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

DATA REQUEST RESPONSE SET 1B

Response to California Energy Commission Staff

DR10 and DR11

DR12, DR14, 16 and DR19

DR53, DR54, DR55, and DR56

DR60, DR61, DR62, and DR63

DR68

DR71, DR72

DR83, DR84

DR85, DR86 and DR87

DR91, DR92, DR93 and DR94

DR103, DR104, DR105, DR106, DR108, DR108, DR109, DR110 and DR111

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September 26, 2022

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 BIOLOGICAL RESOURCES 1

2.1 Construction Laydown and Parking Location (DR10 and DR11)..... 1

2.1.1 Data Request DR10..... 1

2.1.2 Data Request DR11 1

2.2 Hydrostatic Compensation Surface Reservoir And Stormwater Retention Ponds (DR12, DR14, DR16, and DR19)..... 2

2.2.1 Data Request DR12..... 2

2.2.2 Data Request DR14 2

2.2.3 Data Request DR16..... 3

2.2.4 Data Request DR19..... 3

3.0 GEOLOGICAL HAZARDS AND RESOURCES 3

3.1 Geotechnical Data (DR68)..... 3

3.2 Liquefaction and Slope Stability Considerations (DR71 through DR72) 3

3.2.1 Data Request DR71 4

3.2.2 Data Request DR72..... 4

4.0 PROJECT OVERVIEW 4

4.1 Interconnection To Electrical Grid (DR83 through DR84)..... 4

4.1.1 Data Request DR83..... 5

4.1.2 Data Request DR84..... 6

4.2 Options For Use Of Waste Rock (DR85 through DR87) 6

4.2.1 Data Request DR85..... 6

4.2.2 Data Request DR86..... 7

4.2.3 Data Request DR87 7

4.3 Rock Spoil Transport (DR91 through DR94) 7

4.3.1 Data Request DR91 7

4.3.2 Data Request DR92..... 7

4.3.3	Data Request DR93.....	8
4.4	CAISO Interconnection (DR103).....	10
4.4.1	Data Request DR103.....	10
4.5	Alternative Interconnection to LADWP Rosamond Substation (DR104 through DR110).....	10
4.5.1	Data Request DR104.....	10
4.5.2	Data Request DR105.....	10
4.5.3	Data Request DR106.....	11
4.5.4	Data Request DR107.....	11
4.5.5	Data Request DR108.....	11
4.5.6	Data Request DR109.....	11
4.5.7	Data Request DR110.....	11
4.6	Data Requests DR111.....	13
4.6.1	Data Request DR111.....	13

ATTACHMENTS

- Attachment DR93-1 Preferred Route Project Site to Rock Quarry
- Attachment DR109-1 Confidential Attachment - 230 kV generator tie-line system interconnection with the Rosamond Substation

Acronyms and Abbreviations

acfm	actual cubic feet per minute
ACSR	aluminum conductor steel-reinforced
AFC	Application for Certification
Bgs	below ground surface
BLM	U.S. Bureau of Land Management
BUOW	Burrowing Owl
CBOC	California Burrowing Owl Consortium
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
cfm or ft ³ /min	cubic feet per minute
CNDDDB	California Natural Diversity Database
CUP	Conditional Use Permit
DKF	desert kit fox
DR	Data Request
EKAPCD	Eastern Kern Air Pollution Control District
EPC	Engineering, Procurement and Construction
FSA	Final Staff Assessment
ft	feet
GESC	Gem Energy Storage Center
Kcmil	Kilo Circular Mills
kV	kilovolt
LADWP	Las Angeles Department of Water and Power
LORS	Laws, Ordinances, Regulations and Standards

m3	square meters
m/s	meters per second
mph	miles per hour
PG&E	Pacific Gas and Electric
PSA	Preliminary Staff Assessment
SCE	Southern California Edison
SIS	System Impact Study
SWHA	Swainson's Hawk
TLRW	Transmission Line Right of Way
WDR	Waste Discharge Requirement
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 1B, numbers DR10 - DR12, DR14, DR16, DR19, DR53 - DR56, DR60 - DR63, DR68, DR71, DR72, DR83 - DR87, DR91 - DR94, and DR103 - DR111, for the Willow Rock Energy Storage Center (WRESC) (21-AFC-2). This response document addresses comments where the applicant requested additional time to respond.

The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as presented by CEC Staff and are keyed to the Data Request (DR) numbers (DR#). New or revised graphics, tables or attachments are provided as attachments and are numbered in reference to the Data Request number. For a hypothetical example, the first attachment used in response to Data Request DR10 would be numbered Attachment DR10-1. 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 BIOLOGICAL RESOURCES

2.1 Construction Laydown and Parking Location (DR10 and DR11)

2.1.1 Data Request DR10

BACKGROUND:

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: Construction laydown and parking would occur within the project site boundaries. The specifics of the laydown and parking will be determined following completion of project optimization.

2.1.2 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: See response DR10.

2.2 Hydrostatic Compensation Surface Reservoir And Stormwater Retention Ponds (DR12, DR14, DR16, and DR19)

BACKGROUND:

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.

2.2.1 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: The proposed cover uses floating shapes that interlock, similar to the Hexa-cover (sold in USA by Field Lining Systems, Inc. (FLSI), <https://flsi.us/products/hexacover-floating-cover/>, website includes images). These products self-organize and stay in-place in winds up to 70 miles per hour (mph), above which they move around and then self-reorganize after the wind subsides. They are very effective at reducing evaporation and waterfowl issues. The reservoir and floating cover is proposed to be roughly 18 acres, subject to final optimization. Final configuration will be shared once complete, please keep this item open.

2.2.2 Data Request DR14

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

Response: The expectation is that the reservoir structure will be built using excess rock produced from the cavern excavation. A decision regarding use of specific materials will be made following additional geotechnical investigations and project optimization. The Applicant estimates that a decision will be made by end of January 2023.

2.2.3 Data Request DR16

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

Response: The present design uses side slopes approximately 4 Height:1 Vertical (4H:1V), approximately 14 degree angle, but is subject to final design from the Engineering, Procurement and Construction (EPC) once geotechnical studies are completed.

2.2.4 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: Rock from cavern construction would be used to construct 6-foot high berm for the stormwater pond. Maintenance of the berm would be checked per requirements identified within Industrial General Permit. Water quality will be checked based on best management practices. The Applicant anticipates that the stormwater pond will be dry for the majority of the year. Water quality would be comparable to any other parking facility in the county. The Site will be enclosed with a fence to prevent wildlife from entering the Project.

3.0 GEOLOGICAL HAZARDS AND RESOURCES

3.1 Geotechnical Data (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.

3.2 Liquefaction and Slope Stability Considerations (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.

3.2.1 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: Yes, the effects of liquefaction have been considered. Liquefaction risk is primarily a concern for the foundation design supporting the surface equipment, as this phenomenon is limited to areas where saturated unconsolidated material is present. Based on our data collection so far, liquefaction is only a potential risk to the shallow portion of the shaft and the risk is very low. The shaft will be delivered with a collar that extends through the upper unconsolidated overburden which will be designed to handle any liquification risks during a seismic event.

3.2.2 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: The slopes will be designed consistent with applicable Laws, Ordinances, Regulations and Standards (LORS) and best practices for the local soil, groundwater, saturation and seismic conditions. Note that the reservoir will be lined, and the reservoir is above the expected groundwater table. Following project optimization and geotechnical investigations, the seismic design for the reservoir will be completed.

4.0 PROJECT OVERVIEW

4.1 Interconnection To Electrical Grid (DR83 through DR84)

BACKGROUND:

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.

4.1.1 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: There is no existing LADWP Rosamond Substation (formally known as the Rosamond Switching Station in LADWP documents). The future, proposed LADWP Rosamond Substation is still in the planning and development phase. Nevertheless, Willow Rock is providing information about this planned substation in the interests of completeness and full disclosure. The LADWP Rosamond Substation, if completed, would be an attractive option for the Willow Rock to be able to directly serve this important California Balancing Authority.

While still in the planning phase, Willow Rock submitted an interconnection application for the Rosamond Substation in October 2020 and paid an application fee to get into the Department's interconnection queue should the Rosamond Substation proceed.

Of course, LADWP is and was the lead agency for permitting the proposed Rosamond Substation. The Willow Rock AFC provides environmental information on the linear corridors proposed to interconnect Willow Rock to this future substation.

The applicant submitted an interconnection request to LADWP on October 2, 2020 and it is listed as Q78 in the LADWP interconnection queue that is publicly available on the LADWP Open Access Same-time Information System ("OASIS") website (<http://www.oasis.oati.com/ldwp/index.html>). A scoping meeting was held on November 25, 2020 in relation to the interconnection request.

As of the August 26, 2022 interconnection queue posted on LADWP's OASIS website it is listed as "Application received". The interconnection request will be studied according to the schedule and practices outlined in the LADWP tariff and business practices. The feedback from the scoping meeting held on November 25, 2020 is that the estimated System Impact Study ("SIS") start date would be April 2023.

4.1.2 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: A formal study has not been prepared by the applicant on the potential for interconnection at the Rosamond Substation. The interconnection request will be studied according to the schedule and practices outlined in the LADWP tariff and business practices and produce a System Impact Study and Facilities Study.

4.2 Options For Use Of Waste Rock (DR85 through DR87)

BACKGROUND:

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.

4.2.1 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: Assuming the excavated materials are suitable for use on the Site, the materials will be crushed subsurface and transported to the surface for use. The suitability of the materials and potential use will be determined following geotechnical investigations, chemical testing, and project optimization. In terms of permitting, in the absence of the Energy Commission's pre-emptive jurisdiction, the following approvals may have been required for preparation of the excavated materials for use:

- East Kern Air Pollution Control District: Permits associated with rock crushing and cavern ventilation
- Lahontan Regional Water Quality Control Board: Waste discharge requirements associated with placement of waste rock on the surface. The WDR's and other best management practices associated with the use of the rock will be dependent on chemical composition of the rock removed.
- Kern County: Grading permits

The number of feet the Site will be raised will be determined following project optimization. The Applicant expects that site elevation will be relatively even across the Site, considering stormwater management measures.

4.2.2 Data Request DR86

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

Response: The Applicant will provide an analysis of potential environmental impacts following project optimization.

4.2.3 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: The air quality, noise, public health and traffic analyses in the AFC were based on the most conservative, worst-case assumption that 100% of the waste rock would be hauled to the quarry.

4.3 Rock Spoil Transport (DR91 through DR94)

BACKGROUND:

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.

4.3.1 Data Request DR91

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

Response: The suitability and portions of the rock used to construction containment structure will be determined following project optimization and additional geotechnical investigations.

4.3.2 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: AFC Appendix 2E provides a summary of haul and material truck quantities. It is estimated that 87 truck round trips per day to/from the quarry would be required to haul 100% of the waste rock to the quarry (92,190 loads over the months 26-60 of the cavern excavation period). These truck trips are assumed to be distributed uniformly over the construction day. AM/PM peak hour trip generation used in the traffic analysis is summarized in Table 5.12-7 of the AFC (page 5.12-22).

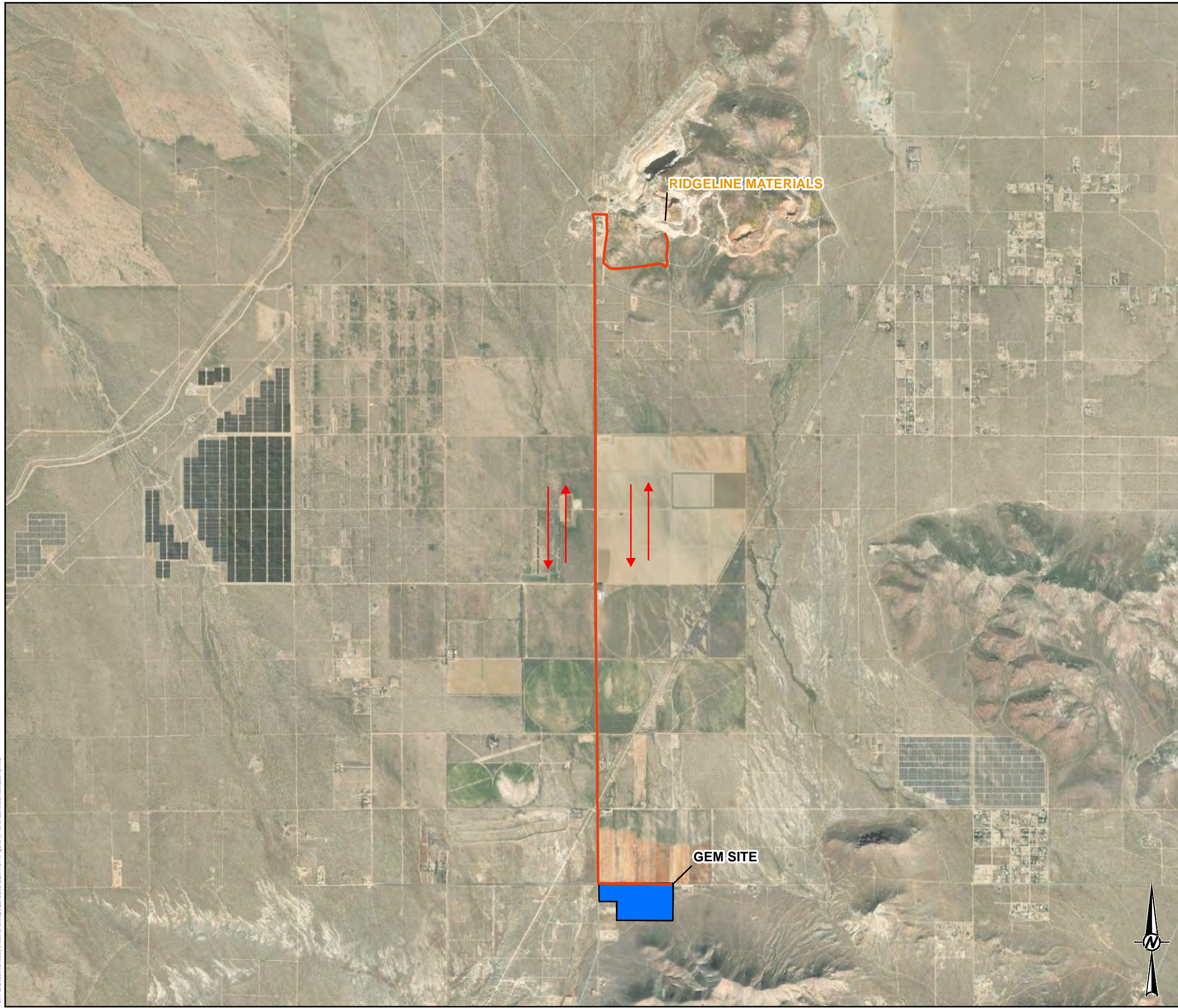
4.3.3 Data Request DR93

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: The preferred route to the local rock quarry located 5 miles north of the project is mapped in Attachment DR93-1. However, the Applicant is still exploring additional waste rock options.

ATTACHMENT DR 93-1

PREFERRED ROUTE PROJECT SITE TO ROCK QUARRY



LEGEND

- GEM SITE
- PREFERRED ROUTE RIDGELINE MATERIALS

0 3,000 6,000
 Feet

REFERENCE

1. COORDINATE SYSTEM: NAD 1983 STATEPLANE CALIFORNIA V FIPS 0405 FEET
2. AERIAL IMAGERY. ESRI PROVIDED BASEMAP SERVICE. IMAGERY COLLECTED 02/23/2020.

CLIENT
HYDROSTOR, INC.

PROJECT
GEM ENERGY STORAGE CENTER

TITLE
ATTACHMENT DR93-1 MAP

CONSULTANT	YYYY-MM-DD	2022-09-26
wsp GOLDER	PREPARED	JAM
	DESIGN	JAM
	REVIEW	-
	APPROVED	-

PROJECT No.
20449449

DR93-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM ANS B

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4.4 CAISO Interconnection (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.

4.4.1 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: A facility loads list is being prepared by the EPC contractor as part of the FEED study. The overall load at the facility is listed at approximately 7MW. This value does not breakdown between critical and not critical loads. The project is working with the EPC contractor to reduce the internal loads.

4.5 Alternative Interconnection to LADWP Rosamond Substation (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.

4.5.1 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: The applicant is seeking CEC certification for the proposed interconnection to the SCE Whirlwind Substation and / or the Rosamond Switching Station. As stated in data response DR83, the August 26, 2022 interconnection queue posted on LADWP's OASIS website it is listed as "Application received". The interconnection request will be studied according to the schedule and practices outlined in the LADWP tariff and business practices. The feedback from the scoping meeting held on November 25, 2020 is that the estimated System Impact Study ("SIS") start date would be April 2023.

4.5.2 Data Request DR105

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

Response: Pursuant to the presentation titled "LADWP Transmission Planning Stakeholder Meeting: Attachment K Planning Q2 Meeting" dated June 30, 2022 which is available on the LADWP OASIS website (http://www.oasis.oati.com/woa/docs/LDWP/LDWPdocs/2022_06_30_Attachment_K_Q2_Presentation.pdf), the Rosamond Substation (with the proper name being the Rosamond Switching Station) will be in-service June 2025 (slide 25 of the aforementioned presentation).

4.5.3 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: See response to DR104 for requested treatment under the licensing process. See DR83 on the status of the interconnection request with LADWP.

4.5.4 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: LADWP has indicated that changes to the LADWP Rosamond Substation (aka Rosamond Switching Station) would be identified as part of the System Impact Study and Facilities Study in the interconnection process.

4.5.5 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 GESC project.*

Response: See response to DR107.

4.5.6 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 the confidential one-line diagram Attachment DR109-1. This diagram was submitted as part of the LADWP interconnection request. Any modifications to the LADWP interconnection request to reflect project design changes will be reported to the CEC.

4.5.7 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: The proposed interconnection is expected to use a 2 x 1590 Kilo Circular Mills (kcmil) Aluminum Conductor Steel-Reinforced (ACSR) "Lapwing" bundle. The conductor would have a summer normal rating (ampacity) of 1877 amperes.

CONFIDENTIAL ATTACHMENT DR 109-1

**DIAGRAM SHOWING THE 230 KV GENERATOR TIE-LINE SYSTEM INTERCONNECTION
WITH THE ROSAMOND SUBSTATION**

4.6 Data Requests DR111

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).

4.6.1 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: The SCE Whirlwind interconnection would require a single crossing of the existing LADWP high voltage transmission right-of-way. Transmission line design for the LADWP crossing is underway. Once completed, a letter will be forwarded to LADWP regarding this proposed crossing. It will provide drawings outlining the proposed crossing design and location where along the LADWP easement it will be located. This engagement will also request all approvals required to cross the LADWP easement.