostor Grid 2	2	5/27/2024	5/31/2024	5	0	24	
Hydrostor Grid 2	3	7/1/2024	7/5/2024	5	0	29	

MOHAVE GROUND SQUIRREL SURVEYS - Camera trapping Results Form

PI or Reporting Biologist: **Dalton Stanfield**

Project Name: **Hydrostor**

			Camera Location (dec. deg.)		Date and Time in Operation				Adult MGS Detected			Juvenile MGS Detected			MGS Detection Dates			
Grid Name or Number	**Camera #**	**Session Num.**	**Latitude**	**Longitude**	**Start**	**End**	**Number of Photos**	**Total Num. MGS Photos**	**Male**	**Female**	**Unknown**	**Male**	**Female**	**Unknown**	**First**	**Last**	**Num. Days MGS Detected**	**Other Species Recorded**
Hydrostor Grid 1	1	1	34.9189	-118.18302	4/26/2024	5/23/2024	12414	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), California Ground Squirrel (Otospermophilus beecheyi), Desert Cottontail (Sylvilagus audubonii), Woodrat (Neotoma lepida), Raven (Corvus corax), Mourning Dove (Zenaida macroura), Flycatcher (Myiarchus sp.), Side-blotched Lizard (Uta stansburiana), Jackrabbit (Lepus californicus), Whiptail (Aspidoscelis tigris)
Hydrostor Grid 1	2	1	34.91912	-118.17958	4/26/2024	4/29/2024	5744	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), Desert Cottontail (Sylvilagus audubonii), Woodrat (Neotoma lepida), Raven (Corvus corax)
Hydrostor Grid 1	3	1	34.91906	-118.17744	4/26/2024	4/29/2024	12253	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), Desert Cottontail (Sylvilagus audubonii), Woodrat (Neotoma lepida), Raven (Corvus corax), Cactus Wren (C. brunneicapillus), Side-blotched Lizard (Uta stansburiana)
Hydrostor Grid 2	4	1	34.91655	-118.15997	4/26/2024	5/1/2024	N/A	0	0	0	0	0	0	0				N/A camera stolen
Hydrostor Grid 2	5	1	34.91662	-118.15764	4/26/2024	5/3/2024	13225	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), Desert Cottontail (Sylvilagus audubonii),
Hydrostor Grid 1	1	2	34.9189	-118.18302	5/26/2024	6/10/2024	25559	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), Woodrat (Neotoma lepida), California Quail (Callipepla californica)
Hydrostor Grid 1	2	2	34.91912	-118.17958	5/27/2024	6/1/2024	25559	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), Woodrat (Neotoma lepida), Desert Cottontail (Sylvilagus audubonii), Jackrabbit (Lepus californicus),
Hydrostor Grid 1	3	2	34.91906	-118.17744	5/26/2024	6/15/2024	25196	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), Woodrat (Neotoma lepida), California Ground Squirrel (Otospermophilus beecheyi), Desert Spiny Lizard (Sceloporus sp.), Red Racer (M. flagellum piceus
Hydrostor Grid 2	4	2	34.91655	-118.15997	5/27/2024	6/1/2024	22	0	0	0	0	0	0	0				N/A captured setup
Hydrostor Grid 2	5	2	34.91662	-118.15764	5/27/2024	6/10/2024	25559	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), California Ground Squirrel (Otospermophilus beecheyi) (CGS also dug up stake)
Hydrostor Grid 1	1	3	34.9189	-118.18302	7/1/2024	7/13/2024	14017	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), Woodrat (Neotoma lepida), California Ground Squirrel (Otospermophilus beecheyi), Jackrabbit (Lepus californicus),
Hydrostor Grid 1	2	3	34.91912	-118.17958	7/1/2024	7/15/2024	0	0	0	0	0	0	0	0				N/A Malfunction
Hydrostor Grid 1	3	3	34.91906	-118.17744	7/1/2024	7/9/2024	25559	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), Woodrat (Neotoma lepida), California Ground Squirrel (Otospermophilus beecheyi), Desert Cottontail (Sylvilagus audubonii),Cactus Wren (C. brunneicapillus), Jackrabbit (Lepus californicus)
Hydrostor Grid 2	4	3	34.91655	-118.15997	7/1/2024	7/15/2024	0	0	0	0	0	0	0	0				No photos captured
Hydrostor Grid 2	5	3	34.91662	-118.15764	7/1/2024	7/13/2024	12238	0	0	0	0	0	0	0				Kangaroo Rat (Dipodomys sp.) Deer Mouse (Peromyscus sp.), Pocket Mouse (Chaetodipus sp.), White-tailed Antelope Squirrel (Ammospermophilus leucurus), California Ground Squirrel (Otospermophilus beecheyi), Jackrabbit (Lepus californicus),

DIPODOMYS
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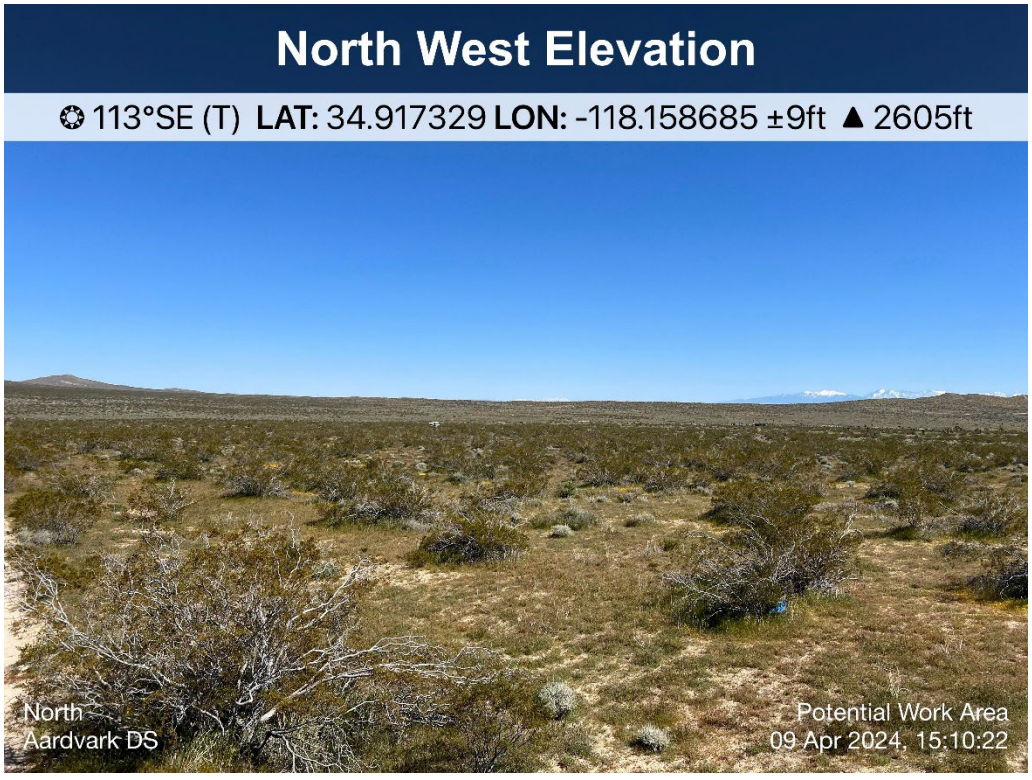
Attachment B

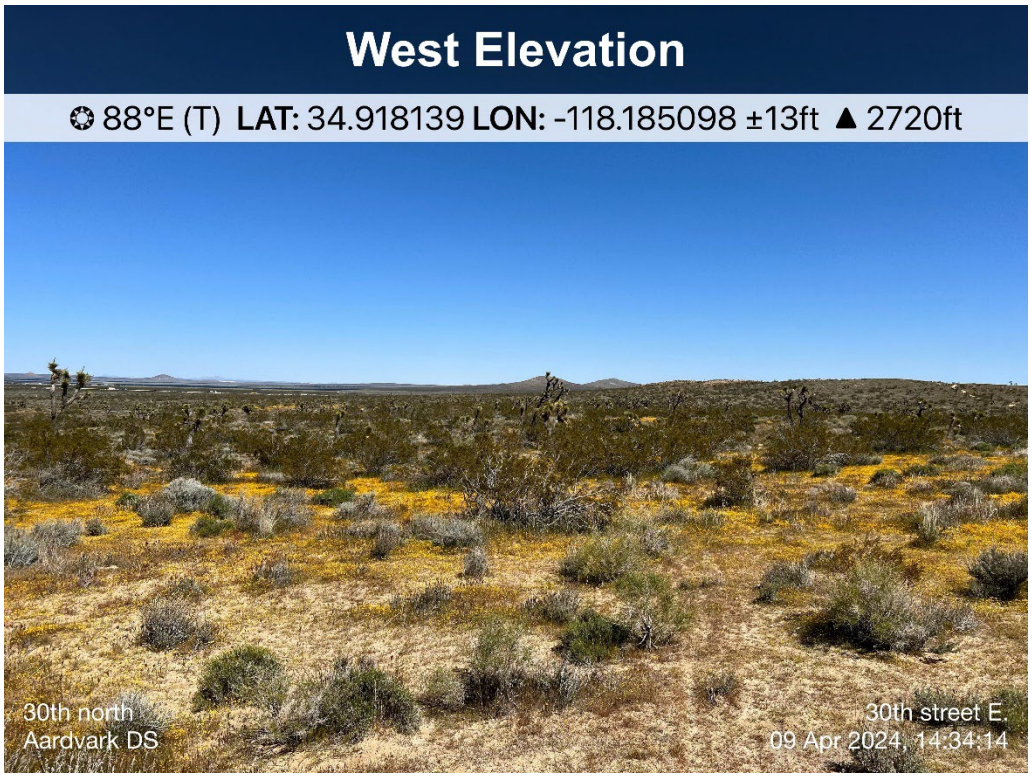
Date	Biologist	Set Time	Check Time	End Time	Temperature °Fahrenheit	Wind Beaufort Scale	Cloud Cover %	Individuals Captured Grid 1	Individuals Captured Grid 2	Comments
4/26/2024	Stanfield	0600	-		51	6	Clear	-	-	Closed due to High Winds
			N/A		-	-	Clear	-	-	
			-	0830	56	8	Clear	-	-	
4/27/2024	Stanfield	0630			50	4	Clear	-	-	
			1030		60	4	Clear	-	-	
			1430		71	5	Clear	-	-	
				1830	66	4	Clear	-	-	
4/28/2024	Stanfield	0630			53	3	Clear	-	-	
			1030		64	2	Clear	*(1 M) Ammospermophilus leucurus*	*(1) Aspidoscelis tigris*	
			1430		77	3	Clear	-	*(2) Aspidoscelis tigris*	
				1830	73	3	Clear	*(1) Aspidoscelis tigris*	*(1) Aspidoscelis tigris (1 M) Ammospermophilus leucurus*	
4/29/2024	Stanfield	0630			59	4	Clear	-	-	
			1030		70	4	Clear	*(1 M) Ammospermophilus leucurus*	*(1 F) Ammospermophilus leucurus*	
			1430		78	5	Clear	*(1 M) Ammospermophilus leucurus*	*(1) Otospermophilus beecheyi, (2 M) Ammospermophilus leucurus*	
				1830	75	5	Clear	-	*(1 M) Ammospermophilus leucurus*	
4/30/2024	Stanfield	0630			57	4	Clear	-	-	
			1030		68	4	Clear	*(2 M) Ammospermophilus leucurus*		
			1430		81	4	Clear	-	*(1) Aspidoscelis tigris (1 F) Ammospermophilus leucurus*	
				1830	73	4	Clear	*(1 F) Ammospermophilus leucurus*	*(2 M) Ammospermophilus leucurus*	
5/1/2024	Stanfield	0615			55	5	Clear	-	-	
			1015		70	5	Clear	*(1 M) Ammospermophilus leucurus*	*(1 F) Ammospermophilus leucurus*	
			1415		73	5	Clear	*(1) Aspidoscelis tigris*	*(1 M) Ammospermophilus leucurus*	
				1815	73	5	Clear	-	*(1) Otospermophilus beecheyi,(1 M) Ammospermophilus leucurus*	
5/27/2024	Stanfield	0600			53	3	Clear	-	-	
			1000		77	3	Clear	-	*(1 M & 1 F) Ammospermophilus leucurus*	
			1400		82	4	Clear	*(1 F) Ammospermophilus leucurus*	*(2) Aspidoscelis tigris*	
				1800	79	4	Clear	-	*(1 M) Ammospermophilus leucurus*	
5/28/2024	Stanfield	0615			61	2	Clear	-	-	
			1015		76	2	Clear	-	*(2 M) Ammospermophilus leucurus*	
			1415		80	4	Clear	*(1) Aspidoscelis tigris*		
				1815	78	4	Clear	-	*(1 M) Ammospermophilus leucurus*	
5/29/2024	Stanfield	0600			63	5	Clear	-	-	
			1000		77	5	Clear	*(1 F) Ammospermophilus leucurus*	*(3 M) Ammospermophilus leucurus*	
			1200		88	5	Clear	-	*(1 M) Ammospermophilus leucurus*	
			1400		89	5	Clear	*(1 M) Ammospermophilus leucurus*	*(1) Aspidoscelis tigris, (2 M) Ammospermophilus leucurus*	
			1600		85	5	Clear	-	*(1) Otospermophilus beecheyi, (2 M & 1 F) Ammospermophilus leucurus*	
				1800	80	5	Clear	*(1 F) Ammospermophilus leucurus*	*(1 M) Ammospermophilus leucurus*	
5/30/2024	Stanfield	0545			55	2	Clear	-	-	Closed Due to High Temp
			0945		72	2	Clear	*(1 M) Ammospermophilus leucurus*	*(1 M & 1 F) Ammospermophilus leucurus*	
				1145	87	3	Clear	-	*(2 M) Ammospermophilus leucurus*	
5/31/2024	Stanfield	0530			56	1	Clear	-	-	Closed Due to High Temp
			0930		74	3	Clear	*(1 M) Ammospermophilus leucurus*	*(1 M & 1 F) Ammospermophilus leucurus*	
				1130	89	3	Clear		*(2 M) Ammospermophilus leucurus*	
7/1/2024	Stanfield	0530			72	3	Clear	-	-	Closed Due to High Temp
			N/A		-	-	Clear	-	-	
				0930	85	3	Clear	*(1 F) Ammospermophilus leucurus*	*(2 M) Ammospermophilus leucurus*	
7/2/2024	Stanfield	0515			64	2	Clear	-	-	Closed Due to High Temp
			N/A		-	-	Clear	-	-	
				0915	85	2	Clear	-	*(3 M & 1 F) Ammospermophilus leucurus*	
7/3/2024	Stanfield	0515			71	2	Clear	-	-	Closed Due to High Temp
			N/A		-	-	Clear	-	-	
				0915	88	3	Clear	*(1 M) Ammospermophilus leucurus*	*(4 M & 3 F) Ammospermophilus leucurus*	
7/4/2024	Stanfield	0510			82	3	Clear	-	-	Closed Due to High Temp
			0710		85	3	Clear	*(1 F) Ammospermophilus leucurus*	*(2 F) Ammospermophilus leucurus*	
				0910	90	3	Clear	-	*(5 M & 1 F) Ammospermophilus leucurus*	
7/5/2024	Stanfield	0510			83	2	Clear	-	-	Closed Due to High Temp
			0710		87	3	Clear	*(1 M & 1 F) Ammospermophilus leucurus*	*(3 F & 2 M) Ammospermophilus leucurus*	
				0910	91	3	Clear	-	*(3 M) Ammospermophilus leucurus*	

Attachment C

Photograph 1: Representative vegetation community on potential work area (North), facing east.



Photograph 2: Representative vegetation community on potential work area (North), facing southeast.



Photograph 3: Representative vegetation communityalong TROW, facing east.

Photograph 4: Representative vegetation communityalong TROW, facing west.

Photograph 5: Representative vegetation community on potential work area (South), facing south.

Photograph 6 (a)(b): Representative captures: white-tailed antelope ground squirrel (*Ammospermophilus leucurus*) (left) and Great Basin whiptail (*Aspidoscelis tigris*) (right).

DIPODOMYS
ECOLOGICAL CONSULTING, LLC

Attachment D

Meadowlark Ecological Consulting, LLC

Amended Memorandum

To: California Department of Fish and Wildlife

From: Dalton Stanfield, Meadowlark Ecological Consulting, LLC (Meadowlark)

Subject: Proposal to conduct California Department of Fish and Wildlife (CDFW) Mohave Ground Squirrel Protocol Surveys (Live Trapping) for the Hydrostor Project, in Kern County, California

Meadowlark Ecological Consulting proposes to conduct California Department of Fish and Wildlife (CDFW) Mohave Ground Squirrel (MGS) protocol surveys on approximately 56.86-acres of potential work areas for the Hydrostor Project (Project). The Project is located along California Highway 14, between Dawn Road and Champagne Ave north of the City of Rosamond, Kern County, CA. The project consists of two disjoint parcels approximately 1500 meters apart. The northern parcel is approximately 46.9 acres, and the southern parcel is approximately 9.96 acres. The southern parcel was highly polluted with trash and illegal dumping, posing a substantial risk of theft, damages, or even take. The southern parcel of 9.96 acres will be omitted for trapping calculations.

In conjunction with the potential work areas the Transmission ROW alignment includes 35.13 acres of potentially suitable MGS habitat, out of 56.86 acres. Suitable habitat was assessed on proximity to urbanized environments and human settlements within a 500ft buffer. The trapping locations were visited on April 9th, for assessment. Biologist recorded high recreational OHV use along much of the Transmission ROW which overlaps with the OHV trails. The overlap of OHV trails and trapping area would likely yield property damage, theft, and incidental take. For those reasons 21.73 acres were designated as high-risk trapping locations and omitted from trapping calculations.

Total acreage of suitable habitat that wasn't high risk for theft, damage, or possible take, amounted to 82.03 acres. This was out of the original 113.72 acres. To assess the MGS habitat in its entirety Meadowlark proposes two smaller grids of 50 traps each. One grid of 50 (2x25) located in undisturbed habitat along the northern edge of the Transmission ROW, with three cameras. This area is the most undisturbed portion of the alignment and is along the northern edge of a CA State Lands Commission piece of land. The second grid of 50 (5x10) in the center part of the northern potential work area with two cameras.

While suitable habitat is over 80 acres, Meadowlark would like confirmation/approval of a deviation from standard trapping practices to cover all the acreage originally proposed of 113.72 acres, when only 82.03 were found to be trappable. Reducing the original need of two (2) grids of 100 traps with ten (10) cameras to two (2) grids of 50 traps and five (5) cameras.

Approx. Center of Grid 1: 34.91872, -118.18034 (WGS84)
Approx. Center of Grid 1: 34.91625, -118.15823 (WGS84)

daltonstanfield@meadowlarkeco.com
(316)308-1225
meadowlarkeco.com
840 N 21st St
Las Vegas, NV 89101

Live Trapping

Principal Investigator: Dalton Stanfield (SC 220270002, MOU 22027-001) will trap utilizing XLK Sherman traps (3 x 3.75 x 12") spaced 35 meters apart. Traps will be baited with a mixture of 4-way livestock feed sprinkled with peanut butter and oat powder. Artificial shade will be provided using A-frame cardboard shade covers. Shade covers will be secured with tent stakes if windy conditions occur.

Meadowlark will first conduct a visual survey to finalize trapping locations. Each sampling location will be surveyed three times during designated survey windows (1st:March 15-April 31; 2nd: May 1-31 and 3rd:June 15-July 15). If an MGS is captured, trapping will cease and CDFW will be notified.

All animals captured during the trapping efforts will be identified to species and released at the capture location. Biometric information such as weight, age class, sex, and reproductive condition will be recorded prior to release.

Camera Trapping

As recommended in the 2023 CDFW MGS Survey Guidelines, Meadowlark biologists will supplement live trapping efforts with five camera trapping stations. Five cameras will be installed within the project site to supplement the live trapping efforts. Each camera station will consist of a Bushnell Core Low Glow Trail Camera (Model 119932CB) or similar facing a bait station. A feeding tube will be used to prevent attracting ravens, and each tube will be staked to the ground with a 12-inch railroad spike to prevent removal by wildlife. Camera setup and specifications will follow the recommendations described in the 2023 MGS Survey Guidelines.

Photos from the camera traps will be downloaded after every five-day camera trapping session and will be reviewed individually by the Principal Investigator. A list of all species photographed will be included in the report, along with representative photographs.

Camera Specifications will follow the recommendations described in Appendix B of the 2023 MGS survey Protocol.

If you have any questions, please feel free to contact Dalton Stanfield at 316-308-1225 or daltonstanfield@meadowlarkeco.com

Sincerely

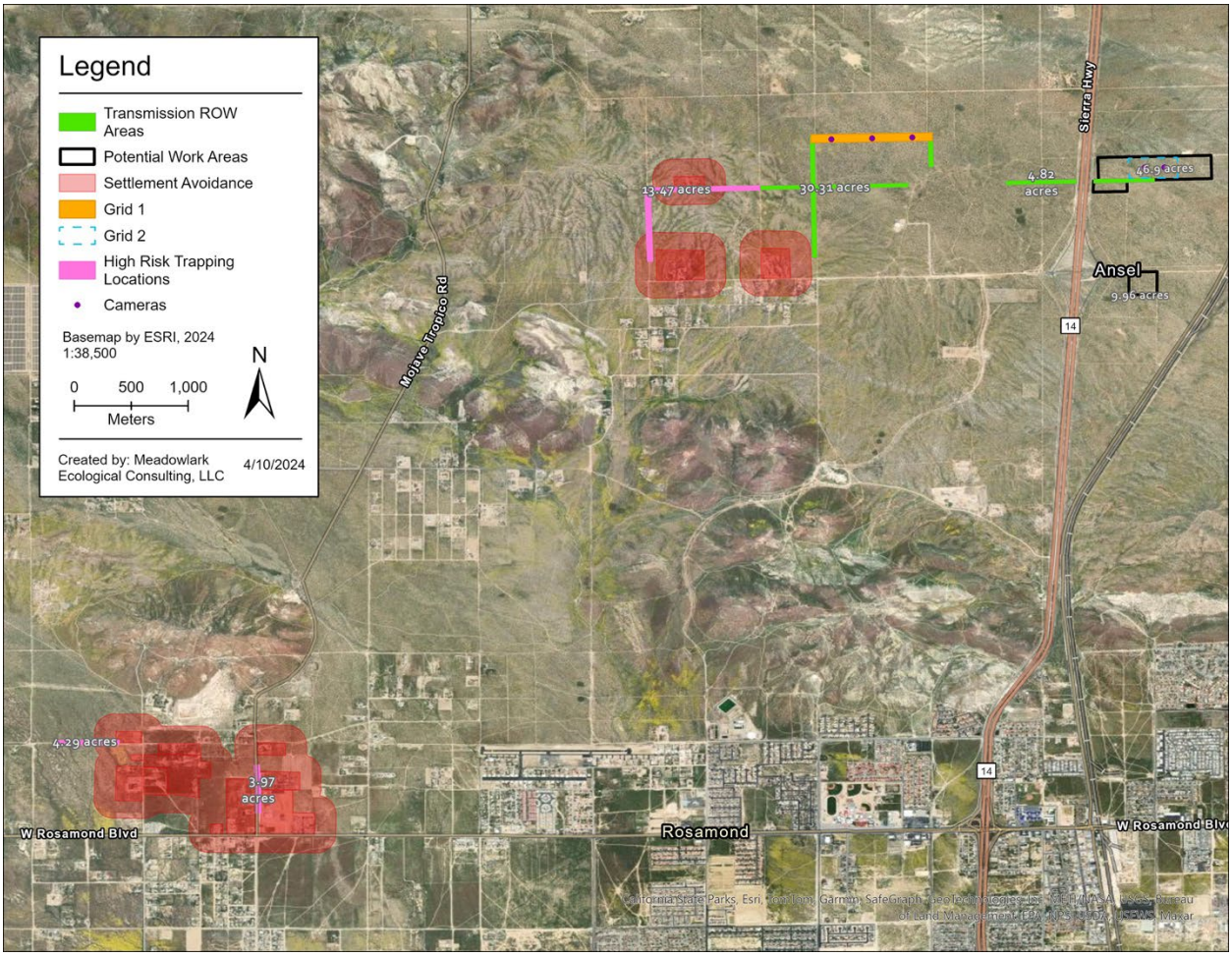
Dalton Stanfield

Literature Cited

California Department of Fish and Game. Mohave Ground Squirrel Survey Guidelines. October 2023.
California Department of Fish and Game. Mohave Ground Squirrel Survey Guidelines. July 2010.
Delaney D.K., Leitner, P. and D. Hacker. 2017. Use of Cameras in Mohave ground Squirrel Studies.

daltonstanfield@meadowlarkeco.com
(316)308-1225
meadowlarkeco.com
840 N 21st St
Las Vegas, NV 89101

Figure 1:



daltonstanfield@meadowlarkeco.com
(316)308-1225
meadowlarkeco.com
840 N 21st St
Las Vegas, NV 89101

Memorandum

To: California Department of Fish and Wildlife

From: Dalton Stanfield, Meadowlark Ecological Consulting, LLC (Meadowlark)

Subject: Proposal to conduct California Department of Fish and Wildlife (CDFW) Mohave Ground Squirrel Protocol Surveys (Live Trapping) for the Hydrostor Project, in Kern County, California

Meadowlark Ecological Consulting proposes to conduct California Department of Fish and Wildlife (CDFW) Mohave Ground Squirrel (MGS) protocol surveys on approximately 56.8-acres off potential work areas for the Hydrostor Project (Project). The Project is located along California Highway 14, between Dawn Road and Champagne Ave north of the City of Rosamond, Kern County, CA. The project consists of two disjoint parcels approximately 1500 meters apart. The northern parcel is approximately 46.9 acres, and the southern parcel is approximately 9.9 acres. Two options are presented to address this disjunction between the parcels.

A) One grid of 100 traps (4x25) and 5 cameras are placed in the northern parcel and the southern parcel has 3 camera stations placed. This area experiences OHV use and illegal dumping leading to habitat degradation. Last year, the parcels comprising the 1500m disjointed area was trapped and no MGS were detected (3 grids and 15 cameras). *Preferred Method

B) One grid of 80 (4x20) traps is placed in the northern parcel with 4 cameras and 20 (4x5) traps with 1 camera is placed in the southern parcel.

In addition to the potential work areas, sections of the projects ROW will be trapped. The entirety of the ROW to be trapped in 2024 encompasses 48.6 acres of suitable MGS habitat and an additional 8.26 acres of unsuitable MGS habitat. Suitable habitat was assessed on proximity to urbanized environments and human settlements within a 500ft buffer. To assess the MGS habitat Meadowlark proposes trapping the sections of the ROW that are still in undisturbed habitat. This would comprise a single trap line totaling approximately 100 traps. This is represented by the ROW Trap Grid Line (figure 1).

Live Trapping

Principal Investigator: Dalton Stanfield (SC 220270002, MOU 22027-001) will trap utilizing XLK Sherman traps (3 x 3.75 x 12”) spaced 35 meters apart. Traps will be baited with a mixture of 4-way livestock feed sprinkled with peanut butter and oat powder. Artificial shade will be provided using A-frame cardboard shade covers. Shade covers will be secured with tent stakes if windy conditions occur.

daltonstanfield@meadowlarkeco.com
(316)308-1225
meadowlarkeco.com
840 N 21st St
Las Vegas, NV 89101

Meadowlark will first conduct a visual survey to finalize trapping locations. Each sampling location will be surveyed three times during designated survey windows (1st:March 15-April 31; 2nd: May 1-31 and 3rd:June 15-July 15). If an MGS is captured, trapping will cease and CDFW will be notified.

All animals captured during the trapping efforts will be identified to species and released at the capture location. Biometric information such as weight, age class, sex, and reproductive condition will be recorded prior to release.

Camera Trapping

As recommended in the 2023 CDFW MGS Survey Guidelines, Meadowlark biologists will supplement live trapping efforts with five camera trapping stations. Five cameras will be installed within the project site to supplement the live trapping efforts. Each camera station will consist of a Bushnell Core Low Glow Trail Camera (Model 119932CB) or similar facing a bait station. A feeding tube will be used to prevent attracting ravens, and each tube will be staked to the ground with a 12-inch railroad spike to prevent removal by wildlife. Camera setup and specifications will follow the recommendations described in the 2023 MGS Survey Guidelines.

Photos from the camera traps will be downloaded after every five-day camera trapping session and will be reviewed individually by the Principal Investigator. A list of all species photographed will be included in the report, along with representative photographs.

Camera Specifications will follow the recommendations described in Appendix B of the 2023 MGS survey Protocol.

If you have any questions, please feel free to contact Dalton Stanfield at 316-308-1225 or daltonstanfield@meadowlarkeco.com

Sincerely

Dalton Stanfield

Literature Cited

California Department of Fish and Game. Mohave Ground Squirrel Survey Guidelines. October 2023.
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840 N 21st St
Las Vegas, NV 89101

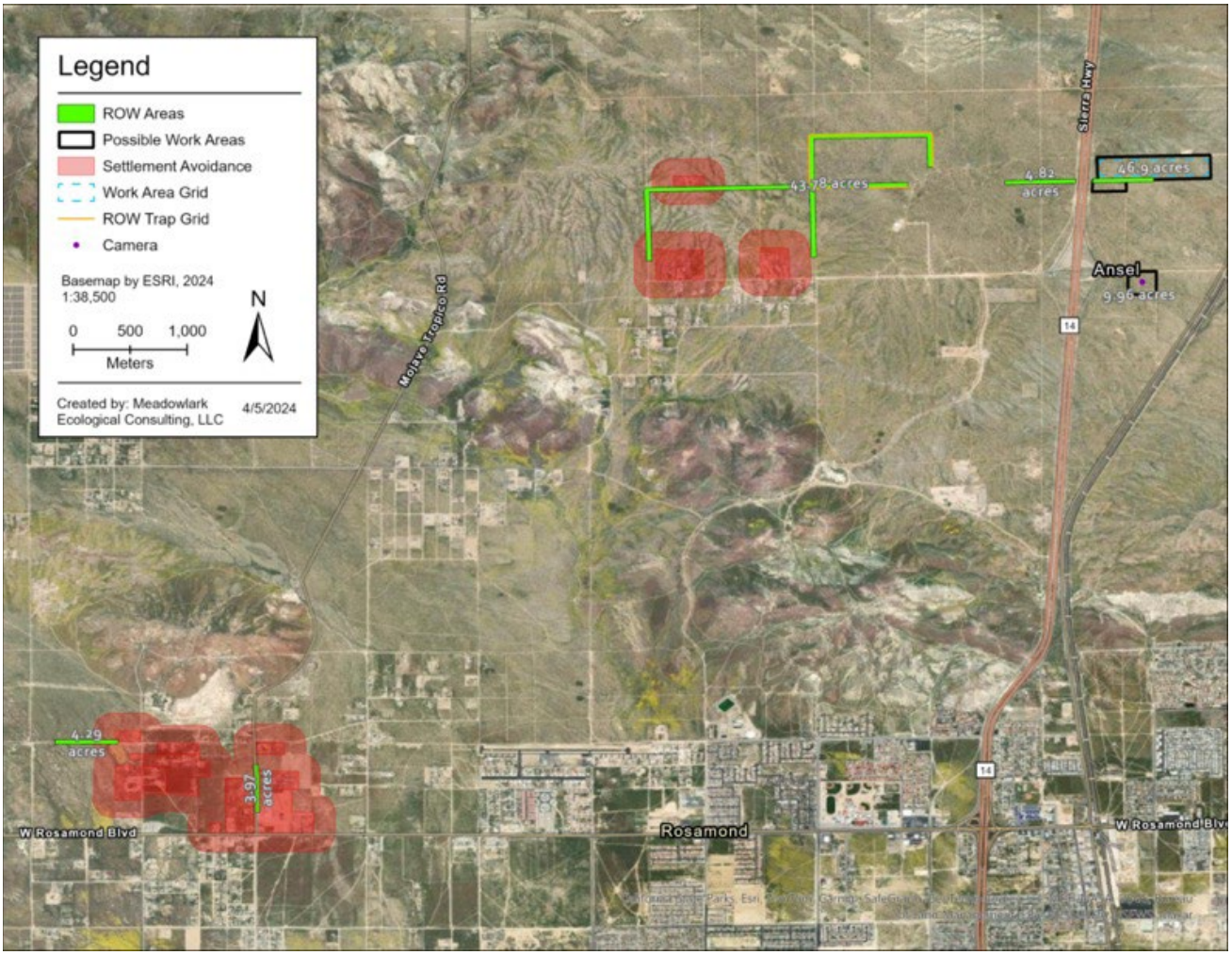

Figure 1:

daltonstanfield@meadowlarkeco.com
(316)308-1225
meadowlarkeco.com
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Las Vegas, NV 89101