

DOCKETED

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Organization:	Golder Associates USA Inc.
Submitter Role:	Applicant Consultant
Submission Date:	8/25/2022 1:30:05 PM
Docketed Date:	8/25/2022

Willow Rock Energy Storage Center (21-AFC-02)

DATA REQUEST RESPONSE SET 1

Response to California Energy Commission Staff Data Requests 1 through 112

Submitted by:

Gem A-CAES LLC

Prepared with technical assistance from:

Golder Associates USA Inc.

1575 Treat Blvd., Suite 201, Walnut Creek, California, USA 94598

August 25, 2022

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ATTACHMENTS

Attachment DR1-1	Substantive EKAPCD Correspondence To Date
Confidential Attachment DR2-1	Electronic Files for Appendix 5.1A and 5.1B Worksheets (Submitted under Confidentiality Request)
Attachment DR6-1	Nonconfidential Summary of the Geotechnical Examination
Attachment DR6-2	BLM Alternative Site Map
Attachment DR6-3	Rosamond Hills Alternative Site Map
Attachment DR6-4	Little Buttes Alternative Site Map
Confidential Attachment DR9-1	Biology GIS Data (Submitted under Confidentiality Request)
Confidential Attachment DR31-1	Desert Tortoise Access Not Granted (Submitted under Confidentiality Request)
Confidential Attachment DR36-1	Burrow and Den Characteristics (Submitted under Confidentiality Request)
Attachment DR50-1	Draft Raven Management Plan
Attachment DR63-1	Map of All Inaccessible Areas For All Surveys Conducted In 2021
Attachment DR70-1	Ideal, Minimum Acceptable and Unacceptable Conditions for Cavern Development
Attachment DR78-1	Table 5.7-4 Noise Summary Table Baseline Ambient Sound Pressure Levels
Attachment DR78-2	Figure 5.7-2 Long-Term Baseline Sound Pressure Levels, One Minute Intervals
Attachment DR82-1	Update to AFC Table 5.8-1 – Records Search Results from Natural History Museum of Los Angeles County
Confidential Attachment DR95-1	Phase II Interconnection Study (Submitted under Confidentiality Request)

Acronyms and Abbreviations

acfm	actual cubic feet per minute
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 ft ³ /min	cubic feet per minute
CNDDB	California Natural Diversity Database
CUP	Conditional Use Permit
DKF	desert kit fox
DR	Data Request
EKAPCD	Eastern Kern Air Pollution Control District
FSA	Final Staff Assessment
ft	feet
GESC	Gem Energy Storage Center
kV	kilovolt
LADWP	Los Angeles Department of Water and Power
m ²	square meters
m/s	meters per second
PG&E	Pacific Gas and Electric
PSA	Preliminary Staff Assessment

SWHA	Swainson's Hawk
TLRW	Transmission Line Right of Way
WEAP	Worker Environmental Awareness Program
WJT	Western Joshua Tree
WRESC	Willow Rock Energy Storage Center

1.0 INTRODUCTION

Attached are GEM A-CAES LLC's (the "Applicant") responses to California Energy Commission (CEC) Staff Data Requests Set 1, numbers DR1 – DR112, for the Willow Rock Energy Storage Center (WRESC) (21-AFC-2). 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 (DR1 through DR112). 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 DR15 would be numbered Attachment DR15-1. 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 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

2.1 Data Requests DR1 through DR3

BACKGROUND

The proposed project will require permits from the Eastern Kern Air Pollution Control District (EKAPCD) (District). For purposes of inter-agency consistency, staff needs copies of all correspondence between the applicant and the District in a timely manner to stay up to date on any issues that arise prior to completion of the Preliminary and Final Staff Assessments (PSA and FSA).

2.1.1 Data Request DR1

DR1: Please provide copies of all substantive correspondence between the applicant and the District regarding the project, including any application(s), supplemental information, including attachments or information referenced in correspondence, and e-mails. Please provide all existing records in accordance with the requirements of title 20, California Code of Regulations (CCR), section 1716. This is a continuing request, requiring ongoing submission of relevant correspondence. Please provide correspondence no more than one week from the date it is created or received. This request is in effect until staff publishes the PSA and FSA.

Response: Copies of the requested correspondence are included in Attachment DR1-1. Future substantive correspondence with EKAPCD will be docketed.

2.1.2 Data Request DR2

BACKGROUND

AFC appendix 5.1A (Emission Calculations for Operation Phase) and 5.1B (Emission Calculations for Construction Phase) are used to document emissions calculations. Staff needs the spreadsheet files of the emission estimates with live, embedded calculations to complete the review.

DR2: Please provide the spreadsheet versions of Appendix 5.1A and 5.1B worksheets with the embedded calculations live and intact.

Response: Live and intact spreadsheet versions of Appendix 5.1A and 5.1B are considered proprietary work product. Accordingly, these are being submitted separately pursuant to an application for confidential designation as Confidential Attachment DR2-1.

2.1.3 Data Request DR3

BACKGROUND: Stack Exhaust Velocity

Section 5.1 Air Quality, Table 5.1-3 on page 5-7 shows an extremely high stack exhaust velocity of 123.3 meters per second (m/s) for the emergency diesel generators. Staff re-calculated the stack exhaust velocity to be 21.6 m/s, based on the stack diameter of 1.5 feet (ft) and exhaust gas flowrate of 7,525 actual cubic feet per minute (cfm or ft³/min) given in Table 5.1-3. Staff's calculation is shown in the equation below:

$$\text{Exhaust Velocity} = \frac{\text{Exhaust Flowrate}}{\text{Stack Area}} = \frac{7525 \text{ ft}^3/\text{min}}{\frac{\pi}{4} \times 1.5^2 \text{ ft}^2} \times \frac{0.3048 \text{ m}}{1 \text{ ft}} \times \frac{1 \text{ min}}{60 \text{ s}} = 21.6 \text{ m/s}$$

Using a high stack exhaust velocity in dispersion modeling would reduce the project impacts. Staff needs to confirm how the stack exhaust velocity of 123.3 m/s was calculated prior to completion of the staff assessment.

DR3: *Please confirm how the stack exhaust velocity of 123.3 m/s was calculated. If there was an error in the calculation of the stack exhaust velocity, please fix the error and redo the dispersion modeling and health risk assessment using the correct stack exhaust velocity.*

Response: The stack exhaust velocity of 123.3 m/s is the correct stack velocity. Therefore, there is no need for revisions to the dispersion modeling.

The correct stack exhaust volume flowrate for each engine is reported in AFC Table 5.1-2 as 42,896.7 acfm and in the manufacturer's supporting specification sheet as 1,214.7 cubic meters per min (which is mathematically equivalent to 42,896.7 acfm). The stack exhaust volume flowrates reported in AFC Table 5.1-3 were erroneously entered.

ATTACHMENT DR1-1

SUBSTANTIVE EKAPCD CORRESPONDENCE TO DATE

Stein, David

From: Miguel Sandoval Ortega <SandovalM@kerncounty.com>
Sent: Thursday, February 24, 2022 4:42 PM
To: Sheen, Maria
Cc: Stein, David; Nyree Grimes; leonidas.payne@energy.ca.gov; Glen Stephens
Subject: RE: Request of Determination of Compliance - Gem Energy Storage Center
Attachments: Request of Determination of Compliance_GEM_02-18-22.pdf

Follow Up Flag: Follow up
Flag Status: Completed

EXTERNAL EMAIL

Hi Maria,

Thanks for submitting the full project details including environmental assessment. Per your request (attached), after reviewing the air quality portion of the documents you provided, the District found the following:
Project includes installation of two (5MW) emergency diesel-fueled piston engines limited to 200 hours per year of operation. Please note, the District requires evaluation for potential chronic and cancer risk to nearby receptors (residents) from the long term exposure to Diesel Particulate Matter (DPM). However, we could not identify a section where DPM emitted from the two 5MW engines was evaluated for cancer risk to nearby receptors. Table 5.9-5 on Volume I, pdf page 376, list all toxic pollutants used for project's health risk assessment, but it does not appear to include DPM as a listed toxic carcinogenic substance. Similarly, Volume II, Appx. 5.9E-Table 1 also list toxic products of diesel combustion that were analyzed but does not include DPM. Before the District can make a determination of completeness, please ensure Health Risk Assessment and air dispersion modeling includes evaluation for associated health risks from DPM emitted by estimated annual operation of diesel engines. Please ensure that DPM was taken into consideration during the development of your Health Risk Analysis . Feel free to contact me if you have any questions.

Regards,

Miguel Sandoval
Air Quality Engineer
Eastern Kern APCD

www.kernair.org



From: Sheen, Maria <Maria_Sheen@golder.com>

Sent: Friday, February 18, 2022 11:23 AM

To: Glen Stephens <Glens@kerncounty.com>

Cc: Miguel Sandoval Ortega <SandovalM@kerncounty.com>; Stein, David <David_Stein@golder.com>; Nyree Grimes <nyree.grimes@hydrostor.ca>; leonidas.payne@energy.ca.gov

Subject: Request of Determination of Compliance - Gem Energy Storage Center

CAUTION: This email originated from outside of the organization. Do not click links, open attachments, or provide information unless you recognize the sender and know the content is safe.

Hello Glen,

Please find attached a letter and the required information to obtain a completeness letter for the determination of compliance for Gem Energy Storage Center. Additionally, you received a link (attached email) that will allow you to download a ZIP file which contains the attachments of the letter. Please let me know if you have any issues downloading the ZIP file. Thank you.

Regards,

Maria Sheen, *she/her*

Sr. Consultant, Environmental Engineer

T: [REDACTED]

C: [REDACTED]



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Stein, David

From: Miguel Sandoval Ortega <SandovalM@kerncounty.com>
Sent: Monday, March 21, 2022 2:19 PM
To: Sheen, Maria
Cc: Stein, David; Nyree Grimes; leonidas.payne@energy.ca.gov; Glen Stephens
Subject: RE: Request of Determination of Compliance - Gem Energy Storage Center
Attachments: GEM-Energy Storage Center.pdf

EXTERNAL EMAIL

Hi Maria,

Please find District letter on the GEM Energy Storage Center. The originals will be sent via post mail.

Regards,

Miguel Sandoval
Air Quality Engineer
Eastern Kern APCD

www.kernair.org



From: Sheen, Maria <Maria_Sheen@golder.com>
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Hi Miguel,

Please find attached the revised version of Section 5.9 Public Health which has incorporated the DPM emissions from the operation of the two emergency diesel engines that were inadvertently omitted from the original health risk assessment. Additionally, you will receive a link (attached email) to allow you to download a ZIP file that contains a copy of the electronic files identified in Appendix E. Please let me know if you have any issues downloading the ZIP file.

Please let me know if there is any additional information you need in order to deem our Application for Certification complete for purposes of the District's Determination of Compliance review.

Otherwise, please send us a confirmation email indicating that the District has determined that our Application for Certification is now complete and the District is now able to commence its Determination of Compliance review.

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Hello Glen,

Please find attached a letter and the required information to obtain a completeness letter for the determination of compliance for Gem Energy Storage Center. Additionally, you received a link (attached email) that will allow you to download a ZIP file which contains the attachments of the letter. Please let me know if you have any issues downloading the ZIP file. Thank you.

Regards,

Maria Sheen, *she/her*
Sr. Consultant, Environmental Engineer

T: [REDACTED]
C: [REDACTED]



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Stein, David

From: Sheen, Maria
Sent: Friday, February 18, 2022 11:23 AM
To: glens@kerncounty.com
Cc: sandovalm@kerncounty.com; Stein, David; Nyree Grimes; leonidas.payne@energy.ca.gov
Subject: Request of Determination of Compliance - Gem Energy Storage Center
Attachments: Request of Determination of Compliance_GEM_02-18-22.pdf; Files (3) from Maria Sheen: Volume II - Gem.pdf,CEC Data Adequacy Recommendation - Gem 123021.pdf...

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Please find attached a letter and the required information to obtain a completeness letter for the determination of compliance for Gem Energy Storage Center. Additionally, you received a link (attached email) that will allow you to download a ZIP file which contains the attachments of the letter. Please let me know if you have any issues downloading the ZIP file. Thank you.

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CONFIDENTIAL ATTACHMENT DR2-1

ELECTRONIC FILES FOR APPENDIX 5.1A AND 5.1B WORKSHEETS

3.0 ALTERNATIVES

3.1 Data Requests DR4 through DR8

BACKGROUND: SITE CONTROL

Sections 1.0 Introduction (subsection 1.6), 5.6 Land Use (page 5-6-1), and 6.0 Alternatives (subsection 6.3.1) of the application for certification (AFC) state that the applicant has obtained site control of the approximately 61-acre parcel through a long-term lease and that site control of the adjoining approximately 10-acre parcel is in process. The extent of the applicant's right to use the properties impacts access by the applicant and staff, which could impact the ability to obtain information about the site and thus, staff's analysis.

Appendix 1B Property Owners List of the AFC shows that the approximately 61-acre parcel is owned by Stricklen Properties. (Section 1.0 Introduction [subsection 1.6] incorrectly states the owner as Strickland Properties.) The owner of the approximately 10-acre parcel is listed as Mahmoud Abdelhak.

3.1.1 Data Request DR4

DR4: Please provide details of the terms of the long-term lease on the approximately 61-acre parcel, including but not limited to the length of the lease and any renewal options.

Response: The Applicant has a long-term lease agreement for the 61-acre parcel. Key provisions of the lease include the following:

- 30-year base term
- Three 15-year extension options
- Full rights and control of both above ground and subsurface property during the term of the lease
- Authority to, install, alter remove, relocate anything on the property during the term of the lease
- 100% ownership and control of all facilities placed or constructed on the property
- Complete access to the site and authority to control site access

3.1.2 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, requiring 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: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

BACKGROUND: U.S. BUREAU OF LAND MANAGEMENT SITE

Section 6.0 Alternatives of the AFC evaluates a U.S. Bureau of Land Management (BLM) site as a potential offsite alternative to the proposed project. The BLM site is likely to be included in staff's analysis of alternatives. The AFC says the site was identified in Hydrostor's preliminary examination of the geology of the area. It also states that the southern 70–80 percent of the site "consists of irregular, complex and steep terrain that would not be conducive to site development."

The AFC discusses two other offsite alternatives, the Little Buttes and Rosamond Hills sites. The Little Buttes site is described as having "less preferred" geologic conditions compared to the proposed project site. The Rosamond Hills site is described as "the least favorable of the alternative sites as a result of the presence of surface fanglomerate and underlying tuff and/or tuffaceous sandstone." (See subsections 6.3.2–6.3.5 of the AFC for further details.) A single aerial photograph in the AFC (Figure 6-1) shows the three offsite alternatives at a very small scale with no distinguishable details.

3.1.3 Data Request DR6

DR6: Please provide a copy of Hydrostor's preliminary geologic examination of the area and a large-scale map (i.e., zoomed in) of the BLM site. Please include similar maps of the Rosamond Hills and Little Buttes sites.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request. A nonconfidential summary of the geotechnical examination is provided in Attachment DR6-1 Larger scale maps of the BLM, Rosamond Hills and Little Buttes sites are provided in Attachments DR6-2, DR6-3 and DR6-4.

3.1.4 Data Request DR7

DR7: Please explain what it means for the site terrain on the BLM site to be irregular and complex, and please provide information on what would be required to prepare the BLM site for development, including the amount and extent of excavation and site leveling required.

Response: The term "irregular" is intended to mean that the site boundary consists of multiple straight sides that have different lengths. The reference to the terrain as "complex" is intended to mean that there are large variations in site elevation over short distances (i.e., the site is not flat, rather it's elevation varies dramatically). The site is an irregularly shaped 14-sided polygon with approximately the southern half of the site on the rugged Willow Buttes. The site elevation varies dramatically, by approximately 350 feet north to south and by approximately 150 feet east to west. Due to the variations in site elevation, significant site leveling, including grading, would be required to prepare the BLM site for development. Additionally, the irregular shape of the site boundary would pose unique challenges to a logical general arrangement of aboveground facilities relative to laying out equipment on a more "regular" rectangular site.

3.1.5 Data Request DR8

DR8: Please provide information on any other known constraints to developing the BLM site that were not discussed in the AFC.

Response: The site does not have public access and additional parcels would need to be acquired to effectuate site access and allow development on the more level northern portion of the site. As previously noted in the Alternatives section, securing sufficient additional level acreage to create a developable site of

sufficient size would involve negotiations with numerous different property holders with no certainty of success. The Applicant would also need to secure a long-term lease/ right-of-way from BLM to develop the BLM portion of the site. The time and resources needed to prepare, submit, and receive a ROW grant from the BLM for development of the site would be a significant constraint that makes the site infeasible. While no focused environmental studies of the site have been completed, facilities located at higher elevations on the Willow Springs Butte may result in greater visual impacts to viewers north of the site.

ATTACHMENT DR6-1

NONCONFIDENTIAL SUMMARY OF THE GEOTECHNICAL EXAMINATION

Summary of Geotechnical Site Screening Assessment

A site screening assessment for a Compressed Air Energy Storage (CAES) cavern at a depth below surface between 400 m (1,310 ft) and 600 m (1,970 ft) was performed for the Willow Rock Energy Storage Center (WRESC) (“Project”) site, the nearby BLM site located on the Willow Springs Butte, the Little Buttes site and the Rosamond Hills site.

The assessment addresses the following issues:

- The geological information for the sites and the area.
- The likely condition of rock at the site at a suitable horizon as close to 600 m (1,970 ft) as possible in the 400–600 m (1,310–1,970 ft) depth range.

PHYSICAL AND GEOLOGIC SETTINGS

On a regional basis, the sites are located in Antelope Valley, which forms the apex between the Garlock and San Andreas Faults and the northwest corner of the Mojave Desert. The Project and BLM sites are located at or adjacent to the Willow Springs Butte in the south-central part of Kern County, California. The sites are located approximately 20 km southeast of the Garlock Fault and approximately 30 km northeast of the San Andreas Fault. Apart from several volcanic intrusions like the Willow Springs Butte that outcrop on surface, the valley consists of alluvium that is typically several hundred meters thick. Oil and gas wells drilled to bedrock within the area and away from the buttes have encountered alluvium from 1,006 m to 1,700 m (3,300 ft to 5,576 ft) thick.¹

Geologic control in the area consists of water supply wells,² three of which are located in the north half of Section 8, Township 9 North (T9N), Range 13 West (R13W) of the San Bernardino Meridian on or near the location of the Project site. The depths of these wells range from 50 m to 99 m (164 ft to 325 ft) based on drillers logs provided on the well completion reports. The deepest of these wells encountered fractured bedrock at 51.8 m (170 ft) and solid bedrock at 91.4 m (300 ft). The depth to the water table as measured in the wells varied from 26.8 m to 50.3 m (88 ft to 165 ft). Local well completion reports show the depth to bedrock to be more than 150 m (500 ft) with a water table ranging from 76 m to 91 m (250 ft to 300 ft) below ground surface.

Figure 1 shows that the surface geology of the Project site consists of Quaternary alluvium⁴ that extends to approximately 100 m based on the water well data discussed above. Figure 2 shows that the alluvium is generally underlain by Cretaceous quartz monzonite (qm) that extends to depth. Surface geology in the vicinity of the BLM site consists of felsite (Tgb), tuff and conglomerate (Tgh) of the Tertiary Gem Hills Formation and Cretaceous quartz monzonite (qm). The groundwater flow rates measured in these types of rocks in the area are typically less than 3.4 cubic meters per hour (m³/h)⁵ (15 US gallons per minute [gpm]), which is readily handled during normal shaft sinking activities.

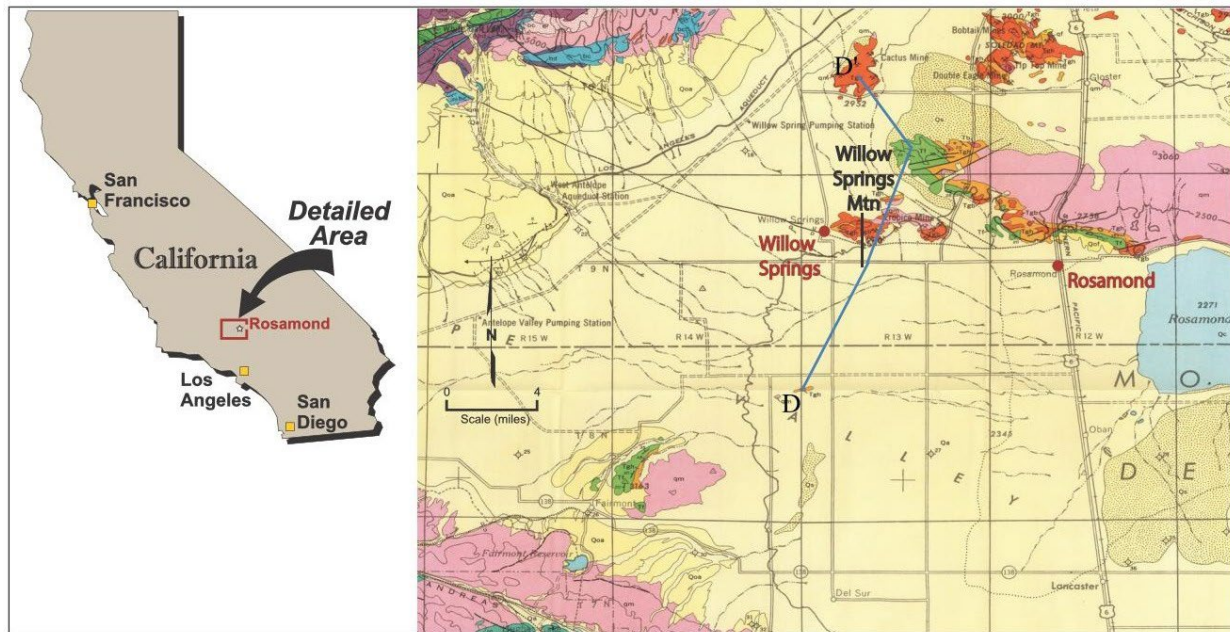
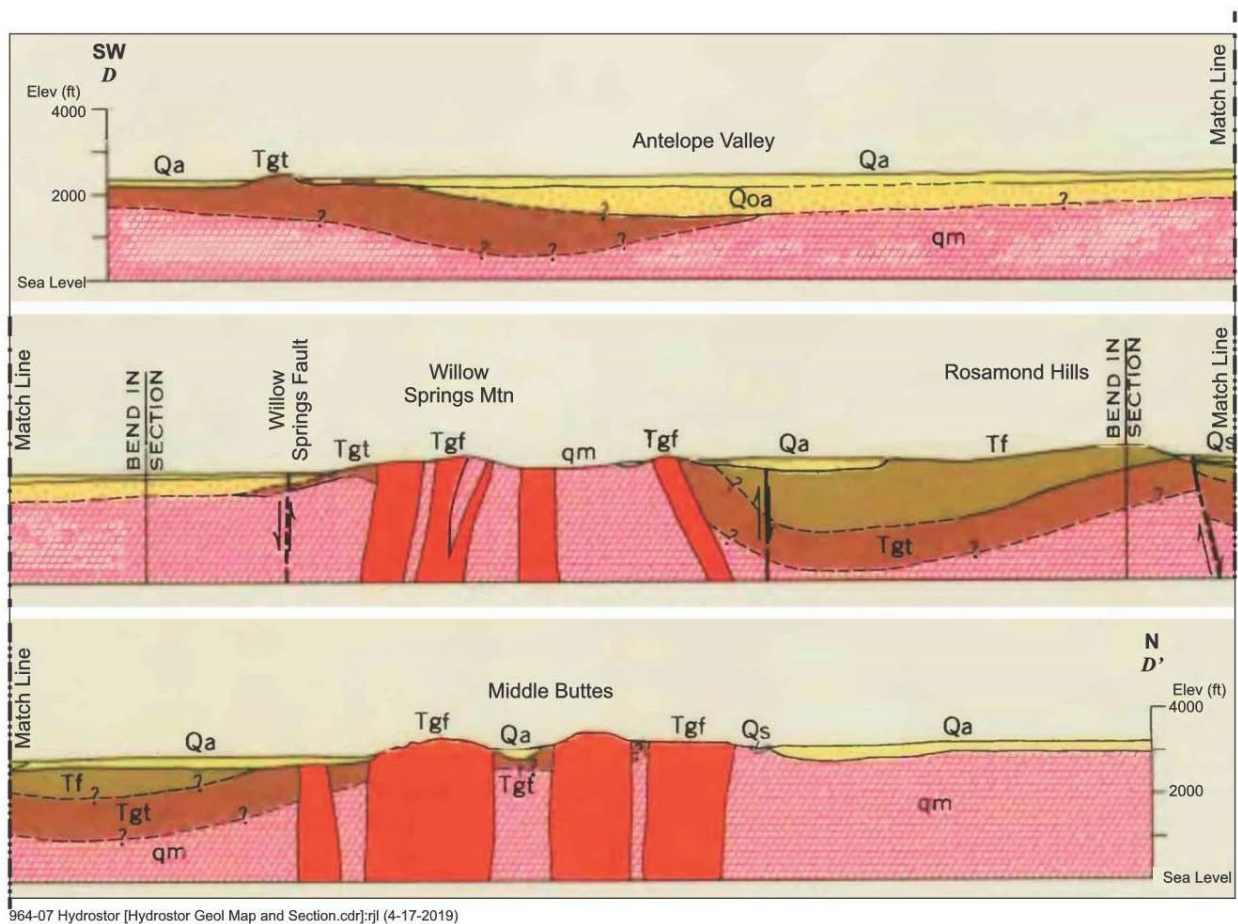


Figure 1. Regional Geology of Willow Springs and Rosamond Quadrangles³

The surface geology of the Little Buttes site consists of Tertiary tuff and tuffaceous sandstone (Tgt) of the Gem Hills Formation. (Little Buttes is the outlier marked Tgt at the southwest end of Section D in Figure 2.) Figure 2 also shows that the surface rock at Little Buttes is underlain by quartz monzonite at a depth of approximately 305 m (1,000 ft). The surface geology of the Rosamond Hills site consists of Tiss Formation fanglomerate⁶ (Tf) on the hill to a depth of approximately 170 m (550 ft) that is underlain by tuff and tuffaceous sandstone (Tgt) to a depth of approximately 430 m (1,400 ft) with quartz monzonite below. On the north part of the site, the surface geology consists of Quaternary sand and alluvium to a depth greater than 150 m (500 ft) that is underlain by fanglomerate and tuffaceous sandstone to depths between approximately 460 m (1,500 ft) and 580 m (1,900 ft). The depth to the water table in the sand and alluvium ranges between 80 m (260 ft) and 110 m (360 ft). Note that based on Figure 2, there is also an inferred fault along the north side of the Rosamond Hills whose nature is unknown.

Deep seismic profiling surveys for the Consortium for Continental Reflection Profiling (COCORP)⁸ and for the Los Angeles Regional Seismic Experiment phase II (LARSE II)⁹ programs indicate that the felsite and quartz monzonite igneous rocks that outcrop in the Willow Springs Butte continue to a depth of approximately 3 km (1.9 miles) below sea level or about 3.8 km (2.4 miles) below ground surface. This means that the favorable rock types and geologic structures identified in the near-surface geology continue to depths considerably greater than the 400–600-m (1,310–1,970 ft) target depth range for the cavern.



964-07 Hydrostor [Hydrostor Geol Map and Section.cdr]:rjl (4-17-2019)

Qa = Quaternary alluvium; Qs = Quaternary windblown sand; Qoa = older alluvial gravel and sand; qm = quartz monzonite; Tf = Fiss Formation fanglomerate; Tgf = Gem Hill Formation felsite; Tgt = Gem Hill Formation tuff and tuffaceous sandstone

Figure 2. NE-SW Section showing the Willow Springs Butte⁷

Shafts can be sunk conventionally through thick, saturated, unconsolidated materials up to 500 m deep. The conventional methods for sinking through unconsolidated materials are freezing or grouting and have been around since the late 19th Century, but they are slow and costly. The length of time required for freezing depends on the ground temperature and the time required to grow the freeze wall and connect it between borings. To set up a freeze wall and then to thaw it after the shaft has been advanced and lined through the unconsolidated zone will add at least a year to the shaft construction time. In addition, the costs are significantly higher as well because of the power required for the pumps and refrigeration units.

With blind shaft drilling, the method selected by Hydrostor, shafts can be readily constructed through unsaturated or saturated sands for depths up to approximately 46 m (150 ft); construction of shafts by blind drilling becomes problematic with sands to depths greater than 61 m (200 ft).

IN-SITU STRESS AND SEISMIC SETTING

The maximum in-situ stress (σ_{hmax}) component near the San Andreas and Garlock Faults is horizontal. Numerous measurements have been taken near the San Andreas Fault and other active faults in California. Using regression lines presented by McGarr et al.,¹⁰ at a depth of 400 m, σ_{hmax} is estimated at 18.7 megapascals (MPa), the minimum horizontal stress (σ_{hmin}) at 10.6 MPa, and the vertical stress (σ_{v}) at 10.6 MPa. At the 600-m target depth of the cavern, σ_{hmax} , σ_{hmin} , and σ_{v} are estimated at 25.7 MPa, 14.5 MPa, and 15.4 MPa, respectively. As discussed under “Bedrock Physical Properties” below, σ_{hmax} is an order of magnitude less than the highest strengths of felsites and quartz monzonites and about 25% of the lowest strengths recorded for quartz. Although the stress regime will have to be considered in cavern design, it is not expected to have a significant effect on project viability.

For any underground excavation, the risk of damage due to earthquakes is primarily restricted to surface or very near-surface structures.¹¹ For the sites under consideration, the Peak Ground Acceleration (PGA) with a 2% probability of exceedance in 50 years was determined to be 0.5 g using United States Geological Survey (USGS) software for the ASCE7-16 Design Standard.¹² According to Dowding and Rozen¹³ and confirmed by others, only minor damage occurs for PGAs between 0.19 g and 0.5 g. Thus, earthquake damage to a cavern is expected to be minor. Conversely, damage to surface buildings at the site from earthquakes could be significant as the maximum expected earthquake magnitude within a 50-year period in the area is 7.5.¹⁴ Nevertheless, the risk of landslides and soil liquefaction is small.

BEDROCK PHYSICAL PROPERTIES

Rock strength properties for the felsite and quartz monzonite in the vicinity of the site were not available. However, felsite and quartz monzonite are common rock types and general strength data are available. Quartz monzonite has a composition similar to granite but with less quartz; felsite is a fine-grained volcanic rock similar to basalt but lighter in color.¹⁵ Uniaxial compressive strength (UCS) values from the literature for quartz monzonite range from 94 MPa to 275 MPa, while those for felsite or basalt range from 150 MPa to over 300 MPa.¹⁶ Openings mined in such rocks can be expected to remain open with minimal ground support for the expected 50-year life of a cavern.

The rock types that compose the intact bedrock have low permeability, but no specific permeability values were found for the local area. In general, the permeabilities for igneous rocks are less than 1×10^{-7} centimeters per second (cm/s)¹⁷ and any flow is in fractures. However, at the target depth of the caverns, fractures are expected to be closed tight at most minor seeps.

The near-surface tuff and/or tuffaceous sandstone at the Little Buttes site is weaker and more permeable than the felsite and quartz monzonite. However, the rock at the cavern depth would be quartz monzonite with properties as discussed above.

The near-surface fanglomerate at the Rosamond Hills site is problematic because its strength will be highly variable depending on whether the matrix or the larger particles (pebbles or boulders) predominate, as well as on the mineralogy of the pebbles/boulders and the matrix.

Overall, however, the unit can be expected to be relatively weak. As with the Little Buttes site, the tuff and/or tuffaceous sandstone will be weaker and more permeable than the felsite and quartz monzonite.

SITE STORAGE NEEDS

The Project site has an area of approximately 60 acres. Based on the 7.5-minute topographic quadrangle map for the Willow Springs area,¹⁸ The surface material at the Project site consists of alluvium and has a slope of approximately 5.5%. This site would require little recontouring.

The slope of the land on the BLM site varies from 6.5% on the north side to 43% near the peak of the butte on the south side of the area. Approximately 120 acres of the approximately 220 acres within the BLM site have a slope of 12.5% or less. Based on a geologic map of the Willow Springs quadrangle,¹⁹ the surface material in the areas with these flatter slopes consists of a small thickness of alluvium, which would need to be recontoured to provide a flat surface.

The Little Buttes site has surface slopes ranging from 12% at the saddle between the peaks to 24% at the higher peak and is smaller in area than the BLM site. The site preparation cost at locations with surface grades can materially increase the construction cost and schedule. The cost could be minimized by constructing the shaft(s) in bedrock near the toe of the slope and siting any permanent facilities and construction staging areas on the adjacent flat-lying alluvium.

The Rosamond Hills site has surface slopes ranging from 34% near the top of the hill to 10% on the lower slope to about 1% on the sand and alluvium. As with other sites, the best option would be to construct the shaft(s) on the lower slope of the hill and to locate any permanent facilities and construction staging areas on the adjacent flat-lying alluvium. However, the variability of the material size in the fanglomerate makes this site less attractive than the Willow Springs sites.

CONCLUSIONS AND RECOMMENDATIONS

The rock at the target depth at both the Project and BLM sites consists of very strong, durable, impermeable, competent bedrock. Caverns have been constructed or are currently being designed in similar competent rock. Large mines in similar rocks also exist at depths of up to 1,950 m (6,400 ft) below surface. Construction of a cavern in the alluvium is not recommended.

The Project and BLM sites are likely the best options for a viable project in the region. Another suitable site is Little Buttes. The presence of surface fanglomerate and underlying tuff and/or tuffaceous sandstone at the Rosamond Hills site makes it the least attractive of the four sites evaluated. The areas that have sandy overburden to depths of 150 m (490 ft) or more are not favorable for advancing shafts by blind drilling.

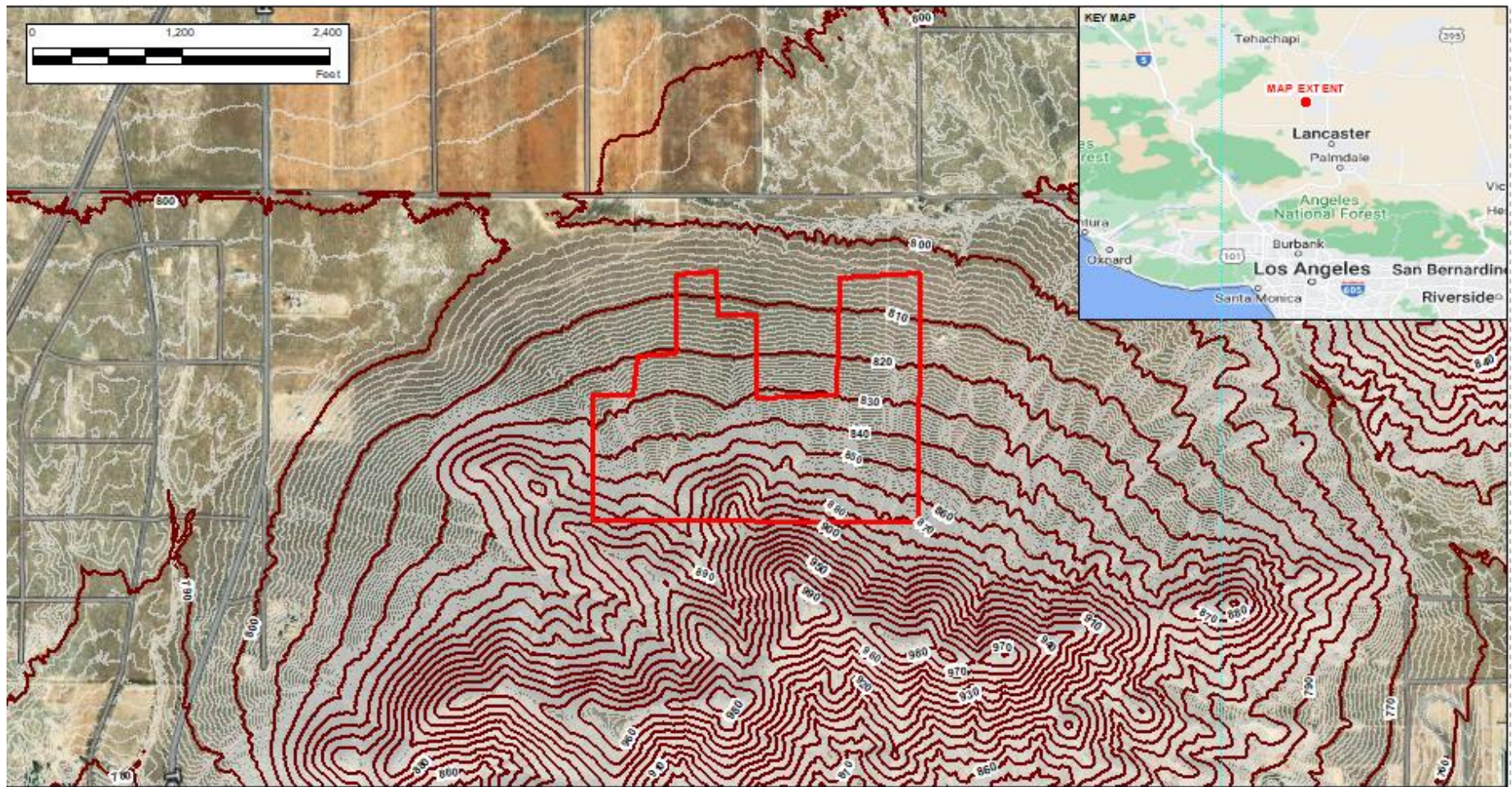
It is recommended that at least one or two cored borings to cavern depth be developed to gather a suite of geotechnical data, including bottom-hole temperature measurements. One hole should preferably be at each planned shaft location.

REFERENCES AND FOOTNOTES

- ¹ Dibblee, Jr., T. W. (1963), *Geology of the Willow Springs and Rosamond Quadrangles*, Geological Survey Bulletin 1089-C, Washington, DC: US Government Printing Office, 117 pp.
- ² California Department of Water Resources (2019), *Well Completion Report Map Application*, available at <https://dwr.maps.arcgis.com/apps/webappviewer>.
- ³ Dibblee, Jr., T. W. (1967), *Areal Geology of the Western Mojave Desert, Plate 1 (West-Half)*, Geological Survey Professional Paper 522, Washington, DC: US Government Printing Office, 1 sheet.
- ⁴ Alluvium consists of clay, silt, sand or gravel deposited by flowing water in river beds, outwash deposits, and flood plains in comparatively recent geologic time.
- ⁵ Dutcher, L. C. and G. F. Worts, Jr. (1963), *Geology, Hydrology, and Water Supply of Edwards Air Force Base, Kern County, California*, Open-File Report 63-146, Long Beach, California: US Geological Survey, 225 pp.
- ⁶ A fanglomerate is rock composed of heterogeneous materials originally deposited in an alluvial fan and subsequently cemented into solid rock.
- ⁷ Dibblee, Jr., T. W. (1963), *Geology of the Willow Springs and Rosamond Quadrangles, Plate 1*, Geological Survey Bulletin 1089-C, Washington, DC: US Government Printing Office, 1 sheet.
- ⁸ Li, Yong-Gang, Thomas L. Henyey, and Leon T. Silver (1992), "Aspects of the Crustal Structure of the Western Mojave Desert, California From Seismic Reflection and Gravity Data," *J. Geophys. Res.*, 97(B6):8805–8816.
- ⁹ Yan, Zhimel, Robert W. Clayton, and Jason Saleeby (2005), "Seismic Refraction Evidence for Steep Faults cutting Highly Attenuated Continental Basement in the Central Transverse Ranges, California," *Geophys. J. Int.*, 160:651–666.
- ¹⁰ McGarr, A., M. D. Zoback, and T. C. Hanks (1982), "Implications of an Elastic Analysis of In Situ Stress Measurements near the San Andreas Fault," *J. Geophys. Res.*, 87(B9):7797–7806.
- ¹¹ Dowding, C. H. and A. Rozen (1978), "Damage to Rock Tunnels from Earthquake Shaking," *J. Geotech. Eng. Div.*, 104(GT2):175–191.
- ¹² USGS (2018), "Seismic Design Web Services: ASCE7-16," obtainable online from <<https://earthquake.usgs.gov/ws/designmaps/ASCE7-16.json?>>.
- ¹³ Dowding, C. H. and A. Rozen (1978), op. cit.
- ¹⁴ Stevens, V. L. and J.-P. Avouac (2017), "Determination of M_{max} from Background Seismicity and Moment Conservation," *Bull. Seismological Soc. America*, 107(6):2578–2596.
- ¹⁵ Best, M. G. (1982), *Igneous and Metamorphic Petrology*, W. H. Freeman and Co., New York, 630 pp.
- ¹⁶ Windes, S. L. (1949), *Physical Properties of Mine Rock Part I*, RI 4459, Washington, DC: US Bureau of Mines, 90 pp.
- ¹⁷ Freeze, R. A. and J. A. Cherry (1979), *Groundwater*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 604 pp.
- ¹⁸ USGS (1974), *Willow Springs 7.5 Minute Topographic Quadrangle Map*, Reston, Virginia, 1 sheet.
- ¹⁹ Dibblee, Jr., T. W. (1963), op. cit.

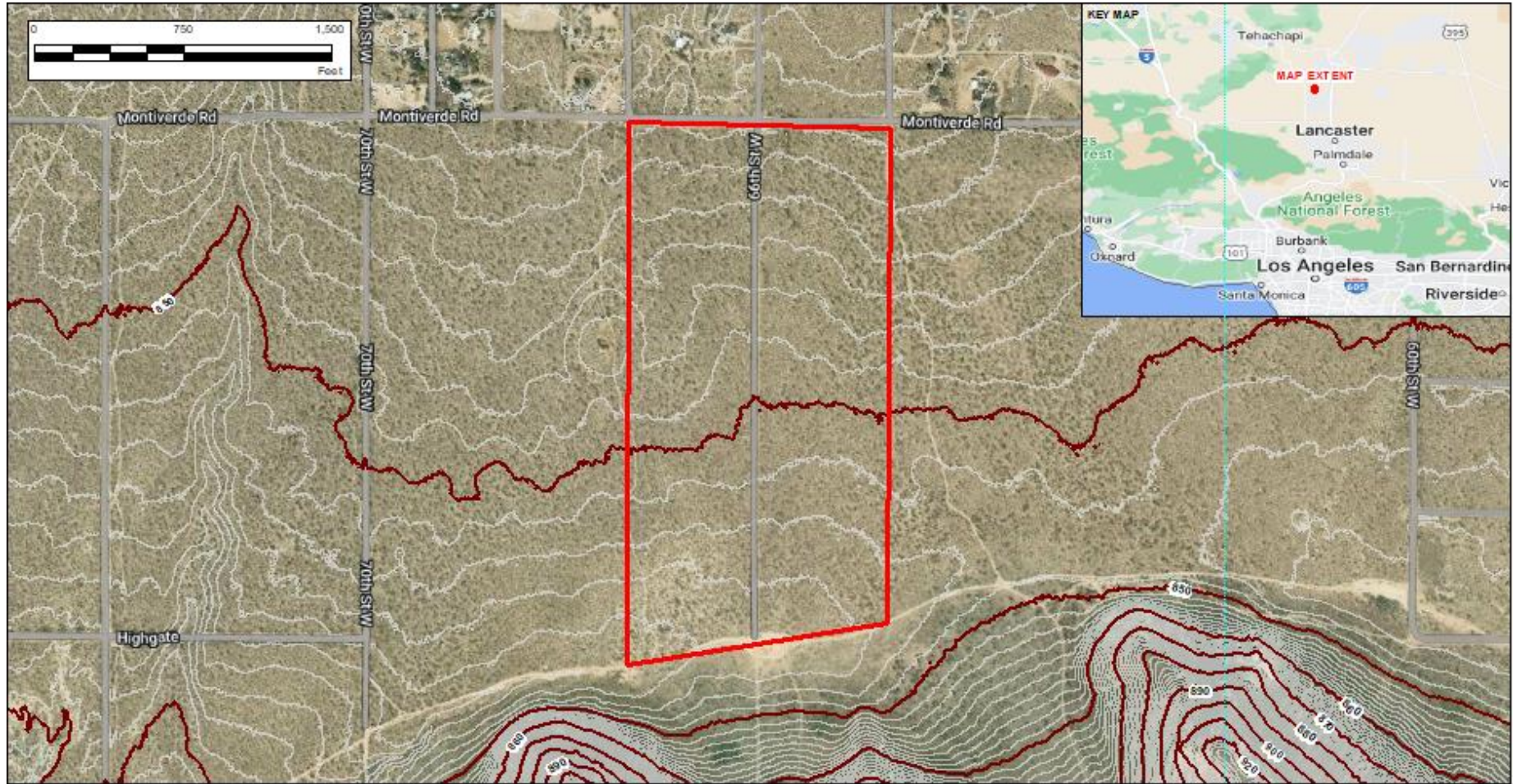
ATTACHMENT DR6-2

BLM ALTERNATIVE SITE MAP



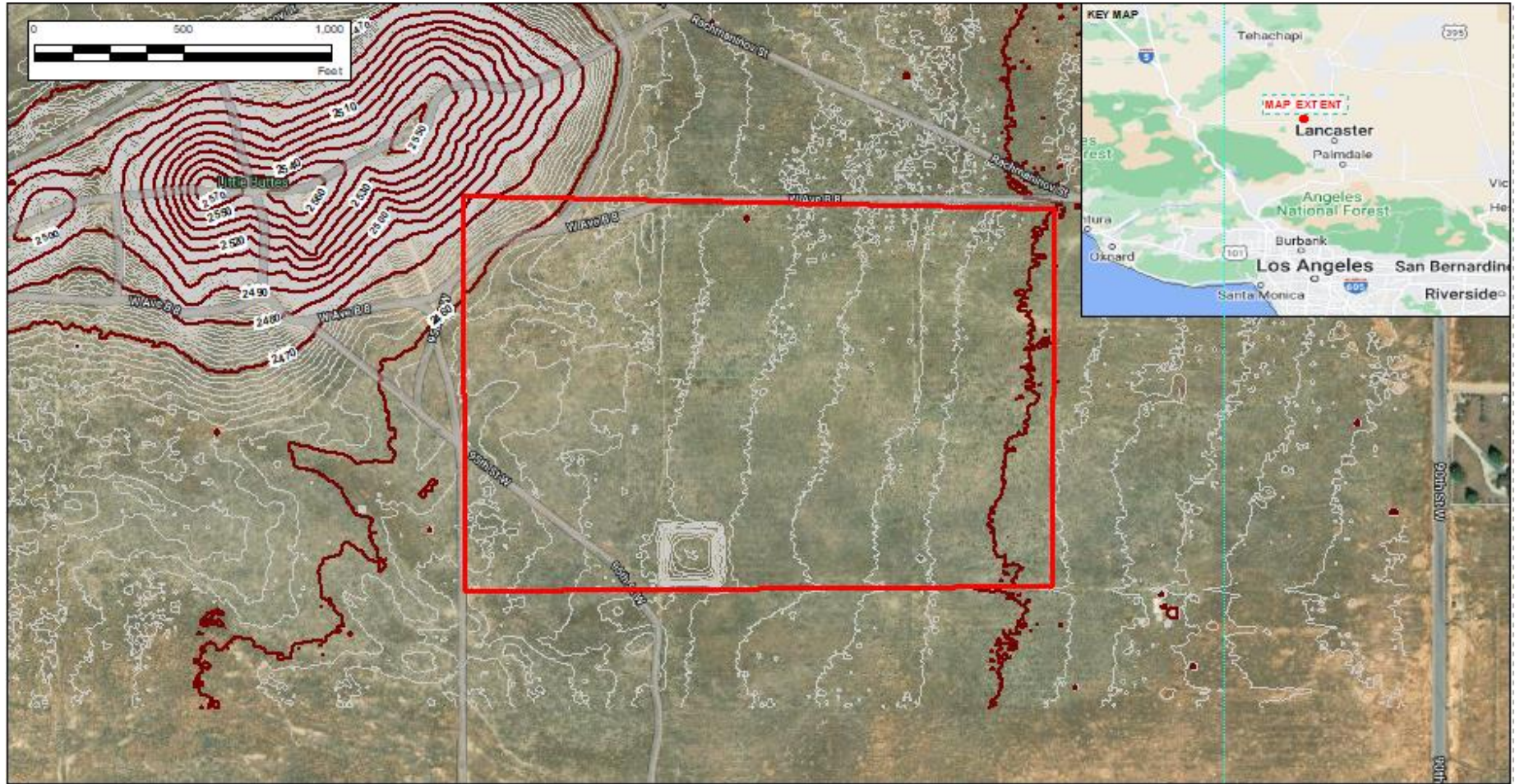
ATTACHMENT DR6-3

ROSAMOND HILLS ALTERNATIVE SITE MAP



ATTACHMENT DR6-4

LITTLE BUTTES ALTERNATIVE SITE MAP



4.0 BIOLOGICAL RESOURCES

4.1 Data Requests DR9 through DR11

BACKGROUND: GIS DATA

The AFC (several Biological Resources documents) provides survey data in figures for special-status species and jurisdictional waters. While figures are very helpful in displaying survey information, GIS data would be even more useful for staff.

4.1.1 Data Request DR9

DR9: *For all survey data included in AFC documents for which GIS data is available, please provide the following data sets in a format compatible with ArcGIS desktop software (preferably geodatabase or shapefile format). Survey data from 1) special status plants, 2) special status wildlife, 3) State and federal jurisdictional features, 4) nest sites, 5) dens, 6) natal dens, 7) burrows, 8) scat, and 9) complexes.*

Response: This information is being submitted separately under an application for confidential designation as Confidential Attachment DR9-1 due to the sensitive nature of the locational information.

4.1.2 Data Request DR10

BACKGROUND: CONSTRUCTION LAYDOWN AND PARKING

The Project Description section of the AFC (TN 240770) mentions a construction laydown and parking area will be located on property north of the site as depicted on the site plan in Figure 2-1. Note 3 of this figure states that temporary construction parking and laydown area is to be located offsite on leased land north of the facility but does not show where this is located. The Biological Resources section of the AFC (TN 240788) states the laydown area for construction would occur within the boundaries of the Gem Energy Storage Center parcel. This contradicts what is mentioned in the Project Description section.

DR10: *Please describe where the construction laydown and parking would occur during construction and provide the location on a map.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this item. In Data Adequacy Supplement #3 submitted June 24, 2022 (TN 243731) the Applicant stated in response to item 2: "Based on a recent re-evaluation of construction staging and laydown requirements, Hydrostor has determined that the 10-acre Strickland parcel will be sufficient to meet construction laydown needs. Accordingly, the 40-acre laydown area north of the project site is not needed for construction and was not surveyed." The Applicant anticipates that a supplemental response will be provided on or before September 25, 2022.

4.1.3 Data Request DR11

DR11: *If this location is outside of the project site and this area has not been surveyed for biological resources, please conduct the appropriate surveys for this area.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this item. The Applicant anticipates that a response will be provided on or before September 25, 2022.

4.2 Data Requests DR12 through DR19

BACKGROUND: HYDROSTATIC COMPENSATION SURFACE RESERVOIR AND STORMWATER RETENTION PONDS

The AFC (DA5.2-1 Biological Technical Report TN 242779) states the hydrostatic compensation surface reservoir would have a floating cover but does not provide any details of what it looks like, how much area it will cover, how it will be prevented from blowing around, bunching up, or blowing away. It also states the reservoir will be constructed using excavated soil and mined rock (Project Description, TN 240770), but no other details are provided. In addition, it is not clear whether the reservoir would have a fence around it to keep out wildlife. American badgers, desert kit fox, various squirrels and other rodents may dig into the rock and earthen berm. In addition, waterfowl, and shorebirds along with other bird species may land on the cover or berm when seeing water as they fly by. Providing water in a desert environment has been problematic for projects with ponds built in the desert environment.

The AFC (Project Description TN 240770) also states that during operations some of the water makeup for the reservoir will be from a non-potable source and produced through the compression sequence. There is no discussion of what the compression sequence is and how it might affect the water quality of the reservoir. In addition to the reservoir, the Project Description (TN 240770) and Water Resources (TN 240751-21) sections mention two stormwater retention ponds, a south pond (150 feet long by 260 feet wide) and a north pond (245 feet long by 180 feet wide), served by perimeter stormwater culverts to manage stormwater onsite. The Proposed Plot Plan (Project Description) states there would be a 6-foot-high berm all around the north pond, but not the south pond. The Water Resources section does not mention the 6-foot-high berm or any details regarding the stormwater ponds outside of water quality.

4.2.1 Data Request DR12

DR12: *Please provide a description(s) and photos of the floating cover and how much of the surface area it will cover.*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this item. The Applicant anticipates that a response will be provided on or before September 25, 2022.

4.2.2 Data Request DR13

DR13: *Please describe how the floating cover will be kept in place during windy conditions. How will it be prevented from blowing to one side, bunching up, or prevented from blowing away? Will there be straps to keep it in place?*

Response: The proposed cover uses floating shapes that interlock, similar to the Hexa-cover¹. These products self-organize and stay in-place in winds up to 70 mph, above which they self-reorganize once wind subsides.

¹ Field Lining Systems Inc. (FLSI). 2022. HEXA-COVER Floating Cover. Accessible by: <https://flsi.us/products/hexacover-floating-cover/>. Accessed August 2022.

4.2.3 Data Request DR14

DR14: *Please provide details of what materials would be used to construct the reservoir berms.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this item. The Applicant anticipates that a response will be provided on or before September 25, 2022.

4.2.4 Data Request DR15

DR15: *Please explain how the project proposes to prevent wildlife from undermining (from digging and burrowing) the integrity of the rock and earthen berm.*

Response: Best Management Practices will be followed to prevent wildlife from undermining the integrity of the berm. For example, underground exclusionary fencing, the details of which have yet to be determined at this time, would be installed around the perimeter of the berm. The Applicant will consult with California Department of Fish & Wildlife and CEC Staff to develop acceptable exclusionary measures.

4.2.5 Data Request DR16

DR16: *Please provide the slope of the berm from the water to the top of the berm.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this item. The Applicant anticipates that a response will be provided on or before September 25, 2022.

4.2.6 Data Request DR17

DR17: *Please explain what the expected water quality of the reservoir would be and how often the water quality would be monitored.*

Response: Water quality is expected to be very similar to local groundwater quality since groundwater will be the primary source of water for the reservoir. The reservoir will be covered to minimize evaporation. Evaporation from the reservoir will be highly dependent upon the local ambient conditions (such as temperature, precipitation and wind speed). The addition into the reservoir of condensed, essentially distilled water (produced from the air compression process) and collected rainwater will tend to counteract evaporation. These counteracting processes (evaporation and makeup from condensed, distilled water/precipitation) will fluctuate depending on ambient conditions and the frequency/duration/times of operation. However, water quality is expected to be relatively stable. The reservoir water is expected to be tested monthly during the first year of operations, and subsequently the interval will be modified based upon the experience from the first year of operations.

4.2.7 Data Request DR18

DR18: *Please explain what the compression sequence is, when it occurs and how often, and what the expected water quality of this water source would be.*

Response: The "compression sequence" is the charge mode (discussed in Section 2.1.4 of the Project Description). This is when the air compressors are running. This mode of operation results in significant quantities of condensed water being produced from the compression process. In the water balance this is represented as "Produced Water" in AFC Table 5.15-1 and AFC Figure 5.15-5. As it is a result of condensation of water vapor, the water quality will be comparable to that of distilled water.

4.2.8 Data Request DR19

DR19: *Please provide a more thorough discussion of the stormwater ponds. The information should be comprehensive, and include, but not be limited to, details regarding the materials that would be used to construct the 6-foot-high berm, maintenance and environmental risks to the structures, how wildlife (e.g., desert kit fox, American badger, Mohave ground squirrel) would be prevented from undermining the berm, the slope of the berm, the expected water quality of the ponds, and how often the water quality would be checked, etc.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this item. The Applicant anticipates that a response will be provided on or before September 25, 2022.

4.3 Data Requests DR20 through DR24

BACKGROUND: DELINEATION OF STATE WATERS

*The AFC (TN 240788, DA 5.2-3 TN 242780) states there are 58 ephemeral drainage features which total 5.770 acres that are under California Department of Fish and Wildlife (CDFW) jurisdiction. It also mentions CDFW jurisdiction was delineated by measuring the outer width and length boundaries of potentially jurisdictional areas consisting of the greater of either the top of bank measurement or the extent of associated riparian or wetland vegetation. This definition does not apply to arid and desert environments. The Biological Technical Report for CDFW jurisdictional waters followed the California Department of Fish and Game (CDFG) 1994 guidance document which is not the current CDFW guidance when evaluating proposed project activities which may impact episodic state waters. CDFW guidance covers any activity involving the alteration or placement of fill within any river, stream, or lake, including those that are dry for periods of time (ephemeral/episodic) as well as those that flow year-round (perennial). This includes ephemeral streams, desert washes, and watercourses with a subsurface flow, which is appropriate to the type of state waters on and adjacent to the project site (including offsite linear alignments). Here is a link to the Lake and Streambed Alteration Program website (<https://wildlife.ca.gov/Conservation/Environmental-Review/LSA>). To ensure that the delineation of state waters (ephemeral drainages/washes) aligns with current guidance, please refer to: *A Review of Stream Processes and Forms in Dryland Watersheds* (Kris Vyverberg 2010) and *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants* and Appendix G: *The MESA Field Guide, Mapping Episodic Stream* (Brady Roland and Kris Vyverberg 2013).*

It is important to complete the mapping and delineation of streams following the documents listed previously (as preferred by CDFW) so CDFW and CEC staff can review, and the Lake and Streambed Alteration Agreement can be addressed, if needed, in staff's analysis and the details included as a condition of certification. The project design should be based on appropriate technical studies/calculations (e.g., topographic, hydrologic, hydraulic, geotechnical, and scour) to ensure it is properly designed and would not cause streambed degradation or aggradation, redirection of flows, ponding of water, etc.

4.3.1 Data Request DR20

DR20: Please conduct delineation of state waters (ephemeral drainages/washes) pursuant to: *A Review of Stream Processes and Forms in Dryland Watersheds* (Kris Vyverberg 2010) and *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants and Appendix G: The MESA Field Guide, Mapping Episodic Stream* (Brady Roland and Kris Vyverberg 2013) including a delineation and hydrologic analysis for the project site including a buffer (to the extent practicable and as directed by the above protocols) of 1,000 feet around the project site and 500 feet on either side of the gen-tie centerline.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this item and objects to the specified buffers. The Applicant anticipates that a response will be provided on or before October 31, 2022.

4.3.2 Data Request DR21

DR21: Please revise the delineation of ephemeral washes following the methods provided in the three documents mentioned above.

Response: Please see the response to DR20.

4.3.3 Data Request DR22

DR22: Please provide a hydrologic analysis and report that maps the stream extent at various storm events (e.g., 5, 10, 50, 100, 250-year). The extent of each stream mapped should include all areas where water flows at the highest point within the streams and includes the floodplain, if present.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this item. The Applicant anticipates that a response will be provided on or before October 31, 2022.

4.3.4 Data Request DR23

DR23: Please describe how surface water flow patterns have been designed or addressed by the project. This should include a discussion of how stream flow will be altered to flow around project infrastructure and fence lines (security, desert tortoise exclusion, etc.) or whether stream flow will be allowed to flow naturally through each stream impact area following construction.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this item. The Applicant anticipates that a response will be provided on or before October 31, 2022.

4.3.5 Data Request DR24

DR24: Please provide a grading plan, a post-construction drainage plan, construction designs, hydraulic study, and/or other documentation that evaluates how modifications to the streams during project construction would affect changes upstream, onsite, and in downstream water and sediment flow patterns.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

4.4 Data Requests DR25 through DR27

BACKGROUND: WESTERN JOSHUA TREE

Figure 8 (DA 5.2-1 TN 242779) of the Biological Technical Report shows western Joshua trees (WJT) occurring primarily along the roads of the gen-tie with no survey buffer used. CDFW was not consulted regarding protocol. The survey area for all linears including the gen-tie should include (to the extent possible) 500 feet on either side of the linear centerline. In addition, surveys around the project site should extend out to 1,000 feet where possible. The Swainson's hawk Figure 2 (DA 5.2-1) shows nests further out from the roads in the survey area, of which some of these are in western Joshua trees. At a minimum, WJT surveys need to have at least a 290-foot buffer, per CDFW guidance to determine impacts to the seed bank in addition to direct impacts to the trees.

4.4.1 Data Request DR25

DR25: Please survey and map any WJT that occur within 1,000 feet of the project site and 500 feet of the gen-tie route centerline.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

4.4.2 Data Request DR26

DR26: Please provide a complete census of the size classes of each WJT within the project area (including the gen-tie and all appropriate buffers mentioned above). The size classes would be less than 1-meter in height, 1-meter or greater but less than 4-meters, and 4-meters or greater in height.

Response: For the purposes of this AFC proceeding, the Applicant is assuming that the size class for each WJT within the Project area is 4-meters or greater in height. Prior to construction, the Applicant will conduct a pre-construction survey to confirm WJT heights. The pre-construction survey report will summarize results, including specific buffer areas and impact areas. Although CDFW's emergency regulations relating to the WJT have expired, the Applicant anticipates that it will implement avoidance zones of no less than 40 feet for each mapped WJT of 5-meters or greater within the project area to the extent feasible. If avoidance is not feasible, the Applicant will coordinate with the CEC and CDFW on appropriate measures.

4.4.3 Data Request DR27

DR27: Please submit California Natural Diversity Database (CNDDDB) field forms to CDFW for any positive occurrences.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request. All positive occurrences observed of all observed species were documented on CNDDDB field forms and submitted to CDFW on October 6, 2021. Any future surveys conducted that include positive occurrences will be documented on CNDDDB field forms and also submitted to CDFW.

4.5 Data Requests DR28 through DR29

BACKGROUND: CALIFORNIA DESERT NATIVE PLANT PROTECTION – CACTUS SPECIES

The Observed Species List in Appendix 5.2 B (TN 240768-6) shows two cactus species -teddybear cholla (Cylindropuntia bigelovii) and beavertail cactus (Opuntia basilaris) -which are not shown on any maps. Their removal, in addition to western Joshua tree, requires a permit as well as a fee per plant removed in accordance with the California Desert Native Plant Protection Act (Division 23 of the California Food and Agricultural Code). In order to determine the fee and where these species occur, they must be mapped. In addition, the Willow Springs Specific Plan (Kern County Department of Planning and Development Services 1992) requires plants protected by the California Desert Native Plants Act to be preserved where possible and to replant ones that are unavoidably displaced.

4.5.1 Data Request DR28

DR28: *Please map all cacti species as specified in Division 23 of the California Food and Agricultural Code (Chapter 3. Regulated Native Plants [80071 - 80075]) including the two cacti species listed above, found on the project site including (to the extent feasible) a 1,000-foot buffer and 500 feet on either side of the centerline of the gen-tie route.*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

4.5.2 Data Request DR29

DR29: *Please provide a Draft Cactus Salvage and Relocation Plan that would describe which cacti species would be lost, where they occur, and possible relocation site(s). Include in the Draft Cactus Salvage and Relocation Plan details of the survey methods and results, preconstruction impact and avoidance assessment, salvage suitability, salvage and relocation process, and monitoring which includes success criteria.*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

4.6 DATA REQUESTS DR30 THROUGH 35

BACKGROUND: DESERT TORTOISE

The Biological Resources section (TN 240788) mentions desert tortoise surveys followed USFWS 2009 Chapter 4, General Ecology and Survey Protocol for Determining Presence/Absence & Abundance for Desert Tortoise – Mojave Population. However, the current protocol required by USFWS and CDFW is USFWS 2019 Preparing for any action that may occur within the range of the desert tortoise (Gopherus agassizii). In addition, surveys were conducted with a buffer of 150-meters (492 feet) for the entire study area (project site and gen-tie). Surveys should (to the extent possible) or as otherwise indicated in the official survey protocol, include a buffer of 1,000 feet for linears (500 feet on either side of the centerline) and 1,000 feet for the project site. The Biological Resources section also mentions that 10-meter-wide belt transects were used during surveys but does not provide this on a map. Desert tortoise surveys should be conducted by qualified wildlife biologist(s) who have previous experience surveying for desert tortoise, are familiar with the survey protocol, and their sign. In addition, desert tortoise survey results are valid for one year and are

required to be conducted again no sooner than a year prior to the start of ground disturbance (surveys were conducted in April and May of 2021 (TN 242779) and therefore are already outdated). An incidental take permit will be required for this species. This permit will be part of staff's conditions of certification.

The AFC mentions (TN 240788: Section 5_2, Biological Resources, TN 242779: ATT DA 52-1_Biological Technical Report, and TN 242791: ATT DA 52-6_52 Bio Section) desert tortoise surveys were conducted in areas that were accessible to surveyors. Areas with no access, such as private property, were surveyed using binoculars. It is not clear which areas were not surveyed as these areas were not provided on a map. In addition, Table 5.2-2 Biological Surveys Conducted shows surveys were conducted along the gen-tie line but with no buffer distance. Also, no stand-alone desert tortoise survey report was provided. The Introduction section of the AFC (TN 240751-2) mentions the use of a secure perimeter chain link fence but does not mention the use of desert tortoise exclusion fencing.

Since an older outdated protocol was used, and surveys by 2023 will be older than one-year, new surveys would be required.

4.6.1 Data Request DR30

DR30: *Please provide the existing stand-alone desert tortoise survey report, if available.*

Response: Focused desert tortoise surveys were conducted in support of the Project and described in the AFC Data Adequacy Supplemental No. 1 Attachment DA5.2-1 Biological Technical Report submitted on April 25, 2022 (TN 242779). Methods are discussed in Section 3.0, page 13 and results from the focused surveys are discussed in Section 1.0, page 2 and stated the following:

Focused surveys resulted in the detection and mapping of three Class 5 burrows suitable for juvenile desert tortoises within the Survey Area, which includes the entire Project footprint of the proposed energy storage facility parcels, tie-lines and their associated 250-footwide right-of-way (ROW; 125 feet to either side of the centerline) and covers approximately 977 acres. No tortoise sign was present in the vicinity of these burrows. Additionally, spider webbing was present at one of the burrow entrances indicating that burrow was not occupied at the time of the surveys, and no juvenile or adult desert tortoises were observed during either the focused surveys or other surveys completed for the Project.

Results from the focused desert tortoise surveys are included in Confidential Attachment DR31-1. A stand-alone report was not prepared.

4.6.2 Data Request DR31

DR31: *Please provide a map showing the 10-meter-wide transects used during the 2021 surveys.*

Response: Please see Confidential Attachment DR31-1, which has been submitted pursuant to an Application for Confidential Designation, which depicts the transects used during the 2021 surveys.

4.6.3 Data Request DR32

DR32: Please provide a map of the locations showing areas of where access was not permitted to conduct desert tortoise surveys.

Response: Please see Confidential Attachment DR31-1, which has been submitted pursuant to an Application for Confidential Designation, which depicts the areas where access for desert tortoise surveys has not been granted.

4.6.4 Data Request DR33

DR33: Please provide a discussion and details, including diagrams, of any fencing that would be installed around the project site. Include the fence location on a map. Discuss how desert tortoise and other wildlife would be prevented from burrowing under any fencing to gain access to the site.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this item. The Applicant anticipates that a response will be provided on or before October 31, 2022.

4.6.5 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: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

4.6.6 Data Request DR35

DR35: Please submit CNDDDB field forms to CDFW for any positive occurrences.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request. All positive occurrences observed of all observed species were documented on CNDDDB field forms and submitted to CDFW on October 6, 2021. Any future surveys conducted that include positive occurrences will be documented on CNDDDB field forms and also submitted to CDFW.

4.7 DATA REQUESTS DR36 THROUGH DR39

BACKGROUND: DESERT KIT FOX

No surveys were conducted for desert kit fox (DKF) (TN 240788, TN 240768, DA 5.2-1 and DA 5.2-6). The reason provided was because this species is not listed. Although this species is not listed it is a state protected fur-bearing mammal and is protected under Title 14, California Code of Regulations, section 460, which stipulates that desert kit fox take is not allowed. Since take is not allowed, it is important to have survey data of active dens, natal dens, etc. in the project area in order to do proper project planning with avoidance measures. Information regarding suitable dens present in the survey area was provided as part of a data adequacy request under confidential cover. While some data was provided it was anecdotal information obtained while conducting surveys for other species. No focused survey(s) were conducted for this species. To avoid take of this species where no take is allowed, surveys need to occur to ensure sign

was not overlooked. Use USFWS 2011 Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance survey protocols for San Joaquin kit fox since there are no specific survey protocols for desert kit fox.

4.7.1 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: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request. Focused surveys for the DKF were not performed; however, signs for desert kit fox were incidentally collected during wildlife, desert tortoise and burrowing owl surveys. Since those surveys included searches of all observed burrows, any signs of a burrow used by DKF would have been documented by field staff.

Confidential Attachment DR36-1 includes all data points that were collected at each observed den. A compilation of known sightings within a 10-mile radius for desert kit fox cannot be determined because this kit fox subspecies is not on the CDFW's Special Animals List from which the CNDDDB data pertains to². Based on signs observed by staff biologists, presence of DFK is assumed. As such, pre-construction surveys will be conducted. Pre-construction survey methods and buffers for DKF will be in consultation with the CEC and CDFW.

4.7.2 Data Request DR37

DR37: Please provide resumes of biologists for review and approval prior to conducting surveys.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request. All resumes from biological surveys were submitted to the CEC as Attachment DA5.2-5 BioResumes (TN 242785).

4.7.3 Data Request DR38

DR38: Please provide a map of all suitable dens, complexes, natal dens, scat, and DKF detected.

Response: All data collected, including suitable dens, complexes, natal dens, scat and DKF observations during incidental surveys are included in Confidential Attachment DR36-1. Previously submitted information on the desert kit fox was also filed under from Data Adequacy Supplemental No.1 (TN 242776), requests number 7 and 9.

² California Natural Diversity Database (CNDDDB). July 2022. Special Animals List. California Department of Fish and Wildlife. Sacramento, CA

4.7.4 Data Request DR39

DR39: Please submit CNDDDB field forms to CDFW for any positive occurrences.

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request. The CDFW does not accept nor require CNDDDB forms for animal species, such as the desert kit fox, that are not included on the Special Animals List (CNDDDB 2022).

4.8 DATA REQUESTS DR40 THROUGH DR43

BACKGROUND: AMERICAN BADGER

The AFC (TN 240788, TN 240768, DA 5.2-1 and DA 5.2-6) does not provide any information on focused American badger (AMBA) surveys. The AMBA is a State species of special concern and protected as are other special-status species. The limited information regarding suitable dens present in the survey area was provided as part of a data adequacy request provided under confidential cover. While data was provided, it was anecdotal information obtained while conducting surveys for other species. No focused survey(s) were conducted for this species or its sign. To have accurate data, surveys focused on American badger need to occur to ensure all sign was not overlooked and to avoid impacts to this species.

4.8.1 Data Request DR40

DR40: Please conduct focused AMBA burrow surveys within the survey area (project site and gen-tie plus a buffer as recommended through consultation with CDFW). Since there is no protocol for conducting surveys for this species, use biologists familiar with AMBA sign (scat, burrows, dens, tracks, individuals).

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request, which respectfully objects to focused surveys of the American badger (AMBA).

No focused surveys were conducted for the AMBA, however signs for American badger were collected incidentally during wildlife, desert tortoise and burrowing owl surveys, since those surveys included burrow searches that would have also American badger burrows and signs. All data points that were collected for potential American badger dens in Confidential Attachment DR36-1. Based on signs observed, presence of the AMBA is assumed. As such, pre-construction surveys will be conducted. Pre-construction survey methods and buffers for AMBA will be in consultation with the CEC and CDFW.

4.8.2 Data Request DR41

DR41: Please provide resumes of biologists for review and approval prior to conducting surveys.

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request. All resumes from biological surveys were submitted to the CEC as Attachment DA5.2-5 BioResumes (TN 242785).

4.8.3 Data Request DR42

DR42: Please map all suitable dens, complexes, scat, and individuals.

Response: Refer to Confidential Attachment DR36-1 for all incidental data collected in 2021.

4.8.4 Data Request DR43

DR43: Please submit CNDDDB field forms to CDFW for any positive occurrences.

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request. All positive occurrences observed of all observed species were documented on CNDDDB field forms and submitted to CDFW on October 6, 2021.

4.9 Data Requests DR44 through DR47

BACKGROUND: MOHAVE GROUND SQUIRREL

No Mohave ground squirrel (MGS) surveys were conducted (Biological Technical Report DA 5.2-1, TN 242779 and TN 240788). Appendix 5.2 A (TN 240768-6) mentions that suitable habitat occurs throughout the survey area for this species. As a threatened species, surveys would be required given the project location being near the edge of the known geographic range of MGS. Cameras should also be incorporated into the standard survey methodology described in the CDFG 2003, 2010 Mohave Ground Squirrel Survey Guidelines for increased detectability. Use biologists familiar with MGS and who have conducted surveys before.

4.9.1 Data Request DR44

DR44: Please conduct surveys for MGS following the CDFG 2003, 2010 Mohave Ground Squirrel Survey Guidelines. Use cameras to increase detectability of MGS.

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request.

4.9.2 Data Request DR45

DR45: Please consult with CDFW and CEC for the hybrid (camera/live trapping) survey methodology prior to conducting surveys for concurrence of survey methods.

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request.

4.9.3 Data Request DR46

DR46: Please provide resumes of biologists for review and approval prior to conducting surveys.

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request. All resumes from biological surveys were submitted to the CEC as Attachment DA5.2-5 BioResumes (TN 242785).

4.9.4 Data Request DR47

DR47: *Please submit CNDDDB field forms to CDFW for any positive occurrences.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request. All positive occurrences observed of all observed species were documented on CNDDDB field forms and submitted to CDFW on October 6, 2021. Any future surveys conducted that include positive occurrences will be documented on CNDDDB field forms and also submitted to CDFW.

4.10 Data Requests DR48 through DR49

BACKGROUND: CROTCH'S BUMBLE BEE

According to page 5.2A-3 of 5.2A-3 (TN 240768-6), Crotch's bumble bee habitat consists of "open grassland and scrub habitats and food plants include Asclepias, Chaenactis, Lupinus, Medicago, Phacelia, and Salvia. Nests are often located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees". This page further states that "Suitable habitat is found in portions of the Survey Area".

*In 2018, the Xerces Society for Invertebrate Conservation, the Center for Food Safety, and the Defenders of Wildlife petitioned the California Fish and Game Commission to list four species of native bumble bees as endangered under the California Endangered Species Act (CESA), including Crotch's bumble bee (*Bombus crotchii*), a critically imperiled species (CDFW 2022). As a result of the groups' petition, the California Fish and Game Commission voted to begin the listing process in 2019 but was sued by a consortium of California's large scale industrial agricultural interests shortly after its decision. Most recently, a court ruling has allowed the potential listing of *B. crotchii* to move forward (California Courts, 3rd Appellate District, 2022). Even if *B. crotchii* is not listed, CEQA independently requires an agency to identify potential impacts to the environment from the project. (CCR title 14, section 15002)*

Additionally, since at this time the bumble bee is not listed but may become listed by the time the spring survey period begins, it would be in the best interest of the applicant to move forward and conduct surveys on the chance that if the species becomes listed this would prevent any additional delays of the application and possible approval of the project.

Considering this development, and the imperiled nature of the species and its regional importance as a pollinator species, staff, in consultation with CDFW, considers surveys for this species to be necessary. While there are currently no official survey protocols for this species, the active season for Crotch's bumblebee queens is February 1–October 31 (page 17, CDFW 2019). Based on staff's literature search and coordination, to achieve the highest detection probability, focused bee surveys should be conducted between March 1 and June 30.

If this species regains Candidate status or becomes listed, survey protocols may change.

4.10.1 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: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

4.10.2 Data Request DR49

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

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

4.11 Data Request DR50 through DR51

BACKGROUND: RAVEN MANAGEMENT PLAN

While desert tortoise surveys did not find desert tortoise or much sign, the project is within the range of desert tortoise. The AFC (TN 240788, TN 240768, DA 5.2-1 and DA 5.2-6) did not discuss the increased risk of raven predation on juvenile desert tortoise. In addition, the project will have several bodies of water which include a large reservoir, temporary settlement ponds, and water collection ponds. In the desert where water is scarce, these bodies of water become an attractant to wildlife including common raven (a nuisance predator).

4.11.1 Data Request DR50

DR50: Please provide a Draft Raven Management Plan (Plan) for review that identifies where the plan applies, a list of raven management measures that will be implemented at the project and plans to incorporate a basic summary of activities associated with raven management. The focus of the Plan should be on the measures that a project would implement to eliminate raven access to food/water resources, reduce perching and nesting opportunities, and contacting the United States Fish and Wildlife Service (USFWS) in the event that a raven nest is identified at the project. The plan should be brief and concise (1-2 pages) and does not need to include extensive project background information.

Response: Please see Attachment DR50-1 for a draft of the Raven Management Plan for the Project.

4.11.2 Data Request DR51

DR51: *The Plan should include discussion of the following:*

- *A basic summary of activities associated with raven management should be incorporated into any annual environmental compliance reports submitted to CEC and USFWS.*
- *Recommended raven management measures include implementation during all phases of the project (construction, operations, and decommissioning) of standard methods to eliminate/minimize raven food, water subsidies, and active raven nests.*
- *Dispose of all potential sources of food and nesting materials for ravens (human food waste, trash, roadkill) in trash cans or dumpsters that are regularly maintained and are kept closed with secured (i.e., latched) lids/coverings.*

- *Cover, bury, or remove any roadkill or other dead wildlife at the project.*
- *Water should be transported and kept in watertight containers that are maintained regularly to prevent leaks.*
- *If using water for dust abatement minimize use to prevent ponding/standing water.*
- *Any active raven nests should be reported to the USFWS Common Raven Program Manager (Kerry Holcomb: Kerry_Holcomb@fws.gov). Information on raven nests conveyed to the USFWS should include at a minimum the location of the nest and time of initial nest observation. The USFWS will communicate with the project owner about access for dealing with active nests.*
- *The USFWS encourages project owners to remove inactive raven nests and raven nests prior to egg-laying to prevent future nesting by ravens.*
- *The USFWS recommends modifying structures when feasible to prevent raven nesting, i.e., nest and perch deterrents, designing structures to eliminate surfaces large enough for raven nest building, etc.*
- *Information on raven management and the above measures should be incorporated into a Worker Environmental Awareness Program (WEAP).*
- *Payment to the regional raven management and monitoring program. This is a one-time fee. The current cost is (\$105) per acre of total project disturbance. Questions on this payment can be directed to the USFWS's Common Raven Program Manager (see above).*

Response: Please see Attachment DR50-1 for a draft of the Raven Management Plan for the Project.

4.12 Data Requests DR52 through DR56

BACKGROUND: SWAINSON'S HAWK

The Biological Technical Report (DA 5.2-1 TN 242779) discusses the Swainson's hawk (SWHA) survey conducted for the project. Jaime Marquez (CDFW) was consulted prior to conducting the survey. However, the survey deviated from the CDFW protocol (only 2 surveys during Period II rather than 3) and there is no mention of whether CDFW was consulted on this deviation. Also, the survey on April 6, 2021, was only conducted in the morning (not all day). While this may meet survey criteria, it is not conducive to detecting nest building activity. Also, if the survey area includes approximately 14,495 acres as the Focused Swainson's Hawk Survey Report indicates, the area surveyed each day should be provided. The final survey day for Period III was only 30 minutes with surveyors who had not surveyed this project previously.

Survey protocol for SWHA (CEC and CDFG 2010; page 4) requires a 5-mile survey radius. Figure 2 of DA 5.2-1 Biological Technical Report only shows SWHA surveys within the survey area and 0.25-mile around a known nest location both of which are less than the 5-mile survey radius required. Page 4 of the CEC and CDFG 2010 guidance states that "Surveys should be repeated within the 5-mile radius if a survey season ensues or elapses before the onset of project related activities." And further (page 5) "To meet the minimum level of protection for the species, surveys should be completed for at least the two survey periods immediately prior to a project's initiation." The proposed mitigation measure states only that a Swainson's hawk monitoring plan shall be developed. It is important to provide any mitigation measures to CDFW and CEC for review so the measures can be addressed, if needed, in staff's analysis and the details included as a condition of certification.

4.12.1 Data Request DR52

DR52: *Please provide a map of the 5-mile survey radius for Swainson's hawk nest trees. as per CEC and CDFG 2010 page (4) "All potential nest trees within the five-mile radius shall be surveyed for presence of nests. Surveys should be conducted prior to environmental analysis. Surveys should be repeated within the 5-mile radius if a survey season ensues or elapses before the onset of project related activities." As the survey season starts in January, new surveys in 2023 would be required to provide CEC staff with appropriate baseline information, including location and density of this species.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. New surveys in 2023 are proposed for Swainson's Hawk that will follow applicable protocols.

4.12.2 Data Request DR53

DR53: *Please provide a Draft Swainson's Hawk Monitoring Plan that incorporates agency guidelines and specifically references timing of preconstruction surveys for review, comment, and revision.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request.

4.12.3 Data Request DR54

DR54: *Please provide the area surveyed for each day.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request.

4.12.4 Data Request DR55

DR55: *Please provide a discussion to indicate whether the project would impact SWHA foraging habitat and document positive occurrences on maps, suitable habitat, and any other parameters as dictated by the CEC and CDFG 2010 protocol.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request.

4.12.5 Data Request DR56

DR56: *Please submit CNDDDB field forms to CDFW for any positive occurrences.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request. All positive occurrences observed of all observed species were documented on CNDDDB field forms and submitted to CDFW on October 6, 2021. Any future surveys conducted that include positive occurrences will be documented on CNDDDB field forms and also submitted to CDFW.

4.13 Data Requests DR57 through DR59

BACKGROUND: BURROWING OWL

Focused surveys for burrowing owl (BUOW) were conducted following the CDFW 2012 Staff Report on Burrowing Owl Mitigation (Biological Resources section TN 240788, Biological Technical Report DA 5.2-1 TN 242799). CDFW also recommends using the California Burrowing Owl Consortium's (CBOC) 1993 Burrowing Owl Survey Protocol and Mitigation Guidelines along with the CDFW 2012 document when conducting surveys.

The 1993 protocol requires pedestrian survey transects with a distance between transect center line that are no more than 30 meters. Less if there is a lot of vegetation that obscures surveyor's view. The Biological Technical Report and the Biological Resources section do not mention anything about transects. In addition, since only one adult owl was found during surveys and was not associated with a burrow this is considered a negative finding. New burrows can be created at any time and if only the currently known burrows are mapped, some burrows may be missed. Therefore, new surveys would need to be conducted.

4.13.1 Data Request 57

DR57: *Please provide a discussion of the methodology for conducting BUOW surveys and whether pedestrian survey transects were used. If they were not used, please explain why.*

Response: The 2021 Focused Burrowing Owl Report was included in Attachment B to the Blackhawk Biotech report submitted as Attachment DA2-1 (TN 242779) to the Applicant's Data Adequacy Supplement #1 filed April 25, 2022. As stated in Section 3 (pg. 135 of TN 242779), methods included pedestrian survey transects between 10 and 30 meters apart as follows: "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."

4.13.2 Data Request 58

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

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request.

4.13.3 Data Request 59

DR59: *Please submit CNDDDB field forms to CDFW for any positive occurrences.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request. All positive occurrences observed of all observed species were documented on CNDDDB field forms and submitted to CDFW on October 6, 2021. Any future surveys conducted that include positive occurrences will be documented on CNDDDB field forms and also submitted to CDFW.

4.14 Data Requests DR60 through DR63

BACKGROUND: Special Status Plant Species

The AFC (DA 5.2-1 TN 242779, TN 240788) mentions rare plant surveys methods followed: 1) Protocols for Surveying and Evaluating Impacts to Special-status Native Plant Populations and Natural Communities (CDFW 2009), 2) Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants (USFWS 1996), and 3) General Rare Plant Survey Guidelines (Cypher 2002). There is an updated CDFW 2018 protocol that should have been used instead of the 2009 version. In addition, there is no mention of whether reference sites for all the plants that could occur within the project vicinity were used. Part of the protocol requires identification of reference populations to facilitate the likelihood of field investigations occurring during the appropriate floristic period. Also, if rainfall in this area was below normal or differed in timing, the plants may not have bloomed at all or during the “typical bloom period”.

Based on the fact of local documented occurrences as well as the severity of California’s long-standing and ongoing drought—which has the effect of suppressing growth and bloom—plants may well persist in the seedbank and therefore could emerge. The “mega-drought” that California is experiencing, is tracked by the U.S. Drought Monitor (U.S. Drought Monitor 2022). Kern County is currently rated as experiencing “extreme” to “exceptional” drought. That is why reference populations are used, to know if the plant is in bloom when surveys are conducted, or if these results should be considered conclusive. Alkali mariposa-lily and Horn’s milk vetch occur in the project area (AVEP Solar 2019, Appendix E-1 Biological Technical Report) and require further investigation and description. Additionally, “inaccessible areas”, that could only be viewed by binoculars, need to be further defined and mapped. Biologists who specialize in botany and have experience with the flora of the area should be used.

4.14.1 Data Request 60

DR60: *Please conduct special status plant surveys following the Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018).*

Response: Please see Applicant’s Notice Pursuant to 20 CCR § 1716(f) Regarding Staff’s Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. Special status plant surveys following the applicable protocols will be conducted in 2023.

4.14.2 Data Request 61

DR61: *Please provide a report that includes a map of any special status plant species found and details of the methodology, resumes of biologist(s), and discussion of reference populations.*

Response: Please see Applicant’s Notice Pursuant to 20 CCR § 1716(f) Regarding Staff’s Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. A report including results and maps of any special status species will be provided to the CEC following the 2023 survey.

4.14.3 Data Request 62

DR62: *Please submit CNDDDB field forms to CDFW for any positive occurrences.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request.

4.14.4 Data Request 63

DR63: *Please explain what is meant by "inaccessible areas". If these areas were not accessible by foot, conduct special status plant surveys for these areas when access becomes available.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. Inaccessible areas are areas that cannot be accessed by the Applicant. These areas are owned by private owners and have not given written permission to allow access for surveys. Refer to Attachment DR63-1 for a map of all inaccessible areas for all surveys conducted in 2021. Data in inaccessible areas were either not collected or only collected from visual/binocular methods.

CONFIDENTIAL ATTACHMENT DR9-1

SURVEY DATA

CONFIDENTIAL ATTACHMENT DR31-1

DESERT TORTOISE ACCESS NOT GRANTED

CONFIDENTIAL ATTACHMENT DR36-1

BURROW AND DEN CHARACTERISTICS

ATTACHMENT DR50-1

DRAFT RAVEN MANAGEMENT PLAN



REPORT

DRAFT Raven Management Plan
Willow Rock Energy Storage Center (WRESC)

Submitted to:

California Energy Commission

Submitted by:

Golder Associates Inc.

1000 Enterprise Way, Suite 190, Roseville, California, USA 95678

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August 25, 2022

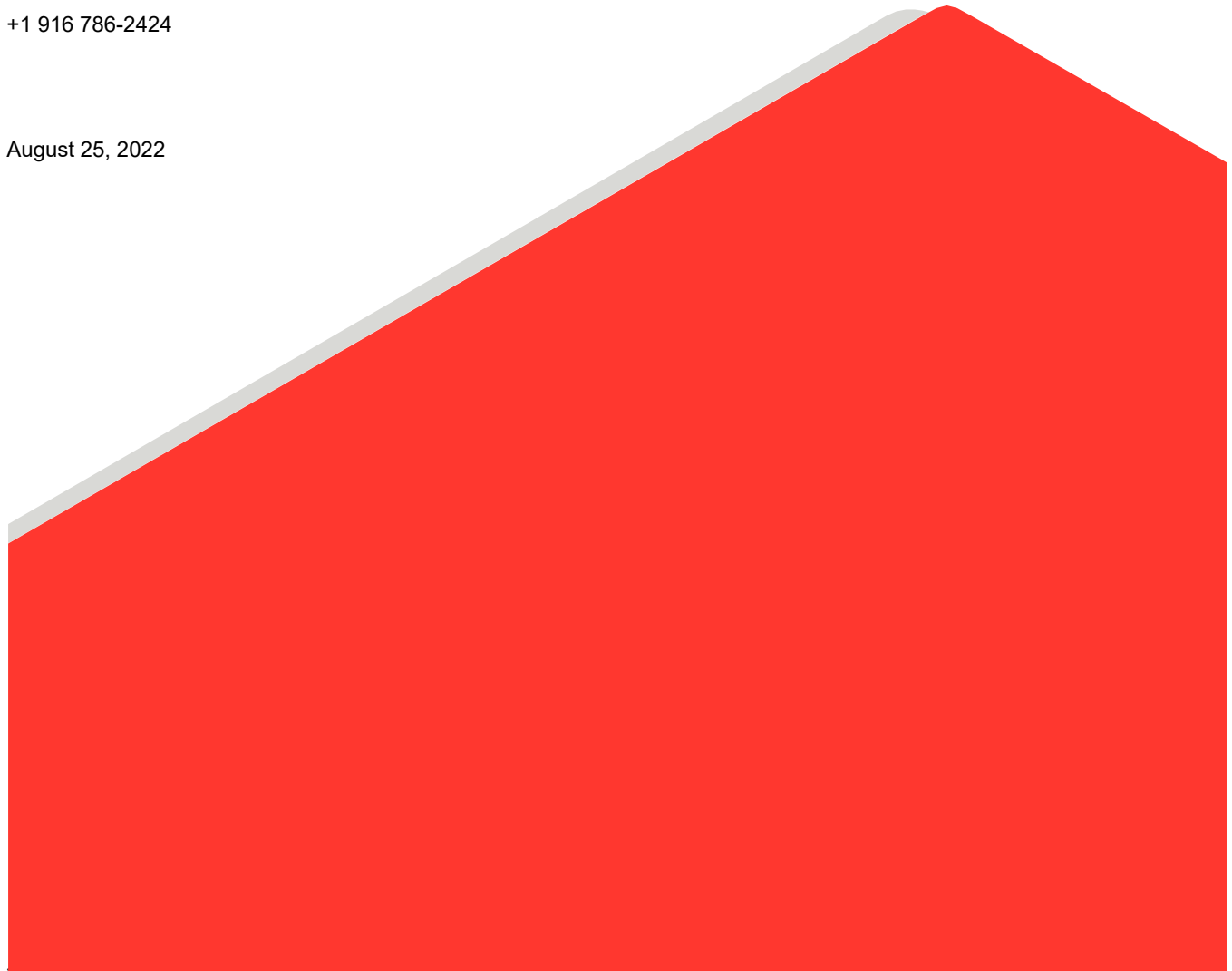


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1.0 INTRODUCTION

In 2021, GEM A-CAES LLC. (Applicant) submitted an Application for Certification (AFC) to the California Energy Commission (CEC) to construct, own, and operate a 500-megawatt (MW) Advanced Compressed Air Energy Storage (A-CAES) facility, in Kern County, California. In addition to the Willow Rock Energy Storage Center (WRESC), the Project will include a 10.9-mile interconnection to the Southern California Edison (SCE) Whirlwind Substation.

This Raven Management Plan (RMP), contained herein, was prepared in response to CEC Staff Data Requests Set 1, Data Request Nos. 50 and 51. The objective of this Raven Management Plan is to reduce potential direct and cumulative effects of raven predation on desert tortoise and other native wildlife species with respect to the Project Area. The intent of this RMP is that it will serve as a working draft that both the CEC and the U.S. Fish and Wildlife Service (FWS) can comment prior to its finalization. Prior to construction, a final RMP will be incorporate agency comments and be submitted to the CEC and FWS for approval.

1.1 Lead and Consulting Agencies

The Lead Agencies for the RMP are the CEC and the Common Raven Program lead by FWS. Consulting agencies are public agencies, other than the lead agencies, that may provide guidance or information needed to satisfy the requirements of the measures contained in this Plan. If the CEC deems necessary, the RMP will be distributed to consulting agencies for review. Consulting agencies identified for the project are the California Department of Fish and Wildlife (CDFW), and Kern County Natural Resources Department.

The Applicant will correspond with the Common Raven Program to identify regional raven management and monitoring program requirements. When deemed necessary by the CEC, the Applicant will make the appropriate payment to the regional raven management and monitoring program.

1.2 Location

The proposed project will be located on an approximately 71-acre project site consisting of two adjacent parcels in unincorporated Kern County (County), approximately 1 mile northeast of the community of Willow Springs and 7 miles west of Rosamond, California 93560. The site is bounded on the north by Sweetser Road and on the west by Tehachapi Willow Springs Rd (90th Street West). The project site is located about 0.25-mile northwest of Willow Springs Butte.

1.3 Raven and Raven Biology

Ravens belong to the family Corvidae (corvids) and includes crows, ravens, jays, magpies and nutcrackers. Corvids composed of over 100 species and often play key roles in biotic communities. Corvids are omnivorous and have been observed to employ effective strategies for foraging including predation, particularly on nests and young, scavenging. Ravens are opportunistic feeders that have been observed to use anthropogenic sources of water and food (Boarman 2003). Ravens are highlight adaptable to a wide range of foods and habitats and have been observed to respond positively to human-altered habitats. A result of their ability to adapt in Western Northern America, populations of corvids have dramatically increased.

In California, ravens are known to be important predators on the eggs and young of several threatened and endangered species. Particularly, in the Mojave Desert and within the general vicinity of the Project Area, ravens are known to be important predators on the Desert tortoise (*Gopherus agassizii*), a threatened species protected by the Endangered Species Act (Liebezeit and George 2002).

2.0 RAVEN MANAGEMENT

The goal of this draft RMP is to outline non-lethal measures that the Project would implement to limit predation on desert tortoise within the vicinity of the Project during the facility's construction and operation phases. Raven management measures outlined in **Table 1** are based on guidance from Alternative A of the USFWS Draft Environmental Assessment to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise (USFWS 2008).

Table 1: Raven Management Measures

Raven Management Measure	Description	Timing
Reduce Access to Anthropogenic Food and Water Sources	<p>Multiple measures can be incorporated to reduce access to anthropogenic food and water sources and can include:</p> <ul style="list-style-type: none"> ▪ Trash Management. During construction, the project area will be kept clutter free. All debris and trash related to construction will be, to the extent feasible, promptly placed in trash bins with lids to prevent access from ravens or other opportunistic scavengers. All trash accumulated will be regularly disposed from the Site to prevent accumulation that could produce excess odors. A Worker Environmental Awareness Program will be developed and will include instruction to avoid feeding any scavengers, including ravens. As discussed in Section 5.14 Waste Management of the AFC, waste generated from operations will be managed onsite and will be disposed in self-closing and/or locked bins. ▪ Facility Security and Fencing. Qualified biological staff will conduct pre-construction surveys to identify biological exclusion zones and place desert tortoise exclusion fencing. During operation, the project site boundaries will be fenced to minimize site entry from scavengers that can expose trash to ravens. Entrance onto the facility will be monitored to prevent personnel and animals to entering the site. ▪ Reduce water availability. During construction, water will be used for drilling and dust suppression. All water will be stored in closed containers or totes and maintained regularly to prevent leaks. To the extent feasible, the minimum amount of water to meet safety and air quality standards for dust suppression will be used. These practices should reduce the amount of puddling. The project components include a above ground reservoir and stormwater retention pond. The surface reservoir and stormwater retention pond will include a floating cover to prevent access from ravens. 	Construction and Operation
Nest Management	<ul style="list-style-type: none"> ▪ Identifying and Removing Raven nests during non-breeding seasons. Preconstruction surveys and construction monitoring will locate all active and inactive nest locations throughout the construction phase of the project. Common raven nest and raptor surveys will be conducted with qualified biologist staff that have expertise in identifying raven and desert tortoise remains. In the event that common raven nest or rapture nest it identified a buffer, as determined by USFWS, will be additionally surveyed to identify potential desert tortoise remains. Potential measures, such as removal of raven nests in off-breeding seasons, may be required and will be determined in consultation with USFWS. In addition, survey methods and buffer radius for raven and rapture surveys will be established in consultation with USFWS and any other applicable associated agency if required. Any active raven nests should be reported to the USFWS Common Raven Program Manager. Information on raven nests conveyed to the 	Pre-construction and construction

Raven Management Measure	Description	Timing
	<p>USFWS should include at a minimum the location of the nest and time of initial nest observation. The USFWS will communicate with the project owner about access for dealing with active nests.</p> <ul style="list-style-type: none"> ▪ Utility Structures. Anthropogenic structures and gen-tie lines offer raven nesting opportunities. The proposed project involves installation of gen-tie lines on utility poles. Where feasible, the proposed project will utilize nest discouragers according to Avian Power Line Interaction Committee (APLIC) guidelines that limit establishment of raven nests (APLIC and USFWS 2005) 	
Dead Animals	<ul style="list-style-type: none"> ▪ Each day that a biological monitoring is present on site, a search for prey remains and dead carcasses on Site or in nearby areas. A dead carcass observation that is large enough to support several opportunistic feeders or ravens will be reported to local animal control agency within 24 hours to minimize raven presence. Dead animals of special-status species, including the desert tortoise, will be notified to USFWS within 24-hours via phone or email. 	Pre-construction and construction
Establish a Worker Environmental Awareness Program (WEAP)	<ul style="list-style-type: none"> ▪ Worker Environmental Awareness Program will be developed to include raven management measured identified herein. 	Pre-construction and construction
Raven Monitoring and Compliance	<ul style="list-style-type: none"> ▪ Compliance reports will be submitted to the CEC and USFWS. 	

3.0 CLOSING

This Plan will be implemented following approval or concurrence by the CEC and FWS. Minor amendments or clarifications to the RMP will be implemented following receipt of email concurrence from consulting agency staff. Major amendments to this plan that may result from changes in applicable regulations, which alter the procedures outlined in this plan, will be submitted to the CEC and FWS and for concurrence prior to implementation.

4.0 REFERENCES

Avian Power Line Interaction Committee (APLIC) and US Fish and Wildlife Service (USFWS). 2005. Avian Protection Plan Guidelines

Boarman, W. I. 2002. Reducing Predation by Common Ravens on Desert Tortoises in the Mojave and Colorado Deserts. Prepared for the U. S. Bureau of Land Management. U. S. Geological Survey Western Ecological Research Center. San Diego, California.

Liebezeit, J. R. and T. L. George. 2002. A Summary of Predation by Corvids on Threatened and Endangered Species in California and Management Recommendations to Reduce Corvid Predation. Calif. Dept. Fish and Game, Species Conservation and Recovery Program Report 2002-02, Sacramento, CA. 103 pages




U.S. Fish and Wildlife Service, U.S. Department of Agriculture, U.S. Department of Defense, Bureau of Interior. 2008. Environmental Assessment to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise. Ventura Fish and Wildlife Office. Ventura, California

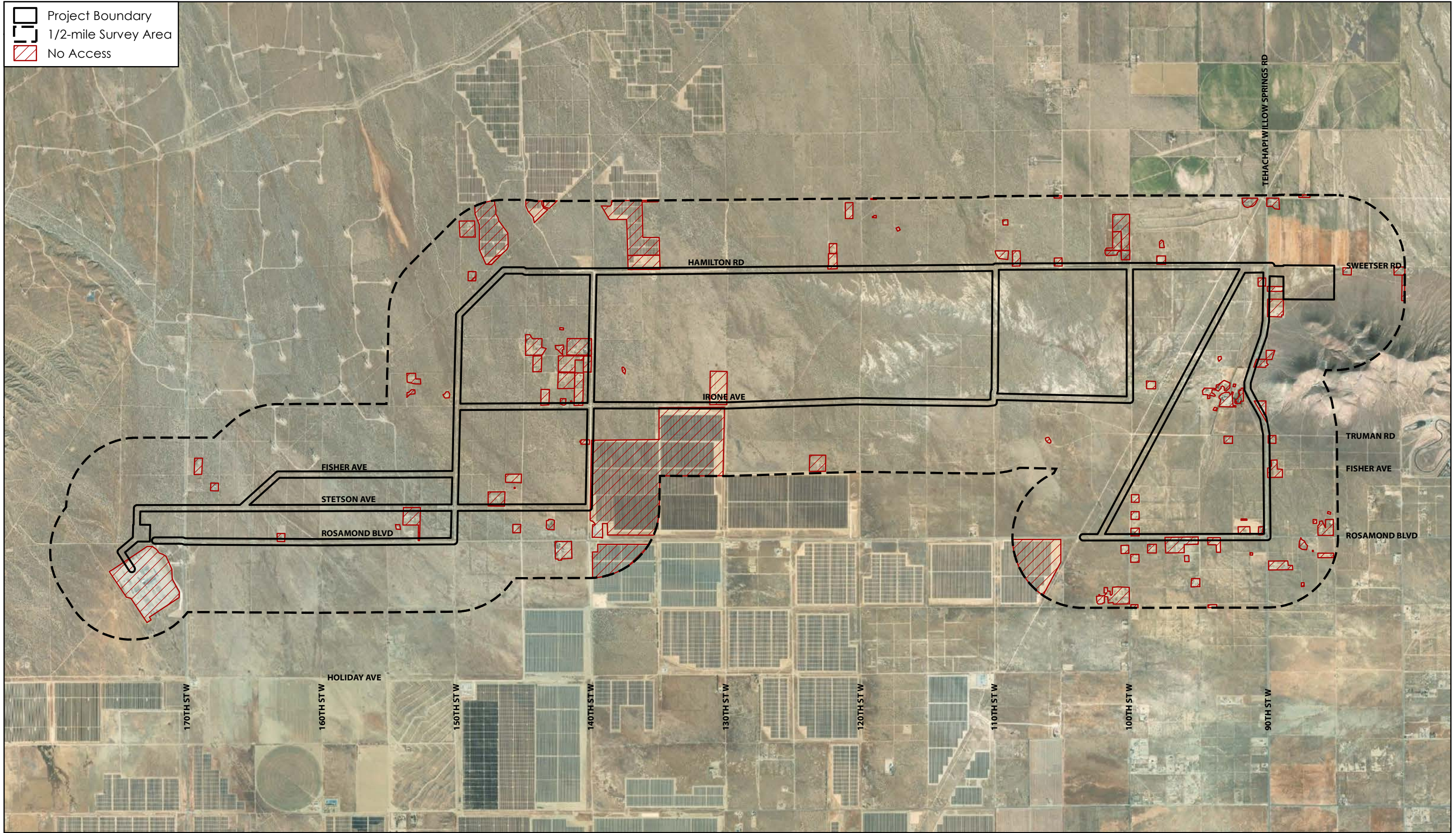


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ATTACHMENT DR63-1

MAP OF ALL INACCESSIBLE AREAS FOR ALL SURVEYS CONDUCTED IN 2021

-  Project Boundary
-  1/2-mile Survey Area
-  No Access



Aerial Photo: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community 2020



Inaccessible areas

Hydrostor Gem Energy Storage Center Project

5.0 GEOLOGICAL HAZARDS AND RESOURCES

5.1 Data Requests DR64 through DR65

BACKGROUND: EXCAVATED ROCK RECYCLE AND REUSE

Section 2.0 Project Description of the AFC (subsection 2.1.16.2) describes how the construction of the underground compressed air storage cavern has an equivalent volume of excavated material of approximately 1.1 million cubic yards and the excavation waste would generally include soil and rock. Based on preliminary design assumptions, a majority of the cavern waste rock would be hauled off-site to a quarry approximately 5 miles to the north of the site. A preference would be given to using rock onsite, with the anticipation that up to 50 percent of rock would be used onsite.

Section 6.0 Alternatives (subsection 6.4.3) states that the waste rock is expected to be of aggregate quality. As a result, the project would attempt to recycle excavated material for site grading and construction of the earthen berms for the surface compensation reservoir.

5.1.1 Data Request DR64

DR64: *If the geotechnical properties of excavated soil and rock is not suitable to supply all the required material types needed for site grading and embankment construction, what alternative sources of materials have been identified and/or evaluated?*

Response: The Applicant expects the onsite excavated soil and rock to be suitable. No alternative sources of material are expected to be needed at this time and none have been identified.

5.1.2 Data Request DR65

BACKGROUND

Section 5.4 Geological Hazards and Resources of the AFC (subsection 5.4.1.1.1) presents information on Faulting and Seismicity as based on the California Geologic Survey (CGS) Fault Activity Map of California web application. Subsection 5.4.1.4.1 presents information on Ground Rupture as based on the CGS Seismic Hazards Program, Alquist-Priolo Fault Hazard Zone web application. While no Alquist-Priolo Earthquake Fault Zones are mapped in the vicinity of the project, the Willow Springs fault is identified as approximately 4,000 feet west of the site, and trends west-southwest with one segment projected towards the general vicinity of the project site. The CGS Fault Activity Map of California cites the U.S. Department of the Interior Geological Survey, Geologic Map and Sections of the Willow Springs and Rosemond Quadrangles, California, Bulletin 1089-C, prepare by T. W. Dibblee, 1963 (Dibblee 1963) as the source of the mapping, however, the detail provided on web application appears to be reduced.

The 1963 Bulletin (Dibblee 1963) describes the type locality of the Gem formation mapped southeast of the project site at the Willow Springs Butte and states "It is not certain that this section gives the true thickness of the Gem Hill formation; there are several minor faults and parts of the formation may be repeated." This could indicate that there are other unmapped faults in the project vicinity.

The geologic mapping provided on the figures in the AFC appear to all be derived from on the 1963 Bulletin (Dibblee 1963), yet the figures present varying levels of detail. As such, the locations of mapped faults and geologic contacts as well as descriptions of the mapped geologic units do not appear consistent. A brief review of the United States Geological Survey U.S. Quaternary Faults web application and the California

Department of Conservation, California Geologic Survey Fault Activity Map of California web application suggests that there has been subsequent interpretations of the Willow Springs and adjacent faults and that subsection 5.4.1.1.1 of the AFC may need to be updated to reflect these interpretations.

5.1.3 Data Request DR65

DR65: *Please confirm the 1963 Bulletin (Dibblee 1963) is the original source of the all the data you are including in your figures. If more current or alternative data is available, please clarify and provide it.*

Response: Please see the response to DR67.

5.2 Data Requests DR66 through DR68

BACKGROUND

AFC Figure 5.4.2, Geologic Map, cites the source as <http://maps.conservation.ca.gov>, which cites the compilation and interpretation by Charles W. Jennings, 1977. T. W. Dibblee is cited as a contributor to the 1977 compilation. Figure 5.4.6 cites the 1963 Bulletin (Dibblee 1963). The level of detail and descriptions of the geologic units provided on the two figures do not fully agree. The text in section 5.4.1.2 is based on the Jennings, 1977 mapping, and as a result does not provide the most detailed description of the mapped units as the site.

5.2.1 Data Request DR66

DR66: *Please provide the most accurate and consistent geologic mapping and descriptions of the mapped units at and in the vicinity of the project site.*

Response: Figure 5.4.2 was sourced from the California Geological Survey, which is a credible and widely accepted source for performing desktop geologic studies. Figure 5.4.2 was presented in the AFC and used to develop a baseline understanding of the general geologic conditions at and in the vicinity of the project site. Figure 5.4.6 was presented in response to Information Request #20 of the California Energy Commission (CEC) Staff's December 30, 2021, data adequacy recommendation. Specifically, Figure 5.4.6 was presented as a basis to describe the expected stratigraphic units within the vicinity of the site. There are minor differences in the geologic interpretation presented in Figure 5.4.2 (Jennings 1977) and Figure 5.4.6 (Dibblee 1963), but the two maps generally agree in the sense that the vicinity of the site is mostly quaternary aged alluvium with occurrences of tertiary aged rock (e.g., sandstone, tuff, tuff-breccia, and tuffaceous sandstone). The stratigraphic units presented in Figure 5.4.2 per Dibblee (1963) will be confirmed by a site-specific geotechnical investigation prior to detailed design, construction, and operation of the proposed facility.

5.2.2 Data Request DR67

DR67: *While the CEC staff finds the fault map and geologic map submitted for the license application to meet the minimum level of detail required, they may not be of sufficient detail, accuracy, or precision to be solely relied on for final project design. Please provide any new geologic or geologic hazards maps and site reconnaissance mapping performed for the project which you plan to incorporate into the final design.*

Response: The Applicant is in the process of completing a 9-month geotechnical examination of the site. The Applicant anticipates that site-specific geotechnical information will be available in 4Q22. Information incorporated into the design will be provided to the CEC staff.

5.2.3 Data Request DR68

DR68: *Please provide copies of all substantive geotechnical and geological information collected during the subsurface exploration program as well as the results of analyses and laboratory testing performed on the collected data and/or soil and rock samples. This is a continuing request, requiring ongoing submission of relevant information. Please provide no more than 30 days from the date it is created or received. A weekly records delivery to staff is requested. This request is in effect until staff publishes the final staff assessment.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request.

5.3 Data Requests DR69 through DR70

BACKGROUND

AFC Section 5.4 Geological Hazards and Resources (subsection 5.4.1.4.2) discusses seismic shaking and preliminary seismic ground acceleration for the site. The section also states, "advancement of the project is contingent on sound bedrock that is seismically stable at the depth of the underground cavern."

5.3.1 Data Request DR69

DR69: *How is "sound bedrock" defined for the purpose of this project?*

Response: Sound bedrock is defined as a geology that is suitable for economic cavern development. Please see the table below in response to DR70 which outlines the characteristics required to develop a cavern.

5.3.2 Data Request DR70

DR70: *What geologic conditions would constitute "ideal" conditions, "minimum acceptable" conditions, and what would constitute "unacceptable" conditions that would force you to find another site?*

Response: Please see the table below which overviews the ideal, minimum acceptable, and unacceptable conditions for economic cavern development.

ATTACHMENT DR70-1

IDEAL, MINIMUM ACCEPTABLE AND UNACCEPTABLE CONDITIONS FOR CAVERN DEVELOPMENT

Attachment DR70-1: Ideal, Minimum acceptable and unacceptable conditions for cavern development

Cavern Properties	Ideal	Minimum Acceptable	Unacceptable	Notes
Cavern Host Geology Properties	<ul style="list-style-type: none"> High Rock Quality Designation (RQD) Low in-situ stress Durable in the presence of water 	<ul style="list-style-type: none"> Moderate RQD Moderate in-situ stress Durable in the presence of water 	<ul style="list-style-type: none"> Low RQD Very high in-situ stress Not durable in the presence of water 	Durability against water is a go/no-go rock criteria. A combination of the overall rock strength (measured by RQD) and in-situ stress will be assessed to determine what cavern opening can be supported in the host geology. Rock will be unacceptable if both strength is low, and stresses are high
Cavern Host geology depth	<ul style="list-style-type: none"> 1,800 – 2,100 feet 	<ul style="list-style-type: none"> 1,300 – 1,800 feet or 2,100 feet to 2,500 feet 	<ul style="list-style-type: none"> <1,300 or > 2,500 feet 	Targeting a cavern construction depth of 1,800 feet to 2,100 feet for optimal construction costs. Shallower or deeper depths can be accommodated to a certain extent to an increased cost to deliver
Cavern host geology permeability	<ul style="list-style-type: none"> Low intrinsic permeability and low levels of fracturing (overall permeability <10⁻⁷ m/s) 	<ul style="list-style-type: none"> Low intrinsic permeability and moderate to high levels of fracturing (fracturing managed with grouting during construction to achieve overall permeability of 10⁻⁵ m/s) 	<ul style="list-style-type: none"> High intrinsic permeability and/or very high levels of fracturing (intrinsic permeability <10⁻⁵ m/s or fracturing so great that it can not be managed with grouting) 	It is important for the rock to have a low intrinsic permeability (natural permeability of the rock if unfractured). Permeability resulting from fracture can be managed with grouting during construction, while intrinsic permeability can not.
Overburden quality and thickness	<ul style="list-style-type: none"> Highly consolidated and competent overburden (bedrock at surface) 	<ul style="list-style-type: none"> Moderately consolidated or 	<ul style="list-style-type: none"> Very thick (>500 feet) of unconsolidated overburden 	Overburden is defined as the surficial earth/geology that overlays the bedrock on site. Low overburden thickness (<100

Cavern Properties	Ideal	Minimum Acceptable	Unacceptable	Notes
		loosely consolidated overburden <ul style="list-style-type: none"> Moderate overburden thickness (100 feet – 500 feet) 		feet) is ideal and will lead to the lowest draft delivery cost for cavern access. The quality of the overburden can be managed economically. Unconsolidated and high permeable overburdens will require pre-grouting before shaft drilling adding to cost and schedule.
Natural Hydrostatic Head and Recharge	<ul style="list-style-type: none"> Ample hydrostatic head and recharge 	<ul style="list-style-type: none"> Moderate to no hydrostatic head and recharge 	<ul style="list-style-type: none"> N/A 	Natural hydrostatic head and recharge aid in the sealing of the cavern against air leakage. This is secondary assessment criteria and is unlikely to be the primary cause of ruling out a site.
Faulting and Seismic Activity	<ul style="list-style-type: none"> No faulting or seismic activity in the area of interest 	<ul style="list-style-type: none"> Inactive faults present in the cavern and shaft construction zone 	<ul style="list-style-type: none"> Active faults present in cavern and shaft construction zone 	Inactive faults are not a big concern for cavern development and can be managed through grouting and/or ground support as required. Active faults in the cavern or shaft construction zone would pose an unacceptable risk for development.

RQD = Rock Quality Data; N/A = Not Available.

5.4 Data Requests DR71 through DR72

BACKGROUND

AFC Section 5.4 Geological Hazards and Resources (subsection 5.4.1.4.3) discusses liquefaction hazards for the project and concludes only surface structures would be affected. Damage to the casing/lining of the deep shafts that access the underground cavern could result in loss of the confinement of the overlying aquifers and the surface reservoir.

5.4.1 Data Request DR71

DR71: *Have the effects of liquefaction on the deep vertical shafts been considered or performed? What analyses would be appropriate to analyze liquefaction at the locations of the deep shafts and what would be the resulting effects on their casing/lining?*

Response:

Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

5.4.2 Data Request DR72

BACKGROUND

AFC Section 5.4 Geological Hazards and Resources (subsection 5.4.1.4.8) discusses slope stability of permanent slopes and embankments and identifies the embankment dam for the hydrostatic compensation reservoir as a slope that would require slope stability analyses.

DR72: *In addition to static, pseudo-static (seismic), seepage, and rapid drawdown conditions, would slope stability for concurrent pseudo-static (seismic) and rapid drawdown conditions be analyzed? Please provide the results of the analyses.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

5.5 Data Requests DR73 through DR75

BACKGROUND

AFC Section 5.4 Geological Hazards and Resources (subsections 5.4.1.4.10.1 and -10.2) discuss induced seismicity due to reservoir and compressed air cycling. You report, this is not anticipated to be problematic due to the relatively low height of water in the reservoir (less than 50 feet deep) and moderate compressed air pressures involved (1,000 psi or less). The cyclic nature of pressurizing and depressurizing the compressed air cavern and hydrostatic compensation reservoir would, correspondingly, cycle the state of stress in the underlying and surrounding rock formations. These changes could be sensitive to and potentially reactivate existing fractures, shear zones, or joints in the rock mass.

5.5.1 Data Request DR73

DR73: *How will the in-situ stress regime be determined during the geotechnical investigation?*

Response: In-situ stress in the bedrock will be assessed during the borehole program through an overcoring test called Siga. Siga³ measures in-situ rock stress primarily by the use of an overcoring device which operates in conjunction with the HQ wireline coring borehole drilling and permits stresses to be measured at up to 6,500 feet depth. The tool is a re-usable device which returns high-quality two-dimensional stress information quickly.

5.5.2 Data Request DR74

DR74: *How will changes in the stress regime be analyzed during the geotechnical design?*

Response: Please see the response to DR73 above.

5.5.3 Data Request DR75

DR75: *Has the applicant evaluated any underground storage facilities of comparable size and geology that have undergone a similar cyclic pressurization/depressurization scenarios? If yes, please describe their performance and any issues encountered, especially in terms of rock fatigue due to cyclic stress.*

Response: Due to the very small change to the hydrostatic pressure, the expected cyclic pressure magnitudes are expected to be very small, less than 1.5% of the primary operating pressure; this is significantly less than in many stable hardrock hydrocarbon storage caverns.

Approximately 85 hardrock hydrocarbon storage caverns have been constructed in the U.S. since 1950. The average age of U.S. hard rock storage caverns is 50+ years, and the newest was completed in 2016. Approximately 60 caverns remain in active service in the U.S. at the end of 2016, with a combined capacity of about 3,750,000 cubic yards. Approximately 60 conventionally mined storage caverns have been constructed outside the U.S. during the last 30 years. Caverns have been developed in Europe, China, India, Japan, Korea, Taiwan, Australia, and most recently in Singapore.

³ Siga. 2022. In-situ Stress Testing (IST) by Overcoring. Accessible by: <https://siga.com.au/services-2/geomechanics/stress-measurement/in-situ-testing/>. Accessed August 2022.

6.0 LAND USE

6.1 Data Requests DR76 through DR77

BACKGROUND: KERN COUNTY COMMENTS REGARDING REZONES AND CONDITIONAL USE PERMIT

On May 19, 2022, the Kern County Planning and Natural Resources Department submitted comments on the Gem Energy Storage Center application for certification (TN 243152). Comment 1 pertains to Land Use:

1. The proposed 71-acre project site, as described in the AFC submitted to the California Energy Commission (CEC) on December 1, 2021, is located on two adjacent parcels: an approximate 10-acre parcel identified as Assessor's Parcel Number (APN) 315-081-01 and an approximate 61-acre parcel identified as APN 315-081-09. An additional approximate 40-acre parcel north of the project area, APN 315-011-18, is proposed to be used as a temporary construction laydown yard and parking. These parcels are classified as E (2 ½) RS (Estate 2 ½ Acres, Residential Suburban Combining) and E (2 ½) RS FPS (Estate 2 ½ Acres, Residential Suburban Combining, Floodplain Secondary Combining). The proposed use for energy storage is not a permitted use within the current residential zoning for the project site. The proposed project requires a zone change on all three (3) parcels from the Estate (E) Zone District to the Agriculture (A) base Zone District and a Conditional Use Permit (CUP) for the energy storage facility in the Agriculture (A) Zone District (19.12.030.G).

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: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

6.1.2 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: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which respectfully objects to this data request.

7.0 NOISE AND VIBRATION

7.1 Data Requests DR78 through DR79

BACKGROUND: DISCREPANCY IN OBSERVED NOISE DATA

The Sound Pressure Level (SPL) versus time data presented in Table 5.7-5 of the AFC (Summary of Long-term Sound Pressure Levels) for existing long-term ambient noise near noise monitoring location Site 2 does not match the SPL versus time data in Figure 5.7-2 of the AFC (Long-Term Baseline Sound Pressure Levels, One Minute Intervals), which staff understands is a graphical representation of the same data as in the table. For example, in Table 5.7-5, at 0:00 hours on Friday July 9, 2021, the SPL L_{eq} is 32.8 dBA, while in Figure 5.7-2 the SPL L_{eq} at 0:00 hours is above 40 dBA. Another example is that all of the data points for L_{90} in the table that are below 30 dBA, does not correspond to L_{90} data below 30 dBA during the same time taken. Also, the graph shows that the observed noise levels during the night are higher than during the day, which is not typical, as the nighttime noise levels are usually lower than the daytime ones.

7.1.1 Data Response DR78

DR78: Please provide an explanation for the discrepancy between the data presented in Table 5.7-5 and Figure 5.7-2.

Response: Data presented in AFC Table 5.7-5 is accurate. AFC Figure 5.7-2 presented erroneous data, see revised AFC Table 5.7-4 is provided as Attachment DR78-1 and AFC Figure 5.7-2 as Attachment DR78-2. The noise level average for the Long-Term Monitoring location was 44 dBA during the daytime and 40 dBA at night.

7.1.2 Data Response DR79

DR79: Please provide a corrected figure that matches the data presented in the table, unless the data in the table is also incorrect, in which case you will also need to provide the table with the correct data.

Response: Please see the response to DR78 above. During a review of all data tables and figures it was determined that AFC Table 5.7-4 required revision. AFC Table 5.7-4 is provided as Attachment DR78-1. None of the revisions affect the impact analysis or conclusions.

ATTACHMENT DR78-1

TABLE 5.7-4 NOISE SUMMARY TABLE BASELINE AMBIENT SOUND PRESSURE LEVELS

Attachment DR78-1: Table 5.7-4: Noise Summary Table Baseline Ambient Sound Pressure Levels Observed at the Willow Rock Energy Storage Center (former Gem Site) July 2021

Monitoring Location	Date	Time	Start Time (HH:MM)	Sound Pressure Levels (dBA)								Observations
				L _{min}	L _{max}	L ₁₀	L ₅₀	L ₉₀	L _{eq}	L _{90dn} ^a	L _{eqdn} ^b	
Site 1: Tehachapi Willow Springs Road - West	9-Jul-21	Daytime	15:02	31.4	76.3	64.8	52.0	35.3	60.2			Cars on nearby highway - continuous. Birds, insects.
		Nighttime ^c						33.3	49.8	40.1	60.1	
Site 2: Hamilton Road - East	9-Jul-21	Daytime	13:52	33.9	66.4	40.7	37.2	34.7	38.7			Cars on highway. Wind. AC unit of nearby residence. Distant cars from racetrack.
	9-Jul-21	Nighttime	0:45	30.2	58.7	34.5	31.5	30.9	32.7	38.1	40.7	Sporadic distant cars. Insects.
Site 3: Tehachapi Willow Springs Road -North	9-Jul-21	Daytime	14:14	33.3	34.3	59.7	52.7	39.5	55.9			Intermittent cars on highway. Birds. Transmission line cracking. Large trucks.
	9-Jul-21	Nighttime	1:37	31.4	71.5	48.6	33.9	33.3	49.8	41.3	57.8	Transmission line cracking, birds. Intermittent cars on highway.
Site 4: Hamilton Road - West	9-Jul-21	Daytime	14:40	30.7	81.0	38.5	34.2	32.0	52.1			Distant generator hum. Distant cars. Wind.
	9-Jul-21	Nighttime	2:17	30.4	57.3	35.9	32.7	31.1	33.7	37.7	50.4	Distant cars. Insects. Distant plane.
Site 5: Tehachapi Willow Springs Road - South	9-Jul-21	Daytime	15:30	31.5	70.0	61.2	47.8	36.1	55.0			Intermittent cars on highway. Birds. Insects.
		Nighttime ^c						33.3	49.8	40.2	57.4	
Site 6: 140th St W and Irone Ave	9-Jul-21	Daytime	16:05	32.0	57.5	45.3	38.1	35.1	41.3			Plane overhead. Insects and birds. Wind.
		Nighttime ^c						31.1	33.7	38.4	42.4	
Site 7: 110th St W and Irone Ave	9-Jul-21	Daytime	16:35	30.9	59.0	46.7	40.1	34.8	42.7			Wind in trees.
		Nighttime ^c						31.1	33.7	38.3	43.1	
Long Term Monitoring	8-Jul-21 to	Continuous	15:00	19.5	78.2	47.3	37.8	27.6	43.2	43.1	47.4	Wind, cars on highway, insects, birds.
	9-Jul-21											
Kern County General Plan, Chapter 3 Noise Element - exterior noise at residential receptor											65.0	

Source: Golder 2021

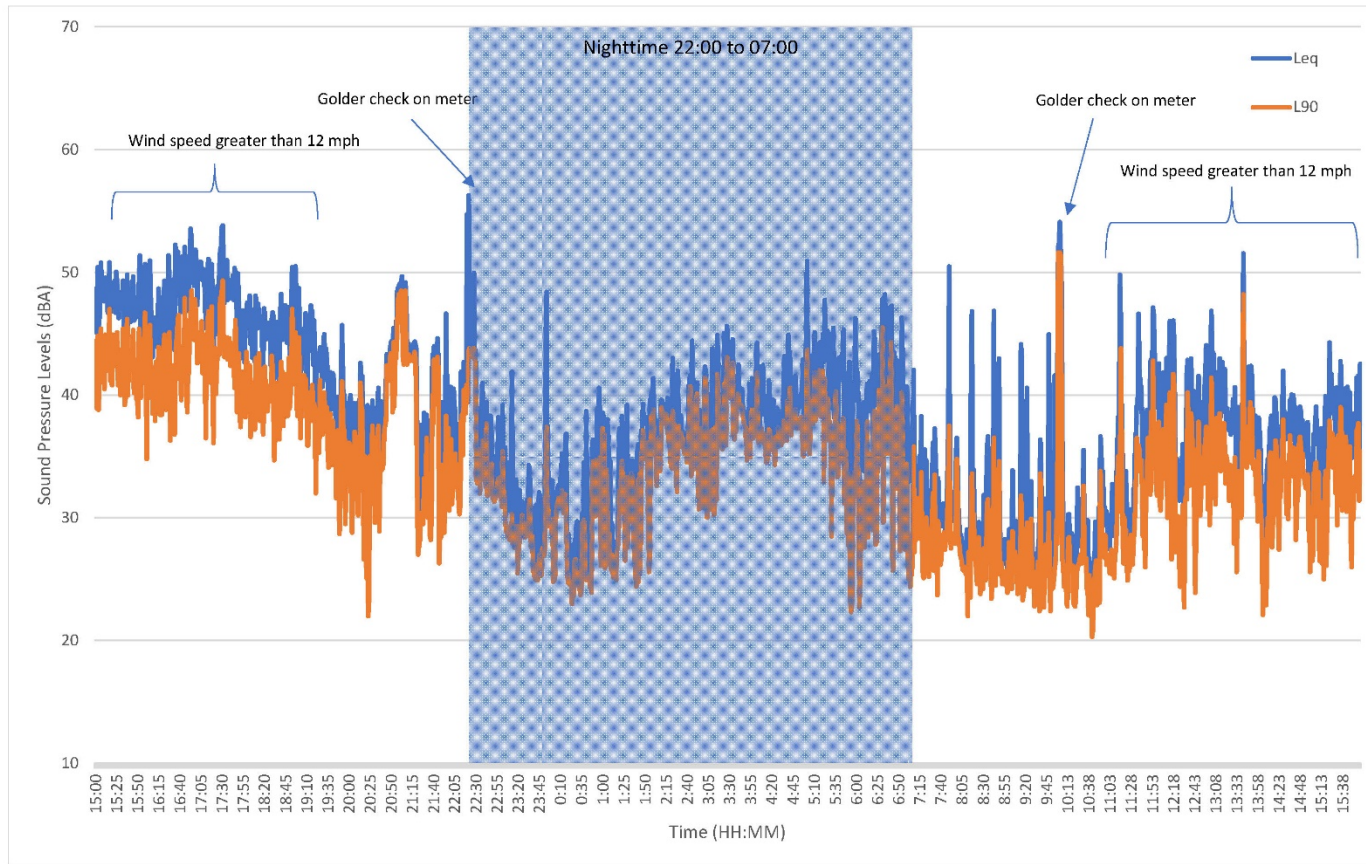
^a Calculated using the daytime L₉₀ and the nighttime L₉₀

^b Calculated using the daytime L_{eq} and the nighttime L_{eq}

^c Site 3 nighttime L₉₀ and L_{eq} used to predict calculated L_{dn} at Sites 1 and 5, and Site 4 nighttime L₉₀ and L_{eq} used to predict calculated L_{dn} at Sites 6 and 7.

ATTACHMENT DR78-2

FIGURE 5.7-2 LONG-TERM BASELINE SOUND PRESSURE LEVELS, ONE MINUTE INTERVALS



8.0 PALEONTOLOGICAL RESOURCES BACKGROUND

8.1 Data Requests DR80 through DR82

BACKGROUND

Section 5.8.1 introduces the project area, however, Figures 5.8-1 and 5.8-2 identify blue lines as the Project Area but the figures do not identify the location of the main facility.

8.1.1 Data Request DR80

DR80: Please provide updated figures showing where the main facility would be located and identify what the blue lines represent.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before October 31, 2022.

8.1.2 Data Request DR81

BACKGROUND

Section 5.8 Paleontological Resources (subsection 5.8.1.1.1), discusses regional geology and its implications on potential paleontological resources. The cited map is from 1963 (Dibblee 1963) and while it meets the minimum level of detail, it may not be of sufficient detail to adequately determine the presence of Holocene versus Pleistocene and older geologic units.

Note: The heading Section 5.8.1.1.1 is repeated multiple times in the AFC.

DR81: Please provide any new geologic maps available and any reconnaissance level or specific geologic mapping conducted during the preparation of the AFC.

Response: The most accurate, publicly available geologic maps were provided in the AFC.

8.1.3 Data Request DR82

BACKGROUND

Section 5.8.1.1.1 discusses the results of records searches for paleontological resources. Table 5.8-1 does not include a location in comparison to the site. Additionally, the table indicates the "Location" as feet "bgs."

DATA REQUEST DR82

DR82: Please provide location data in Table 5.8-1 with respect to proximity to the site. Clarify the "Location" and its units in Table 5.8-1.

Response: Please see Attachment DR82-1 below that includes an update to AFC Table 5.8-1.

ATTACHMENT DR82-1

**UPDATE TO AFC TABLE 5.8-1 – RECORDS SEARCH RESULTS FROM NATURAL HISTORY
MUSEUM OF LOS ANGELES COUNTY**

Attachment DR82-1: Update to AFC Table 5.8-1 – Records Search Results from the Natural History Museum of Los Angeles County

ID	Taxon	Common Name	ERA	ID	Location	Approximate Distance from Site
LACM VP 7891	Hemiauchenia	Lamine camelid	Pleistocene	Unknown	21 feet (ft) bgs	Unknown
LACM VP 7853	Camelidae (camel), others not specified	Fish, amphibian, reptile, small mammal, camel	Pleistocene	Unknown (sandy loess under a dune deposit strand, sandy siltstone, siltstone to clayey siltstone)	3–11 ft bgs.	19 miles
LACM VP 7884	Camelops hesternus	Camel	Pleistocene	Unknown (fluvial brown clayey silt)	4 ft bgs	20 miles
LACM VP 445	Not specified	Invertebrate	Upper Pleistocene	Unknown (lacustrine deposits)	Unknown	Not specified
LACM I 445	Not specified	Invertebrate	Pleistocene	Unknown	Unknown	Not specified
LACM VP 5942-5952	Lampropeltis, Gambelia wislizenii, Sylvilagus, Chaetodippus, Dipodomys, Pituophis	Kingsnake, Pocket gopher, rabbit, Pocket mouse, Kangaroo Rat, snake	Holocene	Unknown	0–3 m bgs	40 miles
LACM VP 7786	Microtus mexicanus	Vole	Unknown	Unknown alluvium (moderately indurated fined to medium grained silty sandstone)	10-11 ft bgs	70 miles
LACM VP 3722	Equus	Horse	Pleistocene	Unknown	Unknown	22 miles

Source: PaleoWest. 2021. Paleontological Resource Assessment Report for the Hydrostor A-CAES Project Kern County, California. Technical Report No. 21-219 September 13, 2021. bgs = below ground surface

9.0 PROJECT OVERVIEW

9.1 Data Requests DR83 through DR84

BACKGROUND: INTERCONNECTION TO ELECTRICAL GRID

Section 2.0 *Project Description of the AFC (subsection 2.1.20)* states that the Gem facility would connect to the Southern California Edison (SCE) or Los Angeles Department of Water and Power (LADWP) electrical grid via a 230 kilovolt (kV) overhead line running either to the SCE Whirlwind Substation or the future LADWP Rosamond Substation. It also states that the potential interconnection with the Rosamond Substation has been studied.

Section 6.0 *Alternatives (subsection 6.4.1)* discusses the proposed interconnection to the SCE Whirlwind Substation via a 10.9-mile route. Several alternative interconnections are described, including two that could potentially interconnect to the future LADWP Rosamond Substation (Routes 2A and 2B). The two LADWP alternatives are approximately 2.5 to 3.5 miles long. The AFC states that interconnecting to the Rosamond Substation would be consistent with the project's overall objectives.

Section 3.0 *Electric Transmission (subsection 3.3)* describes the transmission interconnection studies for the proposed project. It states that a separate interconnection request was submitted to LADWP on October 2, 2020, for the potential interconnection of the project to LADWP's planned Rosamond Substation and that the LADWP interconnection has not yet been studied by LADWP. In its July 5th comment letter on the Gem Energy Storage Center (TN# 243839), LADWP commented that a potential interconnection with the Rosamond Substation should be coordinated through its Transmission Planning Group with an e-mail address for Sunaja Lakshman: Sunaja.Lakshman@ladwp.com.

Section 5.6 *Land Use (page 5-6-1)* states that the timing for development of the Rosamond Substation is unknown; however, online information from LADWP indicates that the Rosamond Substation is budgeted and expected to be in service in December 2023.

Staff considers the potential interconnection of the project at the Rosamond Substation an option requiring analysis in the staff assessment.

9.1.1 Data Request DR83

DR83: Please provide information on the status and possible schedule for preparation of a Phase I Interconnection Study for LADWP's Rosamond Substation. Staff requests a copy of the Phase I study when it is available.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

9.1.2 Data Request DR84

DR84: Staff requests the details and any study results prepared by the applicant on the potential interconnection at the Rosamond Substation.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

9.2 Data Requests DR85 through DR87

BACKGROUND: OPTIONS FOR USE OF WASTE ROCK

Section 2.0 Project Description of the AFC (subsection 2.1.16.2) describes how construction of the underground compressed air storage cavern would produce excavation waste (generally soil and rock). Project construction would require excavating approximately 1.1 million cubic yards of waste rock that is expected to be of aggregate quality. It states that most of the cavern waste rock would be hauled offsite to a quarry approximately 5 miles north of the project site, but that preference will be given to using up to 50 percent of the rock on the site.

Section 6.0 Alternatives (subsection 6.4.3.1) describes the possible option of using all the waste rock to raise the entire project site by several feet. If it were determined to be feasible, using the waste rock on the site could avoid certain impacts of hauling surplus material to the quarry. Conversely, using the waste rock on the site could increase certain impacts, such as impacts on visual resources, air quality impacts from increased particulate matter, noise impacts at nearby receptors, and it could require additional measures for stormwater management. Processing of rock for use on the site would require a permit from Kern County.

Staff considers the potential for the site to be raised from distributing waste rock aggregate over the site an option requiring analysis in the staff assessment. The work to process and use waste rock on the site requires details on possible options and the potential environmental impacts relating to those options.

9.2.1 Data Request DR85

DR85: *Please fully describe the processes and any permitting requirements for preparing all the excavated material for use on the site and an estimate of how many feet the site would be raised as a result. Please discuss whether the increased elevation would be relatively even across the site.*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

9.2.2 Data Request DR86

DR86: *Please provide an analysis of the environmental impacts caused by processing and using all of the waste rock onsite.*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

9.2.3 Data Request DR87

DR87: *Please provide an analysis of the environmental impacts caused by using any portion less than 100 percent of the waste rock onsite and hauling the remainder to the quarry.*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

10.0 TRANSPORTATION

10.1 Data Requests DR88 through DR90

BACKGROUND: KERN COUNTY COMMENTS ON APPLICATION FOR CERTIFICATION

On May 19, 2022, the Kern County Planning and Natural Resources Department submitted comments on the Gem Energy Storage Center application for certification (TN 243152). Comments number three and five below pertain to Transportation:

3. Tehachapi-Willow Springs Road and Sweester [sic] Road are classified as Future Expressway and Secondary (Collector) Highway by the Willow Springs Specific Plan Circulation Element, respectively. These alignments require a dedication of 55' and 45' from the centerline of the roads. No facilities or structures can be constructed in this area. If a portion of the proposed facility needs to encroach into those dedications, then a Specific Plan Amendment would be required to delete or downgrade the alignment. This process requires a hearing before the Board of Supervisors and can only be heard at a scheduled General Plan Amendment window date (i.e., April, June, September, and December).

5. Full improvements to Type B standards (plate attached – Attachment A) are required for Sweester [sic] Road from Tehachapi – Willow Springs Road to the project entrance. Currently this road is a dirt, unmaintained public access easement which is not passable during wet weather.

10.1.1 Data Request DR88

DR88: Please confirm if any project facilities or structures would be constructed in the Tehachapi-Willow Springs Road and Sweetser Road dedication located 55 feet and 45 feet from the road centerline.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before October 31, 2022.

10.1.2 Data Request DR89

DR89: If project facilities or structures would encroach within the Tehachapi-Willow Springs Road and Sweetser Road dedications, please provide CEC staff with copies of communications with Kern County staff and identify at which Board of Supervisors hearing (i.e., April, June, September and December) the project would request a Specific Plan Amendment to delete or downgrade the alignment.

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before October 31, 2022.

10.1.3 Data Request DR90

DR90: Please describe construction activities required to prepare Sweetser Road and Tehachapi-Willow Springs Road for construction worker, equipment, and material vehicle access to the site.

Response: The traffic analysis conducted for the project showed that the intersection of Tehachapi-Willow Springs Road and Sweetser Road would have less than significant impact during construction. The east leg of the intersection (Sweetser Road) was assumed to have one lane in each direction in the analysis and the assumed lane configuration at the intersection would be able to accommodate the construction related traffic

(trucks and employee automobiles). Sweetser Road /Hamilton Road to the east of the intersection is currently an unmaintained dirt road. The road will be graded and widened to at least one lane in each direction, and crushed rock will be laid out to provide temporary access to the site during construction.

The road will be ultimately developed to Kern County Type B standards as required by the document, *Kern County Planning and Natural Resources Department Comments – Agency Participation in Review of AFC for GEM Energy Storage Center Project*, dated May 19, 2022.

10.2 Data Requests DR91 through DR94

BACKGROUND: ROCK SPOIL TRANSPORT

Approximately 1.1 million cubic yards of rock would be excavated to construct the compressed air storage caverns. It is anticipated that a portion of the rock would be reused on-site to construct the containment structure. The remaining spoil is expected to be transported to the local quarry, located 5 miles north of Tehachapi-Willow Springs Road

10.2.1 Data Request DR91

DR91: *What portion of the 1.1 million cubic yards of rock would be needed to construct the containment structure?*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022

10.2.2 Data Request DR92

DR92: *Please describe the total number of truck trips associated with the removal of the unused portion of rock off-site per day, and the number of trips expected to occur during AM peak and PM peak hours.*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

10.2.3 Data Request DR93

DR93: *Would all truck trips associated with the removal of the rock take the same route to the local rock quarry located five miles north of the project site? Provide a map showing the preferred route.*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

10.2.4 Data Request DR94

DR94: *Please confirm if Holiday Rock located on Trotter Avenue would be used for disposal of rock spoils. If another site has been selected, please disclose the name and location.*

Response: Applicant expects to utilize a site within approximately 5 miles of the Project site. The specific site has not been finalized at this time.

11.0 TRANSMISSION SYSTEM ENGINEERING BACKGROUND

11.1 Data Requests DR95 through DR101

BACKGROUND

Appendix G of the CEQA Guidelines requires consideration of the impacts on utility and service systems from the construction or operation of the project. For the identification of impacts on the transmission system resources and the indirect or downstream transmission impacts, staff relies on the Phase I and Phase II Interconnection Studies for ensuring the interconnecting grid meets the California Independent System Operator (California ISO) reliability standards. The studies analyze the effect of the proposed project on the ability of the transmission network to meet reliability standards. When the studies determine that the project will cause a violation of reliability standards, the potential mitigation or upgrades required to bring the system into compliance are identified. The mitigation measures can include the construction of downstream transmission facilities. CEQA requires the analysis of any downstream facilities for potential indirect impacts of the proposed project. Without complete Phase I and Phase II Interconnection Studies, staff is not able to fulfill the CEQA requirement to identify the indirect effects of the proposed project.

11.1.1 Data Request DR95

DR95: *Provide the California ISO Phase III Interconnection Study of the proposed 500 MW GESC to the California ISO control grid. The Study should analyze the system impacts with and without the project during peak and off-peak system conditions, and demonstrate conformance or non-conformance with the utility reliability and planning criteria with the following provisions:*

- *Identify major assumptions in the base cases including imports to the system, major generation and load changes in the system and queue generation.*
- *Analyze the system for N-0, important N-1 and critical N-2 contingency conditions and provide a list of criteria violations in a table showing the loadings before and after adding the new generation.*
- *Analyze Short circuit duties.*
- *Analyze system for Transient Stability and Post-transient voltage conditions under critical N-1 and N-2 contingencies, and provide related plots, switching data and a list for voltage violations in the studies.*
- *Provide a list of contingencies evaluated for each study.*
- *List mitigation measures considered and those selected for all criteria violations.*
- *Provide electronic copies of *.sav and *.drw PSLF files.*
- *Provide power flow diagrams (MW, percent loading & P. U. voltage) for base cases with and without the project. Power flow diagrams must also be provided for all N-0, N-1 and N-2 studies where overloads or voltage violations appear. Provide the pre and post project diagrams only for an elements largest overload.*

Response: Please see Confidential Attachment DR95-1 for the Phase II Interconnection Study. Please also see, *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request.

11.1.2 Data Request DR96

DR96: *Please provide a complete project description includes drawings of the changes required at the interconnecting substation, SCE's Whirlwind Substation.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request.

11.1.3 Data Request DR97

DR97: *Please provide detailed one-line diagrams of the Whirlwind Substation before the proposed project.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request.

11.1.4 Data Request DR98

DR98: *Please provide detailed Whirlwind Substation one-line diagram after the proposed project interconnection. Show all equipment ratings, including bay arrangement of the breakers, disconnect switches, buses, transformers and other equipment that would be required for interconnection of the GESC project. Please include any potential changes in the substation and to the existing fence line at the Whirlwind Substation.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which respectfully objects to this data request. The Applicant does not anticipate the need for any changes to the existing fence line at the SCE Whirlwind Substation.

11.1.5 Data Request DR99

DR99: *Please provide detailed one-line diagrams showing the 230 kV generator tie-line system interconnection with the Whirlwind Substation.*

Response: In *Data Adequacy Supplemental No.1* submitted on April 25, 2022, Data Request #4 discusses that SCE considers the detailed one-line diagrams showing the 230kV generator tie-line system interconnecting with the Whirlwind Substation as Critical Energy Infrastructure Information. SCE stated that this information will not be shared without a non-disclosure and use agreement.

Please see the response to DR95 for information regarding the interconnection to the Whirlwind Substation.

11.1.6 Data Request DR100

DR100: *Provide DWG NO. 21-5291-50-3642-004.*

Response: The requested drawing was referenced in AFC Section 3 figures in error. The requested drawing does not exist.

"The reference to DWG NO. 21-5291-50-3642-004 in the AFC was an error. There is no such drawing at this time."

11.1.7 Data Request DR101

DR101: *Please provide the conductor name, type, current carrying capacity, and the overhead conductor size for the transmission line which would connect the GESC to the SCE Whirlwind Substation.*

Response: The specifics for the gen-tie are still under evaluation. The specific conductor name and type have not yet been selected. The Applicant will supplement this response by October 31, 2022.

11.2 Data Requests DR102 through DR103

BACKGROUND

The California ISO Interconnection Request (IR) Application and the Queue Cluster 13 Phase I Report, Appendix A-Q1782, both include a 100 MW battery energy storage system (BESS) as part of the GESC project. Also, as indicated in the Gem Data Adequacy Master Response No 1, dated April 25, 2022, the GESC does not include a battery component. The one-line diagram in the AFC and the diagram included in the California ISO Phase I study are not consistent.

11.2.1 Data Request DR102

DR102: *The California ISO Phase I Report, Appendix A-Q1782 Figure A.1: Generating Facility One-Line Diagram is different from the figures in Section 3 of the AFC.*

- *Please provide a clarification of the proposed project design and provide a list of the equipment including but not limited to transformers, generators, and their ratings for the GESC.*
- *Please provide one-line diagrams which coordinate with the California ISO report so that staff can understand what is including in the licensing process. Show the proposed generators, transformers, generator tie-lines, breakers arrangement and other required equipment and their ratings.*

Response: The Project is in the process of updating the one-line diagrams as part of the optimization. The design will meet all local, state and federal requirements for electrical design and interconnection of a large storage asset. The Applicant will supplement this response by October 31, 2022.

11.2.2 Data Request DR103

DR103: *How many MW would be needed to maintain one power block? What is the auxiliary load for one power block and the GESC?*

Response: Please see Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

11.3 Data Request DR104 through DR110

BACKGROUND

Section 1.0 Introduction in the AFC in provides an alternative interconnection for the GESC to a future Los Angeles Department of Water and Power (LADWP) Rosamond Substation via an approximately 3.5-mile 230 kV transmission line.

11.3.1 Data Request DR104

DR104: *Is the project owner seeking CEC certification of both the proposed interconnection to the SCE Whirlwind Substation and the alternative interconnection to the LADWP Rosamond Substation? If the project owner is seeking certification of both interconnection alternatives, then the information requested in TSE Data Requests 101-106 is required.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

11.3.2 Data Request DR105

DR105: *When would the LADWP Rosamond Substation be built?*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

11.3.3 Data Request DR106

DR106: *Should the alternative interconnection route to the LADWP Rosamond Substation be considered under licensing process? If it is the case, please provide an interconnection study from LADWP.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

11.3.4 Data Request DR107

DR107: *Please provide a complete project description that includes drawings of the changes required at the interconnecting substation, LADWP Rosamond Substation.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

11.3.5 Data Request DR108

DR108: *Please provide detailed Rosamond Substation one-line diagrams after the proposed project interconnection. Show all equipment ratings, including bay arrangement of the breakers, disconnect switches, buses, transformers and other equipment that would be required for interconnection of the GESG project.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

11.3.6 Data Request DR109

DR109: *Please provide detailed one-line diagrams showing the 230 kV generator tie-line system interconnection with the Rosamond Substation.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

11.3.7 Data Request DR110

DR110: *Please provide the conductor name, type, current carrying capacity, and the overhead conductor size for the transmission line which would connect the GESC to the future LADWP Rosamond Substation.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

11.4 Data Requests DR111 through DR112

BACKGROUND

As shown in Section 1.0 Introduction Figure 1-4, the GESC proposed preferred and alternate transmission interconnection routes would potentially impact the LADWP Transmission Line Right of Way (TLRW).

11.4.1 Data Request DR111

DR111: *Please provide evidence showing coordination with LADWP and approval from LADWP for the proposed transmission routes crossing and/or using the LADWP TLRW.*

Response: Please see *Applicant's Notice Pursuant to 20 CCR § 1716(f) Regarding Staff's Data Requests Set 1*, submitted on August 15, 2022, which requests more time to respond to this data request. The Applicant anticipates that a response will be provided on or before September 25, 2022.

11.4.2 Data Request DR112

DR112: *Please confirm that the GESC would be connecting to SCE not PG&E as shown in Figure 3-2.*

Response: The Applicant confirms that Figure 3-2 should reference SCE not PG&E.

CONFIDENTIAL ATTACHMENT DR95-1

PHASE II INTERCONNECTION STUDY