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Document Title:	Willow Rock Energy Storage Center Data Request Response 1 Workshop Responses
Description:	This document provides GEM A-CAES LLC's (the "Applicant") written responses to data requests from California Energy Commission Staff's Data Requests Set 1 regarding the Application for Certification for the Willow Rock Energy Storage Center (WRESC) (21-AFC-2). These data requests were the subject of discussion and resolution at the CEC Staff Workshop held on October 11, 2022, and subsequent information exchange held on October 19, 2022 between the Applicant and CEC Staff.
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Willow Rock Energy Storage Center (21-AFC-02)

DATA REQUEST RESPONSE SET 1
Workshop Responses

Response to California Energy Commission Staff

DR5, DR34, DR36, DR48, DR49, DR58, DR68-2, DR76 and DR77

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November 16, 2022

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ATTACHMENTS

Acronyms and Abbreviations

acfm	actual cubic feet per minute
ACSR	aluminum conductor steel-reinforced
AFC	Application for Certification
Bgs	below ground surface
BLM	U.S. Bureau of Land Management
BUOW	Burrowing Owl
CBOC	California Burrowing Owl Consortium
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
cfm or ft3/min	cubic feet per minute
CHRIS	California Historical Resources Information System
CNDDB	California Natural Diversity Database
CUP	Conditional Use Permit
DKF	desert kit fox
DPM	diesel particulate matter
DPR	Department of Parks and Recreation
DR	Data Request
EKAPCD	Eastern Kern Air Pollution Control District
EPC	Engineering, Procurement and Construction
FSA	Final Staff Assessment
ft	feet
GEM / GESC	Gem Energy Storage Center
HCM	Highway Capacity Manual
HRA	Health Risk Assessment
ITE	Institute of Transportation Engineer
Kcmil	Kilo Circular Mills
KOG	council of governments
kV	kilovolt
LADWP	Las Angeles Department of Water and Power
LORS	Laws, Ordinances, Regulations and Standards
m^3	square meters
m/s	meters per second
mph	miles per hour
OHP	Office of Historic Preservation
PG&E	Pacific Gas and Electric
PM10	particulate matter
PMI	point of maximum impact
PSA	Preliminary Staff Assessment
ROW	Right of Way
SCE	Southern California Edison
SIS	System Impact Study
SWHA	Swainson's Hawk
TLRW	Transmission Line Right of Way
TOC	Table of Contents
VMT	vehicle miles travelled
WDR	Waste Discharge Requirement
WEAP	Worker Environmental Awareness Program
WJT	Western Joshua Tree

1.0 INTRODUCTION

This document provides GEM A-CAES LLC's (the "Applicant") written responses to data requests from California Energy Commission Staff's Data Requests Set 1 regarding the Application for Certification for the Willow Rock Energy Storage Center (WRESC) (21-AFC-2). These data requests were the subject of discussion and resolution at the CEC Staff Workshop held on October 11, 2022, and subsequent information exchange held on October 19, 2022 between the Applicant and CEC Staff.

Information included in this Data Request Response Set 1 Workshop Responses include a brief summary of controlled detonation activities anticipated during the construction phase. Responses related to the following Data Requests (DR) are addressed DR5, DR34, DR36, DR48, DR49, DR58, DR68-2, DR76 and DR77.

The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as presented by CEC Staff and are keyed to the Data Request (DR) numbers (DR#). New or revised graphics, tables or attachments are provided as attachments and are numbered in reference to the Data Request number. For a hypothetical example, the first attachment used in response to Data Request DR34 would be numbered Attachment DR34-1. In instances where an attachment to data response was previously submitted, the data response attachment is sequentially numbered as the next attachment in the series to avoid confusion with previously docketed attachments. For example, the Desert Kit Fox Biological Report included herein is designated as Attachment DR36-2 because an Attachment DR36-1 was previously docketed with Data Response Set 1. Each page in this response document is sequentially page-numbered consistently with the remainder of the document, although some attachments may also have their own internal page numbering system.

2.0 WORKSHOP INFORMATION REQUEST; SUMMARY OF CONTROLLED DETONATION ACTIVITIES

At the October 11th workshop, the Applicant agreed to provide a summary of the controlled detonation activities. The Applicant is providing Attachment 2-1 Controlled Detonation Information Summary to describe the expected activities associated with the use of explosives during the construction phase for construction of the cavern.

- Controlled detonation (commonly referred to as "blasting") events will only occur at most twice daily during the last 24 months of project construction.
- Each controlled detonation event will last no longer than a few seconds and may be perceived as sound similar to a popping firecrackers or a firearm going off in rapid succession in the distance
- Controlled detonation will NOT be continuous.
- No surface detonation of explosives will occur at any time.
- All controlled detonation will be conducted approximately 2,000 feet below ground surface.
- Noise and vibration from controlled detonation may be perceptible to attentive nearby receptors but will not result in noise or vibration that exceeds any applicable standards.
- Controlled detonation impacts will not pose any risk to the health and safety of county residents.

3.0 ALTERNATIVES

3.1 Site Control (DR5)

3.1.1 Data Request DR5

DR5: *Please describe the status of the process to secure site access for the adjoining approximately 10-acre parcel, including whether property purchase or a lease is being negotiated. If site access will be through a long-term lease, please provide information on the expected length of the lease and renewal options. This is a continuing request, regarding ongoing updates on the status of the applicant's efforts to obtain adequate rights to the parcel, and for the terms of any occupancy rights once obtained.*

Response: Hydrostor completed purchase of the 10-acre parcel (Kern County Assessor Parcel Number 315-081-01) on October 22, 2022.

4.0 BIOLOGICAL RESOURCES

4.1 Desert Turtle (DR34)

4.1.1 Data Request DR34

DR34: *Please conduct desert tortoise surveys following USFWS 2019 protocol and provide details of methods used and map results. Include on the map the 10-meter-wide belt transects. Include areas that were not accessible at the time the previous surveys were conducted.*

Response: At the October 11th Workshop, the applicant agreed to prepare a stand-alone desert tortoise report to provide clarification as well as additional details regarding the survey protocols and methods used to conduct desert tortoise surveys. A separate stand-alone report summarizing desert tortoise surveys is included as Attachment DR34-1.

4.1.2 Desert Kit Fox (DR36)

4.1.3 Data Request DR36

DR36: *Please conduct DKF surveys within the study area (project site and, where possible, 1,000-foot buffer, plus gen-tie out 500 feet from either side of the linear facility centerline) including a compilation of known sightings within 10 miles pursuant to USFWS 2011 (page 1) protocols. Biologists conducting the surveys should be familiar with all DKF signs (scat, burrows, dens, tracks, individuals).*

Response: At the October 11th Workshop, the applicant agreed to prepare a stand-alone summary addressing the Desert Kit Fox (DKF). The methods and findings of the DKF surveys are presented in a stand-alone DKF survey report included as Attachment DR36-2.

4.2 Crotch's bumble bee (DR48 and DR49)

4.2.1 Data Request DR48

DR48: *Please conduct surveys for Crotch's bumble bee. Prior to conducting surveys consult with CDFW and CEC staff for guidance of survey protocol methodology.*

Response: At the October 11th Workshop, the applicant agreed to prepare a habitat assessment of the Project site for Crotch's bumble bee. Attachment DR48-1 presents the findings of the habitat assessment for the Crotch's bumble bee.

4.2.2 Data Request DR49

DR49: *Provide a complete survey report, including at minimum, surveyor qualifications, and map of suitable habitat and any positive findings.*

Response: At the October 11th Workshop, the applicant agreed to prepare a habitat assessment of the Project site for Crotch's bumble bee. Attachment DR48-1 presents the findings of the habitat assessment for the Crotch's bumble bee. The Applicant will discuss the habitat assessment with CEC and California Department of Fish and Wildlife staff on or about November 18, 2022.

4.3 Burrowing Owl (DR58)

4.3.1 Data Request DR58

DR58: *Please conduct surveys for western burrowing owls following CDFW 2012 and CBOC 1993 protocols.*

Response: At the October 11th Workshop, the applicant agreed to revise the burrowing owl technical report to reflect a more detailed discussion of the survey methods used to conduct protocol surveys for the species so it is clear that all required methods were followed based on the California Department of Fish and Wildlife 2012 Staff Report on Burrowing Owl Mitigation. The revised stand-alone report is included as Attachment DR58-1.

5.0 GEOLOGIC HAZARDS AND RESOURCES

5.1 Monthly Geotechnical Data Summary (DR68-2)

5.1.1 Data Request DR68-2

DR 68-2: *Following the remote workshop with CEC staff on October 11, 2022, it was mutually agreed that the Applicant would submit the monthly progress reports required by Kern County in accordance with the Conditional Use Permit issued by the County for the ongoing WRESC site geotechnical data collection effort to satisfy DR68. The first of these reports, Attachment DR68-1 Willow Rock Energy Storage Center (21-AFC-02) Monthly Geotechnical Update – September 2022, was docketed on October 17, 2022 (TN 246604). Due to file size limitations associated with the normal docket, the data associated with the September report was subsequently submitted to CEC Staff via the CEC's large file transfer system, Kiteworks, on November 9, 2022. CEC Staff has agreed to docket this supplemental material.*

Response: The text of the next monthly report, Attachment DR68-2 Willow Rock Energy Storage Center (21-AFC-02) Monthly Geotechnical Update – October 2022 is included with this data response without the appendices. Due to file size limitations associated with the normal docket, the complete report including the appended data is being submitted to CEC Staff via the CEC's large file transfer system, Kiteworks. CEC Staff has agreed to docket this supplemental material.

6.0 LAND USE

6.1 Project Plan and timeline (DR76)

6.1.1 Data Request DR76

DR76: *Please discuss the plan and timeline for resolving the project's inconsistencies with the current zoning, as discussed by the County in their letter referenced above. The applicant should obtain from the County the necessary rezones of the parcels from Estate designations to Agriculture designations before CEC staff prepares the Final Staff Assessment.*

Response: The Applicant has been in coordination with Kern County Planning & Natural Resources Department regarding the process and timing for rezoning the parcels where infrastructure will be built and construction laydown will occur. The Applicant plans to submit a Zone Change Application (FORM 101) to Kern County for the subject project parcels by year-end 2022. The Applicant understands that the County's processing time is variable for each request and dependent upon the degree of complexity, among other factors. In general, the Applicant understands that the application will be reviewed by County staff and presented to the Planning Commission and Board of Supervisors for approval during their regularly scheduled public hearings. Based on communications with the County, the Applicant understands that the processing of the Zone Change Application is anticipated to take approximately three to six months. The Applicant further understands that the County intents to use the CEQA exemption for early activities related to thermal power plants actions undertaken by a public agency relating to any thermal power plant site or facility subject to a regulatory program certified pursuant to Public Resources Code Section 21080.5. (Public Resources Code § 21080(b)(6); 14 C.C.R. 15271.) If additional parcels that are not currently under site control are subsequently acquired at a later date to support the Project, the County has advised the Applicant to apply for those additional parcels at that later date.

6.2 Conditional Use Permit (DR77)

6.2.1 Data Request DR77

DR77: *Because of the CEC's exclusive authority over the proposed project, a Conditional Use Permit will not be necessary from Kern County. Please provide confirmation from the County that the necessary findings for a Conditional Use Permit could be made, but for the CEC's jurisdiction, to enable CEC staff to make findings of consistency with the County's zoning designations following the rezoning from Estate designations to Agricultural designations.*

Response: While the project will be made consistent pursuant to the path described below, the Applicant defers to Kern County Planning & Natural Resources Department to provide its own formal comments in the CEC's AFC process. Given that the Application is still in the Discovery phase, it would be premature to opine on the consistency at this stage, absent CEQA clearances.

Once the parcels have been appropriately rezoned through the County's process, the project will be consistent with the "Resource Extraction and Energy Development Uses" as allowed by the Exclusive Agriculture (A) zoning district (Kern County Municipal Code Chapter 19.12.030). Given this consistency path forward, the project will not have a significant environmental impact to Land Use and Planning because it will not conflict with any land use plan, policy or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

At the October 11th Workshop, the Applicant agreed to provide its assessment of whether the requisite findings for approval of a CUP could be made. Pursuant to Section 19.104.040 of the Kern County Code, the County must make the following findings in issuing a CUP:

The proposed use is consistent with the goals and policies of the applicable general or specific plan.

A. The proposed use is consistent with the purpose of the applicable district or districts.
B. The proposed use is listed as a use subject to a conditional use permit in the applicable zoning district or districts or a use determined to be similar to a listed conditional use in accordance with the procedures set out in Sections 19.08.030[1] through 19.08.080[2] of this title.
C. The proposed use meets the minimum requirements of this title applicable to the use.
D. The proposed use will not be materially detrimental to the health, safety, and welfare of the public or to property and residents in the vicinity.

As discussed in Table 5.6-4 of the AFC, the Applicant believes that the Project is consistent with the goals and policies of the Kern County General Plan. Pursuant to Sections 19.12.020 and 19.12.030 of the Kern County Zoning Ordinance, construction and operation of energy facilities on areas zoned A (Exclusive Agriculture) require approval of a conditional use permit (CUP). Energy facilities are considered to be a compatible use and are permitted on properties zoned for exclusive agricultural use with the approval of a CUP.

As detailed further below in Tables 1 and 2, following the rezoning of the site to A (Exclusive Agriculture), the Project will be consistent with the purpose of the applicable district and would be a use subject to a conditional use permit in the applicable zoning district but for the CEC's exclusive jurisdiction. The Project will incorporate design features and mitigation measures that will ensure that potential adverse impacts will be mitigated to the extent feasible and will be constructed and operated in compliance with applicable laws, ordinances, regulations, and standards (LORS).

[1] Kern County Code of Ordinances. Chapter 19.08.030 Determination of similar use – generally. https://library.municode.com/ca/kern_county/codes/code_of_ordinances?nodeId=TIT19ZO_CH19.08INGEST_19.08.030DESIUEN. Accessed November 14, 2022.

[2] Kern County Code of Ordinances. Chapter 19.08.080 Determination of similar use –criteria. https://library.municode.com/ca/kern_county/codes/code_of_ordinances?nodeId=TIT19ZO_CH19.08INGEST_19.08.030DESIUEN. Accessed November 14, 2022

Table 1: Permitted Uses for Parcel Zoned Exclusive Agriculture

Kern County Zoning Designation A (Exclusive Agriculture) ordinance	Allowable Land Uses	Conclusion
19.12.020 D: Utility and Communications Facilities	Transmission lines and supporting towers, poles, and underground facilities for gas, water, electricity, telephone, or telegraph service owned and operated by a public utility company or other company under the jurisdiction of the California Public Utilities Commission pursuant to Section 19.08.090 of this title	Project components are in alignment with several of the permittable elements listed in 19.12.020 D.
19.12.020 D: Utility and Communications Facilities	Utility substation	Project components are in alignment with a permittable utility substation under 19.12.020 D
19.12.020 E: Resource Extraction and Energy Development Uses	Explosives storage, temporary	Excavation of the storage cavern will occur in the last approximately 24 months of project construction. There will be no permanent onsite storage of explosives. Cavern construction would require the temporary use of explosives. As such, the Project would be in alignment with the permittable use of temporary explosive storage listed in 19.12.020 E.
19.12.020 F: Miscellaneous	Accessory buildings, including cargo containers, if incidental and accessory to a permitted use	The Project's construction and operations phases would include permittable assessor buildings and cargo containers listed in 19.12.020 F.

Kern County Zoning Designation A (Exclusive Agriculture) ordinance	**Allowable Land Uses**	**Conclusion**
19.12.020 F: Miscellaneous	Corporate or administrative offices, when the combined square footage does not exceed ten thousand (10,000) square feet, in conjunction with, and accessory to, a use permitted or conditionally permitted in this chapter	The Project's operations phase would include administrative offices which are allowable land uses under 19.12.020 F.
19.12.020 F: Miscellaneous	Drainage sump, if proposed and approved as part of a tentative subdivision map or tentative parcel map, or if accessory to a permitted use	The Project's operations phase would include water storage facilities which is allowable under 19.12.020 F.
19.12.020 F: Miscellaneous	Flood control facilities	The Project would include permittable flood control facilities as listed in 19.12.020 F.
19.12.020 F: Miscellaneous	Managed wetlands	Permitted use does not apply to the Project.

Table 2: Allowable Land Uses for Parcels Zoned Exclusive Agriculture with a Conditional Use Permi

Kern County Zoning Designation A (Exclusive Agriculture) ordinance	Allowable Land Uses	Conclusion
19.12.030 G: Resource Extraction and Energy Development Uses.	Electrical power generating plant	The Project would consist of an electric power generating facility as listed in 19.12.020 G.
19.12.030 G: Resource Extraction and Energy Development Uses.	Explosives storage, permanent	Permitted use does not apply to the Project.
19.12.030 G: Resource Extraction and Energy Development Uses.	Mining and mineral extraction pursuant to Chapter 19.100 of this title	Permitted use does not apply.
19.12.030 G: Resource Extraction and Energy Development Uses.	Rock, gravel, sand, concrete, aggregate, or soils crushing, processing, or distribution	The Project's construction would involve some elements listed in 19.12.030G that would be permittable with a CUP.
19.12.030 I. Institutional Uses	Water treatment plant	Does not apply
19.12.030 K. Miscellaneous Uses	Construction staging and equipment storage, temporary	The Project's construction phase would require temporary construction staging and equipment storage which are permittable under 19.12.030 K.
19.12.030 K. Miscellaneous Uses	Corporate or administrative offices in excess of ten thousand (10,000) square feet in conjunction with, and accessory to, a use permitted or conditionally permitted in this chapter	The Project's operations phase would include administrative offices which are permittable under 19.12.030 K.
19.12.030 K. Miscellaneous Uses	Drainage sump	The project's operations phase may require a drainage sump which is allowable with a CUP under 19.12.030 K.

ATTACHMENT 2-1

Controlled Detonation Information Summary

Willow Rock Energy Storage Center (21-AFC-02)
Attachment 2-1
Controlled Detonation of Explosives
Information Summary

Willow Rock Energy Storage Center will require the excavation of an approximately 1.1 million cubic yard compressed air storage cavern at a target depth of approximately 2,000 feet (ft) below the ground surface (bgs) in hard bedrock. Initial access to the cavern depth will be accomplished using a conventional rotary drilling technique. No controlled detonation of explosives, commonly referred to as "blasting," will be done at the surface or during the drilling phase of the cavern construction.

Five vertical shafts are expected to be drilled to facilitate cavern construction. One 8-ft diameter (dia) shaft will be used for equipment and personal access, two 8-ft dia shafts for rock removal, and two 6-ft dia shafts for ventilation. All shafts will be lined and sealed with air and water-tight casing to prevent any cross-contamination with the surrounding environment.

It is expected that excavation of the storage cavern will occur in the last approximately 24 months of project construction. During this 2-year period, twice-daily (at most) underground controlled detonation of explosives of a few second durations each would occur at the beginning of each shift as described below. Controlled detonation is NOT continuous throughout the day.

After the shaft target depth is achieved by drilling, initial storage cavern excavation will commence using a physical/mechanical excavation. Once the cavern is large enough blasting will be initiated with personnel underground. Explosives will be placed in closely spaced locations and detonated remotely from above ground. Initially, personnel will clear the underground area after placing the explosives and remain aboveground during the actual detonation sequence. Each controlled detonation will occur in a very short sequence, on a slight delay (on the order of a few milliseconds) from each other, with the total combined detonation sequence lasting no more than a few seconds. Once the cavern is large enough for personnel to remain safely underground, the blasting sequences would be initiated from a safe underground location. The remainder of the shift work would involve clearing and removal of rock debris, conventional (non-explosive) underground excavation, collection of samples and at the end of the shift, preparation and placement of controlled detonation explosives for the next sequence.

Following return of the first shift to ground level and before the next shift enters the shaft, the next controlled detonation sequence would be remotely initiated, again lasting no more than a few seconds. Thereafter the second shift would descend into the cavern and reinitiate the same process.

Unlike "mining," no detonation occurs on the surface. Because the twice daily controlled detonations would occur at a depth of 2000 ft bgs, the shafts would serve to effectively muffle the sound. Moreover, since the detonations are below ground, there is no risks aboveground and no rock debris or other releases aboveground. Depending on the depth of activities, the controlled detonation of explosives may result in some perceptible sound and vibration at the very nearest residences during the two daily detonations. The perception of the controlled denotations could be characterized as a series of audible, rapidly spaced, popping sounds similar to a firecracker, perceptible at a distance but because of the short duration and distance, considered to be minor and infrequent.

The vibration (air-overpressure) and noise traveling up through the shaft and to the closest receptors through the air will generate both an audible noise and pressure that could be perceptible. The maximum air-overpressure level is estimated to be less than 120 linear decibels (dBL) at the closest receptor {approximately 1,300 feet away}. This maximum potential pressure level twice daily is similar to a 20 mile per hour wind, could be noticeable, and would be well below any threshold causing impacts.

Impulse (instantaneous) noise from controlled detonation could reach up to 140 A-weighted decibels (dBA) at the detonation location, attenuating to approximately 90 dBA at 500 ft from the detonation within the unoccupied shaft. With a 2,000 ft shaft the noise level at the closest aboveground receptor (1,300 ft estimated distance) would conservatively be estimated to be 74 dBA. This projected sound level does not

include the additional sound attenuation the 2,000 ft drill shaft will provide. This instantaneous noise level is below typical worker health-related exposure levels for an 8-hour workday of 85 dBA; therefore, no negative health impacts would be expected onsite or offsite.

The maximum vibration at the nearest residence is estimated to be in the range of 0.10 inches per second (in/sec) with the use of recommended electronic detonators. This level is at or slightly below the vibration level noticeable to an attentive receptor. Other types of detonators which could increase this vibration level will not be used. The actual sound pressure level would depend on several parameters, such as amount of explosive required in a specific location, the diameter of explosive bore, placement/spacing, detonation delay between locations, and weather conditions as ambient conditions can further dampen attenuation. Given the short duration, the twice-daily denotations would not significantly change the receptor's daily time-weighted noise exposure levels set forth in the Application for Certification.

The Code of Federal Regulations, under Title 30, Captor VII, Subchapter B, Part 715 regulates the use of explosives and sets the maximum ground vibration to not exceed 1.00 in/sec at 301 ft to 5,000 ft from the detonation site. The controlled detonation will meet this standard, as stated above, with the vibration at the nearest residence estimated to be in the range of 0.10 in/sec. In addition, while this regulation does not provide an air-overpressure standard, a level of less than 120 dBL would meet typical international standards which are generally between 120 and 130 dBL.

Given the limited nature of the activity, we do not anticipate that the public would be significantly impacted by the controlled detonations. To facilitate communication and awareness and to demonstrate conformance with applicable requirements, nearby residents would be informed of anticipated activities in advance. Pre-detonation testing would be done to monitor and adjust controlled detonation sequence and duration to minimize noise and vibration to extent possible. The applicant would also conduct noise and vibration monitoring during initial controlled detonations to demonstrate that noise and vibration impacts are insignificant.

The controlled detonation work would be carried out by a mining company with Bureau of Alcohol, Tobacco and Firearms Arms (ATF)-certified personnel and all activity would be completed consistent with Federal and California Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA) and any other applicable laws, ordinances, regulations, and standards.

ATTACHMENT DR34-1

Desert Tortoise Survey Report

BLACKHAWK Environmental

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DESERT TORTOISE SURVEY REPORT

HYDROSTOR, INC. WILLOW ROCK ENERGY STORAGE CENTER PROJECT

WILLOW SPRINGS, KERN COUNTY, CALIFORNIA

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ATTACHMENTS

1.0 EXECUTIVE SUMMARY

This report presents the methods and results of the United States Fish & Wildlife Service (USFWS) protocol desert tortoise (*Gopherus agassizii*) survey conducted in April and May 2021 on the proposed Willow Rock Energy Storage Center Project (Project) in Kern County, California. The Project seeks to construct an energy storage facility known as the Willow Rock Energy Storage Center (WRESC) on approximately 70 acres and approximately 10.9 miles of 230 kilovolt (kV) single-circuit tie-lines interconnecting to the existing Southern California Edison (SCE) Whirlwind Substation or an approximately 3.5-mile 230 kV single-circuit tie-line interconnecting to the future Los Angeles Department of Water and Power (LADWP) Rosamond Substation. Each tie-line would include a 125-foot-wide corridor on primarily undeveloped land. The proposed energy storage sites and the tie-lines are collectively known as the Hydrostor Willow Rock Energy Storage Center Project. The Project boundary, which includes the energy storage facility parcels plus all proposed alternatives for the tie-lines, covers approximately 977 acres in and near Willow Springs, Kern County, California. The Survey Area included all accessible portions within the Project boundary, plus one transect within accessible portions 100 meters beyond the Project boundary, akin to the area of potential effect. Where access was not possible (primarily on privately owned, developed lands), binoculars were used to the greatest extent feasible to search for desert tortoises and/or tortoise sign.

The purpose of the survey was to document presence or absence of desert tortoise on the Project site and its area of potential effect utilizing pedestrian surveys of 10-meter-wide belt transects. Data collection included documenting presence or absence of desert tortoise, including live or dead individuals, and all tortoise sign (i.e., burrows, tracks, scat, egg fragments, remains).

In summary, no live or dead tortoises (including an absence of adults, subadults and juveniles) or definitive desert tortoise sign were observed, indicating no definitive tortoise activity within the Survey Area. A total of three Class 5 burrows (defined as possibly tortoise and in good condition) were detected in the Survey Area. This finding does not indicate desert tortoise presence, merely, the potential presence.

2.0 METHODS

2.1 Literature Review

Prior to conducting desert tortoise surveys, the California Natural Diversity Database (CNDDB) was searched to assess the potential for the Project site to support State and/or federally listed threatened, endangered, and/or otherwise special-status plant and wildlife species, including the desert tortoise. The CNDDB review was extended to 10 miles beyond the Project site. A review was also conducted of the USFWS Environmental Conservation Online System (ECOS) database and indicated that the Project is located within the Desert Tortoise Western Mojave Conservation Unit. Additionally, the Project is located outside of protected lands per the California Protected Areas Database (CPAD) and California Conservation Easement Database (CCED). Biological resource reports prepared for other projects in the Project vicinity were also reviewed, including the *Big Beau Solar Project, Kern County, California, Biological Technical Report* (ICF 2019) and the *Biological Resources Technical Report, AVEP Solar Project* (Western EcoSystems Technology 2020). Freely available aerial imagery was also reviewed via a desktop analysis for existing conditions and historical land use trends (Google 2021). The results of the literature review were used to focus biological survey efforts for special-status species and sensitive resources perceived to have the potential to occur on and/or adjacent to the Project site. A total of three occurrences of desert tortoise were recorded within 10 miles of the Project: in 2006 (one small adult observed crossing a road on April 25, 2006), 2010 (one class 4 burrow), and 2013 (one 40–50-year-

old female observed foraging on April 23, 2013). The paucity of desert tortoise observations from the CNNDB reflected the overall lack of desert tortoise presence from the forementioned other projects reviewed from the Project vicinity.

2.2 Field Survey Methodology

Field surveys for desert tortoise were conducted from April 12 to May 5, 2021, by Blackhawk Environmental, Inc. qualified biologists who had previously attended the Desert Tortoise Council Survey Techniques workshop and/or previously had been approved as Biological Monitors by USFWS on prior projects. Surveys were conducted during the appropriate season when desert tortoises are expected to be active, if present. Temperatures ranged from approximately 47° Fahrenheit during the early morning hours to 96° with varying wind speeds between approximately 0 to 12 miles per hour (mph), with mostly clear skies and no precipitation.

The protocol survey followed the guidelines and requirements in *Preparing for Any Action that May Occur Within the Range of the Mojave Desert Tortoise (Gopherus agassizii)* (USFWS 2019) utilizing both the Small Project Survey and Linear Project Survey methods for the energy storage facility sites and the transmission line routes, respectively. For 10-meter-wide belt transect placement, one transect was followed between the transmission line centerline and each edge of the 125 ft.-wide corridor, plus another transect 100 meters beyond the edge of the transmission line corridor, for a total of four transects per transmission line route. Transects inside the WRESC parcels were spaced approximately 20 meters apart, plus one transect at 100 meters surrounding each parcel. The methodology used during the 2021 desert tortoise survey followed the 2019 protocol for *Linear Project Survey* for the transmission line portion, as related to the potential impact areas within the 250-ft. wide transmission line routes. The 2021 desert tortoise survey also followed the *Small Project Survey* to cover 100% of the WRESC parcels with an additional survey transect completed 100 meters beyond each of these parcels. The transects beyond the proposed Project footprint limits were included to cover the estimated action area at the conceptual stage of this Project at the time of the surveys. In addition, burrowing owl (*Athene cunicularia*) transects and Swainson's hawk (*Buteo swainsoni*) surveys included incidental desert tortoise searches that are not depicted on any Project figures or exhibits, as they were multi-disciplinary and not specifically for tortoises. Thus, the tortoise survey coverage area included all transects depicted on the 2021 Desert Tortoise Survey Exhibit, as well as some additional, unspecified foot-accessible areas within the 150-meter-wide burrowing owl survey area and the 1/2-mile-wide Swainson's hawk survey area.

The survey team walked pedestrian transects and searched for/recorded all signs of desert tortoise including live or dead individuals (or parts thereof), scat, burrows, tracks, and eggshell fragments. Biologists walked approximately 205 linear kilometers of transects (127.7 miles) within the Survey Area, for a total daily effort of approximately 29.3 linear kilometers (18.2 miles) per surveyor. After all desert tortoise surveys have been completed, the 2019 protocol requires Table 2 spreadsheets to be used to provide a point estimate and confidence interval for most larger Projects where tortoise presence has been identified. Table 1 below presents the survey dates, personnel and conditions for each survey pass.

Table 1. Desert Tortoise Survey Dates, Personnel, and Survey Conditions

Date	Personnel	Start/End	Temperature (F°)	Wind (mph)	Cloud Cover (%)	Precipitation
4/12/21	Katie Quint	0728-1542	58-86	3-9	0-25	0/0
4/14/21	Katie Quint Tamara Kramer	0645-1500	47-65	1-12	0-25	0/0
5/4/21	Katie Quint Tawni Gotbaum	0545-1515	54-96	0-8	0-10	0/0
5/5/21	Katie Quint Tawni Gotbaum	0545-1530	56-93	1-7	0-10	0/0

Sign was classified based on the following rating system:

Burrows and Dens:
(1) currently active, with tortoise or recent tortoise sign
(2) good condition, definitely tortoise; no evidence of recent use
(3) deteriorated condition; definitely tortoise
(4) deteriorated condition; possibly tortoise
(5) good condition; possibly tortoise

Scats:
(1) wet (not from rain or dew) or freshly dried; obvious odor
(2) dried with glaze; some odor; dark brown
(3) dried; no glaze or odor; signs of bleaching (light brown) tightly packed material:
(4) dried; light brown to pale yellow; loose material; scaly appearance
(5) bleached, or consisting of only plant fiber

Carcass:
(1) fresh or putrid
(2) normal color; scutes adhere to bone
(3) scutes peeling off bone
(4) shell bone is falling apart; growth rings on scutes are peeling
(5) disarticulated and scattered

3.0 RESULTS

3.1 Site Characteristics

The proposed Project is located on privately-owned lands situated in and around the community of Willow Springs in Kern County (Attachment A, Figure 1). Elevations within the Project's Survey Area range from 2,591 feet above mean sea level (msl) to approximately 2,835 feet above msl, with topography generally sloping toward the southwest. Existing conditions within the desert tortoise Survey Area broadly include areas of sparse to moderately high desert vegetation cover, intermixed with disturbed areas. A total of 13 vegetation communities were observed and mapped within the Survey Area: Creosote-White Bursage Series, Saltbush Scrub, Developed/Disturbed, Creosote-Saltbush Series, Developed, California Matchweed-Rubber Rabbitbrush Series, Agricultural Land, Annual Buckwheat/ Grasses, Creosote-White Bursage Series – Disturbed, Rubber Rabbitbrush Scrub, Saltbush Scrub – Disturbed, Disturbed and Ornamental. Soft intergrades between these vegetation communities were often present, with plant species of the described communities often present to varying degrees in

adjoining communities. Vegetation communities were described based on dominant plant(s) species generally characterizing the specific vegetation community. In addition, developed habitat was present within the surrounding Survey Area as compacted dirt and paved roadways, buildings and solar arrays. Disturbed habitat, agricultural and ornamental landscaping land uses also occurred within the Survey Area. Overall, the open, sparsely vegetated, generally flat terrain offered excellent viewing opportunities for desert tortoise surveys.

The eastern portion of the Project ranges topographically from gently sloping hills with sparse vegetative cover to relatively steep slopes associated with ephemeral drainages (dry at the time of the surveys) with ample bare ground and sandy to gravelly soils. A mix of rural-residential development, solar arrays, electrical infrastructure, agricultural land, and paved and dirt roads intersect the landscape. Most of the Project right-of-way (ROW) is centered on paved and dirt roads, and a large stretch of the ROW parallels an existing transmission/gen-tie line running northeast to southwest. The WRESC parcels are located entirely on sparsely vegetated, undeveloped land.

The central portion of the Project consists of generally flat, sparsely vegetated open areas with occasional gentle slopes, as well as scattered residences, solar arrays and dirt roads. The ROW is primarily centered on dirt and paved roads with the remainder of the Survey Area on a mostly undeveloped area. Existing solar arrays occur along the northern and southern boundaries of this portion of the Survey Area.

The western portion of the Project consists of generally flat and gradually sloped land with a range of low to moderate vegetative cover. Dirt and paved roads associated with historical and current rural-residential development, as well as access roads to existing solar arrays to the northeast and south, Manzana Wind facilities to the north, and the existing Whirlwind Substation to the southwest, regularly intersect the landscape. An existing transmission/gen-tie line, originating at the Whirlwind Substation, runs northeast to southwest through this portion of the Survey Area. One portion of the proposed tie-line route extends into the existing Whirlwind substation; therefore, part of the Project site and Survey Area were within the developed footprint of the Whirlwind substation. However, the existing Whirlwind substation was excluded from these surveys due to a lack of authorized access and a perceived lack of suitable special-status species habitat. Despite the presence of numerous dirt roads and scattered rural-residential development, the western portion of the Survey Area remains mostly undeveloped.

Developed areas within the Survey Area were excluded from the survey as unsuitable habitat. For habitat where biologists could not safely survey or gain permission to access, such as private property, surveys were conducted by meticulously scanning the area using binoculars. All desert tortoise-relevant data and wildlife species were recorded in the field notes of the biologists, and suitable tortoise burrow locations were recorded using the ESRI ArcGIS Collector application.

3.2 Desert Tortoise

3.2.1 Protocol Survey

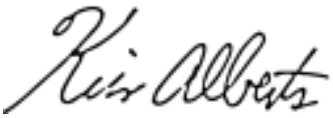
A total of 205 kilometers (127.7 miles) of transects were walked throughout the protocol Survey Area. Property access restrictions prevented biologists from entering all areas within the proposed Project boundary. No live or dead desert tortoises, parts thereof and/or definitive desert tortoise sign were detected in the protocol Survey Area. Furthermore, only three Class 5 burrows were detected; no Class 1, 2, 3, or 4 burrows, scat, egg fragments, carcasses and/or tortoise tracks were detected. Spider webs

were covering the opening of at least one of the Class 5 burrows, indicating no recent use or occupation by desert tortoises. With no observed tortoises or definitive desert tortoise sign, the Table 2 spreadsheet is unnecessary, as the result is zero tortoises.

4.0 DISCUSSION AND CONCLUSION

Suitable desert tortoise habitat was present in the protocol Survey Area; however, no desert tortoise or their definitive sign indicating their presence was detected. Therefore, no compensatory mitigation is proposed.

I hereby certify that the statements furnished above present the data and information required for this biological survey results report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.



Kris Alberts
Principal Biologist

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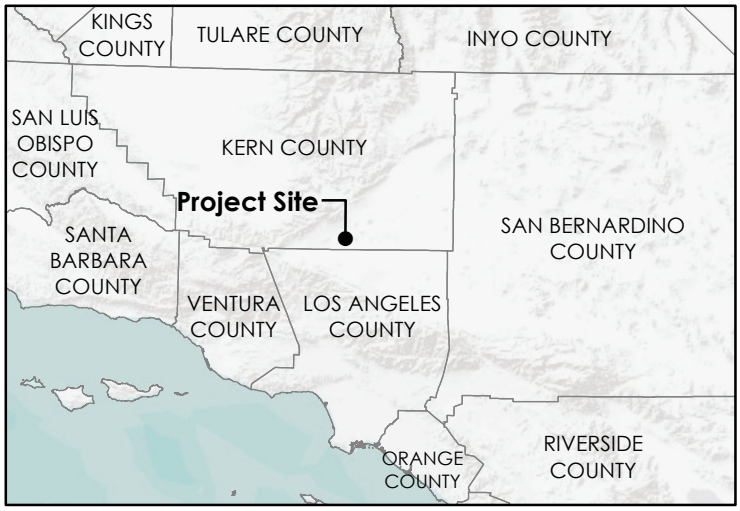
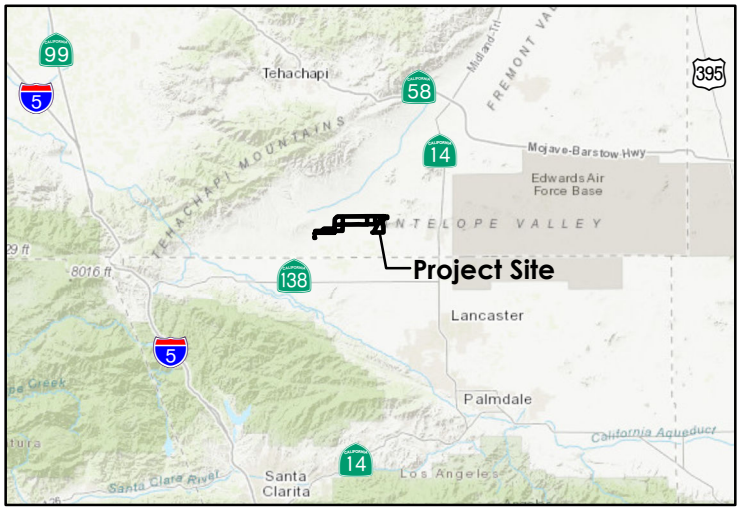
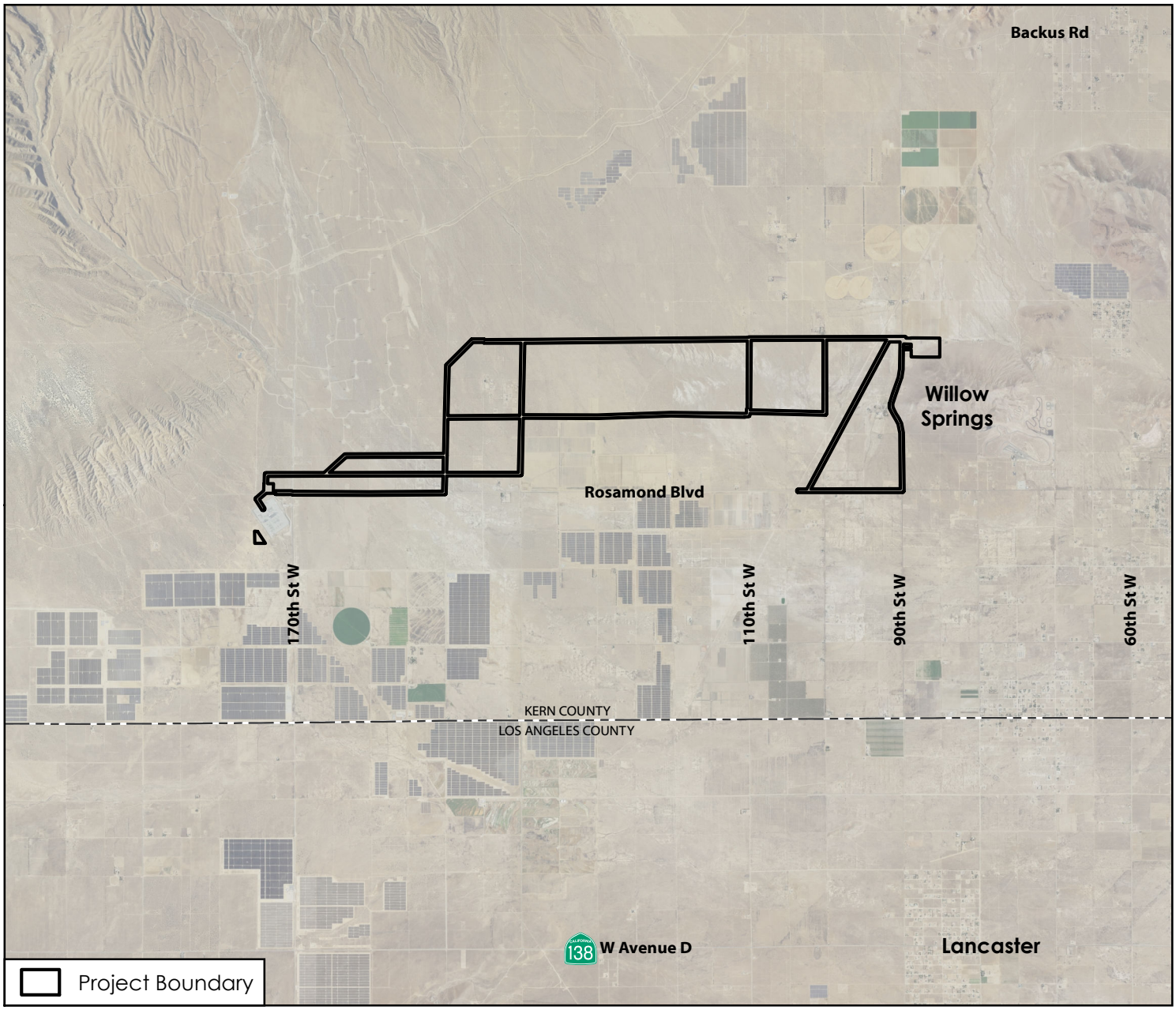
ATTACHMENT A

Figures

Blackhawk Environmental







Aerial Photo: USDA NAIP 2018

Figure 1

Project Vicinity and Location

Willow Springs

BLACKHAWK Environmental

N

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2021 Desert Tortoise Survey Exhibit

ATTACHMENT B

Photo Pages

Blackhawk Environmental

Photograph 1: South-facing view of creosote-white bursage series habitat suitable for desert tortoise at the north end of the western Gem parcel.

Photograph 2: West-facing view of creosote-saltbush series habitat suitable for desert tortoise within the eastern Gem solar parcel.

Photograph 3: East-facing view of saltbush scrub habitat within the northwest corner of the eastern Gem solar parcel.

Photograph 4: Representative, northeast-facing view of a suitable burrowing owl burrow complex that could become utilized by desert tortoises within the Survey Area.

Photograph 5: West-facing view of California matchweed-rubber rabbitbrush series habitat suitable for desert tortoise within the Survey Area.

Photograph 6: Class 5 desert tortoise burrow observed on April 13, 2021. Business card shown in the foreground to illustrate the small size of the burrow.

Photograph 7: Class 5 desert tortoise burrow observed on April 14, 2021. Business card shown in the foreground to illustrate the small size of the burrow.

ATTACHMENT DR36-2

Desert Kit Fox Biological Memo Report

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November 16, 2022

Hydrostor, Inc., Willow Rock Energy Storage Center

Desert Kit Fox Biological Memo Report

Willow Springs, Kern County, California

Blackhawk Environmental (Blackhawk) was contracted by Golder Associates, Inc. for a proposed Project that seeks to construct an energy storage facility site known as the Willow Rock Energy Storage Center (WRESC). WRESC is approximately on 70 acres and 10.9 miles of 230 kilovolt (kV) single-circuit tie-lines interconnecting to the existing Southern California Edison (SCE) Whirlwind Substation or an approximately 3.5-mile 230 kV single-circuit tie-line interconnecting to the future Los Angeles Department of Water and Power (LADWP) Rosamond Substation. Each tie-line would include a 125-foot-wide corridor on primarily undeveloped land. The proposed energy storage sites and the tie-lines are collectively known as the Hydrostor Willow Rock Energy Storage Center Project (Project). Blackhawk was tasked with conducting a suite of biological resource surveys, including a reconnaissance-level survey and protocol level surveys for burrowing owl (*Athene cunicularia*), desert tortoise (*Gopherus agassizii*) and Swainson's hawk (*Buteo swainsoni*) to document the existing conditions on the site and to conduct presence/absence surveys for threatened and endangered species that potential occur within the Project site.

Although there is no specific protocol survey for desert kit fox (*Vulpes macrotis macrotis*), this species was noted as potentially occurring within the Project and was included as a species of interest while conducting protocol surveys for other listed species. All information associated with desert kit fox was collected and used to produce this Biological Memo Report. The Project boundary, which includes the energy storage facility parcels plus all proposed alternatives for the tie-lines, covers approximately 977 acres in and near Willow Springs, Kern County, California. The Survey Area, which includes the Project boundary plus a 150-meter buffer, covers approximately 4,460 acres (similar to the total area associated with the burrowing owl protocol survey).

The California Code of Regulations generally prohibits take of resident game birds, game animals and furbearing mammals at any time except as provided for in Title 14 and in the Fish and Game code (Cal. Code Regs. Tit. 14, § 250). Additionally, it specifies that fisher, marten, river otter, desert kit fox and red fox may not be taken at any time (Cal. Code Regs. Tit. 14, § 460). Furthermore, it prohibits any person to harass, herd or drive any game or nongame bird or mammal or furbearing mammal. Harassment is defined as an intentional act which disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering. This section does not apply to a landowner or tenant who drives or herds birds or mammals for the purpose of preventing damage to private or public property, including aquaculture and agriculture crops (Cal. Code Regs. Tit. 14, § 251).

Since initial desert kit fox surveys include pedestrian-based burrow searches as an integral component, the desert kit fox surveys were conducted in concert with the methods used for focused burrowing owl and desert tortoise surveys.

Prior to conducting field surveys, the California Natural Diversity Database (CNDDB) was searched to assess the potential for the Project site to support State and/or federally listed threatened, endangered, and/or otherwise special-status plant and wildlife species. The CNDDB review was extended to 10 miles beyond the Project site. Biological resource reports prepared for other projects in the Project vicinity were also reviewed, including the *Big Beau Solar Project, Kern County, California, Biological Technical Report* (ICF 2019) and the *Biological Resources Technical Report, AVEP Solar Project* (Western EcoSystems Technology 2020). Freely available aerial imagery was also reviewed via a desktop analysis for existing conditions and historical land use trends (Google 2021). The results of the literature review were used to focus biological survey efforts for special-status species and sensitive resources perceived to have the potential to occur on and/or adjacent to the Project site.

Using the results of a literature review as background preparation for the habitat assessment and focused surveys, Blackhawk Environmental biologists Desiree Johnson, Katie Quint, Tawni Gotbaum, Hayley Milner and Tamara Kramer conducted the four focused burrowing owl surveys following California Department of Fish and Wildlife (CDFW) protocol. No surveys were conducted within five days following a rain event. The Survey Area included the entire Project footprint of the proposed energy storage facility parcels, tie-lines and their associated 250-foot-wide right-of-way (ROW) (125 feet to either side of the centerline), plus a 150-meter buffer surrounding all proposed Project features.

The survey methods followed the latest accepted CDFW burrowing owl protocols (2012) and were performed in the same fashion as other burrowing owl surveys for similar projects in the Antelope Valley/Willow Springs area (ICF 2019, Western EcoSystems Technology 2020). CDFW protocol stipulates that four visits constitute a complete suite of focused burrowing owl surveys, with the first occurring between February 15 and April 15 and the remaining three to occur at least three weeks apart so that the last occurs between June 15 and July 15. In addition, desert kit fox was also included as part of the desert tortoise survey effort, which was based on the USFWS 2019 survey protocol. Both the burrow survey and desert tortoise protocol survey, require a 100% cover of the Project during separate survey efforts. Therefore, the confidence level that these surveys accurately captured desert kit fox presence/absence is high.

The first portion of the overall survey effort included preliminary vegetation mapping and a biological reconnaissance survey, conducted on March 31, 2021, by Blackhawk Environmental Principal Biologist Kris Alberts and Associate Biologist Tawni Gotbaum. Representative photographs were collected along the Project route to capture current site conditions within and surrounding the Project footprint and were included in the *Hydrostor Gem Energy Storage Center Application for Certification Project Biological Technical Report (*Blackhawk Environmental 2021). Since suitable habitat was observed on site for desert kit fox, and the species is known to occur in the Project vicinity, this species was included as a species of interest while conducting surveys for burrowing owl and desert tortoise. The first survey was conducted during the week of April 12, 2021, by Blackhawk biologists Desiree Johnson, Katie Quint, Tawni Gotbaum, Hayley Milner and Tamara Kramer using ESRI ArcGIS Collector software to demarcate desert tortoise suitable habitats from non-suitable habitats (Figure 2). Following the initial assessment and the first focused survey, three additional surveys were conducted only in areas of suitable habitat with a focus on mapped suitable burrows and burrow complexes.

All surveys were conducted in the early morning or late afternoon hours on April 12-16, May 3-5, May 25-26 and June 16 by walking slowly through suitable habitats. Biologists walked a maximum of 30-meter-wide belt transects within the Survey Area to provide 100-percent visual coverage. Transects were spaced as close as 10 meters, depending on vegetative density and topography. While walking the transects, biologists specifically searched for desert kit for and kit fox sign (i.e., tracks and scat) and desert kit fox-suitable burrows, burrow complexes and burrow surrogates. Biologists paused at least every 100 meters, as appropriate, to scan for desert kit fox using binoculars and/or the naked eye. For habitat where biologists could not safely survey or gain permission to access, such as private property, surveys were conducted by meticulously scanning the area using binoculars. If desert kit fox were not directly observed at a suitable burrow with desert kit fox sign, sign was cleared from around the burrow entrances to facilitate detection of fresh sign that would indicate recent occupation in subsequent survey passes. Survey pass 1 included a full sweep of the entire Survey Area (100% cover), while subsequent survey passes focused only on areas known to have suitable burrows that resulted from survey pass 1. All desert kit fox-relevant data and wildlife species were recorded in the field notes of the biologists. All observed desert kit fox-suitable burrows and habitats are shown on Figure 2. Desert kit fox survey conditions are presented in Table 1.

Table 1. Desert Kit Fox Survey Conditions

Date	Pass #	Personnel	Start/End Times	Start/End Temperature (F°)	Start/End Wind Speed (mph)	Start/End Cloud Cover (%)	Start/End Precipitation
4/12/21	1	Desiree Johnson Katie Quint	0700-1540	55/86	0-3/6-9	0/25	0/0
4/13/21	1	Desiree Johnson Katie Quint Hayley Milner	0645-1530	58/82	6-8/10-16	0/15	0/0
4/14/21	1	Desiree Johnson Katie Quint Hayley Milner Tamara Kramer	0645-1500	47/65	1-3/6-12	0/25	0/0
4/15/21	1	Desiree Johnson Katie Quint Hayley Milner Tamara Kramer Tawni Gotbaum	0645-1550	48/71	3-5/13-16	2/18	0/0
4/16/21	1	Desiree Johnson Hayley Milner Tamara Kramer	0645-1600	46/81	1-2/1-2	0/0	0/0

		Tawni Gotbaum					
5/3/21	2	Desiree Johnson Hayley Milner	0545-0800	59/76	1-3/4-7	5/20	0/0
			1740-1950	79/71	5-8/4-6	0/0	0/0
5/4/21	2	Desiree Johnson Hayley Milner Katie Quint Towni Gotbaum	0540-1515	55/96	1-2/2-5	0/10	0/0
			1735-1920	88/79	8-14/7-15	0/0	0/0
5/5/21	2	Desiree Johnson Hayley Milner Katie Quint Towni Gotbaum	0540-1530	58/93	2-4/2-4	0/10	0/0
5/25/21	3	Desiree Johnson Hayley Milner Tamara Kramer	0525-0800	65/72	2-5/8-12	5/10	0/0
			1745-1945	83/72	3-5/2-4	25/65	0/0
5/26/21	3	Desiree Johnson Hayley Milner Tamara Kramer	0535-0745	61/62	4-7/1-3	100/10	0/0
6/16/21	4	Desiree Johnson Hayley Milner	0530-0735	71/92	1-3/3-8	90/70	0/0
			1800-1930	109/102	8-10/7-9	60/60	0/0

Protocol-level, desert tortoise surveys were conducted following the 2019 USFWS protocol, *Preparing for Any Action That May Occur Within The Range Of The Mojave Desert Tortoise*. Desert kit fox were identified as species of interest during the desert tortoise surveys. For desert tortoise transect placement, one transect was followed between the transmission line centerline and each edge of the 125 ft.-wide corridor, plus another transect 100 meters beyond the edge of the transmission line corridor, for a total of four transects per transmission line route. Transects inside the WRESC parcels were spaced approximately 20 meters apart in open terrain, plus one transect at 100 meters surrounding each parcel. The transects beyond the proposed Project footprint limits were included to cover the estimated action area at the conceptual stage of this Project at the time of the surveys. In addition, if kit foxes or their sign were observed during Swainson's hawk protocol surveys, those would also have been depicted on Project figures or exhibits. However, no additional kit fox observations were made beyond the 4,460-acre Survey Area, therefore, all desert kit fox observations are confined to the 4,460-acre Survey Area. Thus, the desert kit fox survey coverage area included all transects depicted on the 2021 Desert Tortoise Survey Exhibit, as well as additional foot-accessible areas within the 150-meter-wide burrowing owl survey area. Although not focused on desert kit fox, incidental observations of desert kit fox and sign presence/absence were included in the 1/2-mile-wide Swainson's hawk survey

area. The methodology used during the 2021 desert tortoise survey followed the 2019 protocol for *Linear Project Survey* for the transmission line portion, as related to the potential impact areas within the 250-ft.-wide transmission line routes. The 2021 desert tortoise survey also followed the *Small Project Survey* to cover 100% of the WRESC parcels with an additional survey transect completed 100 meters beyond each parcel.

To summarize the desert kit fox survey methodology, desert kit fox burrow, sign and individual searches were implemented during the protocol surveys for burrowing owl, desert tortoise and Swainson's hawk surveys.

Results

The surveys resulted in the detection of one desert kit fox individual, 11 desert kit fox-suitable burrows, and six desert kit fox-suitable burrow complexes within the Survey Area. Desert kit fox scat was found in association with four of the individual burrows and three of the burrow complexes, indicating they had been recently active.

Conclusions and Recommendations

Due to the sighting of the desert kit fox individual and fresh sign at multiple suitable burrows and burrow complexes during the surveys, desert kit fox is determined to be present on the Project site.

Since a desert kit fox was observed within the Survey Area over the course of the surveys, the proposed Project has the potential to adversely affect locally occurring desert kit fox, both permanently and temporarily. By implementing the recommended mitigation measures detailed in this report, temporary and permanent desert kit fox impacts may be adequately mitigated. If direct desert kit fox impacts cannot be avoided, additional consultation with CDFW may be required to mitigate for Project-related impacts.

With the implementation of the proposed mitigation measures for potential Project-related impacts to desert kit fox, no negative impacts to the species are anticipated, and the Project will fulfill the requirements related to biological resources pursuant to CEQA and State of California standards.

- **MM-Kit Fox 1:** A Construction Worker Environmental Awareness Training and Education Program shall be developed and implemented. All new construction workers shall attend an Environmental Awareness Training and Education Program, developed and presented by the Lead Biologist. The program shall include information on the life history of the desert kit fox; as well as other wildlife and plant species that may be encountered during construction activities. The program shall also discuss the legal protection status of each species, the definition of "take" under the Federal Endangered Species Act and California Endangered Species Act, measures the Project operator is implementing to protect the species, reporting requirements, specific measures that each worker shall employ to avoid take of wildlife species, and penalties for violation of the Federal Endangered Species Act, California Endangered Species Act and/or the California Code of Regulations that protects the desert kit fox.

    - An acknowledgement form signed by each worker indicating that Environmental Awareness Training and Education Program has been completed shall be kept on record;

- A sticker shall be placed on hard hats indicating that the worker has completed the Environmental Awareness Training and Education Program. Construction workers shall not be permitted within the Project areas unless they have attended the Environmental Awareness Training and Education Program and are wearing hard hats with the required sticker;
- A copy of the training transcript and/or training video, as well as a list of the names of all personnel who attended the Environmental Awareness Training and Education Program and copies of the signed acknowledgement forms shall be submitted to the Kern County Planning and Community Development Department;
- The construction crews and contractor(s) shall be responsible for unauthorized impacts from construction activities to sensitive biological resources that are outside the areas defined as subject to impacts by Project permits; and
- An Operation and Maintenance (O&M)-phase version of the Environmental Awareness Training and Education Program will be maintained within the onsite O&M facility for review as may be necessary during the life of the project.

- **MM-Kit Fox 2:** To prevent inadvertent entrapment of desert kit foxes or other wildlife during construction, all excavated, steep-walled holes or trenches more than two feet deep shall either be covered with plywood or similar materials at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. All holes and trenches, whether covered or not, shall be inspected for trapped wildlife at the start and end of each workday. Before such holes or trenches are filled, they shall be thoroughly inspected by the Lead Biologist or approved biological monitor for trapped wildlife. If trapped animals are observed, escape ramps or structures shall be installed immediately to allow escape. If a listed species is found trapped, all work in the vicinity shall cease immediately. If the animal is apparently uninjured, then the Lead Biologist shall directly supervise the provision of escape structures and/or trench modification to allow the trapped animal to escape safely. Work shall not resume in the vicinity of the animal, and it shall be allowed to leave the work area and Project site on its own. If the listed animal is injured, then the Lead Biologist or approved biological monitor shall immediately contact the U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife to identify an individual with the appropriate permit or authorization to handle listed species, who shall bring the animal to a pre-identified wildlife rehabilitation or veterinary facility for care.

- **MM-Kit Fox 3:** To enable kit foxes to pass through the Project site after construction, the security fence, and any permanent interior fencing shall be a wildlife-friendly design that meets the goals of allowing wildlife to move freely through the Project site during operation, leaving 4- to 7-inch openings or portals in the fence or the fence shall be raised 7 inches above the ground leaving a gap between the fence mesh and the ground. In the latter case, the bottom of the fence fabric shall be knuckled (wrapped back to form a smooth edge) to protect wildlife that passes under the fence.

- **MM-Kit Fox 4:** Biological Monitoring shall be implemented during construction. The Lead Biologist or approved biological monitor shall monitor all initial ground-disturbance activities and remain on-call throughout construction in the event a desert kit fox wanders into the Project site.
- **MM-Kit Fox 5:** Preconstruction surveys shall be conducted by a qualified biologist for the presence of desert kit fox dens within 14 days prior to commencement of construction activities. The surveys shall be conducted in areas of suitable habitat for desert kit fox. Surveys need not

be conducted for all areas of suitable habitat at one time; they may be phased so that surveys occur within 14 days prior to the portion(s) of the Project site scheduled for disturbance. If potential dens are observed and avoidance is feasible, the following buffer distances shall be established prior to construction activities:

- Desert kit fox potential den: 50 feet.
- Desert kit fox active den: 100 feet.
- Desert kit fox: 500 feet.

If avoidance of the potential dens is not possible, the following measures are required to avoid potential adverse effects to the desert kit fox:

- If the qualified biologist determines that potential dens are inactive, the biologist shall excavate these dens by hand with a shovel to prevent desert kit foxes from re-using them during construction.
- If the qualified biologist determines that potential dens may be active, an onsite passive relocation program shall be implemented. This program shall consist of excluding desert kit foxes from occupied burrows by installation of one-way doors at burrow entrances, monitoring of the burrow for seven days to confirm usage has been discontinued, and excavation and collapse of the burrow to prevent reoccupation. After the qualified biologist determines that desert kit foxes have stopped using the dens within the Project boundary, the dens shall be hand-excavated with a shovel to prevent re-use during construction.

- **MM-Kit Fox 6:** Kit fox may use construction pipes, culverts, or similar structures for refuge. Therefore, all construction pipes, culverts, or similar structures that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit fox before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, work shall immediately halt in the vicinity, and that section of pipe shall not be moved until the Lead Biologist has been consulted and the kit fox allowed to move from the work area of its own accord. The Lead Biologist will direct work stoppages near the animal to allow it to freely move out of the pipe and away from the work area. Kit fox shall not be handled or captured by anyone without the appropriate permit or authorization.

- **MM-Kit Fox 7:** Trash and food items shall be contained in closed containers and removed daily to avoid attracting kit fox predators such as coyotes and feral dogs.

- **MM-Kit Fox 8:** A maximum 15 mph speed limit shall be required at the Project site during construction activities.

- **MM-Kit Fox 9:** To the extent feasible, surface construction activities within 500 feet of an active kit fox den or complex shall cease at dusk and not start before dawn.

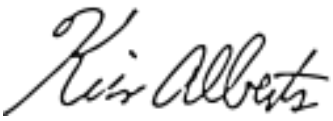
- **MM-Kit Fox 10:** All night-time lighting shall be directed down and toward the project area.

- **MM-Kit Fox 11:** No rodenticides or herbicides shall be applied in the Project area.

Additional measures may be required for Project authorization upon finalization of the proposed Project design or as Project construction needs may dictate.

For questions or concerns regarding this memo report, please call me at 619-972-8714 or e-mail me at kris@blackhawkenv.com.

Sincerely,



Kris Alberts
Principal Biologist

BLACKHAWK
Environmental

ATTACHMENTS

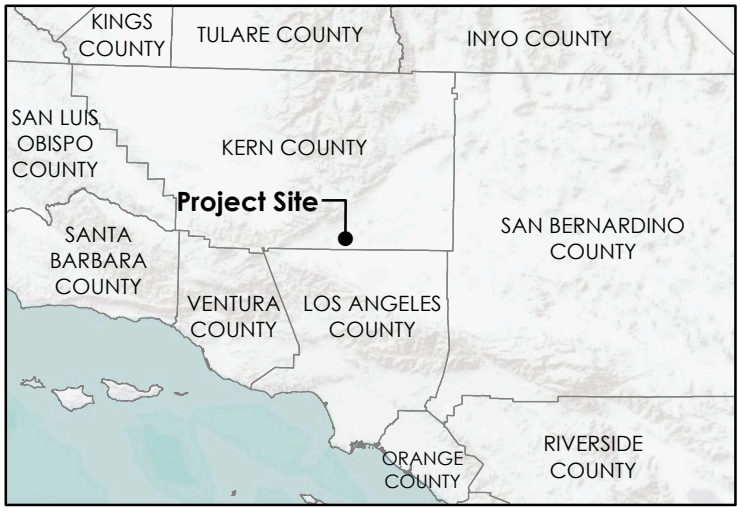
A: Figures

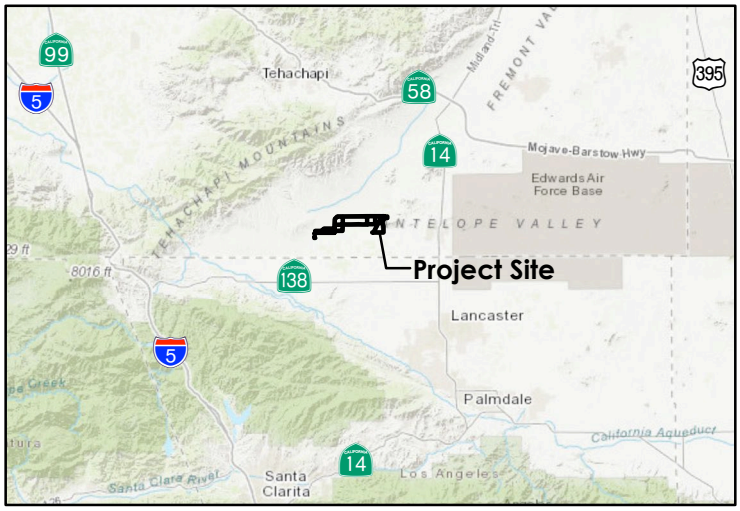
B: Photo Pages

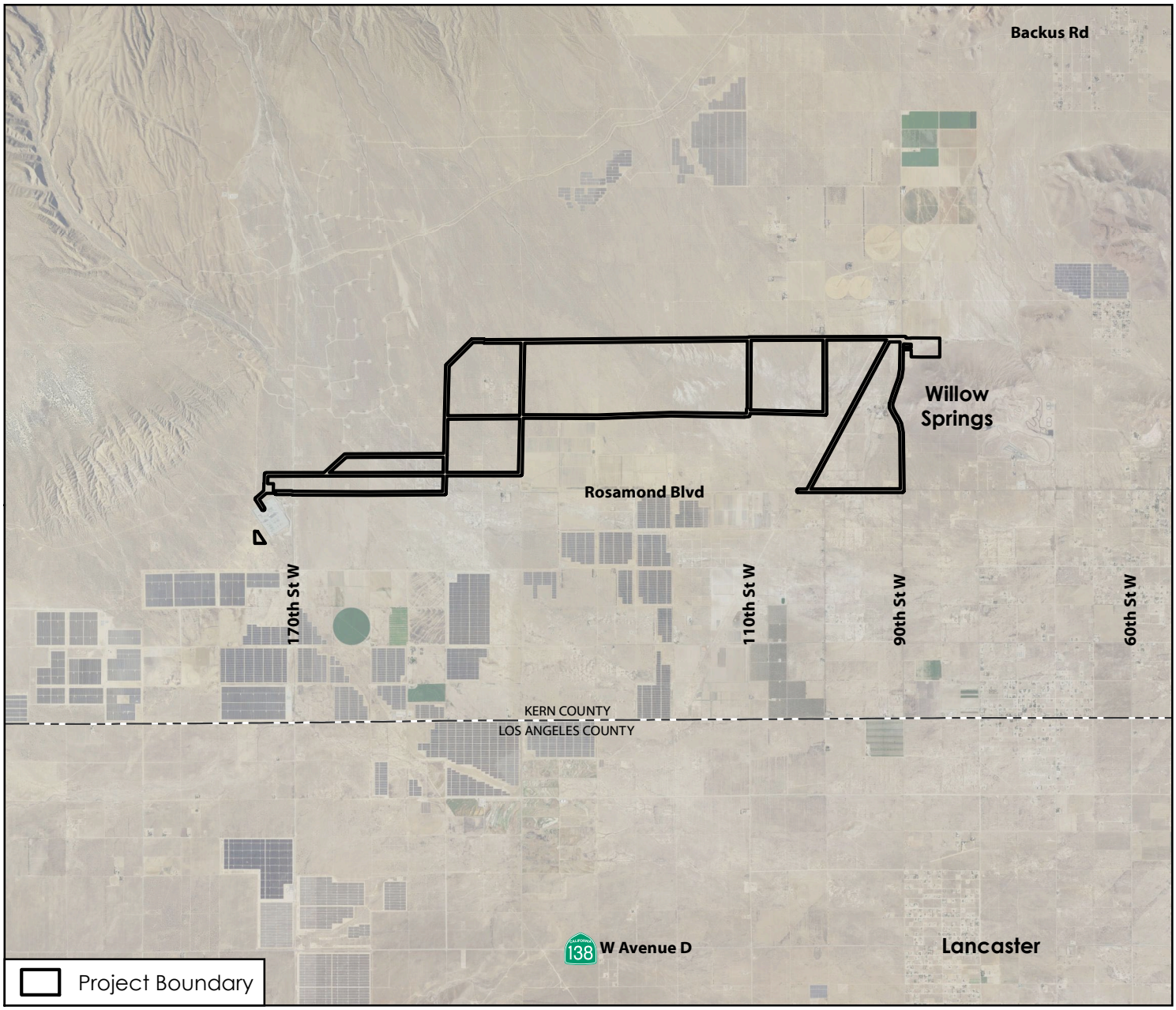
ATTACHMENT A

Figures

Blackhawk Environmental







Aerial Photo: USDA NAIP 2018

Figure 1

Project Vicinity and Location

Willow Springs

BLACKHAWK Environmental

N

0 2 Miles

Confidential Figure Redacted

Potential Kit Fox Burrows

ATTACHMENT B

Photo Pages

Blackhawk Environmental

Photograph 1: South-facing view of a desert kit fox observed south of the Abdelhak Parcel.

Photograph 2: Northwest-facing view of an occupied desert kit fox burrow in a pipe near the southeast corner of the Abdelhak Parcel,

ATTACHMENT DR48-1

Crotch's Bumble Bee Habitat Assessment

Attachment DR48-1
Crotch's Bumble Bee Habitat Assessment for the Willow Rock Energy Center Project (21-AFC-02)

BACKGROUND

On June 12, 2019, the California Fish and Game Commission (Commission) accepted for consideration the October 17, 2018 petition to list Crotch's bumble bee and three other bumble bee species. Following acceptance of the petition, the Commission provided notice that Crotch's bumble bee would be considered a candidate species. Normally, within a one-year period, the Commission is required to submit a written report with their determination of whether the species listing is warranted. However, due to a series of litigations and evaluation of the state Endangered Species Act, the species was removed from consideration and then subsequently relisted as a candidate species, delaying a final decision. Therefore, the Commission is still considering whether listing this species as Endangered is warranted. Until that decision is made, under the California Fish and Game Code, candidate species such as Crotch's bumble bee are to be treated as a fully listed endangered species.

As a potential newly listed endangered species, a formal survey protocol has not been established for this species. However, there are constituent habitat components that are required by Crotch's bumble bee that can be used to identify if a protocol-level surveys are appropriate. This document identifies those key habitat components and provides a detailed habitat assessment to determine if additional protocol-level surveys are warranted for the Willow Rock Energy Center Project (21-AFC-02).

HABITAT ASSESSMENT METHODOLOGY

This habitat assessment began with a detailed literature review to identify existing documents that describe the key constituent habitat components for this species, a review of existing biological resources documents for the project site, a review of known recorded occurrences, a brief site visit, and a discussion with a known expert for this species (Dr. Doug Yanega, UC Riverside). As part of the process for assessing whether protocol level surveys are required, determining if the site is within the known range of the species, has suitable habitat, and is within 5 miles of a recent known recorded occurrence are all important factors that must be considered.

Documents identified that included information regarding Crotch's bumble bee include the following resources:

1. A Petition to the State of California Fish and Game Commission to List the Crotch bumble bee (*Bombus crotchii*), Franklin's bumble bee (*Bombus franklini*), Suckley cuckoo bumble bee (*Bombus s*uckleyi), and western bumble bee (*Bombus occidentalis occidentalis*) as Endangered under the California Endangered Species Act. October 2018

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2. California Natural Diversity Data Base, Rarefind 5, California Department of Fish and Wildlife, 2022
3. Xerces Society Web Site: https://www.xerces.org/endangered-species/species-profiles/bumble-bees/crotchs-bumble-bee (Crotch's Bumble Bee | Xerces Society).
4. Los Padres Forest Watch Website: https://lpfw.org/our-region/wildlife/crotchs-bumblebee. Crotch's Bumblebee | Los Padres ForestWatch (lpfw.org)
5. A conservation conundrum: protecting bumble bees under the California Endangered Species Act, Hatfield and Jepsen, California Fish and Wildlife Species CESA Issue: 98-106 2021
6. Nature Serve Explorer Website: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.834085/Bombus_crotchii (Bombus crotchii | NatureServe Explorer)

Following the literature review for Crotch's bumble bee, additional documents reviewed included biological resources documents specifically associated with the proposed project:

1. Biological Technical Report – Hydrostor, Inc. Gem Energy Storage Center Application for Certification Project. October 1, 2021
2. Jurisdictional Delineation Report – Hydrostor, Inc. Gem Energy Storage Center Application for Certification Project. October 4, 2021
3. Focused Swainson's Hawk Survey Report – Hydrostor, Inc. Gem Energy Storage Center Application for Certification Project. September 2, 2021
4. Focused Burrowing Owl Survey Report – Hydrostor, Inc. Gem Energy Storage Center Application for Certification Project. September 2, 2021

Following the literature review, a review of the October 2022 California Natural Diversity Database (CNDDB), the Xerces "Bumble Bee Watch" and iNaturalist databases were completed to identify the current known recorded locations of Crotch's bumble bee. A site visit by a WSP senior biologist was completed to document existing site conditions in October 2022 to ensure that existing conditions have not significantly changed since the reports were completed in 2021.

Following the site visit, known entomological expert Dr. Doug Yanega, with the University of Riverside, was contacted to discuss the existing site conditions, determine if the project site contains suitable habitat, and determine the potential for Crotch's bumble bee to occur on-site.

Key Constituent Habitat Components for Crotch's's Bumble Bee

Crotch's bumble bee is historically known to occur throughout the state of California but has lost approximately 70% of its range and is currently associated with areas around the Sacramento area and coastal southern California. Based on the location of the Willow Rock Energy Center Project (21-AFC-02), it was determined that the project site is located within the current range of this species.

Bumble bees, in general, have three habitat requirements including suitable nesting sites, suitable overwintering sites for the queen, and available nectar and pollen

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throughout the duration of the colony period (spring, summer, and fall). Nesting sites are generally associated with abandoned rodent holes or occasionally abandoned bird nests (Osborne et al. 2008). Crotch's bumble bee's nesting and overwintering locations are not well documented, but they are most likely underground nesters that overwinter in soft, disturbed soil (Goulson 2010), or under leaf litter or other debris (Williams et al. 2014).

The flight period for Crotch's bumble bee queens in California is from late February to late October. The flight period for workers and males in California is from late March through September (Thorp et al. 1983). It should be noted that biological surveys were completed on the project site, consisting of 100% cover of the entire project site, from March 31, 2021 to July 13, 2021, which is well within the peak activity period for this species.

Crotch's bumble bee are generalist foragers and have been reported visiting a wide variety of flowering plants. This species has a very short tongue, and thus is best suited to forage at open flowers with short corollas. The plant families most commonly associated with Crotch's bumble bee observations or collections from California include Fabaceae (pea family), Apocynaceae (dogbane family), Asteraceae (sunflower family), Lamiaceae (mint family), and Boraginaceae (forget-me-not family) (Richardson 2017).

Similarly, in an analysis largely based on records from California, Thorp et al. (1983) reports that Crotch's bumble bee records are primarily associated with plants in the pea family, mint family, Hydrophyllaceae (waterleaf family), Asclepiadaceae (milkweed family), and sunflower family. Williams et al. (2014) report plants in the genera *Asclepias, Chaenactis, Lupinus, Medicago, Phacelia,* and *Salvia* as examples of food plants. It should be noted that these floral associations do not necessarily represent Crotch's bumble bee preferred plants, but rather represent the prevalence of these flowers in the landscape where this species occurs.

Based on a conversation with Dr. Doug Yanega, he identified some key constituent habitat components that are required for any population of Crotch's bumble bee to survive. As stated above, the activity period for this species is from late February to late October. This species of bumble bee requires a constant supply of nectar sources during the entire or nearly the entire colony period (spring, summer, and fall). This is due to the basic life cycle of the bumble bee. When queens emerge from overwintering, they require a sufficient amount of early spring flowers to provide enough nutrients to reach reproductive success. Once additional worker bees and males emerge in the summer, they too require a constant supply of flowering plants to continue their life cycle. As the bees prepare for overwintering, they require additional flowering plants during the late blooming period of summer to early fall. At a minimum, this species requires 5 to 6 months of consistent flowering plants in large numbers to provide sufficient food source to complete their life cycle.

Habitat Assessment of Project Site

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The closest recorded occurrence of this species is located 11 miles south of the project at the Antelope Valley Poppy Preserve State Natural Reserve. This observation was recorded in 2019. Typically, a species has a moderate to high potential to occur within a project site if there is a known recorded occurrence within 5 miles of the project site. Therefore, the potential for this species to occur within the project would drop to a low to moderate potential based on the known recorded occurrences.

The plants observed within the project site that occur in the above-mentioned plant families according to the list provided by Richardson 2017 include Oleander (*Nerium oleander*), white bursage (*Ambrosia dumosa*), Cooper's goldenbush (*Ericameria cooperi*), rubber rabbitbrush (*Ericameria nauseosa*), matchweed (*Gutierrezia sarothrae*), Mojave cottonthorn (*Tetradymia stenolepis*), Mohave woodyaster (*Xylorhiza tortifolia*), bristly fiddleneck (*Amsinckia tessellate*), and chia sage (*Salvia columbariae*). While the plant species listed above were identified within the project site, they are not present in significant numbers and are scattered throughout the landscape with no significant patches.

The plants observed within the project site that occur in the above-mentioned plant families according to the list provided by Thorp et al 1983 include chia sage, white bursage, Cooper's goldenbush, rubber rabbitbrush, matchweed, Mojave cottonthorn, and Mohave woodyaster. While the plant species listed above were identified within the project site, they are not present in significant numbers and are scattered throughout the landscape with no significant patches.

The plants observed within the project site that occur in the above-mentioned plant families according to the list provided by Williams et al. 2014 include chia sage. While the plant species listed above were identified within the project site, they are not present in significant numbers and are scattered throughout the landscape with no significant patches.

Dr. Yanega was provided a map of the project site to understand the location of the Willow Rock Energy Center Project (21-AFC-02) and a description of the existing vegetation communities. He stated that Crotch's bumble bee is not known to occur in open desert scrub habitat similar to the habitat that occurs on site. There is simply not a sufficient population of flowering plants to support a population of this species. He also indicated that this species is not as mobile as common honeybees. If there is not a population of the species on the project site now, it is highly unlikely that a population would move onto the site in the future. He identified that one of the only places in Kern County near the project site that could provide suitable habitat for this species would be near the Piute Pond facility on Edwards Air Force Base, which is 10 miles east of the project site.

Because the plant species are scattered throughout the landscape with no significant patches, the project site does not contain the suitable habitat required for this species, namely an extensive amount of available nectar sources. This would drop the potential to occur to a level of not likely to occur. Although the project site is within the known range for this species, there is no known recorded occurrence near the project site and there are no suitable nectar sources within the project site to provide appropriate

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habitat. Therefore, based on our knowledge of Crotch's bumble bee required habitat components, this species is not likely to occur on site and additional protocol surveys are not warranted.

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ATTACHMENT DR58-1

Focused Burrowing Owl Survey Report (Updated)

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HYDROSTOR, INC. WILLOW ROCK ENERGY STORAGE CENTER APPLICATION FOR CERTIFICATION PROJECT

FOCUSED BURROWING OWL SURVEY REPORT (UPDATED)

WILLOW SPRINGS, KERN COUNTY, CALIFORNIA

Prepared for:

Golder Associates, Inc.
Attn.: Peter Masson
1575 Treat Blvd., #201
Walnut Creek, CA 94598

Prepared by:

Blackhawk Environmental, Inc.
1720 Midvale Drive
San Diego, CA 92105
Contact: Kris Alberts
619-972-8714
kris@blackhawkenv.com

November 16, 2022

TABLE OF CONTENTS

ATTACHMENTS

EXECUTIVE SUMMARY

Blackhawk Environmental (Blackhawk) was contracted by Golder Associates, Inc. for a proposed Project that seeks to construct the Willow Rock Energy Storage Center (WRESC). WRESC parcels consist of approximately 70 acres and 10.9 miles of 230 kilovolt (kV) single-circuit tie-lines interconnecting to the existing Southern California Edison (SCE) Whirlwind Substation or an approximately 3.5-mile 230 kV single-circuit tie-line interconnecting to the future Los Angeles Department of Water and Power (LADWP) Rosamond Substation. Each tie-line would include a 125-foot-wide corridor on primarily undeveloped land. The proposed energy storage site and the tie-lines are collectively known as the Hydrostor Willow RockEnergy Storage Center Project (Project). Blackhawk was tasked with conducting a literature review followed by four protocol-level focused burrowing owl (*Athene cunicularia*; BUOW) surveys and producing this Focused Burrowing Owl Survey Report. The Project boundary, which includes the energy storage facility parcels plus all proposed alternatives for the tie-lines, covers approximately 977 acres in and near Willow Springs, Kern County, California. The Survey Area, which includes the Project boundary plus a 150-meter buffer, covers approximately 4,460 acres.

To support Project consistency with California Environmental Quality Act (CEQA) guidelines, Blackhawk Environmental was contracted to perform surveys for burrowing owl per the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). The initial habitat assessment and focused burrowing owl surveys resulted in the detection and mapping of a total of 65 unoccupied, suitable burrowing owl burrows and 41 unoccupied, suitable burrowing owl burrow complexes within the Survey Area. Burrowing owl sign was present at one suitable burrow complex within the Project site, and burrowing owl sign was present at one suitable burrow plus one suitable burrow complex within the Survey Area. **One adult burrowing owl was observed within the Survey Area during the April 16, 2021 survey; however, the burrowing owl was not detected on subsequent surveys, nor was an occupied burrow identified in the vicinity of the observation.**

With the recommendations of a preconstruction burrowing owl take avoidance survey to be conducted within 14 days prior to initial ground disturbance/construction activities, a final take avoidance survey to be conducted within 24 hours of initial ground disturbance/construction activities, shelter-in-place activities for occupied burrows, passive relocations of non-nesting burrows, collapsing unoccupied burrows, and/or biological monitoring during construction, no negative impacts to burrowing owl are anticipated. Preconstruction survey methods should follow those described in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). If burrowing owls are determined to occupy the Project site or the immediate vicinity as construction is set to commence, the California Department of Fish and Wildlife (CDFW) and/or other pertinent parties will be notified, and avoidance measures will be implemented during the peak breeding season (February 15 through July 15). If burrowing owls are present during the non-peak breeding season (July 16 through February 14), and nesting is not actively occurring, burrowing owl exclusion measures may be implemented in accordance with CEQA standards and in consultation with CDFW and the United States Fish and Wildlife Service (USFWS).

1.0 INTRODUCTION

Blackhawk Environmental (Blackhawk) was contracted by Golder Associates, Inc. for a proposed 70-acre energy storage facility and approximately 10.9 miles or 3.5 miles of tie-lines (depending on the selected alternative) on primarily undeveloped land for the proposed Hydrostor WRESC Project (Project). Blackhawk was tasked with: conducting a literature review; conducting an onsite reconnaissance-level biological survey and sensitive species habitat assessment; conducting a jurisdictional delineation survey; conducting focused burrowing owl (*Athene cunicularia*; BUOW), desert tortoise (*Gopherus agassizii*), Swainson's hawk (*Buteo swainsoni*) and rare plant surveys; providing a Jurisdictional Delineation Report; providing a Swainson's Hawk Survey Report; providing a Biological Technical Report (BTR) and; providing this Focused Burrowing Owl Survey Report. The Survey Area covers approximately 4,460 acres of privately and publicly owned land, a 977-acre portion of which is proposed for energy storage and associated tie-line development for this Project. The Survey Area is located within fragmented natural habitat that is intersected by dirt and paved roads, scattered rural residential development, electrical infrastructure and existing solar arrays. The Project is in and around the community of Willow Springs, immediately west of Willow Springs Butte, and is generally bound by Hamilton Road to the north and Rosamond Boulevard to the south (Figure 1).

The purpose of these surveys and report is to identify and document the presence/absence of suitable burrowing owl burrows, burrowing owl sign (i.e., cough pellets, whitewash, feathers, tracks, nest decorations) and/or burrowing owls potentially occurring within the Project site and surrounding areas up to 150 meters from the Project site boundary (Survey Area), and then to propose mitigation measures to avoid, minimize and/or mitigate for any potential adverse direct or indirect impacts. The Project site is not covered by any Habitat Conservation Plan (HCP) but is subject to State review, the Project is required to follow CEQA biological standards for common and sensitive onsite biological resources that are known to be present or that may be present onsite, including the burrowing owl.

The initial burrow survey effort took place during the week of April 12-16, 2021 and included a focused burrowing owl survey for the Project site and the Survey Area. Three additional focused burrowing owl surveys were completed within the breeding season by July 15, 2021. This report describes the results of the focused burrowing owl survey effort conducted for the Project.

1.1 Project Description

The proposed Project broadly includes the installation of new energy storage facilities and new single-circuit tie-lines. WRESC will be a nominal 500-megawatt (MW) advanced compressed air energy storage (A-CAES) facility deploying Hydrostor Inc. (Hydrostor) proprietary A-CAES technology. The site 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. The WRESC project will consisting consist of the following main elements:

- Approximately 70-acre energy storage site with security fencing and access gate
- Five electric motor-driven air compressors and five 100 MW turbine-generators
- Heat exchangers
- Thermal storage system

- Hydrostatically compensating approximately 500-acre-foot surface water reservoir with floating cover
- Underground compressed air storage cavern
- Related interconnecting conduits and facilities
- Electric fire pump with emergency 250 horsepower (hp) diesel-fired backup engine
- Two 5-MW, 4.16-kV emergency diesel-fired engines to maintain critical loads in the event of a loss of power
- Onsite 230 kV substation
- An approximately 10.9-mile 230 kV single-circuit tie-line interconnecting to the Southern California Edison (SCE) Whirlwind Substation, or an approximately 3.5-mile 230 kV single-circuit tie-line interconnecting to the future Los Angeles Department of Water and Power (LADWP) Rosamond Substation.

WRESC does not require combustion of fossil fuel and will not produce combustion-related air emissions during normal operation.

WRESC will be an energy storage facility consisting of five, 100-MW (nominal) power blocks. Each power block will contain a motor-driven air compressor drivetrain, heat exchangers, and an air turbine generator and their ancillary equipment. Each power block will share a common set of thermal storage tanks (hot and cold) as well as the air storage cavern.

Hydrostor's proprietary technology is a low-cost, bulk-scale energy storage solution. It provides long-duration, emission-free storage that can be flexibly sited where the electricity grid requires it, providing multi-hundred megawatts of generation capacity and a suite of ancillary services in a fifty (50) year life. This is enabled by combining industry-proven technologies with two key innovations: the use of hydrostatically compensated air storage caverns and a proprietary thermal management system.

The energy storage systems store compressed air in purpose-built underground storage caverns, analogous to those used worldwide for hydrocarbon storage. The storage caverns are flooded with water through a hydraulic conduit from a water storage compensation reservoir at the ground surface level. The weight of the water in this compensation reservoir maintains a near-constant air-pressure in the cavern throughout both the charging and discharging cycles, supporting efficient operation, and significantly reducing the cavern volume requirements.

The thermal management system captures the heat developed during air-compression, stores it, and re-uses it when generating electricity, making the process adiabatic. This increases the system's efficiency and eliminates the need for burning of fossil fuels, as is required for traditional CAES.

When the Hydrostor system is charging (known as "Charge Cycle"), off-peak or surplus electricity from the grid is used to drive air compressors, converting the electrical energy into potential energy in the compressed air and heat energy stored by the thermal energy management system. At multiple points in the compression process, the heat generated during air-compression is transferred to a thermal fluid by a set of heat exchangers and stored separately for later use during the discharge cycle.

The air stream exits the compression process at the same pressure as maintained in the air storage cavern which is governed by the vertical distance between the cavern and the connected hydrostatic compensation reservoir located at the surface. As air is charged into the storage cavern, water is displaced up the hydraulic conduit and into the surface reservoir. This maintains a near-constant pressure of the air within the cavern and stores substantial potential energy in the elevated water. Once in the cavern, the air can be stored until electricity is required.

To generate electricity (known as the "Discharge Cycle"), compressed air is discharged from the cavern, which allows the compensation water to re-flood the cavern. Similar to the charge cycle, the compensation water from the reservoir maintains a near-constant air pressure in the cavern during discharging. The cool high-pressure air exiting the cavern is re-heated using the heat stored by the thermal management system and the same set of heat exchangers that were initially used to extract it. The reheated compressed air is then used to drive air-expansion turbine-generators which efficiently convert the stored potential energy back into electricity for the grid.

1.2 Existing Conditions

Existing conditions within the Survey Area broadly include areas of sparse to moderately high desert vegetation cover, intermixed with disturbed areas suitable for fossorial mammals and consequently, burrowing owls. Evidence of occupancy by fossorial mammals, such as white-tailed antelope squirrel (*Ammospermophilus leucurus*) and California ground squirrel (*Otospermophilus beecheyi*), was moderate.

The eastern portion of the Project ranges topographically from gently sloping hills with sparse vegetative cover to relatively steep slopes associated with ephemeral drainages (dry at the time of the surveys) with ample bare ground and sandy to gravelly soils. A mix of rural residential development, agricultural land, and paved and dirt roads intersect the landscape. The majority of the Project right-of-way (ROW) is centered on paved and dirt roads, and a large stretch of the ROW parallels an existing transmission/gen-tie line running northeast to southwest. The WRESC parcels are located entirely on sparsely vegetated, undeveloped land.

The central portion of the Project consists of generally flat, sparsely vegetated open areas with occasional gentle slopes, as well as scattered residences and dirt roads. The ROW is primarily centered on dirt and paved roads with the remainder of the Survey Area on a mostly undeveloped area. Existing solar arrays occur along the northern and southern boundaries of this portion of the Survey Area.

The western portion of the Project consists of generally flat and gradually sloped land with a range of low to moderate vegetative cover. Dirt and paved roads associated with historical and current rural residential development, as well as access roads to existing solar arrays to the northeast and south, Manzana Wind facilities to the north, and the existing Whirlwind Substation to the southwest, regularly intersect the landscape. An existing transmission/gen-tie line, originating at the Whirlwind Substation, runs northeast to southwest through this portion of the Survey Area. One portion of the proposed tie-line route extends into the existing Whirlwind substation; therefore, part of the Project site and Survey Area were within the developed footprint of the Whirlwind substation. However, the existing Whirlwind substation was excluded from these surveys due to a lack of authorized access and a perceived lack of suitable owl habitat. Despite the presence of numerous dirt roads and scattered rural residential development, the western portion of the Survey Area remains mostly undeveloped.

Trees observed within the Survey Area are correlated primarily to rural residential development in the form of ornamental plantings and windbreaks that vary in height from six to 40 feet. Scattered tamarisk (*Tamarix* spp.), averaging 20 feet in height, also occur throughout the Survey Area. Native Joshua trees (*Yucca brevifolia*) also occur as a component of the high desert vegetation communities in the Survey Area. Cover types and vegetation communities are depicted in Figure 2 (Attachment A) and further discussed in Section 4.0.

2.0 REGULATORY SETTING

The proposed Project is subject to a host of State, federal and regional regulations associated with a number of regulatory programs. These programs often overlap and were developed to protect natural resources, including State and federally listed threatened and/or endangered plant and wildlife species, aquatic resources (e.g., rivers, creeks, ephemeral streambeds, wetlands and riparian areas), other special-status plant and wildlife species that are not listed as threatened or endangered by the State or federal governments, and special-status vegetation communities.

2.1 State and/or Federally Listed Plant and Wildlife Species

The Federal Endangered Species Act (FESA) protects federally listed plant and wildlife species, and the California Endangered Species Act (CESA) protects State-listed plant and wildlife species. The following sub-sections detail these laws.

2.1.1 State of California Endangered Species Act

California's Endangered Species Act (CESA) defines an endangered species as "a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that is in danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease." The State defines a threatened species as "a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an Endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as rare on or before January 1, 1985 is a threatened species." Candidate species are defined as "a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the commission has formally noticed as being under review by the department for addition to either the list of endangered species or the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to either list." Candidate species may be afforded temporary protection as though they were already listed as threatened or endangered at the discretion of the Fish and Game Commission. Unlike the Federal Endangered Species Act (FESA), CESA does not list invertebrate species.

Article 3, Sections 2080 through 2085, of the CESA addresses the taking of threatened, endangered, or candidate species by stating "No person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts, except as otherwise provided." Under the CESA, "take" is defined as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Exceptions authorized by the state to allow "take" require permits or memoranda of understanding and can be authorized for endangered species, threatened species, or candidate species for scientific, educational, or management purposes and for take incidental to otherwise lawful activities. Sections 1901 and 1913 of the California Fish and Game Code provide that notification is required prior to disturbance.

2.1.2 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973 defines an endangered species as "any species that is in danger of extinction throughout all or a significant portion of its range." A threatened species

is defined as "any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under provisions of Section 9(a)(1)(B) of the FESA it is unlawful to "take" any listed species. "Take" is defined in Section 3(18) of FESA: "...harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Further, the United States Fish and Wildlife Service (USFWS), through regulation, has interpreted the terms "harm" and "harass" to include certain types of habitat modification that result in injury to, or death of species as forms of "take." These interpretations, however, are generally considered and applied on a case-by-case basis and often vary from species to species. In a case where a property owner seeks permission from a federal agency for an action that could affect a federally listed plant and animal species, the property owner and agency are required to consult with USFWS. Section 9(a)(2)(b) of the FESA addresses the protections afforded to listed plants.

2.1.3 State and Federal Take Authorizations for Listed Species

Federal or state authorizations of impacts to or incidental take of a listed species by a private individual or other private entity would be granted in one of the following ways:

- Section 7 of the FESA stipulates that any federal action that may affect a species listed as threatened or endangered requires a formal consultation with USFWS to ensure that the action is not likely to jeopardize the continued existence of the listed species or result in destruction or adverse modification of designated critical habitat. 16 U.S.C. 1536(a)(2).

- In 1982, the FESA was amended to give private landowners the ability to develop Habitat Conservation Plans (HCP) pursuant to Section 10(a) of the FESA. Upon development of an HCP, the USFWS can issue incidental take permits for listed species where the HCP specifies at minimum, the following: (1) the level of impact that will result from the taking, (2) steps that will minimize and mitigate the impacts, (3) funding necessary to implement the plan, (4) alternative actions to the taking considered by the applicant and the reasons why such alternatives were not chosen, and (5) such other measures that the Secretary of the Interior may require as being necessary or appropriate for the plan.

- Sections 2090-2097 of the California Endangered Species Act (CESA) require that the state lead agency consult with CDFW on projects with potential impacts on state-listed species. These provisions also require CDFW to coordinate consultations with USFWS for actions involving federally listed as well as state- listed species. In certain circumstances, Section 2080.1 of the California Fish and Game Code allows CDFW to adopt the federal incidental take statement or the 10(a) permit as its own based on its findings that the federal permit adequately protects the species under state law.

2.2 California Environmental Quality Act

Shortly after the United States federal government passed the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA) was passed in 1970 to institute a statewide policy of environmental protection. CEQA does not directly regulate land uses, but instead requires state and local agencies within California to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts. CEQA makes environmental protection a mandatory part of every California state and local agency's decision-making process.

2.2.1 CEQA Thresholds of Significance

Environmental impacts relative to biological resources are assessed using impact significance threshold criteria, which reflect the policy statement contained in CEQA, Section 21001(c) of the California Public Resources Code. Accordingly, the State Legislature has established it to be the policy of the State of California to:

> *"Prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities..."*

Determining whether a project may have a significant effect, or impact, plays a critical role in the CEQA process. According to CEQA, Section 15064.7 (Thresholds of Significance), each public agency is encouraged to develop and adopt (by ordinance, resolution, rule, or regulation) thresholds of significance that the agency uses in the determination of the significance of environmental effects. A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant. In the development of thresholds of significance for impacts to biological resources CEQA provides guidance primarily in Section 15065, Mandatory Findings of Significance, and the CEQA Guidelines, Attachment G, Environmental Checklist Form. Section 15065(a) states that a project may have a significant effect where:

> *"The project has the potential to: substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, substantially reduce the number or restrict the range of an endangered, rare, or threatened species, ..."*

Therefore, for the purpose of this analysis, impacts to biological resources (specifically, burrowing owls) are considered potentially significant (before considering offsetting mitigation measures) if one or more of the following criteria discussed below would result from implementation of the proposed Project.

2.2.2 Criteria for Determining Significance Pursuant to CEQA

Attachment G of the 1998 State CEQA guidelines indicates that a project may be deemed to have a significant effect on the environment if the project is likely to:

> ***a)*** *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.*
>
> ***b)*** *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.*
>
> ***c)*** *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*

d) *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.*

e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

f) *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

2.2.3 CEQA Guidelines Section 15380

The CEQA requires evaluation of a project's impacts on biological resources and provides guidelines and thresholds for use by lead agencies for evaluating the significance of proposed impacts. Sections 5.1.1 and 5.2.2 below set forth these thresholds and guidelines. Furthermore, pursuant to the CEQA Guidelines Section 15380, CEQA provides protection for non-listed species that could potentially meet the criteria for state listing. For plants, CDFW assigns California Rare Plant Ranks (CRPR) to species categorized as List 1A, 1B, or 2 of the California Native Plant Society (CNPS) *Inventory of Rare and Endangered Plants in California* may meet the criteria for listing and should be considered under CEQA. CDFW also recommends protection of plants, which are regionally important, such as locally rare species, disjunctive populations of more common plants and/or plants on the California Rare Plant Rank (CRPR) 3 or 4 lists; however, for the purpose of the associated Biological Technical Report for this Project, CRPR list 3 and 4 species were not evaluated.

2.3 Special-Status Species Designations

Special-status plant and wildlife species are protected by State and federal laws and regulations. USFWS and CDFW are the primary regulatory agencies. A variety of designations are used to designate various levels of listing statuses. These designations are further described in the following sub-sections.

2.3.1 Federally Designated Special-Status Species

Some years ago, the USFWS instituted changes in the listing status of candidate species. Former C1 (candidate) species are now referred to simply as candidate species and represent the only candidates for listing. All references to federally protected species in this report (whether listed, proposed for listing, or candidate) include the most current published status or candidate category to which each species has been assigned by USFWS. Additionally, the USFWS *Birds of Conservation Concern 2008* report was published to identify the migratory and non-migratory bird species (beyond those already federally listed) that represent the highest conservation priorities for USFWS.

For this report, the following acronyms are used for federal special-status species:

FE Federally listed as Endangered
FT Federally listed as Threatened
FPE Federally proposed for listing as Endangered
FPT Federally proposed for listing as Threatened
FC Federal Candidate species (Former Category 1 candidates)
BCC USFWS Birds of Conservation Concern

2.3.2 State-Designated Special-Status Species

Some mammals and birds are protected by the State of California as Fully Protected (FP) Mammals or Fully Protected Birds, as described in the California Fish and Game Code, Sections 4700 and 3511, respectively. California Species of Special Concern (SSC) are species designated as vulnerable to extinction due to declining population levels, limited ranges, and/or continuing threats; the burrowing owl is one such species. This list is primarily a working document for the CDFW's California Natural Diversity Database (CNDDB). Informally listed taxa are not protected but warrant consideration in the preparation of biotic assessments. For some species, the CNDDB is only concerned with specific portions of the life history, such as roosts, rookeries, or nest sites.

For this report, the following acronyms are used for State special-status species:

SE State-listed as Endangered
ST State-listed as Threatened
SCE State candidate for listing as Endangered
SCT State candidate for listing as Threatened
FP State Fully Protected
SSC Species of Special Concern

2.4 Additional Applicable Local, State and Federal Regulations

Each of the following regulations bears some applicability toward assessing the natural resources of the Project Site and any effects that construction and long-term operations and maintenance activities may have upon such resources. These are included for informational and referential purposes only.

2.4.1 Fish and Wildlife Conservation Act of 1980

The Fish and Wildlife Conservation Act of 1980 (PL 96-366; 16 USC §§2901 et seq.) provides for conservation, protection, restoration and propagation of certain species, including migratory birds threatened with extinction.

2.4.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (PL 65-186, as amended; 16 USC §§ 703 et seq.) protects most birds, whether or not they migrate. Birds, their nests, eggs, parts, or products may not be killed or possessed. Game birds are listed and protected except where specific seasons, bag limits, and other features govern their hunting. Exceptions are made for some agricultural pests, which require a USFWS permit (yellow-headed, red-winged, bi-colored red-winged, tri-colored red-winged, Rusty and Brewer's blackbirds, cowbirds, all grackles, crows and magpies). Some other birds that injure crops in California may be taken under the authority of the County Agricultural Commissioner (meadowlarks, horned larks, golden-crowned sparrows, white- and other crowned sparrows, goldfinches, house finches, acorn woodpeckers, Lewis' woodpeckers and flickers). Permits may be granted for various non-commercial activities involving migratory birds and some commercial activities involving captive-bred migratory birds.

2.4.3 California Fish & Game Codes 3500 Series

California Fish & Game Codes 3500, 3503, 3503.5, 3505, 3511 and 3513 are State regulations that cover resident and non-resident game birds, protected bird nests, protected raptor nests, egrets, ospreys, Fully Protected bird species, and take considerations for Migratory Bird Treaty Act birds.

- **Code 3500:** "(a) Resident game birds are as follows:
  (1) Doves of the genus *Streptopelia*, including, but not limited to, spotted doves, ringed turtledoves, and Eurasian collared-doves.
  (2) California quail and varieties thereof.
  (3) Gambel's or desert quail.
  (4) Mountain quail and varieties thereof.
  (5) Sooty or blue grouse and varieties thereof.
  (6) Ruffed grouse.
  (7) Sage hens or sage grouse.
  (8) Hungarian partridges.
  (9) Red-legged partridges including the chukar and other varieties.
  (10) Ring-necked pheasants and varieties thereof.
  (11) Wild turkeys of the order *Galliformes*.
  (b) Migratory game birds are as follows:
  (1) Ducks and geese.
  (2) Coots and gallinules.
  (3) Jacksnipe.
  (4) Western mourning doves.
  (5) White-winged doves.
  (6) Band-tailed pigeons.
  (c) References in this code to "game birds" means both resident game birds and migratory game birds."

- **Code 3503:** "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto."

- **Code 3503.5:** "It is unlawful to take, possess, or destroy any birds in the orders *Falconiformes* or *Strigiformes* (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

- **Code 3505:** "It is unlawful to take, sell, or purchase any aigrette or egret, osprey, bird of paradise, goura, numidi, or any part of such a bird."

- **Code 3511:** "(a) (1) Except as provided in Section 2081.7 or 2835, fully protected birds or parts thereof may not be taken or possessed at any time. No provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected bird, and no permits or licenses heretofore issued shall have any force or effect for that purpose. However, the department may authorize the taking of those species for necessary scientific research, including efforts to recover fully protected, threatened, or endangered species, and may authorize the live capture and relocation of those species pursuant to a permit for the protection of livestock. Prior to authorizing the take of any of those species, the department shall make an effort to notify all affected and interested parties to solicit information and comments on the proposed authorization. The notification shall be published in the California Regulatory Notice

Register and be made available to each person who has notified the department, in writing, of his or her interest in fully protected species and who has provided an e-mail address, if available, or postal address to the department. Affected and interested parties shall have 30 days after notification is published in the California Regulatory Notice Register to provide any relevant information and comments on the proposed authorization.

(2) As used in this subdivision, "scientific research" does not include any actions taken as part of specified mitigation for a project, as defined in Section 21065 of the Public Resources Code.

(3) Legally imported fully protected birds or parts thereof may be possessed under a permit issued by the department.

(b) The following are fully protected birds:

(1) American peregrine falcon (*Falco peregrinus anatum*).
(2) Brown pelican.
(3) California black rail (*Laterallus jamaicensis coturniculus*).
(4) California clapper rail (*Rallus longirostris obsoletus*).
(5) California condor (*Gymnogyps californianus*).
(6) California least tern (*Sterna albifrons browni*).
(7) Golden eagle.
(8) Greater sandhill crane (*Grus canadensis tabida*).
(9) Light-footed clapper rail (*Rallus longirostris levipes*).
(10) Southern bald eagle (*Haliaeetus leucocephalus leucocephalus*).
(11) Trumpeter swan (*Cygnus buccinator*).
(12) White-tailed kite (*Elanus leucurus*).
(13) Yuma clapper rail (*Rallus longirostris yumanensis*)."

- **Code 3513:** "It is unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act."

3.0 METHODS

Other biological reports prepared for nearby or adjacent projects have acknowledged the presence of burrowing owl and suitable burrowing owl foraging habitat on and/or adjacent to previous project sites (ICF 2019, Western EcoSystems Technology 2020). CNDDB records include 21 records of this species within five miles of the Project site (CDFW 2007, 2010, 2011, 2013, 2014).

Using the literature review results as background preparation for the habitat assessment and focused burrowing owl surveys, Blackhawk Environmental biologists Desiree Johnson, Katie Quint, Tawni Gotbaum, Hayley Milner and Tamara Kramer conducted the four focused burrowing owl surveys following CDFW protocol by July 15, 2021. No surveys were conducted within five days following a rain event. The Survey Area included the entire Project footprint of the proposed energy storage facility parcels, tie-lines and their associated 250-foot-wide ROW (125 feet to either side of the centerline), plus a 150-meter buffer surrounding all proposed Project features.

The survey methods followed the latest accepted CDFW burrowing owl protocols (2012) and were performed in the same fashion as other burrowing owl surveys for similar projects in the Antelope Valley/Willow Springs area (ICF 2019, Western EcoSystems Technology 2020). CDFW protocol stipulates that four visits constitute a complete suite of focused burrowing owl surveys, with the first occurring between February 15 and April 15 and the remaining three to occur at least three weeks apart so that the last occurs between June 15 and July 15. The four surveys were conducted accordingly within the peak breeding season, with the first survey conducted after most or all burrowing owl migrants were expected to have moved out of the area, but with any resident burrowing owls present. Therefore, the confidence level that these surveys accurately captured burrowing owl presence/absence is high.

The first portion of the overall survey effort included preliminary vegetation mapping and a biological reconnaissance survey, conducted on March 31, 2021, by Blackhawk Environmental Principal Biologist Kris Alberts and Associate Biologist Tawni Gotbaum. Representative photographs were collected along the Project route to capture current site conditions within and surrounding the Project footprint and were included in the *Hydrostor Gem Energy Storage Center Application for Certification Project Biological Technical Report (*Blackhawk Environmental 2021), as well as Attachment B herein. Since suitable burrowing owl habitat was observed on site and the species is known to occur in the Project vicinity, a focused burrowing owl survey became required per CDFW guidelines. The first focused BUOW survey was performed during the week of April 12, 2021, by Blackhawk biologists Desiree Johnson, Katie Quint, Tawni Gotbaum, Hayley Milner and Tamara Kramer using ESRI ArcGIS Collector software to demarcate BUOW-suitable habitats from non-suitable habitats (Figure 2). Following the initial assessment and the first focused survey, three additional BUOW surveys were conducted only in areas of BUOW-suitable habitats with a focus on mapped suitable burrows and burrow complexes.

All burrowing owl surveys were conducted in the early morning or late afternoon hours on April 12-16 (Pass 1), May 3-5 (Pass 2), May 25-26 (Pass 3) and June 16 (pass 4) by walking slowly through BUOW-suitable habitats, particularly focused on BUOW-suitable burrows. Biologists walked a maximum of 30-meter-wide belt transects within the Survey Area to provide 100-percent visual coverage. Transects were spaced as close as 10 meters, depending on vegetative density and topography. While walking the transects, biologists specifically searched for BUOW, BUOW sign (i.e., cough pellets, whitewash, feathers, tracks, nest decorations) and BUOW-suitable burrows, burrow complexes and burrow surrogates. Biologists paused at least every 100 meters, as appropriate, to scan for BUOW using binoculars and/or the naked eye. In addition, the biologists listened for BUOW calls. For habitat where biologists could not safely survey or gain permission to access, such as private property, surveys were

conducted by meticulously scanning the area using binoculars. If BUOW were not directly observed at a suitable burrow with BUOW sign, sign was cleared from around the burrow entrances to facilitate detection of fresh sign that would indicate recent occupation in subsequent survey passes. Survey pass 1 included a full sweep of the entire Survey Area, while subsequent survey passes focused only on areas known to have suitable burrows that resulted from survey pass 1. All BUOW-relevant data and wildlife species were recorded in the field notes of the biologists. All observed BUOW-suitable burrows and habitats are shown on Figure 2. Survey conditions are presented in Table 1.

Table 1. Survey Conditions

Date	Pass #	Personnel	Start/End Times	Start/End Temperature (F°)	Start/End Wind Speed (mph)	Start/End Cloud Cover (%)	Start/End Precipitation
4/12/21	1	Desiree Johnson Katie Quint	0700-1540	55/86	0-3/6-9	0/25	0/0
4/13/21	1	Desiree Johnson Katie Quint Hayley Milner	0645-1530	58/82	6-8/10-16	0/15	0/0
4/14/21	1	Desiree Johnson Katie Quint Hayley Milner Tamara Kramer	0645-1500	47/65	1-3/6-12	0/25	0/0
4/15/21	1	Desiree Johnson Katie Quint Hayley Milner Tamara Kramer Tawni Gotbaum	0645-1550	48/71	3-5/13-16	2/18	0/0
4/16/21	1	Desiree Johnson Hayley Milner Tamara Kramer Tawni Gotbaum	0645-1600	46/81	1-2/1-2	0/0	0/0
5/3/21	2	Desiree Johnson Hayley Milner	0545-0800	59/76	1-3/4-7	5/20	0/0
			1740-1950	79/71	5-8/4-6	0/0	0/0
5/4/21	2	Desiree Johnson	0540-0755	55/70	1-2/2-5	0/0	0/0

		Hayley Milner	1735-1920	88/79	8-14/7-15	0/0	0/0
5/5/21	2	Desiree Johnson Hayley Milner	0540-0800	58/71	2-4/2-4	0/0	0/0
5/25/21	3	Desiree Johnson Hayley Milner Tamara Kramer	0525-0800	65/72	2-5/8-12	5/10	0/0
			1745-1945	83/72	3-5/2-4	25/65	0/0
5/26/21	3	Desiree Johnson Hayley Milner Tamara Kramer	0535-0745	61/62	4-7/1-3	100/10	0/0
6/16/21	4	Desiree Johnson Hayley Milner	0530-0735	71/92	1-3/3-8	90/70	0/0
			1800-1930	109/102	8-10/7-9	60/60	0/0

4.0 RESULTS

A total of 11 vegetation communities were observed and mapped by Blackhawk in 2021 within the Survey Area: Creosote-White Bursage Series, Saltbush Scrub, Developed/Disturbed, Creosote-Saltbush Series, California Matchweed-Rubber Rabbitbrush Series, Agricultural Land, Annual Buckwheat/ Grasses, Creosote-White Bursage Series – Disturbed, Rubber Rabbitbrush Scrub, Saltbush Scrub – Disturbed, and Ornamental (Figure 2). Soft intergrades between these vegetation communities were often present, with plant species of the described communities often present to varying degrees in adjoining communities. Vegetation communities were described based on dominant plant(s) species generally characterizing the specific vegetation community. In addition, developed habitat was present within the surrounding Survey Area as compacted dirt and paved roadways, and buildings.

Creosote-White Bursage Series

A total of 2,516.82 acres of Creosote-White Bursage Series habitat was mapped in the Survey Area, including 513.26 acres within the Project site. Creosote-White Bursage Series habitat within the Project is characterized by dominant and co-dominant creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) with sub-dominant species that include Cooper's goldenbush (*Ericameria cooperi*), Joshua tree (*Yucca brevifolia*) and Nevada ephedra (*Ephedra nevadensis*). This vegetation community becomes increasingly creosote-bush dominant with reduced white bursage coverage in the central and western portions of the Project site.

Saltbush Scrub

A total of 1,013.02 acres of Saltbush Scrub habitat was mapped in the Survey Area, including 215.60 acres within the Project site. Saltbush Scrub habitat within the Project is characterized by dominant and co-dominant cattle saltbush (*Atriplex polycarpa*), fourwing saltbush (*Atriplex canescens*), shadscale saltbush (*Atriplex confertifolia*), and creosote bush with subdominant species that include shortpod mustard (*Hirschfeldia incana*), doveweed (*Croton setiger*), Nevada ephedra and Joshua tree. Total shrub cover varies throughout the Project with increased cover corresponding with greater dominance by creosote bush.

Developed/Disturbed

A total of 392.76 acres of Developed/Disturbed habitat was mapped in the Survey Area, including 140.38 acres within the Project site. Developed/Disturbed habitat within the Project site is composed of areas of bare ground either sparsely or moderately vegetated with a mix of mostly non-native, invasive, annual, weedy plant species with marginal cover of native species; developed areas consist of buildings, residences and their associated parcel footprints, as well as existing solar array facilities. Dominant plant species included shortpod mustard, brome grasses (*Bromus* spp.), Russian thistle (*Salsola tragus*), bristly fiddleneck (*Amsinckia tessellata*), anglestem buckwheat (*Eriogonum angulosum*) and doveweed. Additional disturbed habitat was mapped as large areas of bare ground supporting little to no vegetation that indicate historical or current anthropogenic use (i.e., dirt roads, staging areas, vacant lots, and margins of developed areas).

Creosote-Saltbush Series

A total of 180.12 acres of Creosote-Saltbush Series habitat was mapped in the Survey Area, including 44.80 acres within the Project site. Creosote-Saltbush Series habitat is characterized by dominant and co-dominant creosote bush, cattle saltbush, fourwing saltbush and shadescale saltbush with sub-dominant species that include white bursage, shortpod mustard and non-native grasses.

California Matchweed-Rubber Rabbitbrush Series

A total of 78.73 acres of California Matchweed-Rubber Rabbitbrush Series habitat was mapped in the Survey Area, including 18.32 acres within the Project site. California Matchweed-Rubber Rabbitbrush Series habitat is characterized by dominant and co-dominant California matchweed (*Gutierrezia californica*), matchweed (*Gutierrezia sarothrae*) and rubber rabbitbrush (*Ericameria nauseosa*) with subdominant species including creosote bush, Joshua tree and non-native grasses. Additionally, this vegetation community exhibits low overall cover and large gaps between shrubs.

Agricultural Land

A total of 64.48 acres of Agricultural Land was mapped in the Survey Area, including 4.49 acres within the Project site. Agricultural Land within the Project is characterized by landscaped and cultivated areas that have historically been or are currently associated with agricultural operations (i.e., cultivated land and vineyards) and livestock pastureland. This vegetation community does not support native species or natural community types and is adjacent to both developed areas and disturbed habitat.

Annual Buckwheat/Grasses

A total of 33.75 acres of Annual Buckwheat/Grasses habitat was mapped in the Survey Area, including 10.41 acres within the Project site. Annual Buckwheat/Grasses habitat is characterized by dominant and co-dominant anglestem buckwheat, annual wild buckwheat (*Eriogonum* spp.), and non-native grasses (*Bromus* spp.). At the time of the surveys, most species within this vegetation community were either senescent or exhibiting signs of stress due to enduring prolonged drought conditions.

Creosote-White Bursage Series – Disturbed

A total of 43.16 acres of Creosote-White Bursage Series – Disturbed habitat was mapped in the Survey Area, including 9.79 acres within the Project site. Similar to Creosote-White Bursage Series, dominant plant species include creosote and white bursage, however, co-dominant species consist of non-native, invasive, annual, weedy plant species characteristic of Disturbed/ Developed habitat. Signs of anthropogenic disturbance (i.e., dirt roads and partially cleared residential lots) are apparent within this vegetation community.

Rubber Rabbitbrush Scrub

A total of 7.08 acres of Rubber Rabbitbrush Scrub habitat was mapped within the Survey Area, including 4.37 acres within the Project site. Rubber Rabbitbrush Series habitat is characterized by dominant rubber rabbitbrush and sub-dominant creosote bush, with low overall shrub cover and gaps between vegetation comprised of non-native grasses or bare ground.

Saltbush Scrub - Disturbed

A total of 5.49 acres of Saltbush Scrub – Disturbed habitat was mapped in the Survey Area, including 0.59 acre within the Project site. Similar to Saltbush Scrub, this habitat is dominated by cattle saltbush, fourwing saltbush, shadescale saltbush and creosote bush with co-dominant species occurring as non-native grasses (*Bromus* spp.) and forbs, including shortpod mustard, in addition to both increased gaps between shrubs and prevalence of bare ground. Saltbush Scrub – Disturbed habitat within the Project occurs predominantly along the margins of roads, within previously developed areas, and adjacent to existing development.

Ornamental

A total of 0.85 acres of Ornamental habitat was mapped in the Survey Area, all of which was within the Project site. Ornamental habitat occurs in the form of landscaped and planted trees that include cottonwoods (*Populus* spp.), pines (*Pinus* spp.) and tamarisk associated with developed areas or as windbreaks adjacent to dirt and paved roads. Additional Ornamental habitat was mapped as landscaped succulents (e.g., *Opuntia* spp., *Cholla* spp.), turfgrass and oleander (*Nerium* sp.) also associated with developed areas.

Burrowing owl habitat within the Project site includes all habitats as shown on Figure 2. While a large portion of the Project site is composed of open creosote bush- and saltbush-dominated vegetation communities suitable for burrowing owl foraging, nesting opportunities are limited to those areas supporting potential host burrows or surrogates. Most of the developed areas within the Survey Area were excluded from the surveys due to a lack of suitable habitat, burrows, and/or burrow surrogates.

Moderate to high densities of creosote bush, combined with saltbush, white bursage, non-native forbs and grasses that occur within the northern, central and western portions of the Survey Area, as well as scattered landscaped and ornamental shrubs and trees generally associated with disturbed/ developed areas, generally deter fossorial mammal movement and/or burrow establishment by fossorial mammals. These areas offered no owl suitability at the time of the surveys due to an absence of suitable burrows and little to no open ground that burrowing owls utilize to scan for both prey and predators.

Burrowing owl-suitable burrows were found in several portions of the Survey Area, the majority of which were along or within 500 feet of dirt roads. The focused burrowing owl surveys resulted in a total of 65 unoccupied, suitable burrowing owl burrows and 41 unoccupied, suitable burrowing owl burrow complexes in the Survey Area. Within the smaller subset of the Project ROW, 15 suitable burrows and five suitable burrow complexes were mapped; one suitable burrow complex contained old burrowing owl sign. One suitable burrow and one suitable burrow complex with owl sign were documented within the 150-meter buffer outside of the Project site.

The remaining suitable burrows and suitable burrow complexes were observed within the 150-meter buffer surrounding the Project, all of which were unoccupied. Of the documented suitable burrows, only three contained burrowing owl sign (i.e., pellets and/or whitewash); however, the pellets were extremely desiccated, and the whitewash appeared to be fairly old, indicating owl presence in the recent past, perhaps within the last three years, but not currently occupied.

No fresh BUOW sign was observed on any of the focused burrowing owl surveys. One incidentally observed burrowing owl location within the Project ROW is depicted on Figure 2; this owl was not observed with an associated burrow and therefore was assumed to be migrating through the Project. Suitable burrowing owl habitat occurs over most of the Project site and the Survey Area, strongly correlated with areas associated with ephemeral drainages and earthen berms adjacent to dirt roads in open landscapes.

Mapped burrowing owl suitable burrows ranged in size from 10 to 30 centimeters in diameter, with most suitable burrows being openings within the sides of ephemeral drainages and within earthen berms along or near dirt roads. Most of the burrows were in locations of bare ground and were generally located on relatively flat or sloping terrain. Two suitable burrows and two suitable burrow complexes occurred as burrow surrogates in the form of pipe openings within earthen berms. Figure 2 depicts all suitable burrowing owl burrows and burrow complexes, as well as the locations of burrows with owl sign and the single burrowing owl observation that was not associated with a burrow.

5.0 POTENTIAL IMPACTS

One adult burrowing owl and numerous burrowing-owl suitable burrows and burrow complexes, including three burrows with old burrowing owl sign, were found present within the Project site and within the 150-meter Survey Area buffer around the Project. Due to the detection of one burrowing owl within the Project ROW, presence of both suitable habitat and owl sign, and the availability of suitable burrowing owl habitat, this Project may adversely affect burrowing owls both temporarily and permanently. Based on the *Staff Report on Burrowing Owl Mitigation* (2012), a preconstruction burrowing owl take avoidance survey should be conducted within 14 days prior to initial ground disturbance/construction activities, and a final take avoidance survey should be conducted within 24 hours of initial ground disturbance/construction activities, to avoid take of burrowing owls from within the Survey Area. Additional mitigation measures are proposed in the following section to reduce temporary and permanent impacts to less than significant levels.

6.0 CONCLUSION AND RECOMMENDATIONS

Focused burrowing owl surveys took place on the 977-acre Project site and associated 150-meter Survey Area for the proposed Hydrostor Willow Rock Energy Storage Center Project. A total of one individual burrowing owl, 65 unoccupied, suitable burrowing owl burrows and 41 unoccupied, suitable burrowing owl burrow complexes were found. Within the Project ROW, 15 suitable burrows and five suitable burrow complexes were mapped. The remaining suitable burrows and suitable burrow complexes were observed within the 150-meter buffer surrounding the Project. One of the potential burrows within the Project ROW and two of the potential burrows within the 150-meter buffer were found to have burrowing owl sign. With the recommendation of a preconstruction burrowing owl take avoidance survey to be conducted within 14 days prior, plus a follow-up survey within 24 hours prior to initial ground disturbance/construction activities, no negative burrowing owl impacts are anticipated.

Since a burrowing owl was observed within the Survey Area over the course of the surveys, the proposed Project has the potential to adversely affect locally occurring burrowing owls, both permanently and temporarily. By implementing the recommended mitigation measures detailed in this report, temporary and permanent burrowing owl impacts may be adequately mitigated. If direct burrowing owl impacts cannot be avoided, additional consultation with CDFW may be required to mitigate for Project-related impacts. If proposed Project mitigation includes a net increase of artificial burrows installed in optimal locations, long-term burrowing owl occupancy potential may be significantly enhanced.

With the implementation of the proposed mitigation measures for potential Project-related impacts to burrowing owl, no negative impacts to the species are anticipated, and the Project will fulfill the requirements related to biological resources pursuant to CEQA and State of California standards.

- **MM-BUOW 1:** Within 14 days of initiating initial ground disturbance and/or construction activities, conduct a pre-construction take avoidance survey for burrowing owl per guidelines specified in the *Staff Report on Burrowing Owl Mitigation* (2012). In addition, within 24 hours of initiating initial ground disturbance and/or construction activities, conduct a final pre-construction take avoidance survey. Surveys shall include areas within the Project footprint and a surrounding 500-foot (150-meter) buffer. The survey shall consist of walking parallel transects and noting any fresh burrowing owl sign or presence. The results of the take avoidance survey shall be provided to CDFW. If more than 14 days pass between the take avoidance survey and initiation of Project construction, additional take avoidance surveys may be required, depending on what actions have been implemented to deter burrowing owls from moving into the Project footprint and buffer area.

- **MM-BUOW 2:** If burrowing owls are present during construction, adaptive mitigation measures for temporary impacts may include, but not necessarily be limited to: scheduling the construction during non-breeding periods; avoiding proximal areas of occupied burrows during construction; biological monitoring of occupied burrow sites during construction; passive relocation of non-nesting burrows, and; instituting buffer zones and/or "shelter in place" techniques around occupied burrows. If occupied burrows are found during take avoidance surveys or during construction, appropriate construction buffers or setback distances shall be determined by the qualified biologist on a case-by-case basis, depending on the season in which disturbance will occur, the type of disturbance, and other factors that could influence susceptibility to disturbance (e.g., topography, vegetation, existing

disturbance levels, etc.). To the extent feasible, buffers of 250 feet (approximately 75 meters) will be used during the breeding season (February 1 through August 31), and 160 feet (approximately 50 meters) will be used during non-breeding season (September 1 through January 31). "Shelter in place" techniques shall be used if necessary to create a visual and auditory barrier between construction activities and the occupied burrow. Techniques shall include placing hay bales, fencing, or another physical barrier between the occupied burrow and construction activities. The qualified biologist shall determine if and/or when shelter in place is necessary and feasible for implementation. When construction activities commence adjacent to the buffer area, a qualified biologist shall be present on-site full time to monitor the burrowing owl behavior for at least three days. The qualified biologist shall have the authority to increase the setback distance if there are signs of disturbance, such as changes in behavior as a result of construction or other indications of distress by the burrowing owls.

If burrowing owl activity is detected at a burrow within the Project footprint during the non-breeding season (September 1 through January 31), burrowing owls may be excluded from active burrows and encouraged to passively relocate to suitable, unoccupied habitat outside of the exclusion area. Burrowing owls shall be excluded by installing one-way doors in burrow entrances that will allow exit but not re-entry. Although passive relocation does not result in control of the recipient area for burrowing owls, the qualified biologists shall verify that there is an acceptable "recipient" area within a reasonable distance that provides the necessary subsidies to support burrowing owls with the goal to minimize the stress of relocation. Subsidies to be considered include suitable burrows (primary and satellite) and habitat quality (e.g., vegetation cover, diversity) that is equal to or greater than that from which they were relocated. If, during pre-construction surveys, burrowing owl activity is detected at a burrow within the Project footprint during the breeding season (February 1 through August 31), then an appropriate construction buffer or setback distance shall be determined by the qualified biologist on a case-by-case basis. This buffer shall be flagged, and all Project-related activity shall remain outside of the flagged area until a qualified biologist determines the burrow is no longer occupied (e.g., juveniles are foraging independently and are capable of independent survival).

- **MM-BUOW 3:** In the event that burrowing owls will be excluded from the Project footprint and occupied burrows will be impacted, a mitigation site with suitable burrows and habitat shall be secured, and a Burrowing Owl Exclusion Plan shall be developed and approved by CDFW prior to excluding from burrows. Specific objectives for burrowing owl protection addressed by this Burrowing Owl Exclusion Plan shall describe exclusion methodology, burrow excavation procedures, on-site and post-relocation monitoring of occupied burrows, and reporting.

- **MM-BUOW 4:** CDFW may require compensatory mitigation for temporary and/or permanent impacts to burrowing owl-suitable nesting and foraging habitat. If additional mitigation is required, artificial burrowing owl burrows installed onsite at the Project site edges may avoid the need to seek offsite mitigation opportunities while simultaneously incorporating the Project design into enhanced burrowing owl occupancy potential in the immediate area. The energy storage sites may be designed such that artificial burrows may be installed along the borders to any direction, preferably where foraging opportunities would likely be higher.

Specifications include: 1) wood construction, 2) at least two L-shaped entrance/exit tunnels to allow exit points should a predator enter, 3) the nest chamber should have at least 1,700 cm^2 of floor space, 4) the nest chamber should have a hatch in the roof to allow biological monitors to check for owl occupancy (especially nestlings) and other animals (if placed aboveground), or a wide observation pipe (bearing a removable cap) extending from the nest chamber's ceiling to a point approximately one to two feet aboveground, and 5) burrows should be maintained twice per year over time to remain functional for burrowing owls. Maintenance involves simply removing any soil and debris that may have filled vacant burrows due to winds or nearby erosion. In keeping with the locally existing burrow density, artificial burrow sites, at a ratio of 1:1, could be situated on the northern edge of the larger 60-acre WRESC parcel, western edge of the smaller 10-acre WRESC parcel. oriented towards agricultural and/or undeveloped land. Such placement would ensure that the burrows would be protected from long-term operations and maintenance activities, as the outer edges along a fenced perimeter would not be maintained as functional features of the energy storage sites, while also providing optimal locations for owls to scout for prey and predators over agricultural fields and/or undeveloped areas.

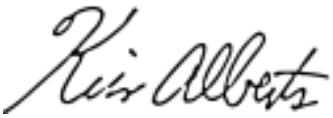
Occupied burrowing owl burrows directly impacted may be replaced by installing artificial burrows on mitigation sites (i.e., conservation easements, in-lieu fee lands, Farm Contract land), or other land as agreed to by CDFW, at a ratio of 1:1. For example, if destruction of two occupied burrows is unavoidable, two artificial burrows should be created in adjacent suitable habitat. If the mitigation sites identified for the Project have at least two suitable burrowing owl burrows for each occupied burrow directly impacted, then artificial burrows may not be installed. Suitable burrows are defined as burrows greater than approximately 4 inches (10 centimeters) in diameter (height and width) and greater than approximately 60 inches (150 centimeters) in depth. Burrows shall be scoped to ensure they are of proper depth for burrowing owls.

- **MM-BUOW 5:** A qualified biologist shall be on-site during all ground-disturbing construction activities in potential burrowing owl habitat. The qualified biologist shall be responsible for implementing and overseeing burrowing owl avoidance and minimization measures. The qualified biologist shall have the authority to stop construction if activities are in violation of avoidance and minimization measures. A qualified biologist possesses a bachelor's degree in wildlife biology or a related field and has demonstrated field experience in the identification and life history of burrowing owl.

Additional measures may be required for Project authorization upon finalization of the proposed Project design or as Project construction needs may dictate.

7.0 SURVEYOR CERTIFICATION

All data, statements, analyses, findings and attachments within this report are accurate and truthful in terms of describing the existing conditions and the Project as proposed to Blackhawk Environmental. By adhering to the mitigation measures proposed within this report and through coordination with the relevant regulatory agencies during the pre-construction, construction and post-construction phases, mitigation related to the complete the Project will be met to CEQA significance thresholds for burrowing owl.



Kris Alberts
Principal Biologist

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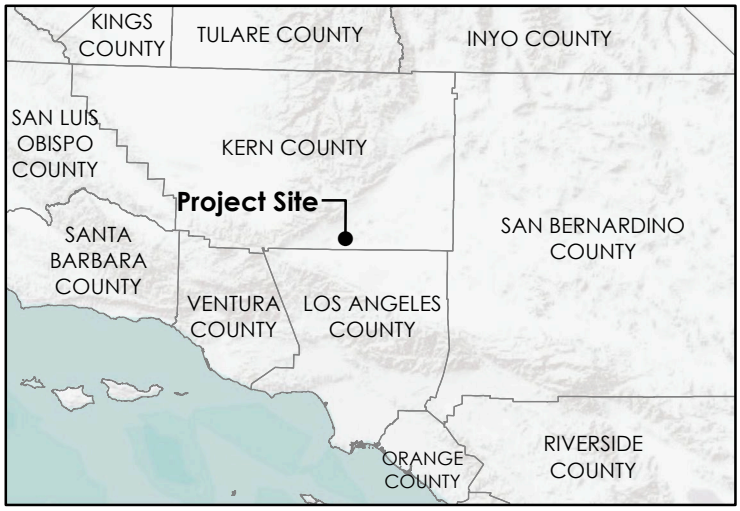
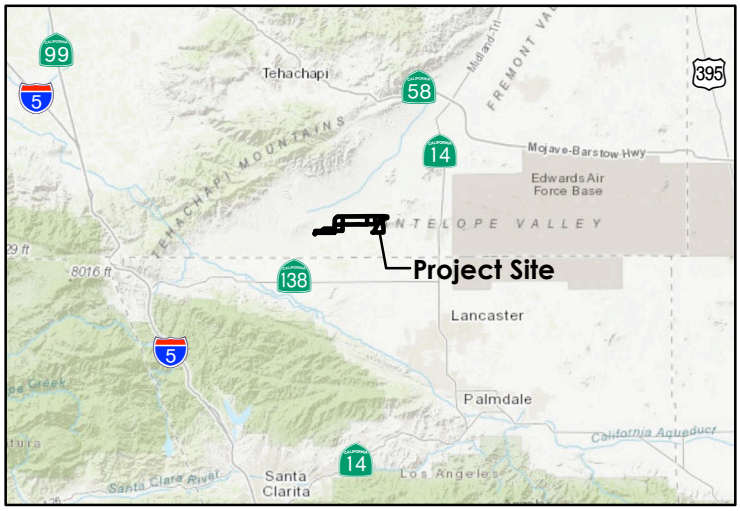
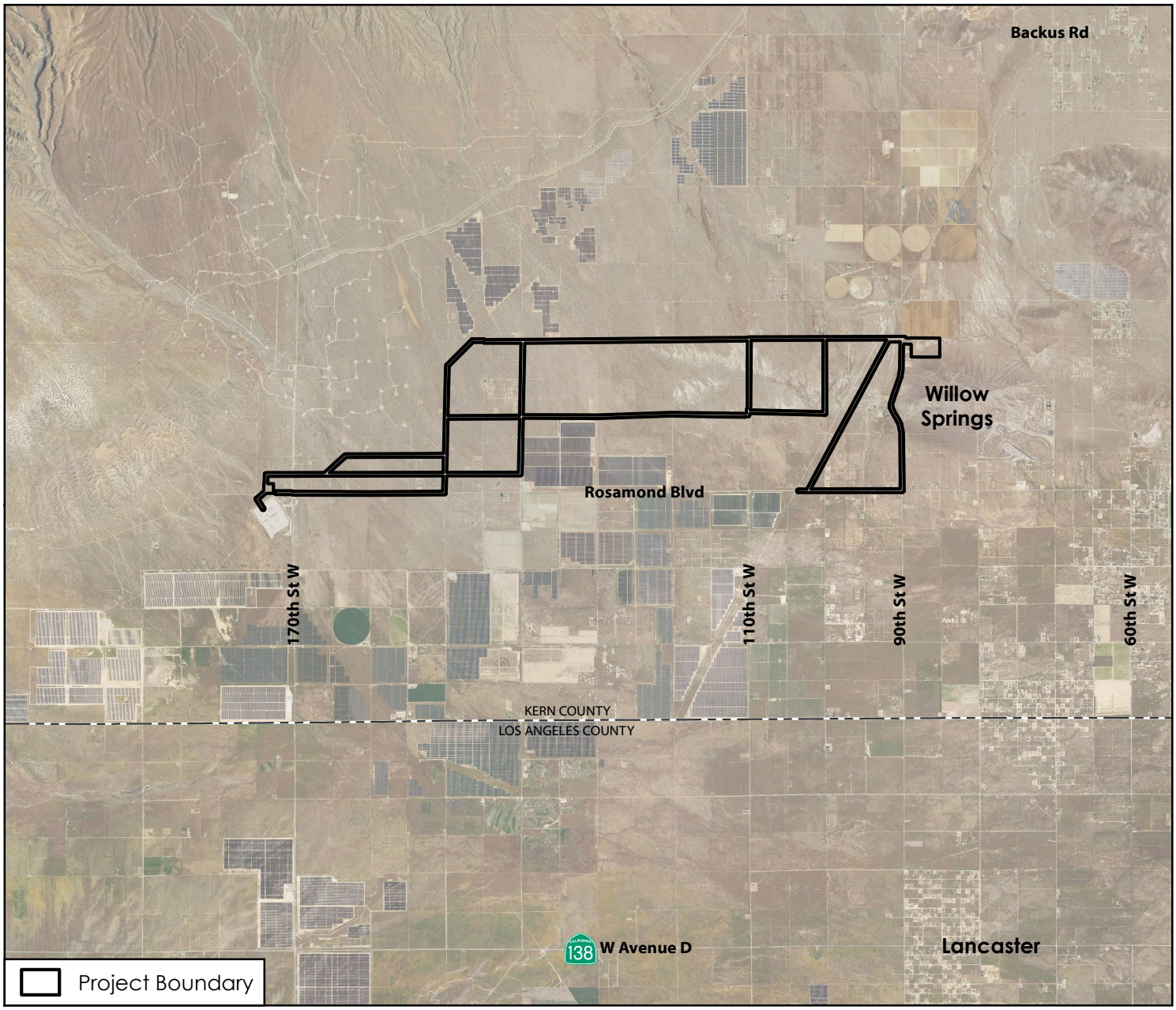
ATTACHMENT A

Figures

Blackhawk Environmental







Aerial Photo: USDA NAIP 2020

Figure 1

Project Vicinity and Location

Willow Springs

BLACKHAWK Environmental

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0 2 Miles

Confidential Figures Redacted

Vegetation and Burrowing Owl Burrow Map
7 panels

ATTACHMENT B

Photo Pages

Blackhawk Environmental

Photograph 1: Representative photo of a suitable unoccupied burrow under a creosote bush.

Photograph 2: Representative photo of an inactive burrowing owl burrow surrounded by whitewash and old burrowing owl cough pellets,

Photograph 3: Representative photo of a suitable burrow; entry coved with spider webs.

Photograph 4: Representative photo of a suitable burrow located under an ephedra shrub.

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Photograph 5: Representative photo of a potential surrogate burrow (culvert pipe) within a dry drainage, located along Stetson Avenue within the ROW.

Photograph 6: Representative photo of a suitable surrogate burrow (plastic pipe).

Photograph 7: Representative photo of a burrow complex located on the side of a wash with multiple entries.

Photograph 8: Representative photo of a burrow complex with multiple entries.

Photograph 9: Representative photo of a suitable burrow located on the side of a wash.

ATTACHMENT DR68-2

Willow Rock Energy Storage Center (21-AFC-02) Monthly Geotechnical Update – October 2022

Willow Rock Monthly Geotechnical Update – October 2022

Status

The table below overviews the status of the various activities that have been initiated during the geotechnical program at the Willow Rock project site as of October 30, 2022.

Activity	Status	Notes
Shallow Borehole Program	Complete	Shallow borehole program was completed June - August 2022 with 8 shallow boreholes and CPT testing.
Seismic Testing Round 1	Complete	Seismic testing was completed in Q1 to provide early insight on bedrock depth and stratigraphy before selecting borehole locations.
Deep Borehole #1	Ongoing - Lab Testing	Drilling and downhole testing has been completed on borehole #1. Lab testing data complete except for chemical analysis.
Deep Borehole #2	Ongoing - Lab Testing	Deep borehole #2 has completed drilling, geophysical logging, and pump & packer testing. In-situ stress testing (sigra) was attempted but no successful tests were completed. Lab testing on core samples is ongoing.
Deep Borehole #3	Ongoing – Core Drilling	Deep borehole #3 is in progress with drilling advancement completed to 1522' BGL as of October 31st. In-situ stress testing, geophysical logging and pump & packer testing will be completed after coring to approximately 2300 feet.

Monthly Update

Deep Borehole #1

Lab testing on borehole #1 has been completed by AAI, with only chemical analysis tests from their partner lab outstanding. This data is expected to be received by mid-November.

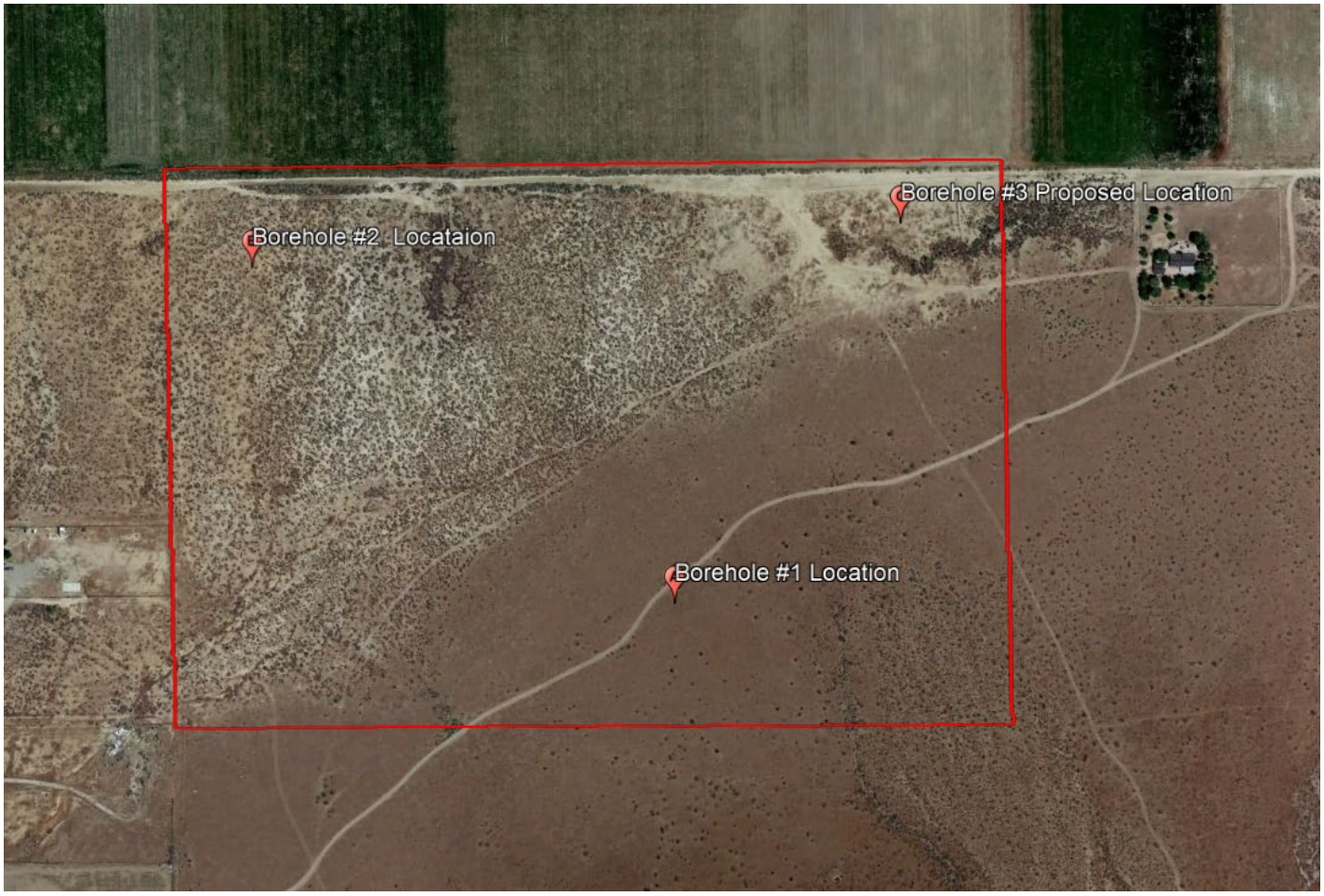
Deep Borehole #2

Pump & packer testing was completed on borehole #2 from October 1st – 10th. This testing was completed to assess the permeability of the host rock formation. Core samples from borehole #2 have been prepared and sent to the lab for UCS, density, specific gravity, slake durability, Poisson's ratio, Young's modulus, and tensile strength tests. Upon completion of drilling and downhole testing on borehole #2, the borehole was closed on October 12th and the drill rig was remobilized to start work on borehole #3

Deep Borehole #3

Construction of the pad for borehole #3 was completed on October 11th. Biological, archaeological, and cultural monitors reviewed the pad location before the start of construction and monitored the ground breaking activities. Drilling work commenced on October 13th and has advanced to 1522 feet as of

October 31st. Borehole drilling will continue until approximately 2300 feet after which In-situ stress testing, geophysical logging and pump & packer testing will be completed.



Supporting Data:

The Applicant is submitting the following technical data from the geotechnical exploration program activities conducted during October 2022:

- Borehole logs with photos for boreholes #1 & 2;
- Preliminary geophysical logging data from borehole #2;
- Pump & Packer data for borehole #2; and
- Lab testing data borehole #1 completed in October.