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**REPORT**

# Opening Testimony and Evidence

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

Submitted by:

**GEM A-CAES LLC**

Submitted by:

**WSP USA Inc.**

401 B Street, Suite 1650, San Diego, California, USA 92101

July 2025



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## 1.0 INTRODUCTION

Attached is GEM A-CAES LLC's (or the Applicant) testimony, including identification of contested issues, in support of the Willow Rock Energy Storage Center (WRESC) (21-AFC-02) evidentiary hearings. In addition, the Applicant's testimony also constitutes the Applicant's comments on the California Energy Commission's (CEC) Final Staff Assessment (FSA) (Transaction Number [TN] #264843). Declarations and resumes for each witness are also provided in Appendix A and B.

## 2.0 PROJECT DESCRIPTION AND GENERAL CONDITIONS OF CERTIFICATION

### I. Introduction

**A. Names:** Curt Hildebrand, Andrew McGillis, Laurel Lees, Victor Grille, Cody Niehus and David Stein

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Exhibit 1001, CONFIDENTIAL Appendix 3A, Interconnection Study Documents (TN 241428), December 2, 2021
- Exhibit 1002, Joint Response of Pecho and Gem Supporting NOI Exemption and Request for Committee Order (TN 241503), February 9, 2022
- Exhibit 1003, Joint Reply to CEC Staff's Response to Applicants' Filing Requesting Exemption from the NOI Process (TN 242224), March 8, 2022
- Exhibit 1004, Gem Data Adequacy Master Response No. 1 (TN 242776), April 25, 2022
- Exhibit 1005, Att DA20-1 A-CAES Historical Operational Summary (TN 242799), April 25, 2022
- Exhibit 1006, Order and Final Commission (TN 243543), June 15, 2022
- Exhibit 1007, Applicant's Notice of Project Name Change (TN 244331), August 5, 2022
- Exhibit 1008, Attachment DR95-1\_C132-North-Q1782-TOT 1002-Gem-Appendix A (TN246751)
- Exhibit 1009, Attachment DR95-1\_QC13PII-SCE-Northern-Q1782TOT 1002-Gem-Appendix A-Attachment 1 (TN 246752)
- Exhibit 1010, Attachment 3 (TN 247169)
- Exhibit 1011, Queue Cluster 13 Phase II – Attachment 1 (TN 247170)
- Exhibit 1012, Appendix A – Q1782 (TN 247171)
- Exhibit 1013, Queue Cluster 13 Phase 2 Attachment 2 (TN 247172)
- Exhibit 1014, Appendix H – SCD Results (TN 247173)
- Exhibit 1015, Appendix G - Generation Sequencing Implementation (GSI) (TN 247174)
- Exhibit 1016, SCE's Northern Hemisphere Import Nomogram Study (TN 247175 )

- Exhibit 1017, Area Report Appendix K (TN 247176)
- Exhibit 1018, QC13 Phase 2 Area Report Appendix E (TN 247177)
- Exhibit 1019, Queue Cluster 13 Phase II – Appendix B (TN 247178)
- Exhibit 1020, Queue Cluster 13 Phase II – Appendix C (TN 247179)
- Exhibit 1021, Queue Cluster 13 Phase II – Appendix D (TN 247180)
- Exhibit 1022, Queue Cluster 13 Phase II – Appendix F (TN 247181)
- Exhibit 1023, QC13 Phase II Appendix L - Subsynchronous Control Interaction Screening Assessment Report (TN 247182)
- Exhibit 1024, Queue Cluster 13 Phase II Interconnection Study Report (TN 247183)
- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024
- Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024
- Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024
- Exhibit 1034, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendix 56A-510A (TN # 254807), March 4, 2024
- Exhibit 1035, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendix 515A-Part II (TN # 254808), March 4, 2024
- Exhibit 1036, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendix 515A-Part I (TN # 254809), March 4, 2024
- Exhibit 1039, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendix 1A-51F (TN 254812), March 4, 2024
- Exhibit 1040, Hi Res Figures V1 File 1 of 2 (TN 254813), March 4, 2024
- Exhibit 1041, High Resolution Figures WRESC SAFC 2 of 2 (TN 254814), March 4, 2024
- Exhibit 1056, CONFIDENTIAL Appendix\_Willow Rock Energy Storage Center Heat and Mass Balance Diagram (TN 256365), March 4, 2024
- Exhibit 1058, Appendix 1D Site Related Property Owners and Relationship to Project Owner (TN 256448) March 4, 2024
- Exhibit 1059, Appendix 1B Property Owner's Addresses and Map (TN 256449) March 4, 2024
- Exhibit 1070, Willow Rock Data Adequacy Response (TN 256622), May 3, 2024
- Exhibit 1071, 2022 Generator Interconnection Reassessment Report Northern Area Final Report (TN 256824), May 2, 2024

- Exhibit 1072, 2022 Generator Reassessment Report (TN 256825), May 2, 2024
- Exhibit 1073, QC13 Phase 2 Study Report Attachment #2 Updated for 2022 Reassessment (TN 256826), May 2, 2024
- Exhibit 1074, Attachment ES-1 Property Owners List (TN 256860) May 31, 2024
- Exhibit 1075, WA-6 Heat and Mass Balance (Block Flow Diagram) (TN 256861), May 31, 2024
- Exhibit 1112, Willow Rock CURE Data Request Set 1 Response (TN 259338), September 27, 2024
- Exhibit 1127, Attachment DR84-1\_Confidential (TN 260240) [includes - Project components, proposed access roads and proposed transmission line poles], October, 28, 2024
- Exhibit 1128, Attachment DR85-1\_Confidential (TN 260241), [includes project component maps], October 28, 2024
- Exhibit 1130, Attachment DR67 Large Generator Interconnection Agreement (TN 260243), October 23, 2024
- Exhibit 1140, Willow Rock Updated SAFC Project Description- Section 2 Redline (TN 261563), February 5, 2025
- Exhibit 1141, Willow Rock Updated SAFC Introduction-Section 1 Redline (TN 261564), February 5, 2025
- Exhibit 1153, Consolidated Email Response to CEC Staff on Lahontan's February 26, 2025 Request for Additional Information (TN # 261932) (TN 262349), March 25, 2025
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025
- Willow Rock Data Adequacy Response, Attachment PD-1 (Exhibit number and TN to be assigned)
- Willow Rock Data Adequacy Response, Attachment PD-2 (Exhibit number and TN to be assigned)
- Willow Rock Data Adequacy Response, Attachment PD-3 (Exhibit number and TN to be assigned)
- Willow Rock Data Adequacy Response, Attachment PD-4 (Exhibit number and TN to be assigned)
- Willow Rock CURE Data Request 2 Response Attachment DR168-1 (Exhibit number and TN to be assigned)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Project Description**

The WRESC will be a nominal 520-megawatt (MW) gross (500 MW net) and 4,160 megawatt-hour (MWh) gross (4,000 MWh net) facility using Hydrostor, Inc.'s (Hydrostor's) proprietary, advanced compressed air energy storage (A-CAES) technology. Energy stored at the WRESC will be delivered to Southern California Edison's (SCE's) Whirlwind Substation located southwest of the WRESC at the intersection of 170th Street W and Rosamond Boulevard, via a new approximately 19-mile 230-kilovolt (kV) generation-tie (gen-tie) line.

The WRESC will be capable of operating on a 24 hours per day, 7 days per week, and 365 days a year with an approximately 50-year lifespan. WRESC will typically cycle between Charging Mode (compression/energy storage) lasting approximately 14 hours and Discharging Mode (decompression/power production) lasting 8 hours at nameplate capacity.

During Charging Mode, electric power will be drawn from the grid (typically off-peak) to run the all-electric air compressors. Compressed air will be injected into a water-filled subterranean cavern displacing the cavern water upward into the hydrostatically compensating reservoir. Heat generated during the compression process will be recovered to heat water in a closed loop thermal storage system, with hot water stored in aboveground spherical tanks (spheres). Upon completion of the charging cycle, the system will be available to generate electricity.

During the Discharge Mode, water from the hydrostatically compensating reservoir will be allowed to flow down into the subterranean cavern, displacing the stored compressed air which will be expanded in power turbines to generate electricity for up to 8 or more hours. Hot water recovered and stored in the aboveground spheres during the charging cycle will be used to reheat the expanding air at intermediate turbine stages to facilitate higher efficiency power generation. During the compression process, water vapor entrained in the compressed air will be condensed and recycled. Dry air exiting the power turbines will be discharged to the atmosphere through five stacks, one serving each power generation train. No fossil fuels will be required to operate the Willow Rock facility

## **B. Facility Location**

Willow Rock will be located in unincorporated Kern County (County), approximately 4 miles north of Rosamond, California. The WRESC site is within the southeast quarter of Section 33 of Township 10 North, Range 12 West.

The approximately 88.6-acre WRESC site is located on the western portion of an approximately 112-acre parcel with Assessor's Parcel Number (APN) 431-022-13 that is bisected by Sierra Highway and the Union Pacific Railway. The eastern portion of APN 431-022-13 is not included in the project boundary and will remain undeveloped. The WRESC site is bounded on the north and west by undeveloped property, on the east by Sierra Highway, and on the south by Dawn Road approximately 1,800 feet east of the State Route 14 corridor. Additional parcels adjacent to the WRESC site within the project boundary may be used for temporary parking, construction laydown, or construction of an architectural berm.

The WRESC site is currently proposed on undeveloped land in an area zoned Exclusive Agriculture (A) District. The area surrounding the project boundary is largely undeveloped with very sparse residential development; the nearest residence is approximately 0.8 miles northwest of the northwest corner of the WRESC site.

## **C. Key WRESC Features**

WRESC includes the following key features:

- A-CAES Energy Storage Process, Cooling Systems and Electric Transmission
  - All-electric-motor-driven air compressors configured in four trains, totaling nominally 500 MW net
  - Air-powered turbine generators with air discharge stacks
  - Heat extraction and recovery main process heat exchangers
  - Thermal storage system using water
  - Electric, air-cooled heat exchangers

- Hydrostatically compensating surface reservoir with liner and interlocking shape floating cover
- Evaporation pond for process water
- Aboveground piping pipe racks and filter houses
- Underground compressed air storage cavern
- Interconnecting shafts for movement of compressed air and water to and from the cavern
- Optional permanent aboveground architectural berm for onsite re-use of excavated cavern rock<sup>1</sup>
- Approximately 19-mile long 230 kV single-circuit, double-conductor bundle generation-tie (gen-tie) line interconnecting to the SCE Whirlwind Substation with a preferred gen-tie route and alternate route options
- Approximately 186 transmission poles
- Operation and Maintenance Facilities, Ancillary Support Systems and Other Features
  - Site stormwater drainage system and stormwater percolation/evaporation pond
  - Water supply from adjacent existing Antelope Valley East Kern Water Agency's supply pipeline
  - Fire detection and fire monitoring system
  - Firewater tank and fire suppression system
  - Electric and Diesel-fired backup emergency fire pump
  - Diesel-fired emergency backup power supply engines to maintain critical loads in the event of a loss of power
  - Combined Office, Control Room, and Maintenance Building
  - Employee and visitor parking area with electric vehicle charging ports and landscaping
  - Primary and secondary entrances with security access gates and site perimeter fencing
  - Permanent plant access roads within the WRESC
  - Extension/upgrades to Dawn Road between the State Route (SR) 14 interchange and Sierra Highway
  - Unpaved access road for portions of the gen-tie line corridor that do not have established access

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<sup>1</sup> Approximately 1.3 million cubic yards of crushed rock (accounting for swell and void space) would be extracted during construction of the cavern. The WRESC will include options for managing the extracted rock that may be implemented alone or in any combination, including (a) permanent onsite storage in the form of an architectural berm around portions of the WRESC; (b) off-taker transport for commercial use; and (c) off-taker transport for permanent offsite storage. The size of the potential architectural berm will depend on the quantity of rock.

■ Temporary Construction Facilities

- Temporary laydown and parking areas including cavern construction laydown area, construction phase earthwork areas, cavern rock temporary re-use areas, cavern rock temporary backup re-use areas, and parking areas located on adjacent and nearby parcels
- Temporary rock crushing facility and portable concrete batch plant to support cavern construction and excavated rock management
- Temporary entrances for construction
- Temporary conductor pull and tensioning sites
- Temporary disturbance for each transmission pole placement

A Comprehensive Project Description is included as Attachment A.

**D. Preferred Gen-Tie Route**

The facility will connect with SCE's Whirlwind substation via an approximately 19-mile-long generation tie-line (designated the Preferred Gen-Tie Route). This is the most direct interconnection route that will follow existing Kern County public ROW and an expected franchise agreement with Kern County, maximize the use of existing improved surface road corridors, avoid placement of the line in close proximity to public schools or the downtown Rosemond residential and business district, and minimize the required number of private easements. The Preferred Gen-Tie Route corridor leaves the northern side of the WRESC Site and continues north for approximately 650 feet. It then transitions 90 degrees west and crosses SR 14 and continues west for approximately 1 mile parallel and north of Dawn Road. Just before reaching a property designated as State Lands (Kern County Assessor Parcel Number 431-022-06), the line transitions 90 degrees south to Dawn Road (approximately 0.5 miles), then follows Dawn Road west to Mojave-Tropico Road (approximately 2.2 miles). From Dawn Road, the route follows Mojave-Tropico Road south to Felsite Avenue (approximately 2.8 miles), the turns west in the vicinity of Felsite Avenue to 65th Street W (approximately 1.0 mile), and south along 65th Street W to Rosamond Boulevard (approximately 0.5 mile). The route then continues along Rosamond Boulevard west to the SCE Whirlwind Substation for approximately 10.8 miles. Before reaching 170th Street W, east of the SCE Whirlwind Substation, the line diverts northwest to cross an existing SCE transmission line and then diverts southwest back to the Rosamond Boulevard alignment west of 170th Street W. The total length of the Preferred Gen-Tie Route primary alignment is approximately 19 miles. The Preferred Gen-Tie Route includes five named road segments and two segments that do not follow existing roads, which are located at the SR 14 crossing and the SCE Whirlwind Substation interconnection area. Approximately 17.8 miles would be aboveground, and approximately 1.2 miles would be underground, including at three utility crossing locations along Rosamond Avenue and in a residential area on the Felsite Avenue corridor.

There are six Preferred Gen-Tie Route options that deviate slightly from the primary alignment that are also included in the proposed Project. These are all considered available but less preferable than the primary route. Some may present issues related to feasibility, i.e., ability to gain site control and potential interactions with existing and planned uses. These options include:

- Option 1 (1.3 miles in total or 1.0 mile from the southwest Project corner). Dawn Road approximately 1 mile west of the WRESC Site following the existing SR 14 overpass, instead of the northern crossing location where the primary route is identified. This segment was the original Preferred Gen-Tie Route but was later

changed to the northern SR 14 crossing based on recommendations by the California Department of Transportation (Caltrans) to avoid a more complex review process that would be involved if the gen-tie line crossed SR 14 adjacent to the overpass.

- Option 2a (0.5 miles). This option is a continuation of the SR 14 northern crossing route 0.5 mile farther west to 30th Street W, which cuts through a State Lands parcel (Assessor Parcel Number 431-022-06), which may not be feasible.
- Option 2b (1.1 miles). This option avoids the State Lands parcel by following the northern boundary and remaining outside of the property and ends at the same location as Option 2b at 30th Street W.
- Option 3a (0.5 mile). This option follows 30th Street W to Dawn Road.
- Option 3b (1.2 miles). This option continues west past 30th Street W in the same east-to-west alignment as Option 2a. When it reaches Werner Street, the line would then transition 90 degrees south and follow Werner Street to Dawn Road.
- Option 4 (0.3 miles). This option is an alternate segment of Dawn Road approximately 0.3 mile east of Mojave-Tropico Road that follows the existing roadway used by motorists and visible in aerial imagery. The primary route identified for the preferred gen-tie route at the western end of Dawn Road follows the County's road easement instead of the existing roadway used by motorists and visible in aerial imagery. This variant is included until further direction is provided by the County regarding the route the County prefers to include in its franchise agreement.
- Option 5 (1.5 miles). Mojave-Tropico Road between Felsite Avenue and Rosamond Avenue, and Rosamond Avenue between Mojave-Tropico Road and 65th Street W. This segment was the original Preferred Gen-Tie Route but was later changed to Felsite Avenue and 65th Street W to avoid passing in front of Tropico Middle School. Approximately 0.4 mile of this option would be underground in the vicinity of the school.
- Option 6 (0.2 miles). This option follows Rosamond Boulevard east of 170th Street W in a generally parallel direction before continuing to SCE Whirlwind Substation and provides an alternate route for crossing the existing SCE transmission line corridor northeast of the substation.

The Preferred Gen-Tie Route, including options discussed below, is included as Attachment B.

## **E. Project Objectives**

The WRESC basic project objectives are the following:

- 1) Provide 500 MW of quick-starting, flexible, controllable generation with the ability to ramp up and down through a wide range of electrical output to facilitate the integration of renewable energy into the electrical grid in satisfaction of California's Renewable Portfolio Standard and climate objectives, by displacing older and less efficient generation.
- 2) Interconnect the project to the CAISO-controlled SCE Whirlwind Substation, a major substation in or near the Tehachapi Renewable Wind Resource Area, to facilitate the integration of onshore and offshore renewable energy development.
- 3) Implement a proven sustainable energy storage technology that provides improved technological diversity, non-combustible energy storage, minimal residual hazardous waste at asset retirement, a long-term commercial lifespan of 30 years or greater, and non-degrading energy storage.



- 4) Use A-CAES technology to provide dispatchable long-duration storage and energy delivery for a minimum of 8 hours; fossil fuel and greenhouse gas emissions-free operation; flexible capacity with minimal response time; provide long-duration storage to avoid curtailment through energy storage and to facilitate the further integration of renewable resources; peaking energy for local contingencies; voltage support and primary frequency response, including synchronous power output to support grid resiliency without the need for fossil fuel; superior transient response attributes, including synchronous power output; and superior round-trip thermodynamic efficiency.
- 5) Locate the facility on a site with adequate geologic characteristics for the underground facilities for compressed air storage, including suitable overburden characteristics (limited thickness, constructable soil type); deep subsurface geological formation (2,000 to 2,500 feet below ground surface) of sufficient quality and definition at the required depth for construction of the excavated storage cavern; ultra-low hydraulic conductivity and permeability in deep subsurface geological formation to retain water and air under pressure within the excavated storage cavern; and competent geological structural integrity to sustain an excavated storage cavern at depth intact indefinitely, allowing for repeated compressed air injection and discharge cycles over the life of the project without eroding or collapsing.
- 6) Site the project on land with acceptable constructability and with adequate access and size for construction of aboveground facilities—at least approximately 80 acres.
- 7) Site the project near adequate water supply for construction.
- 8) Locate the project on a site that is available to provide adequate site control, through long-term lease or purchase.
- 9) Minimize additional supporting infrastructure needs and reduce potential environmental impacts by locating the facility near existing and planned infrastructure, including access to an existing substation with available transmission capacity.
- 10) Create jobs in Kern County and the state of California through both construction and operation of the facility.
- 11) Be a good corporate citizen and respected member of the community through the lifecycle of the project.

#### **F. Project Benefits**

The WRESC will provide the following key environmental and economic benefits:

- **Strategic location:** The WRESC is located strategically to facilitate the further integration of variable renewable resources located in the Tehachapi Renewable Resource Area, which will help avoid curtailment of variable renewable energy resources through energy storage and to meet California and regional electric grid reliability needs.
- Hydrostor A-CAES technology that provides:
  - Fossil fuel emissions-free spinning reserve.
  - Flexible capacity with minimal start time.
  - Peaking energy for local contingencies.
  - Voltage support and primary frequency response without burning fossil fuel.



- Superior transient response attributes.
- Superior round-trip thermodynamic efficiency.
- **Minimized land use impacts:** Willow Rock is sited on compatibly zoned parcels in a sparsely populated area. There are no schools, parks, recreational areas, or other sensitive land uses immediately adjacent to the WRESC Site. The project is consistent with the applicable local land uses and land use plans.
- **Key project for integrating renewables:** Willow Rock will provide rapid-response delivery of energy and synchronous condenser voltage support services that are essential to providing reliability support and stability to the grid and integrating intermittent renewable energy sources into the electrical grid.
- **Substantial construction jobs:** Willow Rock will provide approximately 275 to 750 construction jobs (average to peak) with an expected construction payroll of approximately \$400–450 million over the 60-month construction and commissioning period.
- **Permanent local jobs:** Willow Rock will provide approximately 40 full time jobs for operation of the facility.
- **Substantial property tax revenue to Kern County and local schools:** With its sizeable capital cost (estimated at approximately \$1.5 billion), Willow Rock will generate significant income in the form of annual property tax payments, and therefore will provide a robust boost to Kern County's economy and local schools.
- **Local economic benefits:** In addition to the direct employment benefit, Willow Rock will require and use the services of local or regional firms for major maintenance and overhauls, plant supplies, and other support services throughout the life of the Willow Rock facility. The project will not significantly impact local housing, educational, or emergency response resources.
- **Supportive community participant:** The Applicant is committed to working collaboratively with the local community and the County to be a beneficial contributor to community programs and supportive community participant.

#### **G. Project Schedule**

Construction of the WRESC is expected to begin no later than December 2025. Pre-operational testing of the power plant is expected to begin during 2029, and full-scale operation is expected to begin in 2030.

#### **II. Summary of Compliance with Applicable LORS**

The WRESC will comply with applicable LORS.

### **III. Response to Certain Issues Raised in the FSA**

The Applicant has no comments on the Project Description section in the FSA.

### **IV. Proposed Licensing Conditions**

No Conditions of Certification are proposed for the project description. The Applicant does have comments on certain proposed conditions for Facility Design that are addressed in the Applicant's Facility Design testimony. The Applicant has the following comments regarding proposed general conditions of certification that were not incorporated by CEC staff in the FSA:

Page 9-9, COC COM-1 – Please revise text as follows:

**“COM-1 Unrestricted Access.** The project owner shall ~~take all steps necessary to~~ ensure that the CPM, responsible CEC staff, and delegate agencies or consultants have unrestricted access to the facility site, related facilities, project-related staff, and the records maintained on site for the purpose of conducting audits, surveys, inspections, or general or closure-related site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time, whether such visits are by the CPM in person or through representatives from CEC staff, delegated agencies, or consultants.”

Page 9-9, COC COM-2 – Please revise text as follows:

**“COM-2 Compliance Record.** The project owner shall maintain electronic copies of all project files and submittals related to CEC license compliance on site, or at an alternative site approved by the CPM, for the operational life and closure of the project. The files shall also contain at least one hard copy of:

1. the facility’s Supplemental AFC;
2. all post-certification amendment petitions and CEC orders;
3. all post-certification site-related environmental impact and survey documentation;
4. all post-certification appraisals, assessments, and studies for the project;
5. all finalized original and amended structural plans and “as-built” drawings for the entire project;
6. all citations, warnings, violations, or corrective actions applicable to the project, and
7. the most current versions of any plans, manuals, and training documentation required by the COCs or applicable LORS.

The CEC staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this condition.”

Page 9-10, COC COM-4 – Please revise text as follows:

**“COM-4 Pre-Construction Matrix and Tasks Prior to Start of Construction.** Prior to construction, the project owner shall submit to the CPM a compliance matrix including only those conditions that must be fulfilled before the start of construction.

The matrix shall be included with the project owner’s first compliance submittal or prior to the first pre-construction meeting, whichever comes first, and shall be submitted in a format similar to the description below.

Site mobilization and construction activities shall not start until the following have occurred:

1. the project owner has submitted the pre-construction matrix and all compliance verifications pertaining to pre-construction COCs; and
2. the CPM has issued an authorization-to-construct letter to the project owner.

~~The deadlines for submitting various compliance verifications to the CPM allow staff sufficient time to review and comment on, and, if necessary, also allow the project owner to revise the submittal in a timely manner. These procedures help ensure that project construction proceeds according to schedule. Failure to submit required compliance documents by the specified deadlines may result in delayed authorizations to commence various stages of the project.~~

~~If the project owner anticipates site mobilization immediately following project certification, it may be necessary for the project owner to file compliance submittals prior to project certification. In these instances, eCompliance verifications can be submitted in advance of the required deadlines and the anticipated authorizations to start construction. The project owner must understand that submitting items required in compliance verifications prior to these authorizations is at the owner's own risk. Any approval by CEC staff prior to project certification is subject to change based upon the Decision, or amendment thereto, and early staff compliance approvals do not imply that the CEC will certify the project for actual construction and operation.~~

Page 9-13, COC COM-11 – Please revise text as follows:

**“COM-11 Amendments, Staff-Approved Project Modifications, Ownership/Operational Control Changes, Staff and Project Owner Jointly Initiated Amendments and Verification Changes.** The project owner shall petition the CEC, pursuant to title 20, California Code of Regulations, section 1769, to modify the design, operation, or performance requirements of the project or linear facilities, or to transfer ownership or operational control of the facility. The CPM will determine whether staff approval will be sufficient, or whether Commission approval will be necessary consistent with the requirements of section 1769. It is the project owner's responsibility to contact the CPM to determine if a proposed project change triggers the requirements of section 1769. Section 1769 details the required contents for a petition to amend a CEC Decision.”

Page 9-14, COC COM-13 – Please revise text as follows:

**“COM-13 Emergency Response Site Contingency Plan.** No less than 60 days prior to the start of construction (or other CPM-approved) date, the project owner shall submit, for CPM review and approval, an Emergency Response Site Contingency Plan (Contingency Plan). Subsequently, no less than 60 days prior to the start of commercial operation, the project owner shall update (as necessary) and resubmit the Contingency Plan for CPM review and approval. The Contingency Plan shall evidence a facility's coordinated emergency response and recovery preparedness for a series of reasonably foreseeable emergency events. The CPM may require Contingency Plan updating over the life of the facility consistent with any changes in applicable law.”

**ATTACHMENT A**  
**Comprehensive Project Description**

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## Appendices

### APPENDIX 2A

Engineering Design Criteria

### APPENDIX 2B

Construction Manpower and Equipment Schedule

### APPENDIX 2C

Heat and Mass Balance Diagrams (*This Appendix Is Filed Under a Request for Confidential Designation*)

### APPENDIX 2D

Water Balance Diagrams and Construction Water Use

### APPENDIX 2E

Construction Traffic Volume Estimate

## 2.0 Project Description

The Willow Rock Energy Storage Center (WRESC, or Willow Rock) will be located on approximately 88.6 acres of private land immediately north of Dawn Road and between State Route (SR) 14 and Sierra Highway within unincorporated, southeastern Kern County, California. The WRESC will be a nominal 520-megawatt (MW) gross (500 MW net) and 4,160 megawatt-hour (MWh) gross (4,000 MWh net) facility using Hydrostor, Inc.'s (Hydrostor's) proprietary, advanced compressed air energy storage (A-CAES) technology. Energy stored at the WRESC will be delivered to Southern California Edison's (SCE's) Whirlwind Substation located southwest of the WRESC at the intersection of 170th Street W and Rosamond Boulevard, via a new approximately 19-mile 230-kilovolt (kV) generation-tie (gen-tie) line. The WRESC will be capable of operating on a 24-hour basis, 365 days a year with an approximately 50-year lifespan.

The proposed project includes the following key features:

- A-CAES Energy Storage Process, Cooling Systems and Electric Transmission
  - Eight electric-motor-driven air compressors configured in four trains, totaling nominally 500 MW net
  - Four nominally 130 MW air-powered turbine generators with 100-foot-tall air vent stacks
  - Heat extraction and recovery main process heat exchangers
  - Thermal storage system using water, including up to six, 87.5-foot-diameter by 100-foot-tall (maximum) hot-water spherical storage tanks and two 150-foot-diameter, 60-foot-tall cold-water storage tanks
  - Cooling system: three air-cooled heat exchangers with evaporative mist system using excess internally produced process water
  - One approximately 21.5-acre, 600-acre-foot capacity hydrostatically compensating surface reservoir with liner and interlocking shape floating cover
  - Aboveground piping pipe racks and filter houses
  - Underground compressed air storage cavern (approximately 900,000 cubic yards capacity)
  - Interconnecting conduits for movement of compressed air to and from the cavern
  - Potential permanent aboveground architectural berm for onsite re-use of excavated cavern rock<sup>1</sup>
  - Onsite 230 kV substation with oil-filled transformers with 230/13.8 kV rating
  - One approximately 19-mile-long 230 kV single-circuit double-bundle conductor generation-tie (gen-tie) line interconnecting to the SCE Whirlwind Substation with a preferred gen-tie route and route options
  - Approximately 186 transmission poles (approximately 0.2 acres permanent disturbance)
- Operation and Maintenance Facilities, Ancillary Support Systems, and Other Features
  - Site stormwater drainage system and stormwater percolation/evaporation pond
  - Water supply connection to an existing Antelope Valley East Kern Water Agency's supply pipeline adjacent to Sierra Highway east of the WRESC Site
  - Fire detection and fire monitoring systems
  - Firewater tank and fire suppression system
  - Acoustic enclosures for Turbomachinery
  - Weather Enclosures for Motor Control Center
  - One diesel-fired 345-kilowatt (kW) (460 horsepower) emergency fire pump
  - Three diesel-fired up to 2.5 MW, 4.16 kV emergency backup power supply engines to maintain critical loads in the event of a loss of power
  - One combined office, control room, and maintenance building
  - Employee and visitor parking area with electric vehicle charging ports and landscaping
  - Primary and secondary entrances with security access gates and site perimeter fencing
  - Permanent plant access roads within the WRESC Site

---

<sup>1</sup> Approximately 1.3 million cubic yards of crushed rock (accounting for swell and void space) would be extracted during construction of the cavern. The WRESC will include options for managing the extracted rock that may be implemented alone or in any combination, including (a) permanent on-site storage in the form of an architectural berm around portions of the WRESC; (b) off-taker transport for commercial use; and (c) off-taker transport for permanent off-site storage. The size of the potential architectural berm will depend on the quantity of rock. The height is expected to not exceed approximately 10 feet. If all the rock were re-used onsite, the total facility size would increase by up to an additional approximately 74.6 acres for a total of approximately 163.5 acres.



- Extension/upgrades to Dawn Road between the SR 14 interchange and Sierra Highway

■ Temporary Construction Facilities

- Up to approximately 122.2-acre total laydown areas including cavern construction laydown area, construction phase earthwork areas, cavern rock temporary re-use areas, cavern rock temporary backup re-use areas, and parking areas located on adjacent and nearby parcels
- Rock crushing facility and concrete batch plant to support cavern construction and excavated rock management (acreage included in total temporary disturbance)
- Two temporary entrances for construction; the Dawn Road construction entrance may be converted to permanent
- An estimated up to 1.5 miles of unpaved temporary access road along the gen-tie line corridor as needed (approximately 3.7 acres)
- Approximately 35 conductor pull and tensioning sites (approximately 21.5 acres total)
- Approximately 75- by 75-foot temporary disturbance for placement of each transmission pole (approximately 23.6 acres total)

Willow Rock will not require the combustion of fossil fuel and will not produce combustion-related air emissions during normal operation.<sup>2</sup>

The WRESC Site is located immediately north of Dawn Road and immediately west of Sierra Highway, Rosamond, California, on the 88.6-acre portion of Assessor's Parcel Number 431-022-13, located west of Sierra Highway. The final site boundary and potential construction laydown areas depend on whether the facility will include onsite re-use of excavated cavern rock in an architectural berm on the west and north sides of the facility. **Figure 2-1** and **Figure 2-2** show the WRESC Site and potential construction laydown areas with and without the architectural berm option, respectively. **Table 2-1** summarizes all parcels that will be associated with immediate site development if excavated cavern rock is hauled offsite. **Table 2-2** summarizes all parcels that will be associated with immediate site development if excavated cavern rock is re-used onsite in an architectural berm.

**Table 2-1: Main Facility and Associated Parcels with Excavated Cavern Rock Hauled Offsite (No Architectural Berm)**

Assessor's Parcel Number	Owner	Parcel Size (acres)	Use
431-022-13	Zevsar Concepts LLC	88.6	Main facility - permanent
431-122-18	Private Owner	20.3	Temporary construction laydown and parking, if needed
431-022-12	Private Owner	17.2	Temporary construction laydown and parking
431-022-11	Private Owner	17	Temporary construction laydown and parking
431-022-08	GEM A-CAES LLC	79.4	Only approximately 13.4 acres of the parcel are expected to be used for temporary construction laydown and parking and/or Permanent environmental mitigation site

<sup>2</sup> The project will include three emergency diesel-fired engines to maintain critical loads in the event of a loss of power and one diesel-fired fire pump engine. These engines are expected to operate less than 50 hours per year for reliability testing and maintenance and will not operate concurrently during testing. The diesel-fired engines will operate in an emergency for other critical facility loads when electric power is not available. A separate diesel-engine-driven fire pump will provide water in the event of an emergency. This emergency backup equipment does not need to operate for the WRESC to function during normal operation.

**Table 2-2: Main Facility and Associated Parcels with Onsite Cavern Rock Re-use (with Architectural Berm)**

Assessor's Parcel Number	Owner	Parcel Size (acres)	Use
431-022-13	Zevsar Concepts LLC	88.6	Main facility - permanent
431-122-18	Private Owner	20.3	Architectural berm – permanent, if needed
431-022-12	Private Owner	17.2	Architectural berm - permanent
431-022-11	Private Owner	17	Architectural berm - permanent
431-122-01	Private Owner	0.9	Temporary construction and gentle line corridor
431-122-02	Private Owner	2.4	Temporary construction and gentle line corridor
431-122-03	Private Owner	4.9	Architectural berm - permanent
431-122-04	Private Owner	2.5	Temporary construction and gentle line corridor
431-122-07	Private Owner	5.1	Architectural berm - permanent
431-122-08	Private Owner	5.1	Architectural berm - permanent
431-122-14	Private Owner	1.3	Architectural berm – permanent, if needed
431-122-15	Private Owner	1.3	Architectural berm - permanent
431-122-16	Private Owner	1.3	Architectural berm - permanent
431-122-17	Private Owner	1.2	Architectural berm - permanent
431-111-30	Private Owner	20.6	Temporary construction laydown
431-112-24	GEM A-CAES LLC	5.1	Temporary construction laydown
431-112-25	GEM A-CAES LLC	5.1	Temporary construction laydown
431-112-26	GEM A-CAES LLC	5.1	Temporary construction laydown
431-112-27	GEM A-CAES LLC	5.1	Temporary construction laydown
471-061-05	Private Owner	2.5	Temporary construction laydown and parking
471-061-06	Private Owner	2.4	Temporary construction laydown and parking
471-061-07	Private Owner	2.5	Temporary construction laydown and parking
471-061-08	Private Owner	2.6	Temporary construction laydown and parking
431-022-08	GEM A-CAES LLC	79.4	Only approximately 13.4 acres of the parcel are expected to be used for temporary construction laydown and parking and/or Permanent environmental mitigation site, if needed

A summary of total permanent and temporary disturbances with and without the architectural berm is provided in **Table 2-3**.

**Table 2-3: Summary of Estimated Permanent and Temporary Disturbance With and Without Onsite Rock Re-use**

Project Element	Disturbed Acreage Without Berm (Rock Hauled Offsite)	Disturbed Acreage With Berm (Onsite Rock Re-use)	Permanent or Temporary <sup>1</sup>
Main Facility	88.6	88.6	Permanent
Architectural Berm	0	74.6	Permanent
Site Construction Laydown and Parking <sup>3</sup>	72.6	69.8 <sup>6</sup>	Temporary
Transmission Pole Foundation	0.2	0.2	Permanent
Transmission Pole Construction Sites <sup>4</sup>	23.6	23.3 <sup>6</sup>	Temporary
Pull and Tensioning Sites <sup>2</sup>	21.5	21.5	Temporary
Transmission Line Undergrounding	0.7	0.7	Temporary
New Access Roads	3.7	2.1	Temporary
<b>Total Permanent</b>	<b>88.8</b>	<b>163.5</b>	Permanent
<b>Total Temporary<sup>5</sup></b>	<b>122.2</b>	<b>117.3</b>	Temporary

<sup>1</sup> Temporary impacts that occur within a permanent impact area were classified as permanent impacts.

<sup>2</sup> Some Pull and Tensioning Sites overlap with Site Construction Laydown and Parking. The overlapping areas have been measured as Pull and Tensioning Sites.

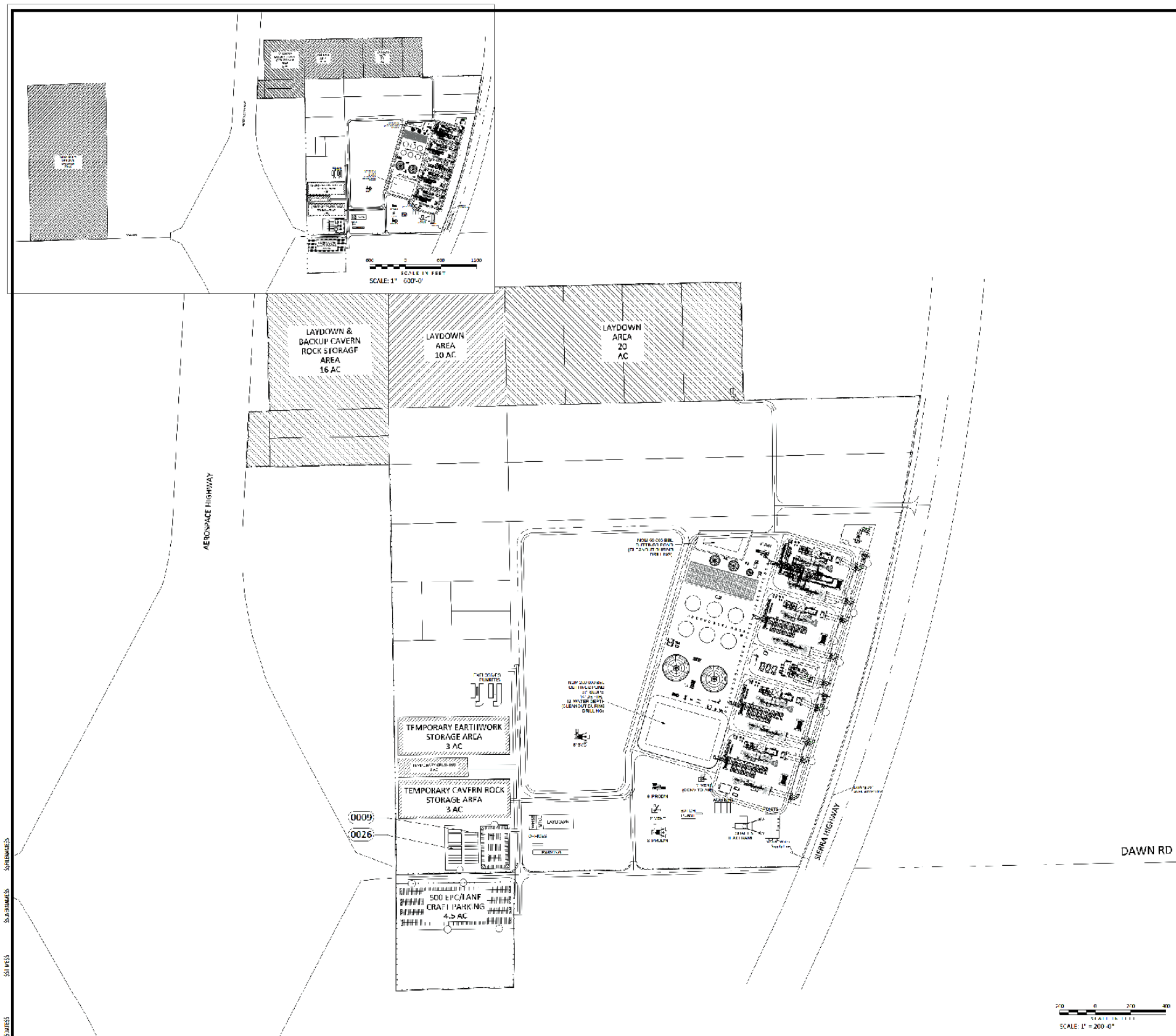
<sup>3</sup> Temporary impacts within pole construction sites, pull and tensioning sites, and access roads that occur within site construction laydown and parking area were subtracted from the site construction laydown and parking area total to avoid double counting of temporary disturbance.

<sup>4</sup> Some Transmission Pole Construction Sites overlap with Site Construction Laydown and Parking. The overlapping areas have been measured as Site Construction Laydown and Parking.

<sup>5</sup> Temporary impacts within pole construction sites, pull and tensioning sites, and access roads that occur within site construction laydown and parking area were subtracted from the site construction laydown and parking area total to avoid double counting of temporary disturbance.

<sup>6</sup> "With berm" acreage reduced marginally from "Without berm" acreage because a portion of this project element lies within the architectural berm boundary

Project elements are described in the following subsections. The project location, ownership, and benefits are described in detail in Chapter 1, Introduction.



NOTES:  
1. TWO OPTIONS FOR THE MINING/CAVERN  
SHAFTS ARE DEPICTED AS FOLLOWS:  
OPTION A - ONE 24" MINING SHAFT AND TWO  
8' WATER SHAFTS.  
OPTION B - TWO 8' WATER SHAFTS, TWO 8"  
CONSTRUCTION SHAFTS, AND ONE 8' SHAFT IN  
PLACE OF THE 24" MINING SHAFT.


- PRELIMINARY -  
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## REFERENCE(S)

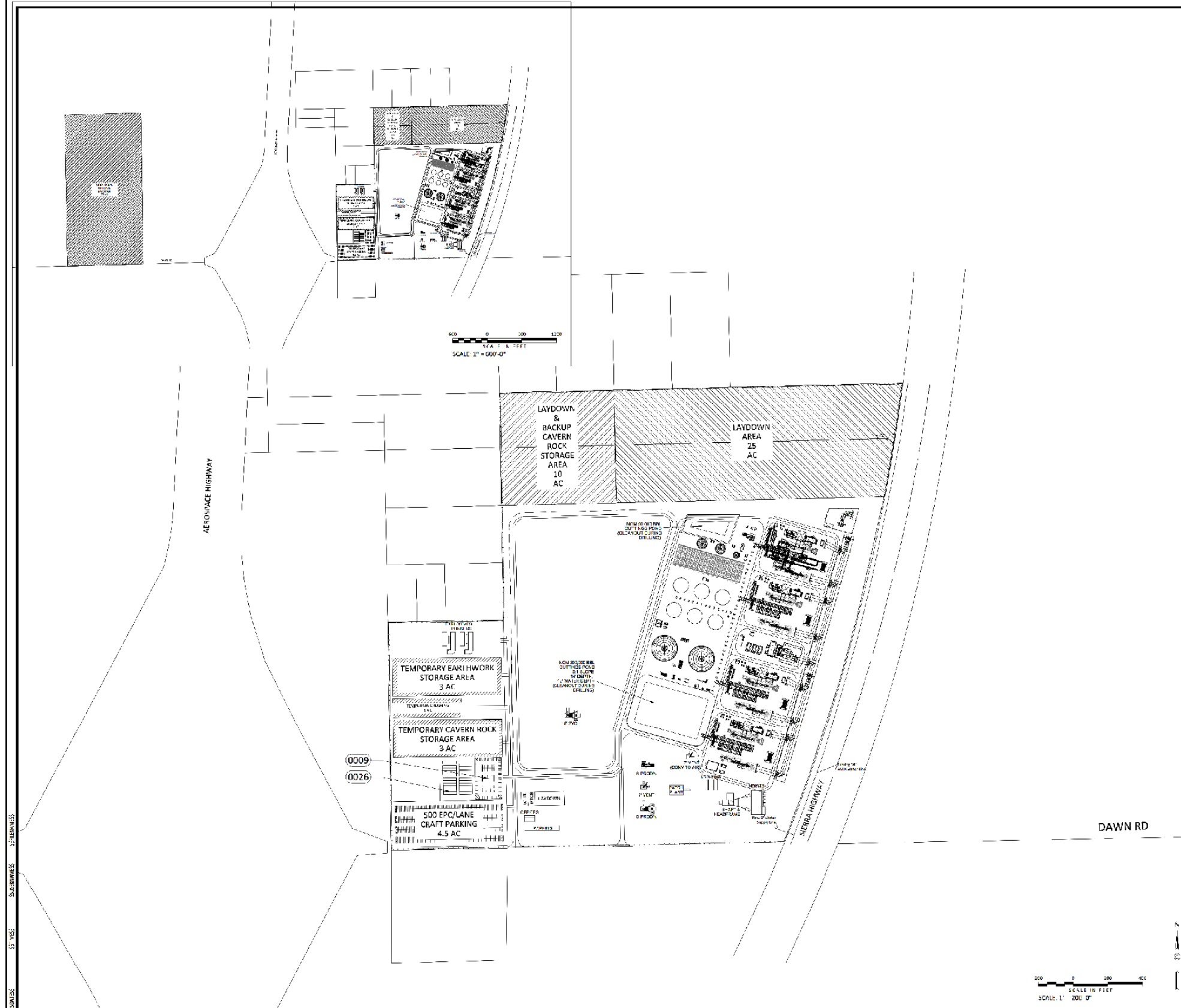
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PROJECT  
WILLOW ROCK ENERGY STORAGE CENTER  
SUPPLEMENTAL AFC

CONSULTANT	YYYY-MM-DD	2024-02-22
	DESIGNED	MK
	PREPARED	MK
	REVIEWED	SCH
	APPROVED	VG/LL

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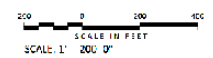




NOTES:  
1. TWO OPTIONS FOR THE MINING/CAVERN SHAFTS ARE DEPICTED AS FOLLOWS:  
OPTION A - ONE 24' MINING SHAFT AND TWO 8' WATER SHAFTS.  
OPTION B - TWO 8' WATER SHAFTS, TWO 8" CONSTRUCTION SHAFTS, AND ONE 8" SHAFT IN PLACE OF THE 24' MINING SHAFT.

LEGEND:  
0009 CONSTRUCTION PARKING  
0026 CONSTRUCTION TRAILERS

- PRELIMINARY -  
NOT FOR CONSTRUCTION



0 50 100 200 FEET	
HYDROSTOR WILLOW ROCK ENERGY STORAGE CENTER	
<b>Hydrostor</b>	
<b>Kiewit</b>	
SITE PLAN CONSTRUCTION PHASE - WITHOUT BERM	
DATE: 02/22/24 BY: J. GAVIN CHECKED: S. GAVIN APPROVED: J. GAVIN	20045352-SP-002



REFERENCE(S)  
1. WRESC SITE RENDERING - KIEWIT 2024  
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE CALIFORNIA V FIPS 0405 FEET  
3. MAP SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEBCO, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

CLIENT  
GEM A-CAES LLC

PROJECT  
WILLOW ROCK ENERGY STORAGE CENTER  
SUPPLEMENTAL AFC

TITLE  
WRESC SITE AND CONSTRUCTION LAYDOWN/PARKING – NO  
ARCHITECTURAL BERM OPTION

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PREPARED	MK	
REVIEWED	SCH	
APPROVED	VG/LL	

## 2.1 Generating Facility Description, Design, and Operation

The WRESC will be a nominal 4,160 MWh energy storage facility capable of charging and discharging daily. The overall facility will consist of four nominal 130 MW (gross) trains, outputting a total of 500 MW net at the point of interconnection. Each train will contain an electric motor-driven air compressor drivetrain, heat exchangers, an air turbine generator, air exhaust stacks and ancillary equipment. Each train will share a common set of thermal storage tanks (hot and cold water), as well as the air storage cavern.

The WRESC will be designed and constructed following the design criteria provided in Appendix 2A, Engineering Design Criteria following applicable laws, ordinances, regulations, and standards (LORS).

### 2.1.1 General Site Arrangement and Layout

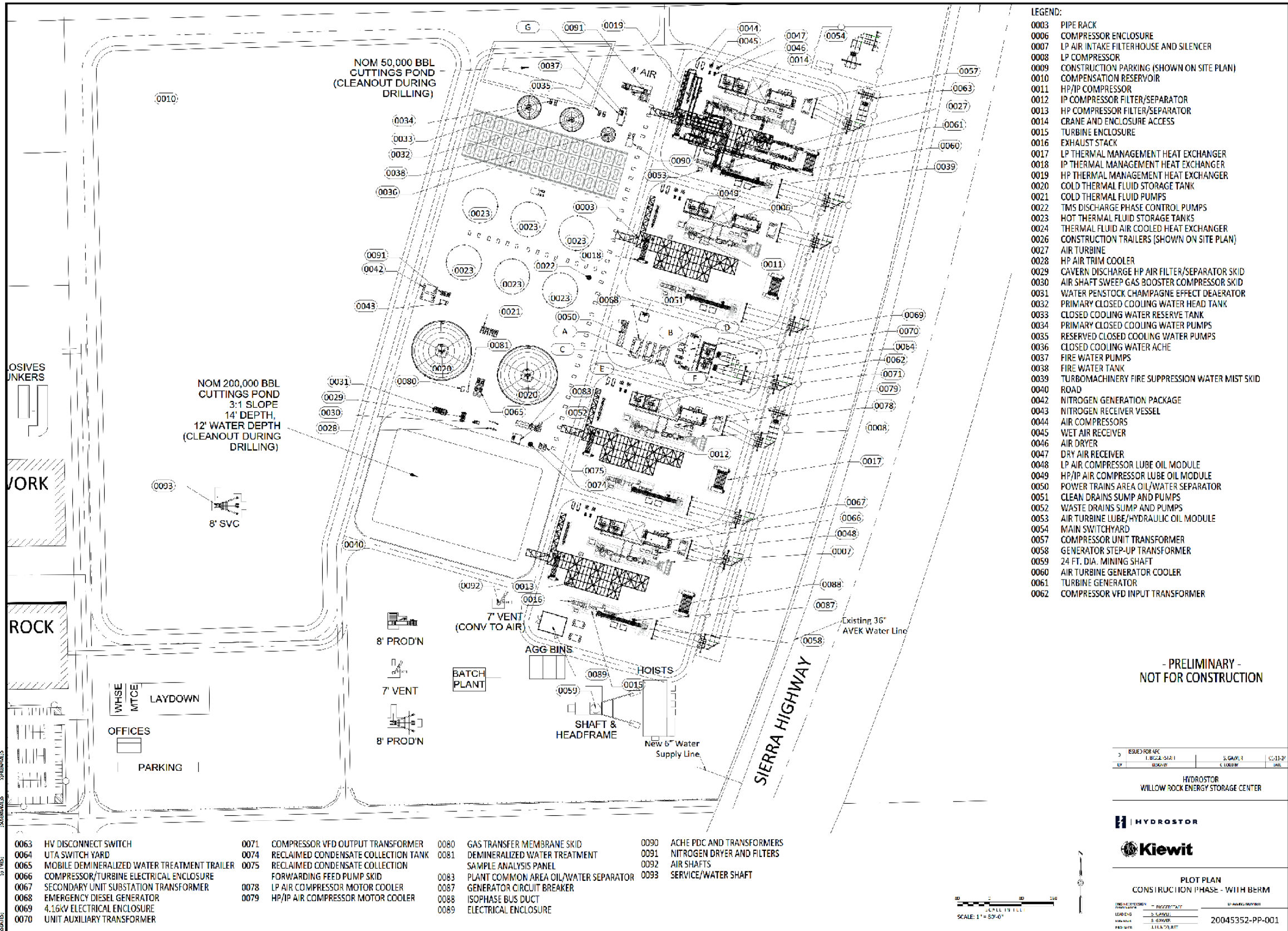
**Figure 2-3** and **Figure 2-4** show the plot plan or general arrangement for the WRESC Site during the construction phase and operations phase, respectively. **Figure 2-5** and **Figure 2-6** present elevation drawings showing the project profile with and without the berm option, respectively. The main access to the Willow Rock site will be from Dawn Road. There will be two entry/exit points from Dawn Road for heavy load traffic. Access at the west side will lead to the laydown area, while access at the east side will lead to the east end of the Power Block. Temporary access during construction will be obtained from crushed rock driveways from both Dawn Road and Sierra Highway; the Dawn Road temporary construction access may be converted to permanent. The Sierra Highway access point will enter the WRESC Site at the construction laydown areas to the north. The permanent entrances and main plant roads within WRESC Site will be surfaced to provide internal access to all project facilities and onsite buildings. Personnel parking spaces, electric vehicle charging stations, and parking lot landscaping will be provided and will conform to Kern County requirements. The areas around equipment will have crushed rock surfacing, not paved or concreted. **Table 2-4** summarizes the preliminary square footage for the single onsite building, a combined office, control room, warehouse and maintenance building.

**Table 2-4: Approximate Building Square Footage**

Building Structure	Area (square feet)
Office and control room	5,000
Warehouse and maintenance area	1,600
Combined building area	6,600



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GEM A-CAES LLC

**PROJECT**  
WILLOW ROCK ENERGY STORAGE CENTER  
SUPPLEMENTAL AFC

**TITLE**  
WRESC PLOT PLAN - CONSTRUCTION PHASE

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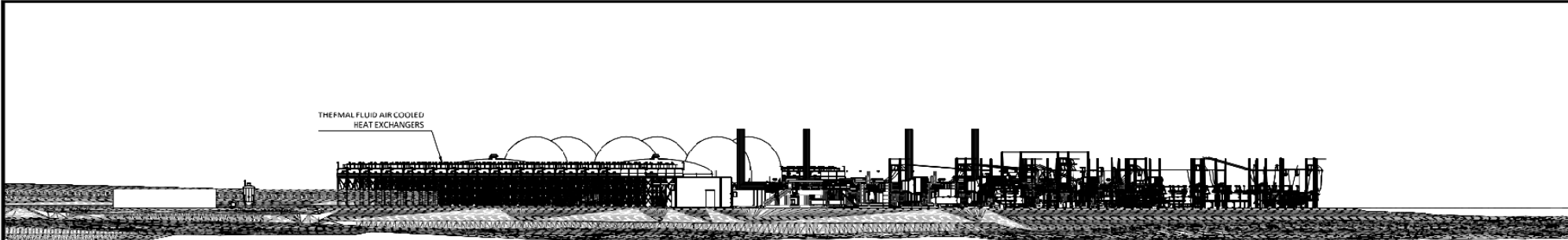
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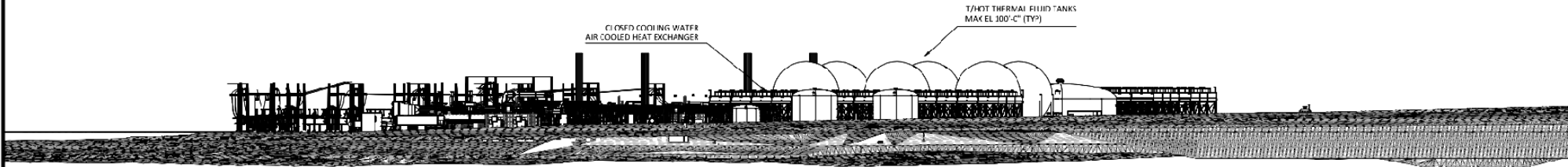




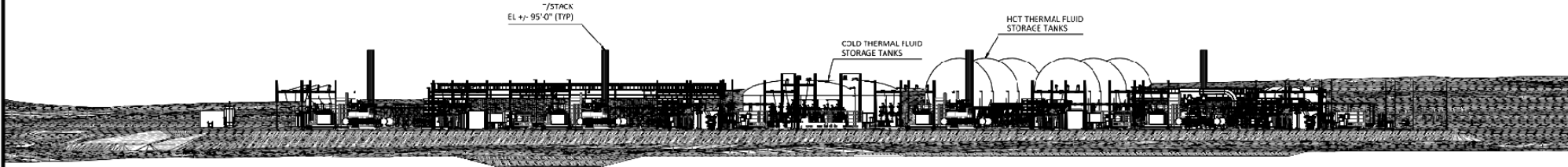
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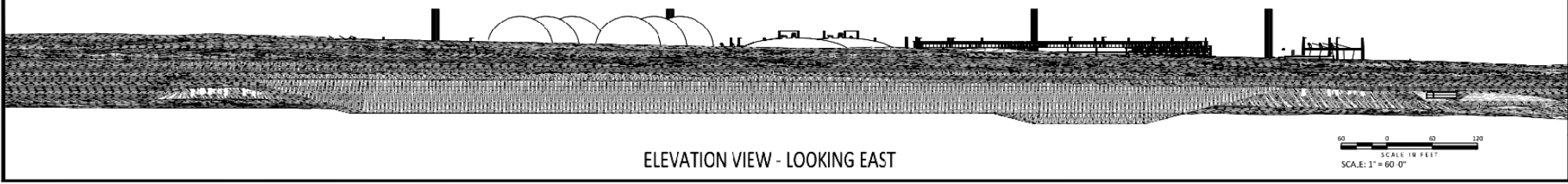
ELEVATION VIEW - LOOKING NORTH



ELEVATION VIEW - LOOKING SOUTH





ELEVATION VIEW - LOOKING WEST



ELEVATION VIEW - LOOKING EAST

NOTES:

- PRELIMINARY -  
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ISSUED FOR AFC	
NO.	REVISION
HYDROSTOR WILLOW ROCK ENERGY STORAGE CENTER	
 	
ELEVATION VIEWS OPERATIONS PHASE - WITH BERM	
DESIGNED BY E. BIGGERSTAFF	PROJECT NUMBER 20045352-EL-001
PREPARED BY S. GAWTH	
REVIEWED BY J. LUNDQUIST	



- REFERENCE(S)
1. WRESC SITE RENDERING - KIEWIT 2024
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WILLOW ROCK ENERGY STORAGE CENTER  
SUPPLEMENTAL AFC

TITLE  
WRESC SITE ELEVATION PROFILE - WITH ARCHITECTURAL  
BERM OPTION

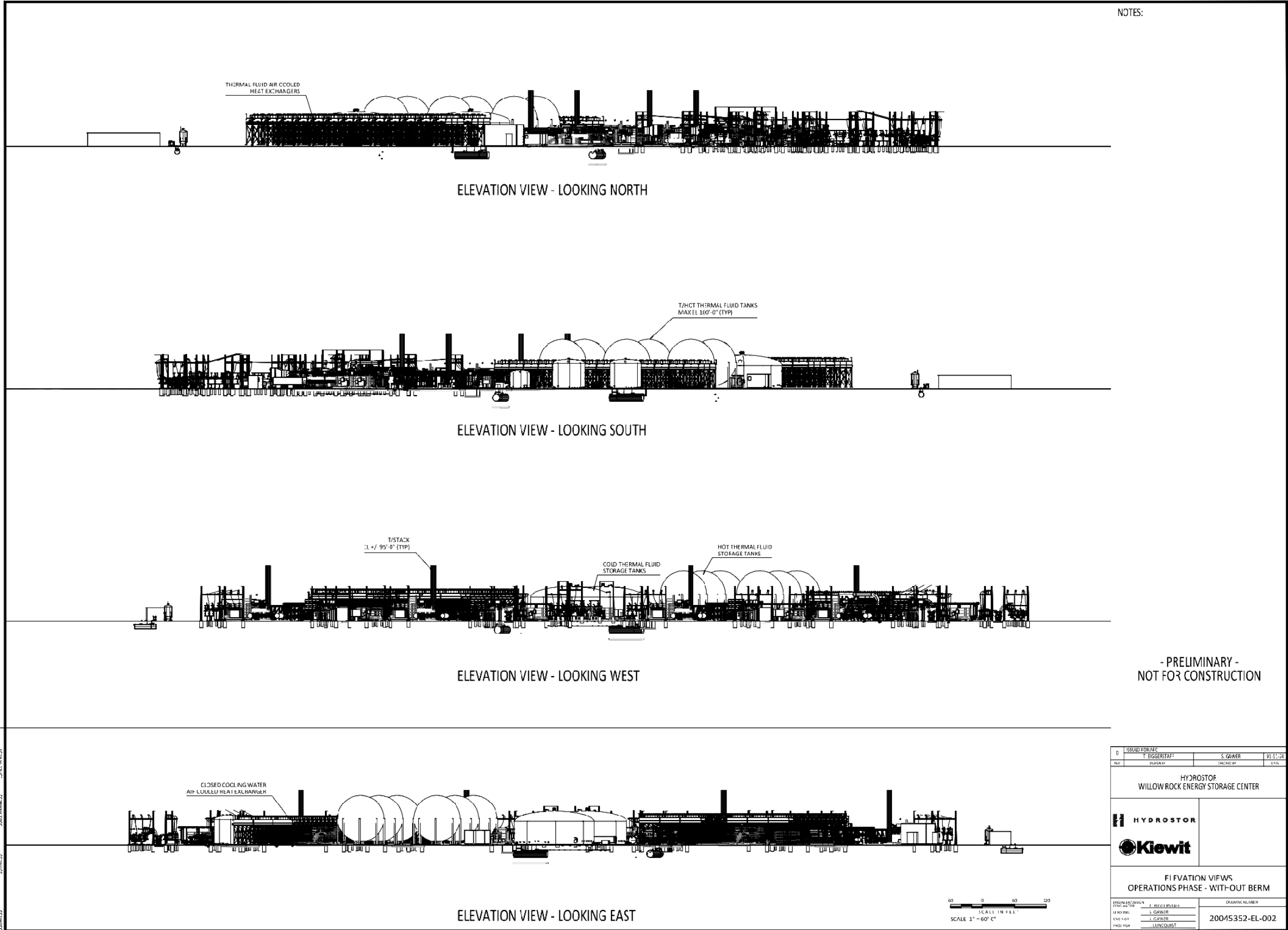
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PREPARED	MK	
REVIEWED	SCH	
APPROVED	VG/LL	

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TITLE

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BERM OPTION

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PREPARED	MK	
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APPROVED	VG/LL	

PROJECT NO. 31406639.003 CONTROL 01 REV. 0 FIGURE 2-6

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

## 2.1.2 Process Description

Hydrostor's proprietary A-CAES technology is a low-cost, bulk-scale energy storage solution. It provides long-duration, emission-free storage that can be sited where the electricity grid requires long-duration storage, providing multi-hundred MW of generation capacity and a suite of ancillary services with an estimated 30-year service life for major equipment and an estimated 50-year service life for the cavern. This is enabled by combining industry-proven technologies with two key innovations: the use of hydrostatically compensated air storage caverns and a proprietary water-based thermal management system.

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

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

When the Hydrostor A-CAES system is charging (known as the "charge cycle"), off-peak energy or surplus electricity (such as excess solar that might otherwise be curtailed when production exceeds demand) from the grid is used to drive air compressors, converting the electrical energy into potential energy in the compressed air and heat energy stored by the thermal energy management system. At multiple points in the compression process, the heat generated during air compression is transferred to boiler-grade water as the only thermal water by a set of heat exchangers and is stored separately for later use during the discharge cycle.

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

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

This energy storage system uses non-toxic materials and does not use fossil fuels as part of the energy storage process. The process combines proven, off-the-shelf technologies (air compressors, water-based thermal storage and turbine generators) and the underground storage cavern design, all with a track record of successful performance in other industries/applications.<sup>3</sup> **Table 2-5** summarizes the main process.

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<sup>3</sup> A video summarizing Hydrostor's technology can be found at the following link: <https://www.youtube.com/watch?v=cN39gCh9PWg>.



**Table 2-5: Energy Storage Process Steps**

<b>STEP 1</b> <b>Air Compression Using Electricity</b>	<b>STEP 2</b> <b>Heat Capture in a Thermal Management System</b>	<b>STEP 3</b> <b>Compressed Air Storage</b>	<b>STEP 4</b> <b>Compressed Air Conversion to Electricity</b>
<i>Off-peak or surplus electricity from the grid is used to operate air compressors that produce high-pressure heated compressed air.</i>	<i>Heat is extracted from the compressed air and stored in a proprietary thermal management system. This nearly adiabatic process increases overall cycle efficiency and eliminates the subsequent need for burning fossil fuels.</i>	<i>Air is stored in a purpose-built storage cavern, where hydrostatic compensation is used to maintain the system at near-constant air pressure during operation.</i>	<i>Hydrostatic pressure forces air back to the surface, where it is recombined with the stored heat and expanded through turbine generators to generate electricity on demand.</i>

The WRESC heat and mass balance block flow diagrams are shown in Appendix 2C, Heat and Mass Balance Diagrams (confidential). These balances are based on the mean weather conditions at the nearest ASHRAE weather station (Fox Field, Lancaster) using the 95th percentile dry bulb temperature and associated relative humidity for the charging cycle.

The actual net electrical output of the system will vary in response to ambient air temperature conditions, electrical grid operating requirements such as voltage or volt ampere reactive (VAR) support and other operating factors. Operational modes will be driven by good operating practices, market conditions, and grid dispatch requirements.

As a long-duration energy storage asset, the WRESC will be able to provide power during periods of increased need on the grid such as times of high electrical load, periods when intermittent renewable source generation fluctuates, when baseload plants are not operating or are being brought online, or during grid emergency conditions and/or local reliability needs. To maximize efficiency, the facility is expected to charge during times of low demand on the grid such as times of low electrical load and during periods when renewable source generation is higher than the instantaneous system demand, thus affording the ability to store excess renewable generation that might otherwise be lost.

### **2.1.3 Facility Operational Modes**

Hydrostor's facility is an electrical energy storage technology with unique operating characteristics that must be considered across its operating states (charge, discharge, standby).

Based on 95% availability, the facility will be designed to operate:

- Up to 13.5 hours per day and 4960 hours per year in charging mode at a total capacity of 500 MW (plus 213 hours at 75% or less).
- Up to 8 hours per day and 2976 hours per year in discharging mode at a total capacity of 500 MW (plus 128 hours at 75% or less).
- A minimum of 372 hours in standby mode.

### **2.1.4 Energy Storage Facility Charge Mode Cycle**

The facility is designed for 520 MW gross rated capacity on both charge and discharge with an 8-hour discharge duration at full rated capacity. The facility will be designed to achieve an average round trip efficiency of 55 to 60 percent. This means that the facility will return 55 to 60 percent of the electric energy used to complete the storage cycle as useful power output during the discharge cycle and that a complete charge of the cavern will require about 13.5 hours at full rated capacity (8 hours divided by 60 percent RTE).

The frequency of charging the system is dependent on the electrical grid operator's requirement to discharge the system. The system could be charged, or partially charged, daily. It could feasibly remain charged for long durations before discharging, but the hot water stored in the spherical tanks must be maintained by electrical heaters for very long standby periods (exceeding a few days).

When electricity from the electrical grid is available, the system will enter charge mode. While charging, electricity is drawn from the electrical grid to operate multi-stage, electrically driven air compressors. Air at atmospheric pressure and ambient temperature is compressed to cavern storage pressure. The cavern storage pressure is expected to be 870 to 1,100 pounds per square inch gauge (psig) across three sequential pressure sections of compression, low pressure, intermediate pressure, and high pressure (LP, IP, and HP, respectively), to allow storage in an underground hydrostatically compensated rock cavern with a floor depth of approximately 2,000 to 2,500 feet below ground surface (bgs).

As the compressed air enters the storage cavern, the air pressure will overcome the hydrostatic head of the compensation water system, forcing an equivalent volume of water out of the cavern and up the compensation shaft (water conduit), increasing the water level of the surface reservoir.

The hot air exiting each section of compression is cooled using boiler-grade water in the LP, IP, and HP heat exchangers. The water exits each heat exchanger and combines into a common stream. The heated water (water) flows to the hot-water spherical tanks, where it is stored at its vapor pressure to avoid vaporization. This is achieved through a system of self-pressurization whereby water vapor generated inside the tank acts as the head gas to maintain positive pressure.

### **2.1.5 Energy Storage Facility Generation/Discharge Mode**

When the plant is sufficiently charged and is called to operate as a power generation facility, a discharge cycle will commence. A grid signal will initiate the operation of the appropriate electrical breakers and transformers, heat exchangers, and balance-of-plant equipment and begin operation of the turbine generators. With the air flowing from the storage cavern, the turbine generators will start receiving reheated high-pressure air, which will allow the turbine generators to ramp up to "sync-idle" speed, whereupon they can be electrically synchronized to the grid. Thereafter the turbine generators will begin loading (increasing electrical output) until they reach the required plant electrical output.

While discharging, the high-pressure air from the cavern will pass through three turbine sections (HP, IP, and LP) to expand the gas from cavern pressure down to atmospheric pressure. The power produced by the turbine will drive a synchronous electrical generator. The turbine stages are pressure-grouped into the same number of pressure sections as the compressors, and, just as in the case with the compressor, air will flow through the turbine sections sequentially. As the air exits the cavern, the surface water reservoir level will decrease and the compensation water level will increase in the cavern, maintaining a near-constant cavern pressure throughout discharge.

For the discharge cycle, the same heat exchangers (LP, IP, and HP) that were used to remove heat-of-compression for storage will be used, but in reverse, using the stored hot water to increase the temperature of the air before each expansion through each turbine section. This is necessary to avoid low temperatures and liquid condensation from the air as it is expanded and naturally cooled through the turbine's blade path. As the water passes through the heat exchangers, it will be cooled by the air, but will not reach a low enough temperature for the next charge cycle. Accordingly, a secondary cooling system is used to reduce the water temperature as required.

### **2.1.6 Energy Storage Facility Standby/Idle Mode**

When the plant is not actively charging or discharging, it will be maintained in standby/idle mode. Standby/idle mode may occur either at the end of a charge cycle (e.g., the plant is ready and waiting to be called to operate as a power generator) or can occur at the end of a discharge cycle (e.g., the need for power generation has ceased and there is no immediate need to (re)charge the facility with potential energy (high-pressure air and hot water). The electrical power draw of the facility during standby/idle primarily consists of relatively small pumps, heaters, and coolers in various sections of the plant.

If the standby/idle mode follows a complete charge cycle, the stored air contained in the cavern will be at the maximum level and maintained at a high pressure by the hydrostatic compensation system, and the stored thermal energy (heat) will be maintained in the insulated hot-water spherical tanks, which are full. Both the motor-driven air compressors and the air-expansion turbine generators will be idle, with the lubricating oil systems heated and lubricating oil circulating through them to keep them warm and ready to start, slow-speed turning gears operating if required, and with the generators or motors internally heated to keep them at an optimum temperature.

If the standby/idle mode follows a full discharge cycle the stored air contained in the cavern will be at the minimum level and the cavern will be mostly filled with compensation water, leaving the water level in the surface-level compensation reservoir at its minimum level, while the remaining air in the cavern stays at constant hydrostatic pressure. Very little water will remain in the hot-water spherical tanks, and the cooled water will be held in the cold thermal storage tank. Both the motor-driven air compression equipment and the air-expansion turbine generators will be idle, with heated lubricating oil circulating, and motor and generator heaters maintaining them at optimum temperatures, all to keep them ready to start. With the hot-water storage tanks are holding a low level of liquid, the temperature will reduce quickly due to the small amount of water in the tank.

Therefore, supplementary heating via tank immersion heaters will be initiated to counteract any temperature and pressure drops.

In very exceptional circumstances (e.g., a complete plant shutdown for major maintenance), the complete plant could be in a wholly de-pressurized, and potentially a wholly cooled state, with potentially all piping and tanks in a de-watered state (except for the cavern and the compensation reservoir), and all turbomachines allowed to cool as major work is conducted.

### 2.1.7 Energy Storage Air Compression Equipment Drivetrain

There WRESC will include four air compression drivetrains in the system, one LP compressor, and one IP/HP compressor for each nominal 130 MW gross train, totaling a nominal 520 MW gross load during charge mode.

The compression/charge portion of the basic facility design will consist of a two-part compression drivetrain, each part using a dedicated electrical motor. The basic framework for the charge/compression equipment consists of:

- **LP compressor:** A dedicated LP compressor drawing filtered ambient air, driven by a synchronous electrical motor, with capacity flow and surge control managed by inlet flow mechanisms combined with discharge piping blow-off valves. Filtration and moisture knockout provisions are fitted as required. A non-return valve will be fitted in the LP compressor discharge to prevent air backflow.

The “low-pressure” air discharge from the LP compressor, after being cooled by the downstream heat exchanger, will then be piped to the inlet of the IP/HP compressor, as described below.

- **IP/HP compressor:** A separate compressor with a combined IP compressor and HP compressor, all driven by a single, separate, synchronous electrical motor. Cooled and filtered inlet air for both pressure groups in this combined compressor will be delivered from the upstream air-to-water heat exchanger.

The high-pressure discharge from the HP compressor section will be directed to a final air-to-water heat exchanger and the resulting cooled air will thereafter be directed to the air storage cavern at near-constant pressure. All compressors will utilize heavy process-industry quality synchronous motors with brushless excitation. Each compressor will be fitted with a dedicated lubricating/control oil system, dedicated synchronous motor controllers, and protective relaying. The compressor surge controller will be integrated to monitor and manage the compressors.

### 2.1.8 Energy Storage Air-Expansion Turbine Generators

The WRESC system will include four air-expansion turbine generators. There will be one turbine and one generator for each 130 MW (gross) train for a plant-wide total of 520 MW (gross).

All turbine generators will be single-casing axial-bladed machines with multiple air inlets and outlets, driving a synchronous generator, and will be complete with power-generation-industry-quality speed/load controls,

generator-protective relaying, voltage regulators, and synchronizing equipment. Each unit will have a dedicated lubricating/control oil system, a dedicated turbine and generator control, and protection systems.

Each air-expansion turbine will consist of three sections or pressure groups. The high-pressure air (produced from the charge cycle) that has been stored in the underground cavern will be utilized to power the turbine. The discharge air will first be piped to the first HP set of heat exchangers where it will be heated, using the hot water from the hot-water (spherical) tanks. The heated air will be used to power the HP heated turbine sections.

After the HP turbine section, the exiting air will have cooled due to the expansion process and will be routed to the IP heat exchangers, where it will be reheated using the hot water. After the IP turbine section, the cooled air will be routed to the LP heat exchangers. This reheated air will be admitted to the low-pressure expansion section of the turbine machine, after which it will exit to the atmosphere via an exhaust stack.

2.1.9 Thermal Management System

The thermal management system will consist of water, main process heat exchangers, fin fan coolers, and both hot and cold thermal storage tanks. During charging, the system will use water to extract heat from the air in the compression process. This heated water will be stored separately in a dense and insulated environment. During discharging, the heat from the heated water will be re-injected back into the air during the expansion process on discharge. The thermal management system is key to an adiabatic and fuel/emission-free process.

The water management system is a closed system whereby the water will be passed between the hot- and cold-water storage tanks during the charge and discharge cycles (as described above). The stored volume within each of the tanks will fluctuate as part of normal operations. Make-up water for the thermal management system will be taken from the reservoir or the Antelope Valley East Kern (AVEK) water supply line and treated before it is sent to the cold-water tank.

Cold water will be stored outdoors in two cylindrical tanks (approximately 150 feet in diameter by 60 feet high). The cold-water tanks will be fitted with a nitrogen blanketing system, operated at low pressure, to prevent air ingress and oxygenation of the treated water.

Hot water will be stored outdoors in up to six spherical storage tanks, each with a diameter of approximately 87.5 feet and a maximum estimated height of up to 100 feet, including appurtenances. The head gas in the hot-water tanks is steam in liquid-vapor equilibrium with the stored water.

The hot-water tanks will be outfitted with immersion fluid electrical heaters that will counteract any thermal losses. Each tank will be insulated for heat conservation.

The LP, IP, and HP heat exchangers will be designed to both heat the air on discharge and cool the air on charge. They are standard industrial shell and tube heat exchangers and will be insulated to retain heat on standby periods. **Table 2-6** summarizes the number of shells of the heat exchangers per 130 MW gross train.

Table 2-6: Heat Exchangers<sup>a</sup>

Stage	Low Pressure	Intermediate Pressure	High Pressure
Type	Shell and Tube	Shell and Tube	Shell and Tube
Number of Shells	3 per train (12 total)	2 per train (8 total)	2 per train (8 total)

<sup>a</sup> Refer to Appendix 2B, Construction Schedule for the heat balances

2.1.10 Hydrostatically Compensating Surface Reservoir

An approximately 600-acre-foot surface reservoir will be excavated and constructed predominantly in cut (below finished grade) using earthen berms approximately 6 feet high. The reservoir will cover a surface area of approximately 21.5 acres and have an average depth of approximately 45 feet. The berms will be constructed from a combination of excavated soil and excavated rock from underground storage cavern construction. Each berm will have an approximate height of up to 6 feet from the exterior toe to the berm’s top. The water level in the

reservoir will fluctuate as to maintain constant underground air storage pressure and be designed to operate with a minimum freeboard of approximately 4 feet at full state of charge. The surface reservoir will be equipped with an engineered liner on the bottom (to prevent percolation and possible comingling with groundwater) and a floating cover consisting of interlocking shapes to minimize evaporative water loss.

The Applicant designed the reservoir to not be DSOD jurisdictional. However, the Applicant was informed during consultation with DSOD that the design will likely be jurisdictional due to technical definitions. The Applicant is currently working to obtain a formal jurisdictional determination from DSOD and is working with CEC Staff to integrate the processes. The reservoir will be constructed in compliance with all applicable laws, ordinances, regulations and standards (LORS). The Applicant expects DSOD will review the final engineering design of the reservoir system which is anticipated to occur post certification by the CEC...

### **2.1.11 Underground Storage Infrastructure (Cavern and Shafts)**

The A-CAES facility will utilize underground storage infrastructure consisting of one underground manmade cavern for the storage of compressed air and compressed air as well as manmade shafts for conveyance of air and water between the cavern and topside facility.

The storage cavern will be constructed in the bedrock below the WRESC Site targeting a depth of approximately 2,000 to 2,500 feet bgs. Initial access to the cavern depth ("cavern access") for mobilization of the construction equipment and crews will be accomplished by one of two methods:

1. Construction of a large-diameter conventionally sunk shaft, or
2. Construction of several rotary drilled (blind bore) shafts.

The preferred cavern access approach is still being finalized, so both options have been shown on the plot plan to date. Regardless of the cavern access technique employed, cavern excavation will be accomplished using the same mining approach and techniques. The cavern construction requirements associated with each of these approaches are described below.

#### **Cavern Access**

To access the cavern during construction, a combination of conventionally sunk shafts and/or rotary drilled shafts will be constructed on a 24-hour-per-day, 7-day-per-week basis.

#### **Conventionally Sunk Shaft**

If a conventionally sunk shaft is used for cavern construction access, a concrete-lined shaft with 24 feet inside diameter will be constructed and equipped with a double-drum hoist, service hoist, dual ventilation ducts, and utilities to support cavern construction. For construction of this shaft, controlled detonations will occur from the top of bedrock surface (approximately 50 to 100 feet bgs) until the cavern construction horizon (2,000 to 2,500 feet bgs) is reached. The controlled detonation associated with shaft construction will increase in depth and decrease in frequency as the shaft is advanced from the surface down to the cavern construction depth. The amount and frequency of controlled detonations will depend on rock properties, but an average of one or two controlled detonations per day are anticipated. Each detonation would last less than a few seconds.

It is expected that the rate of conventional shaft sinking will be around of 5 to 8 feet/day, with an overall shaft construction duration of about 12 to 14 months, including pre-grouting of the overburden. Deeper grouting of the broken bedrock zones will be performed from within the shaft as a step in the sinking cycle if and when necessary.

Once completed, this 24-foot shaft will be sufficient for supporting the hauling, ventilation, and equipment/personnel all in one shaft.

#### **Rotary Drilled Shafts**

If rotary drilled shafts are used for construction access, it is expected that 5- by 8-foot-diameter shafts will be constructed to support the proposed operations. No controlled detonation will be done at the surface or during the drilling phase of the cavern construction if this approach is utilized. Of the five shafts that are constructed, one will



be used for equipment and personnel access, two will be used for material movement (rock hauling), and two will be used for ventilation. To construct these shafts, a lined drill cuttings pond will be required that will hold up to approximately three times the shaft volume in water to support the boring operations. Once complete, the pond will be emptied and backfilled. The drilling water will be used for reservoir fill or disposed offsite by a licensed hauler. Liner material from the drill pond will be removed or perforated, and surplus muck will be spread on top of the settled drill cuttings to completely backfill the pond excavation.

### **A-CAES Process Shafts**

Two types of flow conduits connected to the cavern will be necessary to operate the A-CAES facility: one for the conveyance of air and another for water. It is expected that up to two shafts will be constructed for water conduits, and up to four shafts will be constructed as air conduits. It is possible that fewer shafts will be constructed, but a conservative case is being assumed for this AFC.

If rotary drilled shafts are used for cavern access, two of the cavern access shafts are expected to be repurposed for use as the water shafts for A-CAES operation upon completion of construction. In this case, only the four air wells would need to be constructed. If a conventionally sunk shaft is utilized for cavern construction access, then all six shafts will need to be drilled.

Similar to the rotary drilled cavern access shafts, a drill cuttings pond will be required for the delivery of the A-CAES process shafts. This pond will be sized so that it holds up to approximately three times the shaft volume in water to support the boring operations. Once complete, surplus water will be pumped into the water reservoir, liner material from the drill pond will be removed or perforated, and surplus rock will be spread on top of the settled drill cuttings to completely backfill the pond excavation.

### **Water Shaft**

One large-diameter blind bore or conventionally sunk shaft, approximately 8 feet (blind bore) to 24 feet (conventional) in diameter, will be constructed for use as water conduit during A-CAES operations. Depending on the cavern access used, the shaft either will be a converted construction shaft (for blind bore access) or will be purposely constructed (for conventionally sunk access). The water shaft will be used to convey compensation water between the cavern and topside compensation reservoir during A-CAES operations. The water shaft will be lined and cemented in place to provide formation isolation. The lower end of the water shaft will extend into a sump below the cavern floor to ensure that a water seal will be maintained at all times during operation.

### **Air Shaft**

Up to two blind-bored air shafts, approximately 4 feet in diameter, will be constructed during the cavern construction for use as air shafts during A-CAES operations. The air shaft will be lined and cemented in place for formation isolation. These air shafts will be used to convey compressed air between the cavern and topside process trains during A-CAES operations. The lower end of the air shaft will be located at a high point in the roof of the cavern, such that it is never submerged during operation.

### **Cavern Excavation**

The cavern will be constructed by conventional mining methods including drilling and controlled detonation. The cavern layout will be designed to have a room and pillar or parallel gallery layout. The size and shape of excavated openings will depend on the strength of the host rock and will be finalized during detailed engineering. The size and shape selection of the excavated openings does not materially influence the overall volume of the cavern or rock excavated.

After completion of the cavern access shaft(s), cavern excavation will begin using a combination of conventional controlled detonation methods and physical/mechanical excavation. Cavern excavation will continue on a 24-hour-per-day, 7-day-per-week basis until excavation is complete. The following are the typical steps included in the normal full-scale mining cycle:

1. A jumbo face-drill drills holes into the working face on a predetermined pattern and to a predetermined depth.

2. The drilled holes are loaded with explosives and the charges are set off to break the rock into muck (broken rock).
3. Load-haul-dump vehicles load the muck and haul it from the working face to the production shaft, where it is dumped into the loading pocket and hoisted to the surface.
4. The roof and sidewalls are scaled to remove any loose hanging rock.
5. Rock bolting machines install appropriate ground support (typically rock bolts and wire mesh) for the newly exposed roof and sidewalls.
6. The centerline and drill pattern are marked on the new working face by surveyors and the cycle is repeated.

During underground construction, twice-daily controlled detonation episodes of a few seconds duration each will occur at the beginning of each shift. Controlled detonation is NOT continuous throughout the day and will occur on a regular scheduled approximately 10- to 12-hour intervals. During full-scale cavern excavation, explosives will be placed in closely spaced locations and detonated remotely. Early in the cavern excavation process, personnel will clear the underground area and remain aboveground during the detonation sequence. Once the cavern is large enough, personnel will remain underground during the detonation sequence.

For gallery construction, a top heading will be initially driven, and roof support will be installed as the excavation advances. One or more successive benches will then be excavated to develop the cavern opening to full height. Waste muck will be crushed underground and brought to the surface via a shaft skip. The cavern floors will be graded to drain toward water sump and shaft. Where geology and ground conditions permit, roofs will be sloped up to naturally vent into the air shaft and avoid the possibility of trapped air pockets. Most caverns are completed with unlined, bare rock surfaces, though some are lined with a thin layer of shotcrete for worker safety and geotechnical integrity. Grouting may also be used, if required, to seal large fractures that could permit water inflow. Upon completion of cavern excavation, the cavern will be commissioned into operations which will require the filling and sealing of the construction shafts that are not converted for use in A-CAES operations.

During operations, the cavern will be filled with water through a hydraulic conduit from the surface reservoir. The weight of the water in this surface reservoir will maintain a near-constant air pressure in the cavern throughout both the charging and discharging cycles. This approach supports efficient operations and significantly reduces the cavern volume requirements. The dimensions and design of the cavern are presented in **Table 2-7**.

**Table 2-7: Cavern Design**

Design Element	Value
Depth	Approximately 2,000 to 2,500 feet bgs
Pressure	870 to 1,100 psig
Volume	Approximately 900,000 cubic yards

bgs = below ground surface; psig = pounds per square inch gauge

### 2.1.12 Black Start Capability

The facility will not be designed to be black start capable (i.e. capable of starting up without an external utility power feed).

### 2.1.13 Major Electrical Equipment and Systems

The net electric power generated at the WRESC will be transmitted to the electrical grid at the point of interconnection. Transmission and auxiliary uses are discussed in the following subsections. The electric power required for charging the system will be drawn from the electrical grid with additional power for the auxiliaries. Refer to the preliminary single-line diagram provided in Chapter 3.0, Electric Transmission (Figure 3-3) depicting the onsite Willow Rock main substation, including applicable ratings of key equipment.

For metering of the import and export of power, a power quality meter suitable for revenue metering of MWh and megavolt ampere reactive-hours will be located at the SCE Whirlwind Substation. The power revenue metering will be constructed according to SCE standards.

A power management system will interface with SCE to coordinate power export/import quality and voltage regulation.

### **2.1.13.1 Generators and Motors**

#### **Turbine Generators**

Generators will generate at medium voltage (13.8 kV). This power will be transformed via unit transformers to 230 kV for the electrical grid connection.

Generators are preliminarily rated 150 megavolt amperes (MVA) at 0.9 to 0.95 power factor to supply 130 MW gross and 125 MW net to the electrical grid at the point of interconnection. This allows maximum turndown (reduction in total overall output) of plant, whereby a single generator can operate while other generators are offline for maintenance.

#### **Synchronous Motors for Compression Train**

Full charging capacity requires eight synchronous motors running to supply the four air compressor trains. The power to the synchronous motors will be supplied via unit transformers.

The synchronous motors will normally run at unity or a slightly leading power factor in order to mitigate the VAR import requirements of induction motors within the auxiliary power system.

The synchronous motors will be started using a variable frequency drive (VFD) soft start system. One soft start unit will be utilized for each of the four sets of motors (one two-motor set per compressor power train) if required.

### **2.1.13.2 Alternating Current Power—Transmission**

Power will be generated by the four generators at 13.8 kV and transformed to 230 kV for the grid interconnection. 230/13.8 kV main transformers in each train support connection to the local 230 kV network at the SCE Whirlwind Substation. For motor operation, four additional 230/13.8 kV unit transformers provide back-feed power to the compressor motors. Surge arrestors at the point of interconnection would protect the system from disturbances in the 230 kV system caused by lightning strikes or other system disruptions.

The transformers will be set on concrete foundations, and the design will include a secondary oil containment reservoir to contain the transformer oil in the event of a leak or spill. There will be differential protection on transformers rated 5 MVA and greater. The 230/13.8 kV transformer will be connected to a single-circuit three-phase 230 kV line, which will be connected to the Whirlwind Substation via an approximately 19-mile predominantly overhead gen-tie line. A detailed discussion of the electric transmission system is provided in Chapter 3, Electric Transmission.

### **2.1.13.3 Alternating Current Power—Distribution to Auxiliaries**

The distribution voltages for plant auxiliary systems and lighting will include: 4.16 kV, 480 V, and 208/120 V.

Auxiliary power supplies for instruments will be 24 volts direct current (VDC); however, in the event that increased power consumption is required, 120 volts alternating current (VAC) will be used.

### **2.1.13.4 Direct Current Power Supply System**

Turbine/generator and compressor/motor auxiliaries will be supplied by 125 VDC.

Process control systems (PCS) will be supplied from 24 VDC power supply modules within system cabinets. Control power for the switchgear will be 12 VDC supplied from a dedicated direct current (DC) battery system.

The 125 VDC battery system will be independent of the 120 VAC uninterruptible power supply (UPS) battery system. All DC systems will have 8-hour battery duration.

The system will be designed to provide continuous rated power in the event of main power failure. The DC systems will be located on the emergency generator bus. The DC systems' health will be monitored by the distributed control systems (DCS).

#### **2.1.13.5 Uninterruptible Power Supply System**

An independent UPS system will be dedicated to supply power to the following loads:

- Critical instruments, emergency lighting, and valves
- Control panel fans and other ancillaries
- DCS control racks, including programmable logic controllers (PLCs), flow computers, vibration monitoring system, etc.
- Telecommunications system
- Building cameras and security access system
- Smoke and building heat detector UPS systems include:
  - 20 kVA or less:
    - Input voltage: 208 volts (V)
    - Output voltage: 208 V
  - Greater than 30 kVA:
    - Input voltage: 480 V
    - Output voltage: 480 V

The system will be designed to provide continuous rated power in the event of main power failure. The UPS will be located on the emergency generator bus. The UPS and emergency generators health will be monitored by the DCS.

#### **2.1.13.6 Emergency Power**

Three diesel-fired self-contained 4.16 kV generators, up to approximately 2.5 MW each, will supply emergency power for all critical loads via double sided 5 kV emergency switchgear. These units will meet U.S. Environmental Protection Agency (USEPA) Tier 4 emissions standards and will normally operate only to facilitate maintenance and reliability testing for up to 50 hours per year. Only one unit will operate at a time to perform maintenance and reliability testing.

When needed for emergency power due to a loss of utility interconnection, the generators would activate and operate during the emergency period.

#### **2.1.14 Water Supply and Use**

The AVEK water agency currently owns and operates a 36-inch-diameter water supply line that is located adjacent to the WRESC Site approximately 300 feet east of the WRESC Site's boundary. AVEK will supply Willow Rock with the required water rates and quantities from a new dedicated tap into its water supply line at a location adjacent to the WRESC Site. A permanent 6-inch-diameter buried water pipeline will be installed onsite to deliver water from the AVEK main supply pipeline to the surface reservoir.

These sources will also provide water for filling the storage tank used for fire protection and service water. Appendix 2D, Water Balance Diagrams and Construction Water Use, provides water balance diagrams showing annual average and high temperature ambient operating conditions.

During plant operation, the expected water consumption from AVEK will be less than 2,000 gallons per day, as shown in the water balance. As the cooling and thermal storage systems operate in a closed loop, losses are minimal, and make-up water demand will be small. The reservoir volume is balanced by controlling evaporation with the floating cover, the inflow of annual precipitation, and condensed water from compressed air.

When the plant is operating in charging mode and the compressors are filling the cavern with compressed air, water is produced at the exit of each compression stage. This is caused by compressed air becoming

saturated during compression and moisture in the air condensing in each post-cooling stage. The condensate must be removed from the system to avoid damage to the compressors and sent to the water reservoir and evaporative cooling system.

The water provided by AVEK during operations will mostly be used as a tap water source for offices, maintenance facilities, service water, fire system re-filling, and make-up water for cooling and thermal system water.

During construction and during the initial filling of the surface reservoir the WRESC will require approximately 1,400 acre-feet of water. Construction water requirements are discussed further in Section 5.15, Water Resources. Once the facility commences operation, it is expected to have an annualized surplus of approximately 3.6 acre-feet per year (on average) of non-potable recharge quality water to provide surface reservoir water make-up. Evaporative loss will be reduced by the use of a cover on the reservoir. Since there will be a seasonal variation associated with the production of water as well as evaporation losses, the reservoir will be designed with adequate freeboard to allow for seasonal fluctuations in water inventory.

#### **2.1.14.1 Construction Water**

An estimated 1,400 acre-feet of water (incorporating approximate 20 percent contingency) will be needed throughout the construction and startup period. Most of the water will be used for filling the hydrostatically compensating reservoir. Other uses include supporting construction of the cavern works (shaft drilling and cavern excavation), surface works (hydrotesting and general purpose washdown), and fire system testing. These are discussed briefly below. Refer to Appendix 2D, Water Balance Diagrams and Construction Water Use for the estimated water consumption required during construction by month.

##### **Cavern Works**

Construction of the cavern is estimated to require an estimated 252 acre-feet of water over the construction period. Uses include site preparation, air and shaft drilling, and excavation of the cavern. Refer to Appendix 2D, Water Balance Diagrams and Construction Water Use for the estimated water consumption required during construction by month. Water remaining in the drilling pond(s) after shaft sinking will be filtered, water quality tested and then either sent to the reservoir, or, if necessary based on test results, hauled offsite by an approved waste hauler.

##### **Surface Works**

The surface construction is expected to require approximately 47 acre-feet of water for several purposes over the 24-month period, including the following:

- General purpose (de-dusting roads, daily washdown, etc.)
- Tank and sphere hydrotest
- Piping and vessel hydrotest
- Fire system testing

Water used for hydrotesting will be reused for hydrotesting other systems, including the spheres, pipe circuits, and initial fill. A temporary pumping sub-system with screening and filtering capabilities will be utilized to re-use this water. After all testing, the volume of hydrotest water (losses at flange breaks, nozzle spray tests, etc.) will be screened and filtered to a suitable cleanliness level to supplement the initial fill volume of the cold thermal storage tanks and/or reservoir.

Surface workers are assumed to use 20 gallons of potable water per person per day during all stages of construction, including drinking and wash water.

Refer to Appendix 2D, Water Balance Diagrams and Construction Water Use for the estimated water consumption required for surface construction, by month.

##### **Hydrostatically Compensating Surface Reservoir Fill**

The roughly 600-acre-foot surface reservoir will require approximately 868 acre-feet of water for initial fill (accounting for evaporation losses during the filling period). The reservoir fill will require approximately 14 months, with monthly fill requirements as shown in Appendix 2D, Water Balance Diagrams and Construction Water Use.

The required fill amount accounts for both precipitation and evaporation. After initial filling, the surface reservoir will be equipped with an interlocking shape floating cover estimated to be 90 percent effective in reducing evaporation. The estimated fill amount conservatively assumes no benefit from the cover.

#### **2.1.14.2 Water and Wastewater Requirements**

Demineralized water will be produced onsite and used as make-up water for the water-based thermal storage and closed-cooling medium loops. Appendix 2D includes water balance diagrams for annual average and high temperature conditions, respectively, as well as an estimated month-by-month water balance. Water requirements are further discussed in Section 5.15, Water Resources, subsection 5.15.1.5.

The evaporative cooling water is used intermittently during hot temperatures when the closed-cooling loops cannot meet the cooling objectives of the turbomachinery. The water for the evaporative cooling is expected to be sourced from the produced water at the air compressors such that the evaporative cooling does not require sourcing of additional water.

#### **2.1.14.3 Water Quality**

Section 5.15, Water Resources, includes a projection of the water quality based on available testing data.

#### **2.1.14.4 Water Treatment**

The AVEK supply water will be used for make-up to the plant water system, fire protection, and general needs such as equipment and surface washdown.

The thermal energy storage system and cooling system will be filled with demineralized water during commissioning. A temporary, portable demineralization system will be used to generate water for the first filling and commissioning. Make-up demineralized water will be produced during operations to cover minor losses in the system. The expected quality of demineralized water used for the first filling will have the following characteristics:

- Appearance: clear and colorless
- Odor: odorless
- Total dissolved solids maximum: < 1 part per million (ppm)
- Hardness: < 0.01 Deutsche Harte
- Oil and grease: none
- Conductivity at 25 degrees Celsius: < 0.5 micro Siemens per centimeter
- Chlorides: <0.5 ppm
- Iron: <0.005 ppm
- Copper: <0.01 ppm

#### **2.1.14.5 Water Availability**

AVEK will provide the required quantity and quality of water required by the project. GEM A-CAES LLC (GEM, the Applicant) has filed an application for water service with AVEK and is in the process of securing a water service agreement.

#### **2.1.15 Waste Management**

Waste management is the process whereby all wastes produced at Willow Rock will be properly collected, treated if necessary, and disposed of. Wastes include process wastewater, as well as nonhazardous waste (primarily excavated waste rock) and hazardous waste, both liquid and solid. Waste management is discussed below and in more detail in Section 5.14, Waste Management.



### **2.1.15.1 Wastewater and Stormwater Collection, Treatment, and Disposal**

#### **Wastewater and Septic Waste**

It is expected that the majority of WRESC process wastewater will be able to be reused in the system. Project wastewater that cannot be reused in the process will be collected in portable onsite storage and hauled offsite for disposal using a licensed hauler. It is conservatively estimated that up to approximately 250,000 gallons per year of process wastewater will be managed in this manner. Disposing of this expected small quantity of process wastewater at a licensed offsite facility eliminates the need for an onsite evaporation pond. The water balance diagrams in Appendix 2D show the expected wastewater stream and flow rate under operating conditions.

The septic waste from the administration/control building will be handled by one of the two methods described below:

- Sanitary waste from the administration/control building will be directed to a nearby underground septic storage tank, pumped out periodically by truck, and trucked offsite to an approved disposal facility.
- Alternatively, the sanitary sewer system will consist of a lateral septic system containing a lateral line from the structure to a septic tank. From there, the waste will flow to the lateral system of pipes that allows the waste from the septic system to discharge via perforations in the lateral pipes.

Willow Rock will not have a practice of washing down any equipment with oily residues. Equipment that has oily residues will be cleaned with rags and sorbents, and appropriate cleaning solutions will be applied to the rags and sorbents.

After cleaning, the oily rags and sorbents will be properly stored, manifested, and disposed of by licensed disposal companies in the regulatory-required time frames.

#### **Stormwater**

Onsite stormwater flows generated within the WRESC Site boundary will be routed to an unlined stormwater pond and will not be discharged outside the WRESC Site. Plant area drains will be directed to oil-water separators. There will be at least one oil-water separator for the common plant areas, and one oil-water separator for each power block. Water from the oil-water separator sumps will be discharged to the waste drains sump and then to the lined evaporation pond. The separated oil will be periodically pumped out of the oil-water separators by truck and disposed of offsite by a licensed hauler.

A summary of the approach for offsite perimeter stormwater drainage is described below for the “without berm” and “with berm” options.

##### **Option 1 – Without Berm**

Offsite flows will be diverted via proposed ditches along the north and west side of the WRESC Site to route them to where they are currently flowing. The flows conveyed by the west ditch will discharge stormwater south and then to the ditch along Dawn Road. The flows conveyed by the north ditch will discharge stormwater to the east to the ditch along the Sierra Highway. These ditches will be sized to carry, at a minimum, the 100-year discharge calculated using TR55 SCS Unit Hydrograph methodology.

Onsite flows generated by the WRESC Site will not be discharged outside the WRESC Site Boundary. All the WRESC Site stormwater will be conveyed via sheet flow and system flow (catch basins, swales, and stormwater conveyance piping) to a proposed, unlined stormwater pond on the southeast corner of the WRESC Site.

##### **Option 2 - With Berm**

Offsite flows will be diverted via proposed ditches along the north and west side of the architectural berm and route them to where they are currently flowing. The flows conveyed by the west ditch will discharge stormwater south and then to the ditch along Dawn Road. The flows conveyed by the north ditch will discharge stormwater to the east to the ditch along the Sierra Highway. These ditches will be sized to carry at a minimum the 100-year discharge calculated using TR55 SCS Unit Hydrograph methodology.

Rainwater that falls on the north and west sides of the architectural berm will flow to the proposed ditches along the north and west side of the architectural berm described above. Rainwater that falls on the south and east side of the architectural berm will be directed south and east via ditches on the north and west boundaries of the WRESC Site and flow towards the Dawn Road and Sierra Highway ditches, respectively.

Onsite flows generated by the WRESC Site will not be discharged outside the WRESC Site. All the WRESC Site stormwater will be conveyed via sheet flow and system flow (catch basins, swales, and stormwater conveyance piping) to a proposed, unlined stormwater pond on the southeast corner of the site.

### **Excavation Waste**

The WRESC will produce excavated material associated with typical mining techniques to create the underground compressed air storage cavern. Excavation waste generally includes soil and rock. The cavern has an equivalent volume of excavated material of approximately 1.3 million cubic yards based on an expected swell by a factor of 1.4. The swell factor accommodates the volumetric expansion from solid rock at depth to crushed rock at the surface. Waste management is discussed further in Section 5.14, Waste Management.

Based on preliminary engineering and environmental planning, the Applicant is considering options for adaptive re-use of the cavern rock onsite within the project boundaries or hauled offsite to up to four independent third parties. To plan conservatively, the project analyses assume that cavern rock will be fully reused in four options: up to 100 percent reused onsite as an architectural berm, up to 100 percent hauled offsite to the Robertson's Ready Mix in Los Angeles County, up to 100 percent hauled offsite to the Holliday Rock facility in Kern County, , and/or up to 100 percent hauled offsite to the Vulcan Materials Inc. processing facility in Los Angeles County. At the time of filing, commercial agreements are underway with the private off-takers, and design of an onsite architectural rock berm is being advanced through engineering.

All of the offsite third-party off-takers have expressed interest in potentially reusing the rock material for commercial purposes. Each potential off-taker will have the appropriate permits in place to import material from third parties.

In lieu of hauling the excavated rock offsite, another option is to re-use the material within the project boundaries as an architectural berm. The specific design of the feature is to be determined through final engineering.

#### **2.1.15.2 Solid Nonhazardous Waste**

The WRESC will produce nonhazardous waste related to construction, operation, and maintenance that is typical of power generation and energy storage operations. Surface construction wastes will generally include soil, scrap wood, excess concrete, empty containers, scrap metal, insulation, and sanitary waste. Cavern construction wastes will include some of the same materials, as well as explosives packaging.

Facility waste during operation will include oily rags, scrap metal and plastic, insulation material, defective or broken electrical materials, empty containers, and other solid wastes, including the typical refuse generated by workers. Solid waste will be trucked offsite for recycling or disposal. Waste management is discussed further in Section 5.14, Waste Management.

#### **2.1.15.3 Hazardous Wastes**

Several methods will be used to properly manage and dispose of hazardous wastes generated by the project. Waste lubricating oil will be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters will either be recycled or disposed of in a Class I landfill. Workers will be trained to handle hazardous wastes generated at the WRESC Site. Chemical cleaning wastes will be temporarily stored onsite in portable tanks or sumps and disposed of offsite by an appropriate contractor in accordance with applicable regulatory requirements.

Hazardous materials management is further discussed in Section 5.5, Hazardous Materials Handling.



### 2.1.16 Management of Hazardous Materials

A variety of chemicals will be stored, handled, and used during the construction and operation of Willow Rock, following applicable LORS. Chemicals will be stored in appropriate chemical storage facilities. Bulk chemicals will be stored in storage tanks, and most other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas will be designed to contain leaks and spills. Containment pits and drain piping design will allow a full-tank capacity spill without overflowing the containment area. For multiple tanks located within the same containment area, the capacity of the largest single tank will determine the volume of the containment area and drain piping with an allowance for rainwater. Drain piping for reactive chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors.

Safety showers and eyewashes will be provided adjacent to, or in the vicinity of, chemical use and storage areas. Plant personnel will use approved personal protective equipment during chemical spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and will be instructed in the procedures to follow in the event of a chemical spill or accidental release. Adequate supplies of emergency response equipment, including absorbent material, will be stored onsite for spill cleanup.

A list of the chemicals anticipated to be used at Willow Rock, and their storage locations, is provided in Section 5.5, Hazardous Materials Handling.

### 2.1.17 Fire Protection

The fire protection system will be designed to protect personnel and limit property loss and facility downtime in the event of a fire. The system will include an electric fire pump, a small jockey pump to keep the system under pressure, and a fire protection water network system consisting of hydrants or standpipes and portable fire extinguishers. Where required, automatic or fire sprinkler systems will be provided. A diesel-fired approximately 345 kW (460 horsepower) fire pump will be provided for emergency backup. The fire protection and piping network system will be designed to protect the facility, which will be designed under the following regulations:

- Federal, state, and local fire codes, and occupational health and safety regulations, in concert with the Authority Having Jurisdiction
- California Building Code, where applicable
- Applicable, mandatory National Fire Protection Association standards

The diesel-fired pump engine will meet USEPA Tier 3 emission standards and normally only operate for maintenance and reliability testing for up to 50 hours per year.

Firefighting water will be stored in the service/fire water storage tank. The tank will have an internal service water pump suction standpipe so that the required water volume for a fire event is always available to the fire water pumps. The system can supply maximum water demand for any fire suppression requirements, as well as water for fire hydrants. The total capacity of the tank is estimated at 350,000 gallons, with 300,000 gallons reserved for fire water.

Separation criteria will be evaluated in a fire protection study during further engineering.

Portable and wheeled fire extinguishers will be provided at strategic locations around the facility. Their locations will be determined based on the guidelines of National Fire Protection Association 10 or relevant local requirements.

The following types of portable fire extinguishers can be used as appropriate for the type of risk:

- For areas where there are ordinary combustibles such as wood, cloth, paper, plastic, etc., extinguishers will be suitable for Class A fires. These can be in the form of water, foam, or dry powder.
- For areas where there are flammable liquids, oils, grease, paint etc., extinguishers will be suitable for Class B fires. These can be carbon dioxide (CO<sub>2</sub>) dry powder, or foam or any other suitable film forming foams.
- For areas where there is energized electrical equipment, extinguishers will be suitable for Class C fires. These will be CO<sub>2</sub> or other suitable dry chemicals.

Portable fire extinguishers, where applicable, will be installed at a suitable distance above the floor for ease of deployment and to minimize the potential for corrosion. Fire extinguishers will be fixed to walls, columns, or structural supports as appropriate. Weatherproof storage cabinets will be provided for extinguishers located in open areas. Wheeled extinguishers located in external areas will be equipped with a weatherproof cover.

Section 5.5, Hazardous Materials Handling, includes additional information about fire and explosion risk, and Section 5.10, Socioeconomics, provides information about local fire protection capability.

### **2.1.18 Plant Auxiliaries**

The following systems will support, protect, and control the Willow Rock facility.

#### **2.1.18.1 Process Systems**

A 5 kV substation will be required in the process area to supply power to the area loads. The 230/5 kV transformers will be distributed at the WRESC Site. Large motors in the process area (above 300 horsepower) will be fed from the 5 kV system with many of the motors on emergency power for operation during a power outage.

Smaller motors will be fed from the 480 V system, and some will be on emergency backup power.

#### **2.1.18.2 Heating, Ventilation, and Air Conditioning Systems**

All buildings will be equipped with suitable heating, ventilation, and air conditioning systems and critical systems will operate on emergency power as required.

#### **2.1.18.3 Lighting**

Indoor building lighting will be designed consistent with building code requirements to provide adequate indoor illumination with consideration for human factors. Exterior lighting will be hooded and downward facing to provide adequate space lighting while minimizing offsite glare.

The emergency lighting will be sufficient to illuminate the exit path from process areas and inside the buildings and will be supplied from a 120 V UPS located indoors. Exit signs will be self-illuminating. In outdoor areas, emergency light fixtures will be equipped with rechargeable battery packs with minimum 1-hour battery backup. These emergency lighting fixtures will not normally be switched on and will be identical to the fixtures used throughout the facility.

Process plant lighting and convenience outlets will be supplied from a 208 V/120 V, three-phase, four-wire, 60 hertz system.

Section 5.13, Visual Resources provides additional information regarding the potential for offsite lighting impacts. A detailed lighting plan is included in Appendix 5.13B.

#### **2.1.18.4 Grounding**

All systems will be grounded and bonded as per the National Electric Code and local municipal codes and standards.

All equipment containing flammable liquids or gases and liable to static discharge ignition will be grounded by having one or more anchor bolts connected to the reinforcing bar of the equipment foundation.

The grounding system design will be as per Institute for Electrical and Electronics Engineers (IEEE)-80 and IEEE-142 guidelines. A detailed step/touch potential, including ground potential rise calculation, will be performed. The substation grounding systems will be designed to limit the overall resistance to earth to safe step and touch voltage conditions.

Prior to detailed design execution, sufficient site soil data will be obtained for performing grounding studies and calculations

All equipment will be connected to the ground through a minimum of two paths, except for small equipment that can be safely connected to a single source.

A dedicated, clean, instrument-grounding system will be provided to connect all PCSs, in addition to a standard equipment grounding system.

The instrumentation grounding system will be bonded to the electrical system ground below grade.

### **2.1.18.5 Control System**

#### **Process Control System**

The PCS will provide all monitoring and control of the facility. The PCS configuration will be justified with the plant engineering contractor based on the facility complexity.

The facility will function automatically with minimum operator intervention. Emphasis will be given to automating routine actions so that the operator will have more time to analyze and identify short- and medium-term plant performance, efficiency, and imminent failures.

Adequate instrumentation will be installed to enable operations personnel to monitor facility performance from the central control room with minimum field intervention. Field operators will only assist in visual surveillance and will intervene only when critical equipment and systems warrant immediate attention. All field functions will require a permissive signal from the control system.

For standalone control packages within the facility where operator action will be entirely local, a package common alarm will be connected to the PCS to direct an operator to examine local indicators or panels to determine equipment status.

#### **Operator Interface System**

Under normal conditions, the facility will be operated from the central control room with operator displays with mouse and operator keyboards, radio, and telephone panels, monitors for internet protocol camera access.

The PCS operator workstations will provide the following functions at minimum:

- Presentation of process information to the operator
- Facilities to enable the operator to adjust and control the process
- Monitoring and control of packaged equipment
- Monitoring and control of utility systems
- Short-term logging of process conditions and operator actions
- Diagnostic of the PCS and its component parts
- Site security

#### **Monitoring and Controls**

The PCS will use solid-state equipment and a PLC or DCS to increase reliability and flexibility.

Electromechanical control relays will not be used, except when required for safety interlocks. The plant DCS will meet cyber-security standards as required by the California Independent System Operator.

If the control system involves electromechanical timing sequences or interlocks, auxiliary dry contacts will be provided for indication of steps or conditions. These contacts will be used to interface with the PCS to monitor the operational status.

All failure and alarm switches will be “fail safe”—i.e., an abnormal condition will cause a loss in output signal. Upon loss of power, control circuits and alarms will go to the “fail safe” condition. Solenoid valves and actuating relays will be normally energized and will de-energize upon protective action or alarm. All alarm contacts shall open to alarm. When contacts are controlled by a pneumatically loaded device, the device will be normally loaded and will vent to create the alarm or shutdown condition.

In general, interlock system circuits will be activated from separate primary instruments. Each interlock signal initiating a shutdown will also activate a separate pre-alarm point to indicate that an abnormal condition exists, and

failure to take corrective action will result in a shutdown of the affected equipment. Pre-alarms may be actuated by a “normal” instrumentation system signal.

Communications between the PLC and human-machine interface, and PLC to PCS will be Ethernet transmission control protocol/internet protocol or ProfiNet.

Communications to motor control centers and VFDs will be Ethernet- or fiber-based. Communications to discrete field contacts will be automated with limit switch indications.

Wireless communication devices will be used for communication between control room and operators in the facility.

#### **2.1.18.6 Cathodic Protection**

The cathodic protection system will be designed to control corrosion of metallic piping when buried in the soil. Depending on the corrosion potential, type of soils on the WRESC Site, ease of isolation of buried pipe from the aboveground facilities, and proximity to ground grid and foundations, either a passive or impressed current cathodic protection will be provided where required.

#### **2.1.18.7 Freeze Protection System**

Freeze protection for above- and below-grade piping and instrumentation lines will be evaluated and installed as necessary, based on the expected minimum ambient temperature at the facility. Given that the record minimum temperature near Willow Rock is 24 degrees Fahrenheit, freeze protection is not expected to be required for large piping but may be required for small piping and air tubing. Below-grade piping will be installed below freezing depth according to site's climate and soil data. Where necessary, the above-grade piping will be protected with an electrical heat tracing system and/or continuous circulation in rare instances of freezing temperatures. The foundation of aboveground pipe support will be rooted below the freezing depth.

#### **2.1.18.8 Service Air**

The service air system will supply compressed air to hose connections for general use at the WRESC. Service air headers will be routed to hose connections located at various points throughout the facility.

#### **2.1.18.9 Instrument Air**

The instrument air system will provide dry, filtered air to pneumatic operators and devices. Air from the service air system will be dried, filtered, and pressure-regulated before delivery to the instrument air piping network. An instrument air header will be routed to locations within the facility equipment areas.

#### **2.1.19 Interconnect to Electrical Grid**

The facility will connect to the SCE electrical grid via a 230 kV overhead (predominantly) single-circuit gen-tie line that will run approximately 19 miles from the SCE Whirlwind Substation to the WRESC Site (see Chapter 3, Electric Transmission). The 230 kV line will terminate at a dead-end tower before the main power transformers, which will step down the voltage to 13.8 V and 5 kV, suitable for distribution within the WRESC. The grid connection will be capable of power import and export, rated to suit all operating scenarios. There are expected to be a small number of short underground gen-tie line segments to allow for crossing of a Los Angeles Department of Water and Power high-voltage transmission corridor and in other locations where the transmission corridor is congested with preexisting facilities (see Figure 1-4 in Chapter 1.0, Introduction). Open trenching or horizontal directional drilling will be used to complete these short underground segments.

A preliminary single-line diagram depicting the onsite Willow Rock main substation, including applicable ratings of key equipment, are included in Chapter 3, Electrical Transmission.

## 2.1.20 Project Construction

### 2.1.20.1 Construction Schedule

The construction of the WRESC from site preparation and grading to full-scale operation and construction closure is expected to take roughly 60 months. Major milestones are listed in **Table 2-8**. A more in-depth construction manpower and equipment schedule is provided in Appendix 2B, Construction Manpower and Equipment Schedule. The Applicant will assess the prospect of initiating full-scale operations for a portion of the facility's energy capacity in advance of the target date shown below.

**Table 2-8: Major Project Milestones**

Target Project Milestones	Begin		Complete	
	Month Number	Calendar Date	Month Number	Calendar Date
<i>Site Preparation &amp; Mobilization</i>	1	Dec-25	3	Feb-26
<i>Grading</i>	2	Jan-26	13	Dec-26
<i>Reservoir Excavation</i>	3	Feb-26	13	Dec-26
<i>Shaft Drilling (Ventilation and Process Connections)</i>	10	Sep-26	35	Oct-28
<i>Access Shaft Excavation</i>	11	Oct-26	23	Oct-27
<i>Topside Equipment Installation</i>	15	Feb-27	45	Aug-29
<i>Transmission Line Construction</i>	24	Nov-27	39	Feb-29
<i>Cavern Construction (and Cavern Rock Crushing and Hauling)</i>	24	Nov-27	47	Oct-29
<i>Topside Equipment Commissioning</i>	40	Mar-29	52	Mar-30
<i>Subsurface Commissioning</i>	47	Oct-29	52	Mar-30
<i>Full Plant Commissioning</i>	52	Mar-30	55	Jun-30
<i>Startup</i>	55	Jun-30	60	Oct-30
<i>Construction Demobilization</i>	59	Sep-30	60	Oct-30
<i>Commercial Operation</i>	60	Oct-30	61	Nov-30

Source: Hydrostor 2025

### 2.1.20.2 Construction Workforce

During construction, there will be an average and peak workforce of approximately 273 and 749 workers, respectively, including construction craft workers and supervisory, support, and construction management personnel onsite if 100 percent of the waste rock is hauled offsite. The construction average and peak workforce would decrease slightly to 269 and 731, respectively, if all the excavated rock is re-used onsite in the form of an architectural berm (see Section 5.10, Socioeconomics, Table 5.10-8 for a more detailed breakdown of expected labor requirements).

Surface work will normally occur in 8-hour shifts, 5 days a week. Cavern work is planned as follows:

- Mobilization and site preparation (months 1 through 3): 5 days a week, 10-hour shifts
- Grading, excavation, and shaft drilling (months 2 through 26): 12 hours/day, 10 days on, 4 days off
- Cavern construction (months 26 until completion): 24 hours/day, 7 days/week, 12-hour shifts

During cavern construction, trucks will either haul excavated waste rock up to 24 hours per day from the WRESC Site or re-use the material onsite. Excavated rock during construction may be temporarily stored for re-use if necessary. The temporary storage areas will be located as shown in **Figure 2-1** and **Figure 2-2**.

Cavern construction will occur 24 hours per day, 7 days per week. Additional hours may also be necessary for surface construction work to make up schedule deficiencies or to complete critical activities (e.g., pouring concrete at night during hot weather, and working around time-critical shutdowns and constraints).

### 2.1.20.3 Construction Laydown and Traffic

Construction laydown and parking will be located on property to the west and north of the WRESC Site, as depicted on the WRESC Site plot plans in **Figure 2-1** and **Figure 2-2**. The peak construction site workforce level is expected to last from month 25 through month 46 of the construction period, with the peak being months 26 and 27.

**Table 2-9** provides an estimate of the average and peak construction traffic during the 60-month construction/commissioning period for Willow Rock based on the worst-case workforce (100 percent excavated rock hauled offsite).

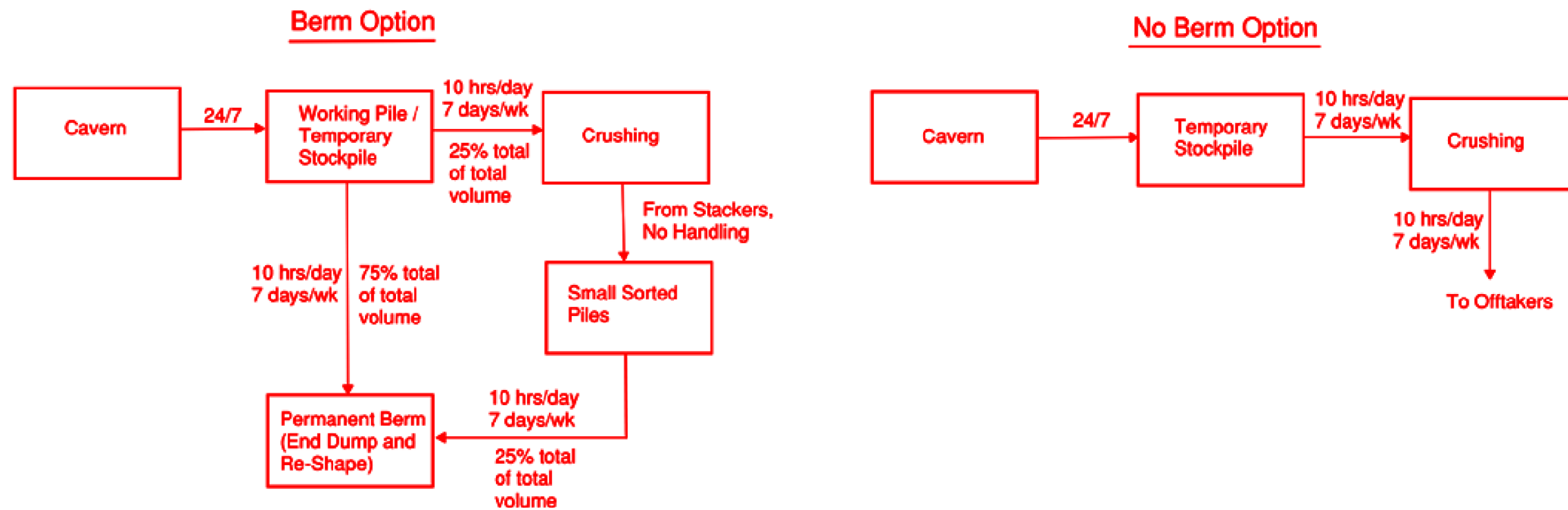
**Table 2-9: Estimated Worst-Case Average and Peak Construction Traffic**

Vehicle Type	Average Daily Trips	Peak Daily Trips
<i>Construction Workers (one way, no carpooling assumed)</i>	273	749
<i>Deliveries</i>	45	60
<i>Total</i>	318	809

### 2.1.20.4 Temporary Construction Rock Crushing Facility

A temporary portable rock crushing facility will be located onsite for up to 10 hours per day, 7 days per week for 22 months beginning approximately in month 25. The rock crushing facility will be capable of processing up to 350 tons per hour and is expected to consist of a primary jaw crusher, a secondary cone crusher, screens, three conveyors, and two stackers. The facility will use a combination of water sprays and a baghouse to control fugitive dust and fine particulate matter emissions. The facility will be capable of operating from a locally provided power feed or using two 779-horsepower diesel-fired engine generators meeting USEPA Tier 4 emission standards. The entire facility is expected to be certified under the California Air Resources Board Portable Equipment Registration Program.

The overall quantity of rock to be crushed will depend on whether an architectural berm will be constructed onsite or whether excavated rock will be hauled offsite. If an architectural berm is constructed, only 25 percent of the excavated rock is expected to be crushed to facilitate berm stability. If the excavated rock is hauled offsite, then up to 100 percent of the excavated rock is expected to be crushed to meet off-taker specifications. These options are depicted diagrammatically in **Figure 2-7**.



## REFERENCE(S)

1. WRESC SITE RENDERING - KIEWIT 2024

CLIENT

GEM A-CAES LLC

## PROJECT

PROJECT  
WILLOW ROCK ENERGY STORAGE CENTER  
SUPPLEMENTAL AFC

TITLE

### ROCK CRUSHING OPERATION PROCESS DIAGRAM WITH AND WITHOUT BERM OPTIONS

CONSULTANT

WS |

YYYY-MM-DD 2024-02-22

DESIGNED	MK
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PREPARED	MK
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REVIEWED	SCH
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APPROVED VG/LL

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FIGURE 2-7



### **2.1.20.5 Temporary Concrete Batch Plant**

A temporary portable concrete batch plant is also expected to be located onsite to support construction of the shafts and, if necessary, initial cavern construction. The concrete batch plant is expected to operate onsite for approximately 12 to 15 months. Construction is expected to require up to 80 cubic yards per day of finished cement. The facility will be capable of operating from a locally provided power feed or using one 500-horsepower diesel-fired engine generator meeting USEPA Tier 4 emission standards. The entire facility is expected to be certified under the California Air Resources Board Portable Equipment Registration Program.

### **2.1.21 Willow Rock Facility Operation**

The WRESC will be operated and monitored continuously 24 hours per day, 7 days per week by qualified and licensed onsite operations staff and will not be remotely operated (other than potential grid regulation-required operations such as generator transfer trips or special protection schemes).

There will be a total of approximately 40 full-time staff to operate the facility. The operations staff will include control room operators (24 hours per day, 7 days per week) and roving operators in the field conducting general rounds at least twice per 12-hour shift.

Additional field checks will be done as needed for maintenance activity, upsets, or other general operations requirements.

## **2.2 Engineering**

In accordance with California Energy Commission (CEC) regulations, this section together with the engineering appendix (Appendix 2A, Design Criteria) and Chapters 3, Electric Transmission present information concerning the design and engineering of Willow Rock. The LORS applicable to Willow Rock's engineering are provided in Appendix 2A along with a list of agencies that have jurisdiction, the contacts within those agencies, and a list of the permits that will be required.

### **2.2.1 Facility Design**

Summary descriptions of the design criteria for all the major engineering disciplines are included in Appendix 2A, Design Criteria.

Design and engineering information and data for the following systems may be found in the related subsections of this Application for Certification:

- Power Generation: see Section 2.1.8, Energy Storage Air-Expansion Turbine Generators. Also see Appendix 2A and Section 2.1.17 which describe the various plant auxiliaries.
- Power Consumption: see Sections 2.1.7, Energy Storage Air Compression Equipment Drivetrain and 2.1.6, Energy Storage Facility Standby/Idle Mode.
- Water Supply System: see Section 2.1.14, Water Supply and Use. Also see Appendix 2D.
- Waste Disposal System: see Section 2.1.15, Waste Management and Section 5.14, Waste Management.
- Noise Abatement System: see Section 5.7, Noise.
- Switchyards/Transformer Systems: see Section 2.1.13, Major Electrical Equipment and Systems; Section 2.1.18.4, Grounding; Section 2.1.13.2, Alternating Current Power—Transmission; Section 2.1.19, Interconnect to Electrical Grid; and Chapter 3, Electric Transmission. Also see Appendix 2A.

#### **2.2.1.1 Facility Safety Design**

Willow Rock will be designed to maximize safe operation. Potential hazards that could affect the facility include earthquake, flood, and fire. Facility operators will be trained in safe operation, maintenance, and emergency response procedures to minimize the risk of personal injury and damage to the facility.



## **2.2.2 Facility Reliability**

This section discusses the expected facility availability, equipment redundancy, fuel availability, water availability, and project quality control (QC) measures.

### **2.2.2.1 Facility Availability**

The WRESC will be designed to be available to operate at its full load at least 95 percent of the time.

Availability is the duration of time that the entire facility will be able to perform its intended task. It is calculated as a ratio expressed in percentage, where the numerator is the number of hours when the system as a whole either (1) is ready to either charge or discharge (during idle/standby periods), or (2) is charging or discharging, all divided by the total number of hours in the period.

Typically, both planned and unplanned outages are subtracted from the availability calculation numerator to calculate actual availability for a period. The availability calculation denominator can be the total amount of time in the day, week, month, or, most commonly, year during which availability is being calculated.

For further clarity, availability is not the same as a typical generating plant's capacity factor, which accounts for annual criteria such as the plant's actual energy MWh output (numerator) versus the plant's nameplate capability to produce MWh over a full year (denominator), and which is usually based on the general assumption that the relevant plant will always operate at baseload.

The WRESC is intended to be operated for approximately 50 years. Reliability and availability projections are based on this operating life. Operation and maintenance procedures will be consistent with industry standard practices to maintain the useful life of plant components.

## **2.2.3 Redundancy of Critical Components**

The following subsections identify equipment redundancy as it applies to project availability. Sparing of equipment must take into consideration the requirement to provide the targeted overall system availability of 95 percent. A Reliability, Availability, and Maintainability (RAM) study will be performed during final engineering design to further refine this preliminary redundancy information.

### **2.2.3.1 Turbomachinery**

As is typical in the industry, there is no redundancy in turbomachinery (spares), given the overall reliability of the component parts and the need to control capital expenditures. Routine minor inspection and maintenance will be performed between charge and discharge cycles during pre-planned outages. Major inspections and overhauls will require shutdowns for removal of the turbomachinery casings, rotors, and other major components.

### **2.2.3.2 Pumps**

All types of pumps are considered susceptible to mechanical breakdown and generally have one installed spare. The decision not to install a spare will depend on the criticality of the service. In general, pumps will be spared in an N + 1 arrangement as an early front-end engineering design assumption until either more accurate input is available or the RAM analysis has completed.

### **2.2.3.3 Heat Exchangers**

Shell and tube (S&T) heat exchangers are less susceptible to mechanical breakdown, though appropriate protection will be provided to safeguard equipment against tube failures and cross contamination of fluids. S&T heat exchangers will not be spared; however, the parallel nature of the heat exchanger system will allow the plant to remain available when individual exchanger units are under service. Appropriate filtration will be included to prevent corrosion and increase reliability. Tube inspection and maintenance allowances will be made in the layout design and procurement.

#### **2.2.3.4 Storage Tanks**

Multiple spherical tanks are required due to size constraints on the technology at the required operating condition, effectively resulting in sparing. They are not spared beyond the minimum number of spherical tanks required to store the hot water. That is, the WRESC will still be able to operate with a spherical tank rendered unusable, but at a reduced charge/discharge duration.

The low-pressure (atmospheric) tank is not susceptible to mechanical breakdown and, as such, does not require frequent shutdowns for maintenance purposes.

Both types of tanks will be inspected and maintained during pre-planned outages, with major inspections coordinated with major work on the turbomachinery.

Critical sensors and transducers will have triple redundancy.

#### **2.2.4 Fuel Availability**

The WRESC will not use fuel for the process. California ultra-low sulfur diesel (15 ppm sulfur by weight) will be used for the emergency backup generators and fire pump and is readily available in the marketplace.

#### **2.2.5 Water Availability**

Potable and process water will be provided by interconnection with the AVEK water distribution system. The availability of water to meet the requirements of the facility need is discussed in more detail in Section 5.15, Water Resources.

#### **2.2.6 Project Quality Control**

The project will implement a QC program that will ensure the highest level of oversight while meeting the desired project outcomes, as well as the appropriate license and social license for ongoing operations.

#### **2.2.7 Quality Control Records**

The following QC records will be maintained for review and reference:

- Project instructions manual
- Design calculations
- Project design manual
- Quality assurance audit reports
- Conformance to construction records drawings
- Procurement specifications (contract issue and change orders)
- Purchase orders and change orders
- Project correspondence
- Any other records as required by LORS

During construction, field QC activities will be performed during the last four stages of the project: receipt inspection, construction/installation, system/component testing, and plant operations. The construction contractor will be contractually responsible for performing the work in accordance with the quality requirements specified by contract.

The subcontractors' quality compliance will be surveyed through inspections, audits, and administration of independent testing contracts.

A plant operation and maintenance program, typical of a project this size, will be implemented at the Willow Rock site to control operation and maintenance quality. A specific program for this project will be defined and implemented prior to initial plant startup.

### **2.2.8 Facility Closure**

Closure of the facility can be temporary or permanent. Temporary closure is defined as a shutdown for a period exceeding the time required for normal maintenance, with an intent to restart in the future. Permanent closure is defined as a cessation in operations with no intent to restart operations. Section 2.3.1 discusses temporary facility closure, and Section 2.3.2 discusses permanent facility closure in relation to the WRESC.

### **2.2.9 Temporary Closure**

For a temporary closure where there is no release of hazardous materials, the Applicant will maintain security of the WRESC facilities and will notify the CEC and other responsible agencies as required by law. If the temporary closure includes damage to the Willow Rock facilities, and if there is a release or threatened release of regulated substances or other hazardous materials into the environment, procedures will be followed as set forth in an Emergency Management Plan in accordance with a Hazardous Materials Plan. Procedures will include methods to control releases, notification of applicable authorities and the public, emergency response, and training for facility personnel in responding to and controlling releases of hazardous materials. Once the immediate problem is solved and the regulated substance/hazardous material release is contained and cleaned up, temporary closure will proceed as described above for a closure where there is no release of hazardous materials.

### **2.2.10 Permanent Closure**

When the facility is permanently closed, the closure procedure will follow a decommissioning plan that will be developed as described below.

The conditions that would affect the decommissioning decision will be presented to the CEC when more information is available and the timing for decommissioning is more imminent.

To ensure that public health and safety and the environment are protected during decommissioning, a decommissioning plan will be submitted to the CEC for approval prior to decommissioning. The plan will discuss the following:

- Proposed decommissioning activities for Willow Rock and all appurtenant facilities constructed as part of Willow Rock
- Conformance of the proposed decommissioning activities to all applicable LORS and local/regional plans
- Associated costs of the proposed decommissioning and the source of funds to pay for the decommissioning

In general, the decommissioning plan for Willow Rock will attempt to maximize the recycling or re-use of all facility components. It is anticipated that the potential cavern rock architectural berm will remain in place to minimize environmental impacts associated with its removal. It will be decommissioned such that no ongoing maintenance is needed for flood control. All nonhazardous wastes will be collected and disposed of in appropriate landfills or waste collection facilities. All hazardous wastes will be disposed of according to all applicable LORS.

APPENDIX 2A

# Engineering Design Criteria

APPENDIX 2B

# Construction Manpower and Equipment Schedule



APPENDIX 2C

# Heat and Mass Balance Diagrams

*(This Appendix Is Filed Under a Request for Confidential Designation)*

APPENDIX 2D

# Water Balance Diagrams and Construction Water Use

APPENDIX 2E

# Construction Traffic Volume Estimate

**ATTACHMENT B**  
**Preferred Gen-Tie Route Map**



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**LEGEND**

**Proposed Transmission Line**

- Preferred Route, Aboveground
- Preferred Route, Underground
- Route Options 1-6, Aboveground
- Route Options 1-6, Underground

**Project Components**

- WRESC Site
- Other Project Parcel
- Project Boundary
- SCE Whirlwind Substation

**KEY MAP**

0 8,000 16,000  
1" = 8,000 feet FEET

**REFERENCE(S)**

1. TRANSMISSION LINES - GEM A-CAES LLC  
2. PARCEL BOUNDARIES - KERN COUNTY GIS DEPT.  
3. COORDINATE SYSTEM: NAD 1983 STATEPLANE CALIFORNIA V FIPS 0405 FEET  
4. MAP SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP, GEBCO, USGS, FAO, NPS, NRCAN, GEODATA, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY  
SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

**CLIENT**

GEM A-CAES LLC

**PROJECT**

WILLOW ROCK ENERGY STORAGE CENTER  
SUPPLEMENTAL AFC

**TITLE**

PROJECT SITE AND FACILITIES MAP

CONSULTANT	YYYY-MM-DD	2024-02-20
	DESIGNED	MK
	PREPARED	MK
	REVIEWED	SCH
	APPROVED	VG/LL

PROJECT NO.	CONTROL	REV.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



## 3.0 ENGINEERING EVALUATION

### 3.1 Facility Design

#### I. Introduction

- A. Names:** Curt Hildebrand, Andrew McGillis, Victor Grille, Lucas Thexton and David Stein
- B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.
- C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
- Exhibit 1001, CONFIDENTIAL Appendix 3A, Interconnection Study Documents (TN 241428), December 2, 2021
  - Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024.
  - Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
  - Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024.
  - Exhibit 1035, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendix 5.15A-Part II (TN # 254808), March 4, 2024.
  - Exhibit 1036, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendix 5.15A-Part I (TN # 254809), March 4, 2024.
  - Exhibit 1040, Hi Res Figures V1 File 1 of 2 (TN 254813), March 4, 2024
  - Exhibit 1041, High Resolution Figures WRESC SAFC 2 of 2 (TN 254814), March 4, 2024
  - Exhibit 1056, CONFIDENTIAL Appendix\_Willow Rock Energy Storage Center Heat and Mass Balance Diagram (TN 256365), March 4, 2024
  - Exhibit 1075, WA-6 Heat and Mass Balance (Block Flow Diagram) (TN 256861), May 31, 2024 Attachment WA-6 Heat and Mass Balance (Block Flow Diagram) (TN 256861), May 31, 2024
  - Exhibit 1127, Attachment DR84-1\_Confidential (TN 260240) [includes - Project components, proposed access roads and proposed transmission line poles], October, 28, 2024.
  - Exhibit 1128, Attachment DR85-1\_Confidential (TN 260241), [includes project component maps], October 28, 2024.Exhibit 1130, Attachment DR67 Large Generator Interconnection Agreement (TN 260243), October 23, 2024.
  - Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.
  - Exhibit 1130, Attachment DR67 Large Generator Interconnection Agreement (TN 260243), October 23, 2024
  - Exhibit 1140, Willow Rock Updated SAFC Project Description- Section 2 Redline (TN 261563), February 5, 2025.
  - Exhibit 1141, Willow Rock Updated SAFC Introduction-Section 1 Redline (TN 261564), February 5, 2025.

- Exhibit 1153, Consolidated Email Response to CEC Staff on Lahontan's February 26, 2025 Request for Additional Information (TN # 261932) (TN 262349), March 25, 2025.
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **I. Summary of Testimony**

### **A. Overview of Facility Design**

The WRESC will be a nominal 520-megawatt (MW) gross (500 MW net) and 4,160 megawatt-hour (MWh) gross (4,000 MWh net) facility using Hydrostor, Inc.'s (Hydrostor's) proprietary, advanced compressed air energy storage (A-CAES) technology. Energy stored at the WRESC will be delivered to Southern California Edison's (SCE's) Whirlwind Substation located southwest of the WRESC at the intersection of 170th Street W and Rosamond Boulevard, via a new approximately 19-mile 230-kilovolt (kV) generation-tie (gen-tie) line. The WRESC will be capable of operating on a 24-hour basis, 365 days a year with an approximately 50-year lifespan.

The basic design parameters and functioning of the WRESC key components have been described by the Applicant in the Supplemental Application for Certification (SAFC), Section 2 – Project Description, Section 3 – Electric Transmission and related data adequacy and data response filings summarized in Section 1C of this testimony. The Applicant provided Engineering Design Criteria to be deployed in the facility design in SAFC Volume II, Appendix 2A - Engineering Design Criteria (contained in TN #254812) including Civil & Structural Engineering Design Criteria, Control Engineering Design Criteria, Electrical Engineering Design Criteria, Mechanical Engineering Design Criteria, and Bases for Design for Compensated Hard Rock Caverns for Compressed Air Energy Storage.

### **B. Summary of Compliance with Applicable LORS**

The WRESC will be designed in accordance with applicable building codes and standards and will comply with applicable LORS.

## **II. Response to Certain Issues Raised in the FSA**

The Applicant proposed minor changes to certain conditions of certification proposed in the PSA that were not accepted by CEC Staff. These proposed changes are still needed and are presented in Section IV below.

## **III. Proposed Licensing Conditions**

### **A. Proposed Revisions to Condition**

Page 4.1-6, COC GEN-1, Verification – Please clarify who will determine what needs to be approved by the delegate chief building official (DCBO), also please revise text as follows:

“within 30 days following receipt of the certificate of occupancy (CofO), the project owner shall submit to the Compliance Project Manager (CPM) a statement of verification, signed and stamped by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the CEC's decision have been met in the area of Facility Design. The project owner shall provide the CPM a copy of the CofO within 30 days of receipt from the DCBO.

Once the CofO has been issued, if feasible, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires DCBO approval for compliance with the above codes. The CPM will then determine if the DCBO needs to approve the work”.

Page 4.1-16 verification of COC STRUC-2, paragraph 1 – Please revise text as follows:

“Within five days of ~~discovering~~ **discovery and verification** of the discrepancy the project owner shall provide the NCR to the DCBO for approval and the CPM.”

Page 4.1-17 COC MECH-1– Typically the responsible mechanical engineer at each major equipment

vendor will sign and stamp, not a single individual. Please revise text as follow:

“MECH-1 The project owner shall submit, for DCBO design review and approval, the proposed final design, specifications, and calculations for the project's mechanical-related components listed in the DCBO-approved master drawing and master specifications list. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such component, the project owner shall request the DCBO's inspection approval of that construction.

The responsible mechanical engineer for the project or the responsible mechanical engineer for the vendor of each major project component shall stamp and sign all plans, drawings, and calculations for the major project's mechanical-related components, subject to DCBO design review and approval, and submit a signed statement to the DCBO when the proposed components have been designed, fabricated, and installed in accordance with all of the applicable LORS, which may include, but are not limited to:

- ASME Boiler and Pressure Vessel Code and Interpretation: Section V, Article 7: Nondestructive Examination; Section VIII, Division 1, Part UG-28: Rules for Construction of Unfired Pressure Vessels; and
- Title 24, California Code of Regulations, Part 2 (California Building Code). The DCBO may deputize inspectors to carry out the functions of the CEC's code enforcement mandate.

The DCBO may deputize inspectors to carry out the functions of the CEC's code enforcement mandate.”

## 3.2 Facility Reliability

### I. Introduction

**A. Names:** Curt Hildebrand, Andrew McGillis and David Stein

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

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- High resolution figures V1, File 1 of 2 and High resolution figures WRESC SAFC 2 of 2 (TN 254813 and TN 254814), March 3, 2024.
- Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024.

- Willow Rock Energy Storage Centre Applicant's Responses to Issue Identification Reports, (TN 259795) October, 30, 2024.
- Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.
- Attachment DR84-1\_Confidential (TN 260240) [includes - Project components, proposed access roads and proposed transmission line poles], October, 28, 2024.
- Attachment DR85-1\_Confidential (TN 260241), [includes project component maps], October 28, 2024.
- Willow Rock CURE Data Request 2 Response (TN 261315), January, 27, 2025
- Willow Rock Data Request Set 3 Response (TN 259675), October, 23, 2024
- Att DA20-1 A-CAES Historical Operational Summary (TN 242799), April, 25, 2022.
- Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315), January 27, 2025

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

The WRESC will be a nominal 520-megawatt (MW) gross (500 MW net) and 4,160 megawatt-hour (MWh) gross (4,000 MWh net) facility using Hydrostor, Inc.'s (Hydrostor's) proprietary, advanced compressed air energy storage (A-CAES) technology. Energy stored at the WRESC will be delivered to Southern California Edison's (SCE's) Whirlwind substation located southwest of the WRESC at the intersection of 170th Street W and Rosamond Boulevard, via a new approximately 19-mile 230-kilovolt (kV) generation-tie (gen-tie) line. The WRESC will be capable of operating on a 24-hour basis, 365 days a year with an approximately 50-year lifespan.

### **B. Facility Availability**

The WRESC will be designed to be available to operate at its full load at least 95 percent of the time. Availability is the duration of time that the entire facility will be able to perform its intended task. It is calculated as a ratio expressed in percentage, where the numerator is the number of hours when the system as a whole either (1) is ready to either charge or discharge (during idle/standby periods), or (2) is charging or discharging, all divided by the total number of hours in the period.

### **C. Redundancy of Critical Components**

The following subsections identify equipment redundancy as it applies to project availability. Sparing of equipment must take into consideration the requirement to provide the targeted overall system availability of 95 percent. A Reliability, Availability, and Maintainability (RAM) study will be performed during final engineering design to further refine this preliminary redundancy information.

#### **i. Turbomachinery**

As is typical in the industry, there is no redundancy in turbomachinery (spares), given the overall reliability of the component parts and the need to control capital expenditures. Routine minor inspection and maintenance will be

performed between charge and discharge cycles during pre-planned outages. Major inspections and overhauls will require shutdowns for removal of the turbomachinery casings, rotors, and other major components.

## **ii. Pumps**

All types of pumps are considered susceptible to mechanical breakdown and generally have one installed spare. The decision not to install a spare will depend on the criticality of the service. In general, pumps will be spared in an N +1 arrangement as an early front-end engineering design assumption until either more accurate input is available or the RAM analysis has completed.

## **iii. Heat Exchangers**

Shell and tube (S&T) heat exchangers are less susceptible to mechanical breakdown, though appropriate protection will be provided to safeguard equipment against tube failures and cross contamination of fluids. S&T heat exchangers will not be spared; however, the parallel nature of the heat exchanger system will allow the plant to remain available when individual exchanger units are under service. Appropriate filtration will be included to prevent corrosion and increase reliability. Tube inspection and maintenance allowances will be made in the layout design and procurement.

## **iv. Storage Tanks**

Multiple spherical tanks are required due to size constraints on the technology at the required operating condition, effectively resulting in sparing. They are not spared beyond the minimum number of spherical tanks required to store the hot water. That is, the WRESC will still be able to operate with a spherical tank rendered unusable, but at a reduced charge/discharge duration. The low-pressure (atmospheric) tank is not susceptible to mechanical breakdown and, as such, does not require frequent shutdowns for maintenance purposes. Both types of tanks will be inspected and maintained during pre-planned outages, with major inspections coordinated with major work on the turbomachinery. Critical sensors and transducers will have triple redundancy.

## **D. Fuel Availability**

The WRESC will not use fuel for the process. California ultra-low sulfur diesel (15 ppm sulfur by weight) will be used for the emergency backup generators and fire pump and is readily available in the marketplace.

## **E. Water Availability**

Potable and process water will be provided by interconnection with the AVEK water distribution system. The AVEK connection will be used to provide water for construction needs, the initial reservoir fill, and the initial charging of the system. Once the facility commences operation it is expected to collect enough water from the air compression process and precipitation to sustain operation without the need for additional AVEK water. The AVEK water supply connection will be maintained as a backup.

## **F. Power Availability**

The WRESC will maintain three diesel fuel-fired 2.5 megawatt (MW) emergency backup generators to maintain operation of critical components and a diesel fuel-fired 375 KW emergency backup fire pump in the event of an emergency loss of power.

## **G. Cavern Reliability**

The Applicant submitted an A-CAES Historical Operation Summary to demonstrate the reliability of the technology (TN #242799). As described in the summary, Hydrostor's A-CAES cavern sizes and operational parameters are



consistent with the sizes and operating parameters of hydrocarbon storage caverns in use today, and contain those same key components. This provides an abundance of real-world experience upon which to base the A-CAES cavern design, and to use in managing and mitigating subsurface issues as they are identified during development, site selection, and construction. In addition, approximately 200 hard rock storage caverns exist globally, storing hydrocarbons – the design and construction of which is directly analogous to air storage caverns.

### **III. Summary of Compliance with Applicable LORS**

The WRESC will comply with all applicable LORS.

### **IV. Response to Certain Issues Raised in the FSA**

The Applicant has reviewed the FSA and is in general agreement with its findings and conclusions.

### **V. Proposed Licensing Conditions**

There are no proposed conditions of certification for Facility Reliability.

## **3.3 Transmission System Engineering**

### **I. Introduction**

**A. Names:** Curt Hildebrand, Cody Niehus, Laurel Lees, Cavan Lee, Tri Luu and David Stein

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Exhibit 1001, CONFIDENTIAL Appendix 3A, Interconnection Study Documents (TN 241428), December 2, 2021
- Exhibit 1008, Attachment DR95-1\_C132-North-Q1782-TOT 1002-Gem-Appendix A (TN246751)
- Exhibit 1009, Attachment DR95-1\_QC13PII-SCE-Northern-Q1782TOT 1002-Gem-Appendix A-Attachment 1 (TN 246752)
- Exhibit 1010, Attachment 3 (TN 247169)
- Exhibit 1011, Queue Cluster 13 Phase II – Attachment 1 (TN 247170)
- Exhibit 1012, Appendix A – Q1782 (TN 247171)
- Exhibit 1013, Queue Cluster 13 Phase 2 Attachment 2 (TN 247172)
- Exhibit 1014, Appendix H – SCD Results (TN 247173)
- Exhibit 1015, Appendix G - Generation Sequencing Implementation (GSI) (TN 247174)
- Exhibit 1016, SCE's Northern Hemisphere Import Nomogram Study (TN 247175 )
- Exhibit 1017, Area Report Appendix K (TN 247176)
- Exhibit 1018, QC13 Phase 2 Area Report Appendix E (TN 247177)
- Exhibit 1019, Queue Cluster 13 Phase II – Appendix B (TN 247178)

- Exhibit 1020, Queue Cluster 13 Phase II – Appendix C (TN 247179)
- Exhibit 1021, Queue Cluster 13 Phase II – Appendix D (TN 247180)
- Exhibit 1022, Queue Cluster 13 Phase II – Appendix F (TN 247181)
- Exhibit 1023, QC13 Phase II Appendix L - Subsynchronous Control Interaction Screening Assessment Report (TN 247182)
- Exhibit 1024, Queue Cluster 13 Phase II Interconnection Study Report (TN 247183)
- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024.
- Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
- Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024
- Exhibit 1070, Willow Rock Data Adequacy Response (TN 256622), May 3, 2024
- Exhibit 1071, 2022 Generator Interconnection Reassessment Report Northern Area Final Report (TN 256824), May 2, 2024
- Exhibit 1072, 2022 Generator Reassessment Report (TN 256825), May 2, 2024
- Exhibit 1073, QC13 Phase 2 Study Report Attachment #2 Updated for 2022 Reassessment (TN 256826), May 2, 2024
- <https://efiling.energy.ca.gov/GetDocument.aspx?tn=264316&DocumentContentId=101033>
- Exhibit 1119, Willow Rock Data Request Set 3 Response (TN 259675), October 23, 2024
- Exhibit 1127, Attachment DR84-1\_Confidential (TN 260240), October 28, 2024
- Exhibit 1130, Attachment DR67 Large Generator Interconnection Agreement (TN 260243), October 23, 2024
- Exhibit 1132, Willow Rock Data Request Set 5 Responses Report (TN 260808), December 23, 2024
- Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315), January 27, 2025
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025
- Willow Rock Data Adequacy Response, Attachment TSD-1 (Exhibit number and TN to be assigned)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

The WRESC will be a nominal 520-megawatt (MW) gross (500 MW net) and 4,160 megawatt-hour (MWh) gross (4,000 MWh net) facility using Hydrostor, Inc.'s (Hydrostor's) proprietary, advanced compressed air energy storage (A-CAES) technology. Energy stored at the WRESC will be delivered to Southern California Edison's (SCE's) Whirlwind Substation located southwest of the WRESC at the intersection of 170th Street W and Rosamond Boulevard, via a new approximately 19-mile 230-kilovolt (kV) generation-tie (gen-tie) line.

The proposed gen-tie would consist of a single-circuit, double-bundle gen-tie line connection, which would require overhead and underground line segments. The overhead line segment would construct with 60 to 140-foot steel transmission poles, spaced approximately 200 to 800 feet apart.

The gen-tie line overhead line segment would be built with aluminum conductor steel reinforced (ACSR) double bundle 1590 thousand circular mils (kcmil) 54/19 "Falcon" conductors. The conductor's current carrying capacity is approximately 1,359 amperes per conductor. One shield wire with an integrated fiber optic cable will be installed with the new gen-tie line associated with the project. The fiber optic cable will be used for any necessary communications within SCE's transmission system. The underground line segment of the gen-tie will be constructed with 2000 kcmil parallel single conductor copper shielded cables. The cable's current carrying capacity is approximately 885 amperes per cable.

The electrical system is protected (protection schemes by utilizing Supervisory Control and Data Acquisition (SCADA)) against ground faults that result in unit ground potential rises.

An updated electrical one-line diagram of the Willow Rock onsite electrical system was submitted with the Applicant's comments to the Preliminary Staff Assessment (TN # 264316) and has been accurately reflected in the FSA. The Willow Rock switchyard will be on the northeastern corner of the WRESC Site. The substation will be of the tubular bus type with interconnecting conductors and will consist of high-voltage sulfur hexafluoride (SF6)-insulated dead-tank circuit breakers and no-load switches.

The WRESC electrical power would be generated using four triple pressure condensing turbine/generator trains with four air-powered turbine generators. Power would be stepped up to 230 kV by generator step-up (13.8/230 kV) transformers rated at 105/140/175 MVA.

Connections to the aerial conductor cable will be provided from the two dual-winding transformers for the inter-tie to the utility grid. The high-voltage circuit breaker will be equipped with a no-load break, air-insulated, disconnect switch. A transformer circuit breaker and isolating disconnect switch will also be installed in each transformer connection to allow for transformer protection and isolation when the corresponding transformer is out of service. Tubular IPS bus type with interconnecting conductors will be used as the primary interconnection material within the switchyard. The IPS and conductors will be attached to post-insulator columns on structural steel supports. The main substation will transform power from 230 to 13.8 kV, and vice versa.

Current and voltage transformers will be located at points within the substation to provide metering and relaying. Control, protection, and monitoring for the substation will take place in the substation protection and control building. Monitoring and alarms will be available to the supervisory control system operator workstations in the control module. All protection and circuit breaker control will be powered from the station battery-backed 125-volt direct-current system.

Each motor/generator substation will have two dual-winding transformers with wye-delta for the generator and delta-wye for the motors. The 13.8 kV side will be fed with underground cables and will be International Organization for Standardization (ISO) phase bus duct connections with SF6 circuit breakers.

## **B. Potential Impacts**

Hydrostor A-CAES USA Inc., parent company to the Applicant, filed an Interconnection Request (IR) with the California Independent System Operator (CAISO) on behalf of the Applicant on April 15, 2020 (in the Cluster 13 IR window). CAISO, in cooperation with SCE, prepared the Phase I Interconnection Study (dated January 25, 2021, as modified by Addendum #1 dated March 10, 2021), which considered the potential system impacts of the proposed Willow Rock interconnect (see confidential docket TN#: 241428, December 12, 2021). As part of the Cluster 13 study process, Willow Rock was studied alongside other interconnection requests in Cluster 13, and, therefore, the Phase I Interconnection Study results represent the most-impacted scenario in terms of potential effects on the transmission system.

The Phase II Interconnection Study results were issued on November 22, 2021, and the 2022 Generator Reassessment Report was issued on July 29, 2022. The results were confidentially docketed (see docket TN#: 247169 through 247183, October 13, 2022).

## **C. Summary of Potential Cumulative Impacts**

The Phase II Study and Reassessment Report both state that potential cumulative transmission system impacts that can be mitigated.

## **D. Avoidance and Minimization Measures**

Avoidance and Minimization measures are set forth in the filings in Section I.C, above. Above.

## **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with applicable LORS.

# **III. Response to Certain Issues Raised in the FSA**

The Applicant is in general agreement with the FSA analysis of transmission system impacts and has no further comments.

# **IV. Proposed Licensing Conditions**

The Applicant agrees with the Transmission System Engineering Conditions of Certification as proposed in the FSA

## **3.4 Worker Safety and Fire Protection**

### **I. Introduction**

**A. Names:** Jesse Steele

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
- Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024.

- Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
- Exhibit 1112, Willow Rock CURE Data Request Set 1 Response (TN 259338), September 27, 2024
- Exhibit 1119, Willow Rock Data Request Set 3 Response (TN 259675), October 23, 2024
- Exhibit 1120, Willow Rock Data Request Set 4 Responses (TN 259736), October 28, 2024
- Exhibit 1132, Willow Rock Data Request Set 5 Responses Report (TN 260808), December 23, 2024
- Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315), January 27, 2025
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025
- <https://efiling.energy.ca.gov/GetDocument.aspx?tn=254813&DocumentContentId=90448>

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

The proposed project would be located in the southeastern portion of Kern County on an undeveloped site.

During the construction, commissioning and operation of the facility, workers may be exposed to various surface and underground hazards such as silica dust, infectious disease such as Valley Fever, increase levels of radiation, loud noises, moving equipment, trench/excavation accidents, electrical hazards, dust hazards, use of explosives, and confined space incidents. This could result in falls, trips, burns, lacerations, being struck by objects, and other potential injuries.

To protect the safety and health of workers during the construction and operation, health and safety programs will be implemented to mitigate hazards and comply with applicable regulations. Periodic audits will be performed by qualified individuals to determine whether proper work practices are being used to mitigate hazardous conditions and to evaluate regulatory compliance.

Construction and operation of the project will be conducted in accordance with all applicable federal, state and local LORS relating to worker health and safety.

### **B. Potential Construction and Operational Impacts**

Workers at the WRESC will be exposed to plant construction, operation conditions, and activities that pose potential safety hazards. A hazard analysis was conducted to evaluate the hazards and assess control measures.

Hazards identified during construction include motor vehicle and heavy equipment use, forklift operation, trenching and excavation, working at heights, cranes and lifting, working with flammable or combustible liquids, hot work, electrical systems, potential exposure to valley fever, working near water and confined space entry. General construction activities include hazards such as use of portable power tools, ergonomic hazards, heat and

cold stress, hazardous vapors, dusts and fumes, occupational noise and pressurized systems. Underground construction poses many hazards including use of explosives, underground excavation activities and shaft drilling.

Hazards identified during facility operation include motor vehicle and heavy equipment use, forklift operation, trenching and excavation, working at heights, cranes and lifting, working with hazardous materials, hot work, maintenance work, electrical systems, potential exposure to valley fever, working near water, exposure to valley fever and confined space entry. General plant operation activities include hazards such as portable power tools, occupational noise, ergonomic hazards, hazardous gases, vapors, dusts and fumes and heat and cold stress.

### **C. Summary of Potential Cumulative Impacts**

The Kern County Rescue Unit (KCRU) located in Bakersfield would be inadequate to provide a timely rescue from the subsurface cavern during construction. Because of the 37 projects within 8.1 miles of the proposed project there is a cumulative impact to KCFD regarding its ability to properly respond to fire, rescue, and EMS emergencies.

Operation of the project would present a significant direct and cumulative impact on the local fire department and mitigation is recommended. The project owner should reach an agreement with the KCFD regarding funding to provide mitigation for direct and cumulative project-related impacts. It is suggested funding be provided for a fully equipped Urban Search and Rescue (USAR) Unit, including necessary equipment for use in Eastern Kern County, and staffing costs during the construction phase.

### **D. Avoidance and Minimization Measures**

To protect the safety and health of workers during the construction and operation of the facility, health and safety programs designed to mitigate hazards and comply with applicable regulations have been proposed. It is suggested that these measures would ensure that impacts to worker safety would be less than significant.

A Construction Safety and Health Program would be developed for the project including safety protocols for a temporary portable rock crushing facility and a temporary concrete batch plant onsite during construction. This plan would discuss hazards associated with the industrial rock crushing facility and the concrete plant including working at elevated locations, moving equipment, electrical systems, cranes and lifting, working with flammable or combustible liquids, hot work, exposure to valley fever, working near water, confined space entry, hazardous dusts, occupational noise and pressurized systems. .

As part of managing operational Health and Safety risks an Injury and Illness Prevention Program (IIPP) will be developed. The IIPP is a worker safety and health program that identifies the authority and responsibility for implementing the program, ensures that employees utilize safe and healthy work practices and that these practices are communicated, identifies and evaluates workplace hazards and corrects them, and implements an employee training program.

The site Fire Prevention Plan will outline site fire hazards proper handling and storage procedures for chemicals, potential ignition sources (such as welding, smoking and others) and their control procedures, and the type of fire protection equipment or systems which can control a fire. Furthermore, the plan would provide site direction for housekeeping requirements, training and equipment maintenance.

The site will incorporate the requirements of the current California Fire Code and be equipped with fire detection and monitoring systems, fire suppression systems for equipment and buildings, one electric jockey fire pump with one back-up diesel-fired 460 horsepower emergency fire pump and various types of portable fire extinguishers. Additionally, there would be an onsite water tank of 330,000 gallons of which 300,000 gallons would be dedicated



for firefighting. The Fire Protection System Impairment Program details prescriptive methods the project owner must follow when the facility's fire protection system becomes impaired.

A Fire Prevention Plan for mining will focus on identifying and mitigating potential ignition sources, controlling combustible materials, and implementing proper ventilation systems. Additionally, the plan will focus on utilizing fire detection and suppression equipment, and providing thorough employee training on fire safety procedures, particularly in areas with flammable gases like methane may exist. The plan will also consider other unique hazards present in the mine environment.

A Controlled Detonations Plan will be developed for the safe excavation of the underground cavern when using explosives. Preparation and implementation of a thorough and comprehensive plan will be developed before any explosives are used onsite.

The Project Construction Controlled Detonation Plan would contain a complete description of how explosives would be safely transported and used at the site, evacuation, security and fire prevention procedures, a blasting equipment list, and procedures for notification of nearby receptors. Notification procedures would include writing to all residents or owners of dwellings or other structures within a 5-mile radius describing how to request and submit a pre-controlled detonations survey. Notification shall include posting a written notice within the project site, in local newspapers, and on the Kern County public website describing proposed controlled detonations activities and how to obtain and submit a pre-controlled detonations survey.

To mitigate the risks associated with Valley Fever, a worker Valley Fever Prevention and Response Plan will be developed that includes an enhanced Dust Control Plan. This plan would include use of equipment with closed cabs, use of dust masks, enhanced dust control methods such as increased frequency of watering and training on Valley Fever risks.

#### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with applicable LORS.

### **III. Response to Certain Issues Raised in the FSA**

The applicant recommends that COC Worker Safety-1 allow for consolidation of the construction Emergency Action Plan and operational Emergency Response Plan into a single, comprehensive Emergency Management Plan to reduce confusion around the number of site plans and thus improving the response time during an emergency event.

The applicant also recommends that the Construction Emergency Action Plan, Construction Emergency Response Plan, the Controlled Detonation, the Hazardous Material Business Plan HMBP, and the Fire Prevention Plan shall be submitted to the Kern County Fire Department (KCFD) and Kern County Sheriff's Office (KCSO) for review and comment concurrently. Furthermore, that written responses from the KCFD and KCSO, if any, shall be submitted to the Compliance Project Manager (CPM) within 30 days of receipt by the Project Owner.

The applicant also recommends that COC Worker Safety-5 allow for the controlled blasting notification radius be reduced from five miles to one mile. Analysis provided indicates that vibrations will be imperceptible to residences at a fraction of this distance.

The current condition requires that controlled detonations notification procedures included in the Controlled Detonations Plan should require the project owner to notify, in writing, all residents or owners of dwellings or other

structures within a one mile radius (or other distance as recommended by either the KCFD Chief or the Kern County Sheriff's Office (KCSO)).

The applicant recommends that COC Worker Safety-8, specifically related to development of a detailed and comprehensive Construction Underground Fire Protection Plan, be revised to coincide with underground construction activities. As such, it is suggested, at least 90 days prior to the start of site mobilization underground construction activities, that the project owner provide to KCFD a copy of the plan for review and comment and to the CPM for review and approval.

COC Worker Safety-11 requires the project owner to install various infrastructure at site including emergency access gates, fire and heat sensors, fire water flow and CCTV cameras. The applicant recommends that this condition be revised to grant the CPM the flexibility to make certain changes based on site and project-specific conditions.

## **IV. Proposed Licensing Conditions**

The Applicant agrees with Worker Safety and Fire Protection Conditions of Certification Worker Safety-1 through Worker Safety-12, with the modifications described above.

### **4.0 ENVIRONMENTAL IMPACT ASSESSMENT**

#### **4.1 Air Quality and Climate Change and Greenhouse Gas Emissions**

##### **I. Introduction**

**A. Names:** Gregory Darvin, David Stein, Curt Hildebrand, Victor Grille and Andrew McGillis

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
- Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024.
- Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
- Exhibit 1039, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendix 1A-51F (TN 254812), March 4, 2024.
- <https://efiling.energy.ca.gov/GetDocument.aspx?tn=262349&DocumentContentId=98874>
- Exhibit 1052, Eastern Kern Air Pollution Control District (EKAPCD) Application (TN 254897), March 7, 2024.
- Exhibit 1054, EKAPCD Determination of Completeness (TN 255273), March 26, 2024.
- Exhibit 1055, EKAPCD Preliminary Determination of Compliance (TN 255594), April 9, 2024.
- Exhibit 1057, Eastern Kern Air Pollution Control District Notice of Final Determination of Compliance (FDOC) (TN 256372), May 14, 2024.

- Exhibit 1070, Willow Rock Data Adequacy Responses (TN 256622), May 31, 2024. Exhibit 1132, Willow Rock Data Request Set 5 Response Report (TN 260808), December 23, 2024.
- Exhibit 1111, Willow Rock Data Request Set 2 Response, Willow Rock Energy Center, (TN 259220), September 19, 2024.
- Exhibit 1112, Willow Rock CURE Data Request Set 1 Response (TN 259338), September 27, 2024
- Exhibit 1119, Willow Rock Data Request Set 3 Response (TN 259675), October 23, 2024.
- Exhibit 1132, Willow Rock Data Request Set 5 Responses Report (TN 260808), December 23, 2024
- Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315), January 27, 2025.
- Exhibit 1153, Consolidated Email Responses to CEC Staff on Lahontan's February 26, 2025 Request for Additional Information (TN # 261932) (TN 262349), March 25, 2025.
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

The Willow Rock project site is located in a rural area that is considered severe nonattainment for 8-hour ozone (2008) and moderate nonattainment for 8-hour ozone. The area is attainment and/or maintenance for all other criteria pollutants. Regulated air emissions from Willow Rock operations will not exceed federal major source thresholds under nonattainment New Source Review (NSR) or Prevention of Significant Deterioration (PSD); therefore, federal NSR will not apply to this project. Because nonattainment NSR does not apply, emission offsets are not required.

### **B. Potential Construction and Operational Impacts**

During construction, regulated air emissions will be emitted to the atmosphere due to combustion of fuel in reciprocating internal combustion engines (off-road and on-road mobile sources), traffic on internal site unpaved roads, bulldozing, wind erosion, grading, rock crushing, a cement batch plant, and material movement. These construction impacts will be temporary and finite in duration. Construction impacts to air quality were determined by air dispersion modeling, which demonstrated compliance with the applicable California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). The calculated emissions of greenhouse gases are not expected to be considered significant.

During operations, the WRESC will not routinely operate combustion units or emit regulated pollutants into the atmosphere. Regulated emissions of air pollutants will only occur from the stationary internal combustion engines used for maintenance and readiness testing or in the emergency event of a fire or power outage. Only two of the 2.5 MW engines are required to support critical loads. The third engine is redundant, and only one engine is assumed to operate at any given time for purposes of maintenance and readiness testing. There will also be a

diesel fuel-fired fire pump engine. Operational impacts to air quality were determined by air dispersion modeling, which demonstrated compliance with the applicable California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

The calculated emissions of greenhouse gases during the operation of the project will be less than the applicable thresholds and therefore, would be considered insignificant.

#### **C. Summary of Potential Cumulative Impacts**

There are no existing sources within six miles of the project boundary that would require a cumulative impact assessment.

#### **D. Summary of Compliance with Applicable LORS**

The WRESC will comply with all applicable laws, ordinances, regulations, and standards (LORS).

### **III. Response to Certain Issues Raised in the FSA**

No comments on the FSA.

### **IV. Proposed Licensing Conditions**

The Applicant agrees with the Air Quality Conditions of Certification AQ-SC1 through AQ-SC-8 and AQ-1 through AQ-18 as proposed in the FSA.

#### **4.2 Biological Resources**

##### **I. Introduction**

**A. Names:** Kate Moss, Scott Crawford, and Laurel Lees

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
- Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024.
- Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
- Exhibit 1038, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendices 5.2A-5.3B (21-AFC-02) (TN 254811), March 4, 2024.
- Exhibit 1042, 2023 Desert Tortoise Survey (TN #254815), March 4, 2024
- Exhibit 1043, WRESC Biological Resources Assessment Report (TN 254816), March 4, 2024
- Exhibit 1044, WRESC Burrowing Owl Focused Survey Report (TN 254817) March 4, 2024
- Exhibit 1045, WRESC Mojave Ground Squirrel Report (TN 254818), March 4, 2024
- Exhibit 1047, WRESC Western Joshua Tree Report 1 of 2 (TN 254820), March 4, 2024

- Exhibit 1048, WRESC Western Joshua Tree Report 2 of 2 (TN 254821), March 4, 2024
- Exhibit 1061, Confidential\_CNDDDB Forms (TN 256485), March 4, 2024
- Exhibit 1062, Confidential\_Swainson's Hawk (TN 256486), March 4, 2024
- Exhibit 1063, Confidential\_Crotch BB (TN 256487), March 4, 2024
- Exhibit 1064, Confidential\_Focused Plant Survey Report (TN 256488), March 4, 2024
- Exhibit 1065, Confidential\_C05\_F5\_2\_4a\_C\_CNDDDBPlants (TN 256489), March 4, 2024
- Exhibit 1066, Confidential\_C06\_F5\_2\_4b\_C\_CNDDDBWildlife (TN 256490), March 4, 2024
- Exhibit 1067, Confidential\_C08\_F5\_2\_6a\_C\_ObservedSSPlants (TN 256491), March 4, 2024
- Exhibit 1068, Confidential\_C09\_F5\_2\_6b\_C\_ObservedSSWildlife (TN 256492), March 4, 2024
- Exhibit 1070, Willow Rock Data Adequacy Response (TN 256622), May 31, 2024
- Exhibit 1078, Willow Rock Wetland Methodology (TN 257622), July 5, 2024
- Exhibit 1081, Willow Rock Desert Tortoise Survey 2024 Addendum (TN 258309), August 5, 2024
- Exhibit 1082, Willow Rock Mohave Ground Squirrel Survey (TN 258310), August 5, 2024
- Exhibit 1083, Willow Rock Joshua Tree Census 2024 Addendum (TN 258311), August 5, 2024
- Exhibit 1084, Willow Rock Swainson's Hawk Survey 2024 Addendum (TN 258312), August 5, 2024
- Exhibit 1085, Willow Rock Sensitive Plant Survey 2024 Addendum (TN 258313), August 5, 2024
- Exhibit 1086, Willow Rock Crotch's Bumble Bee Survey 2024 Addendum (TN 258314), August 5, 2024
- Exhibit 1087, Willow Rock Burrowing Owl Survey 2024 Addendum (TN 258315) August 5, 2024
- Exhibit 1088, Willow Rock Biological Resources Report 2024 Addendum (TN 258316), August 5, 2024
- Exhibit 1091, 31406639-000\_01\_04\_FX-X-04\_Rev1\_SoilsMap-CONFIDENTIAL\_Mapbook (TN 258868), August 5, 2024
- Exhibit 1092, 31406639-000\_01\_05\_FX-X-05\_Rev1\_VegetationMap\_CONFIDENTIAL\_Mapbook (TN 258869), August 5, 2024
- Exhibit 1094, 31406639-000\_01\_08\_FX-X-08\_Rev1\_ProtectedConservedLands\_CONFIDENTIAL\_Mapbook (TN 258871), August 5, 2024
- Exhibit 1095, 31406639-000\_01\_09\_FX-X-09\_Rev1\_SpecialStatusPlants\_CONFIDENTIAL\_Mapbook (TN 258872), August 5, 2024
- Exhibit 1096, 31406639-000\_01\_10\_FX-X-10\_Rev1\_SpecialStatusWildlife\_CONFIDENTIAL\_Mapbook (TN 258873), August 5, 2024
- Exhibit 1097, 31406639-000\_01\_04\_F03-04\_Rev1\_BUOL\_SURveyTransects\_CONFIDENTIAL\_Mapbook (TN 258874), August 5, 2024

- Exhibit 1098, 31406639-000\_01\_05\_F03-05\_Rev1\_BUOL\_Occurances\_CONFIDENTIAL\_MapBook (TN 258875), August 5, 2024
- Exhibit 1099, 31406639-000\_01\_04\_F08-04\_Rev1\_CBBeeAndNectarSources\_CONFIDENTIAL\_MapBook (TN 258876), August 5, 2024
- Exhibit 1101, 31406639-000\_01\_05\_F07-05\_Rev1\_JD\_Vegetation\_CONFIDENTIAL\_MapBook (TN 258878), August 5, 2024
- Exhibit 1105, Hydrostor MGS Survey Report\_Resource Agency Version (TN 25882), August 5, 2024
- Exhibit 1106, 31406639-000\_01\_04\_F05-04\_Rev1\_SP\_CNDDDB\_CONFIDENTIAL\_Mapbook (TN 258883), August 5, 2024
- Exhibit 1107, 31406639-000\_01\_05\_F05-05\_Rev1\_SP\_SensitivePlants\_CONFIDENTIAL\_Mapbook (TN 258884), August 5, 2024
- Exhibit 1108, 31406639-000\_01\_04\_F02-04\_Rev1\_SH\_ActiveNestLocations\_CONFIDENTIAL\_Mapbook (TN 258885), August 5, 2024
- Exhibit 1109, 31406639-000\_01\_05\_F02-05\_Rev1\_SH\_SWHAObsv\_CONFIDENTIAL\_Mapbook (TN 258886), August 5, 2024
- Exhibit 1110, 31406639-000\_01\_04\_F06-04\_Rev1\_JT\_Obsv\_CONFIDENTIAL\_Mapbook (TN 258887), August 5, 2024
- Exhibit 1112, Willow Rock CURE Data Request Set 1 Response (TN 259338), September 27, 2024
- Exhibit 1113, REDACTED 31406639-000 01 C05 F5 2-4a C Rev0 CNDDDBPlants (TN 259423), October 2, 2024
- Exhibit 1114, REDACTED WRESC Swainson's Hawk Focus Survey (TN 259424), October 2, 2024
- Exhibit 1115, Attachment DR26-1-Utility Pole Locations Map Book (TN 259490), September 27, 2024
- Exhibit 1117, Attachment DR74-1 – 2023 and 2024 Swainson's Hawk Survey Nest Locations Map Book (TN 259492), September 27, 2024
- Exhibit 1118, Attachment DR75-1 – 2023 and 2024 Swainson's Hawk Survey Hawk Locations Map Book (TN 259493), September 27, 2024
- Exhibit 1119, Willow Rock Data Request Set 3 Response (TN 259675), October 23, 2024
- Exhibit 1120, Willow Rock Data Request Set 4 Responses (TN 259736), October 28, 2024.
- Exhibit 1121, Attachment DR95-1\_ITP\_Confidential (TN #260234), October 28, 2024
- Exhibit 1122, Attachment DR92-1 Draft Preliminary Conceptual WRESC WJT Relocation Plan\_Confidential (TN 260235), October 28, 2024
- Exhibit 1124, Attachment DR88-1\_Confidential (TN 260237), October 28, 2024
- Exhibit 1125, Attachment DR89-1\_Joshua Tree Census\_Confidential (TN 260238), October 28, 2024



- Exhibit 1126, Attachment DR82-1\_Confidential (TN 260239), October 28, 2024
- Exhibit 1127, Attachment DR84-1\_Confidential (TN 260240), October 28, 2024
- Exhibit 1128, Attachment DR85-1\_Confidential (TN 260241), October 28, 2024
- Exhibit 1129, Attachment DR96-1 Biological Surveys Shapefiles (TN 260242), October 28, 2024
- Exhibit 1133, Willow Rock Center for Biological Diversity Data Request Set 1 Response (TN 260809), December 23, 2024
- Exhibit 1134, Willow Rock Data Request 6 Response (TN 261314), January 27, 2025
- Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315), January 27, 2025
- Exhibit 1139, Willow Rock CEC Data Request Set 6 Attachment DR125-1 (TN #261389), January 31, 2025
- Exhibit 1142, Attachment 1261 – Confidential Mapbook Figure 4 (TN 261844), January 28, 2025
- Exhibit 1148, Follow-up Responses on Biological and Water Resources, Drilling Cuttings, and DSOD Info for Willow Rock Energy Storage Center (TN 262180), March 13, 2024
- Exhibit 1149, Willow Rock Incidental Take Permit (TN #262196), March 14, 2025
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025
- Willow Rock Data Adequacy Response, Attachment BIO-2 (Exhibit number and TN to be assigned)
- Willow Rock Center for Biological Diversity Data Request Set 1 Response, Attachment DR5-1 (Exhibit number and TN to be assigned)
- Willow Rock Data Request 6 Response, Attachment DR126-1 (Exhibit number and TN to be assigned)
- Willow Rock CURE Data Request Set 1 Response, Attachment DR8-1 (Exhibit number and TN to be assigned)
- Willow Rock CURE Data Request Set 1 Response, Attachment DR11-1 (Exhibit number and TN to be assigned)
- Willow Rock CURE Data Request Set 1 Response, Attachment DR42-1 (Exhibit number and TN to be assigned)
- Willow Rock CURE Data Request Set 1 Response, Attachment DR46-1 (Exhibit number and TN to be assigned)
- Willow Rock CURE Data Request Set 1 Response, Attachment DR47-1 (Exhibit number and TN to be assigned)
- Willow Rock CURE Data Request Set 1 Response, Attachment DR66-1 (Exhibit number and TN to be assigned)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best

professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## II. Summary of Testimony

### A. Affected Environment

The Willow Rock Energy Storage Center, or WRESC, is in unincorporated Kern County, north of Rosamond, California. The Project Area is in the western portion of the Mojave Desert Province referred to as the Rosamond Playa, with an elevation that ranges from 2,400 feet (732 meters) to 2,720 feet (830 meters). The Project or Project Area encompasses the WRESC Site (approximately 88.6 acres), the parcels within the Project Boundary, and the right-of-way (ROW) associated with the WRESC's proposed approximately 19-mile gen-tie line. The Project Boundary encompasses the WRESC Site and the parcels of land (an additional approximately 133 acres of private land surrounding the WRESC) that will be allocated for potential temporary staging and laydown area (referred to as the Staging Area) during construction, or the construction of a permanent architectural berm constructed from the material excavated during cavern construction. The Staging Area consists of groups of assessors' parcels referred to as P1, P2N, P2S, and VH.

The region experiences four distinct seasons with large diurnal fluctuations in temperature. Winter storms from the northern Pacific Ocean can bring rain into the region; however, the Tehachapi Mountains, the San Gabriel Mountains, and, to a lesser extent, the Sierra Nevada act as a boundary that prevents west coast moisture and storms from moving east. The rain shadow that these mountain ranges create causes this region to be the hottest and driest portion of the Mojave Desert. Despite the arid climate, the region supports a large variety of flora and fauna, many of which have evolved specifically for the region.

Current land use within proximity of the WRESC Site is mixed, with undeveloped land, rural residential properties, and unauthorized off-road vehicle use. The gen-tie line alignment lies within proximity of residential development, commercial development, historic mining operations, electrical substations, agricultural lands, and solar farms.

The Project area intersects with ten vegetation communities. The majority of the WRESC Site, P1 North, and P2 South are mapped as creosote bush-white bursage scrub with lesser amounts of white bursage, creosote bush scrub, and cheesebrush scrub with patches of disturbed/developed areas. In addition to these communities, Joshua tree woodland, Allscale scrub, creosote bush scrub, rubber rabbitbrush scrub, non-native grassland and forbs, and tamarisk thickets occur along the gen-tie line route options.

Drainages delineated in the Project area are ephemeral and no evidence of jurisdictional waters or wetlands recorded through background data or field verifications.

Twenty-nine species of special status plants occur regionally, four of which were documented during field studies: alkali mariposa-lily (*Calochortus striatus*, documented near the gen-tie line), sagebrush loeflingia (*Loeflingia squarrosa* var *artemisiarum*; documented along an access road west of the Project area and along the gen-tie route), and Mojave monardella (*Monardella exilis*; documented on the western portion of the project area, west of State Route 14), western Joshua tree (*Yucca brevifolia*; documented across the project area and gen-tie line).

Approximately 36 wildlife special status species occur regionally, three of which were documented in the Project area: Crotch's bumble bee (*Bombus crotchii*; recorded foraging on *Phacelia* in the Project area), loggerhead shrike (*Lanius ludovicianus*; observed in the Project area), and Le Conte's thrasher (*Toxostoma lecontei*; observed in the Project area). In addition, burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), and northern harrier (*Circus hudsonius*) were recorded adjacent to the Project area. Species specific

surveys were also conducted for Mohave ground squirrel (*Xerospermophilus mohavensis*) and desert tortoise (*Gopherus agassizii*) with no observations recorded.

The gen-tie line bisects an area identified as a medium priority wildlife corridor. Wildlife movement to and from the WRESC site is impacted in the baseline case by the presence of roadways and a rail line.

## B. Potential Construction and Operational Impacts

### Construction phase

#### Loss of vegetation communities and wildlife habitat

The Project will require removal of vegetation communities at the WRESC facility, access roads, laydown areas, and pole placement and tensioning sites along the gen-tie line.

A summary of permanent and temporary disturbance is provided in Table 2.3 of Attachment A to the Project Description testimony and included for reference in its entirety below.

**Table 2.341: Summary of Estimated Permanent and Temporary Disturbance With and Without Onsite Rock Re-use**

Project Element	Disturbed Acreage Without Berm (Rock Hauled Offsite)	Disturbed Acreage With Berm (Onsite Rock Re-use)	Permanent or Temporary <sup>1</sup>
Main Facility	88.6	88.6	Permanent
Architectural Berm	0	74.6	Permanent
Site Construction Laydown and Parking <sup>3</sup>	72.6	69.8 <sup>6</sup>	Temporary
Transmission Pole Foundation	0.2	0.2	Permanent
Transmission Pole Construction Sites <sup>4</sup>	23.6	23.3 <sup>6</sup>	Temporary
Pull and Tensioning Sites <sup>2</sup>	21.5	21.5	Temporary
Transmission Line Undergrounding	0.7	0.7	Temporary
New Access Roads	3.7	2.1	Temporary
<b>Total Permanent</b>	<b>88.8</b>	<b>163.5</b>	Permanent
<b>Total Temporary<sup>5</sup></b>	<b>122.2</b>	<b>117.3</b>	Temporary

<sup>1</sup> Temporary impacts that occur within a permanent impact area were classified as permanent impacts.

<sup>2</sup> Some Pull and Tensioning Sites overlap with Site Construction Laydown and Parking. The overlapping areas have been measured as Pull and Tensioning Sites.

<sup>3</sup> Temporary impacts within pole construction sites, pull and tensioning sites, and access roads that occur within site construction laydown and parking area were subtracted from the site construction laydown and parking area total to avoid double counting of temporary disturbance.

<sup>4</sup> Some Transmission Pole Construction Sites overlap with Site Construction Laydown and Parking. The overlapping areas have been measured as Site Construction Laydown and Parking.

<sup>5</sup> Temporary impacts within pole construction sites, pull and tensioning sites, and access roads that occur within site construction laydown and parking area were subtracted from the site construction laydown and parking area total to avoid double counting of temporary disturbance.

<sup>6</sup> "With berm" acreage reduced marginally from "Without berm" acreage because a portion of this project element lies within the architectural berm boundary

Permanent habitat loss will occur at the WRESC Site (approximately 88.6 acres), and transmission pole locations (approximately 0.2 acres) along the gen-tie line. An additional up to approximately 74.6 acres will be lost if cavern

rock is re-used on-site. If cavern rock is removed from Site habitat in P1 and P2 will be temporarily lost as these areas could be used for laydowns, parking, and equipment storage. Temporary disturbance will occur at the site construction laydown and parking area (up to approximately 72.6 acres), transmission pole construction sites (up to approximately 23.6 acres), gen-tie line pull and tensioning sites (approximately 21.5 acres), transmission line undergrounding sites (approximately 0.7 acres) and temporary access roads (approximately 3.7 acres).

#### *Impacts to Special-status plants*

Special status plants occurring in the Project area could be lost due to Project construction. Populations located along the gen-tie line (Joshua tree and alkali mariposa lily) can likely be avoided through pole placement. Western Joshua trees located in the WRESC site and P1/P2 will be removed and viable candidates would be relocated.

#### *Impacts to Special-status wildlife*

Special-status wildlife species that occur in or adjacent to the Project area could be impacted by the following during Project construction:

- Loss of habitat in the Project area and gen-tie line
- Increased dust production
- Introduction and propagation of invasive plant species
- Accidental release of hazardous materials
- Accidental mortality due to entrapment (e.g. trenches), crushing, strikes, and collisions
- Disturbance or destruction of active nests
- Disturbance due to noise and vibrations

#### *Impacts to Jurisdictional Waters*

It is expected that construction in WRESC site as well as the P1, P2 north, and Villa Haines additional work space areas will not have impacts on jurisdictional waters. Construction of the P2 South additional work area and installation of the permanent location of the transmission line poles will avoid drainage features, to the extent feasible. Although most drainages can be avoided, construction of the gen-tie line may impact drainage features temporarily for access purposes or pull and tensioning sites. Best Management Practices will be applied if construction must impact drainages and work will be conducted with appropriate permits.

#### Operational Phase

Potential impacts to biological resources during operations may include:

- Stormwater management
- Disturbance to wildlife from noise and light produced from plant operation
- Collision and electrocution hazards from project structures and the gen-tie line.

### **C. Summary of Potential Cumulative Impacts**

Many of the project-related impacts would cease upon completion of the construction phase thereby limiting contribution to regional cumulative impacts. Revegetation of temporarily disturbed areas and provisions for

compensatory lands for permanent loss is expected to offset direct habitat loss. With the application of these measures, the Project is not predicted to notably contribute to cumulative loss of regional habitat.

#### **D. Avoidance and Minimization Measures**

- The following measures would be implemented to reduce impacts to biological resources. These resources would be described in a Avoidance of Western Joshua trees where feasible and relocation of viable candidates where avoidance is infeasible
- Development of a Biological Resources Mitigation Implementation and Minimization Plan (BRMIMP) that outline how avoidance and minimization measures will be implemented
- Assignment of a designated biologist responsible for implementation of biological conditions of certification and biological monitors responsible for monitoring the implementation of biological conditions under the designated biologist.
- Biological Monitoring during clearing, grubbing, vegetation removal, leveling, grading, and other ground-disturbing activities.
- Avoidance of clearing activity during the Crotch's bumble bee active period (March through August)
- Avoidance of clearing works during the bird nesting season and implementation of pre-construction surveys if avoidance is not feasible
- Pre-project surveys for Crotch's bumble bee if avoidance of clearing during the active period is not feasible
- Pre-construction surveys for sensitive biological resources including burrowing owl, desert tortoise, Crotch's bumble bee, Swainson's hawk, loggerhead shrike, Le Conte's thrasher, legless lizard, coast horned lizard, American badger, ringtail, Mohave ground squirrel, and desert kit fox.
- Pre-construction surveys for occupied sensitive small mammal species burrow complexes
- Environmental Awareness Training
- Development of vegetation and invasive plant management plans
- Implementation of collision avoidance measures on portions of the generation tie-line within 5 miles of an active Swainson's hawk nest
- Establish no-construction buffer zone around any identified active nest based on standard requirements and at the discretion of a biological monitor.
- Development of a Sensitive Species Management Plan describing measures to avoid incidental take of special status plants and wildlife
- Development of a Raven Management Plan to reduce potential attraction of common raven, a desert tortoise predator.

The following best management practices would be implemented:

- For jurisdictional drainages, the Applicant will adhere to all avoidance and minimization mitigation measures required by the local agencies, if regulatory permits are required. For areas with unavoidable impacts, the



Applicant will submit applications for the appropriate permits prior to any work, authorization to work within the drainage(s) must be provided prior to any impacts to drainage features.

- BMPs to address erosion and excess sedimentation will be incorporated into the Project plans including but not limited to silt fence, straw wattles, jute netting, and earthen berms.
- Work will be limited to the construction footprint, as outlined in the Project plans.
- Sensitive resources will be marked and protected by temporary fencing (e.g., orange plastic fencing, silt fencing, signage) or other acceptable methods.
- Where applicable, weed-free products will be used to minimize the accidental spread of exotic plants. All construction equipment used for the WRESC will be clean and free of soil and plant material before it is brought to the site and before it leaves the work area, to prevent the spread of invasive plants. A weed eradication plan will be prepared to manage non-native invasive weedy species.
- All storage and staging areas will be placed, to the greatest extent feasible, on existing developed or disturbed locations (e.g., paved, or bare ground surfaces) that have been reviewed and approved by the Project biologist
- All areas used for stockpiling will be kept free of trash and other waste.
- All contractor equipment and vehicles will be inspected for leaks immediately prior to the start of construction and regularly thereafter until the equipment and/or vehicles are removed from the Project premises
- Secondary containment will be required beneath all stationary construction equipment to reduce unanticipated leaks or spills.
- Unless authorized by regulatory authority, Project-related activities—particularly those involving cleaning or fueling or motorized equipment—will occur greater than 100 feet from jurisdictional waters or potentially jurisdictional waters
- Dust impacts will be minimized by implementing appropriate measures that will reduce/control emissions generated by the Project.
- Where feasible, areas of excavation (e.g., pits, trenches, drilling holes) will be covered or excluded using fencing overnight or during periods of inactivity. Routes of escape from excavated pits and trenches will also be installed for wildlife that could become entrapped

Other measures to reduce impacts to special-status species specifically are:

- Burrowing Owl: An incidental take permit application has been prepared to manage potential impacts to burrowing owl. Mitigation measures in the permit application include methods to avoid disturbing burrows, if present, and relocate burrows if necessary.
- Crotch's bumble bee: An incidental take permit application has been prepared to manage potential impacts to Crotch's bumble bee. Mitigation measures in the permit application include methods to avoid disturbing hives, if present, and relocate hives if necessary.
- Western Joshua Tree: The Project will comply with the Western Joshua Tree Conservation Act.

- Special-status plants: a survey for special-status plants will be conducted prior to surface-disturbing activities.
- Other special-status wildlife species: biological monitoring will be conducted to reduce the potential impacts to other special status wildlife species. These measures would be documented in a Project-specific Sensitive Species Management Plan.

#### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with all applicable laws, ordinances, regulations and standards (LORS).

### **III. Response to Certain Issues Raised in the FSA**

Page 5.2-6 of the FSA incorrectly states that “Staff notes that numerous western Joshua trees were documented within the WRESC site by the applicant and these areas may also meet the CNPS definition for Joshua tree woodland”. This statement leaves a gap in the FSA regarding the potential and extent the Project could impact Joshua tree woodlands. The Applicant estimated canopy coverage in the WRESC, P1, and P2 sites as less than 1% western Joshua tree. The California Native Plant Society (CNPS) defines a Joshua tree woodland as areas where western Joshua tree provides at least 1% cover while Juniperus and/or Pinus species provide less than 1% of the cover in the tree canopy. While the Project site supports western Joshua tree, which will be managed via Condition of Certification (COC) Bio-12, canopy density does not achieve the 1% threshold identified by CNPS nor has the area been mapped as western Joshua tree woodland by CDFW through the Vegetation Classification and Mapping Program.

Page 5.2-300 of the FSA inappropriately states that “The project owner shall purchase 843 acres of Crotch’s bumble bee and western burrowing owl mitigation or conservation bank credits.....” and further in the paragraph states “The amount of mitigation required shall be calculated based on the project’s final direct permanent and temporary loss of suitable Crotch’s bumble bee and western burrowing owl habitat”. These two statements are not congruent as one requires the proponent to purchase the maximum amount of mitigation or conservation bank credit while the second statement allows for flexibility based on actual impacts. The statement “the project owner shall purchase 843 acres ....” is also not consistent with COC Bio-6 #9 that reads “provide a final accounting of the before/after whole acreage and a determination of whether more or less habitat compensation is necessary.

Page 5.2-239 – response to TN264316 Comment 5 indicates that the 3:1 ratio “ensures full mitigation under CESA. Fish and Game Code, section 2081(b) requires permittees to minimize and fully mitigate all impacts of the authorized take, and mitigation must be roughly proportional in extent to the impact. The ratio accounts for the initial replacement of lost habitat, ensures functional equivalency is achieved, accounts for uncertainty and risk, and promotes resilience across the landscape by supporting habitat connectivity and ecosystem integrity.” However, the FSA, including the response to comment text does not explain how direct and indirect habitat impacts were quantified and therefore how a 3:1 ratio is equivalent to that loss. The response also indicates that ratio is scientifically defensible; however, does not provide citations.

Page 5.2-300 of the FSA requires the owner to purchase mitigation or conservation bank credits at a location in the Antelope Valley or Western Mojave Desert. There may be no banks that offer Burrowing owl or Crotch’s bumble bee credits in those areas and therefore the measure is not achievable. The location of mitigation or conservation bank should be selected with advance approval by CPM in coordination with CDFW and preferentially selecting locations closer to the Project area where feasible.

Page 5.2-285 of the FSA incorrectly states that the project owner shall provide compensation lands at the following minimum ratios:

- 3:1 for any state or federally listed plants and CRPR 1 or 2 ranked species
- 2:1 ratio for CRPR 1 or 2 ranked species

It is unclear whether CRPR 1 and 2 ranked species that are not state or federally listed would require compensation at a 2:1 or 3:1 ratio.

Page 3.2-307 of the FSA inappropriately states under COC BIO-15 item #1 that surveys for special-status reptiles would be timed to coincide with the time of day and year when these species can be detected while requiring that these surveys be conducted within 2 weeks of construction, with one survey conducted within 24 hours of construction. The statement is unclear as to whether surveys for special-status reptiles would only be required during times of year when these species are typically detectable (generally March through October) or if construction cannot be undertaken during the period of year when these reptile species are brumating and not detectable.

Page 5.2-239 – response to TN264316 Comment 5 indicates that the 3:1 ratio “ensures full mitigation under CESA. Fish and Game Code, section 2081(b) requires permittees to minimize and fully mitigate all impacts of the authorized take, and mitigation must be roughly proportional in extent to the impact. The ratio accounts for the initial replacement of lost habitat, ensures functional equivalency is achieved, accounts for uncertainty and risk, and promotes resilience across the landscape by supporting habitat connectivity and ecosystem integrity.” However, the FSA, including the response to comment text does not explain how direct and indirect habitat impacts were quantified and therefore how a 3:1 ratio is equivalent to that loss. The response also indicates that ratio is scientifically defensible; however, does not provide citations.

Provided below is a summary of the biological and regulatory context for both species for which habitat mitigation is being recommended by CEC Staff at a ratio 3:1 for both permanent and temporary impacts, details the supporting survey and literature review data, and reviews relevant regional precedent for mitigation ratios, and information supporting a more appropriate 2:1 mitigation ratio for permanent impacts and 1:1 mitigation ratio for temporary impacts for the Project.

### **Burrowing Owl**

The burrowing owl occurs in open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation (Haug et al. 2011<sup>2</sup>). In southern California, burrowing owls are found in undisturbed natural areas and in anthropogenically modified areas such as fallow agricultural fields, margins of active agricultural areas, livestock farms, airports, and vacant lots. Burrowing owls burrow selection is opportunistic, typically using natural, unoccupied burrows made by small mammals such as California ground squirrel (*Otospermophilus beecheyi*) and kit fox (*Vulpes macrotis*), as well as drainpipes, culverts, and other suitable natural or man-made cavities at or below ground level. Suitable burrows are characterized as burrows with an entrance larger than 4 inches (11 centimeters), sloping entrance (no vertical holes), and more than 36 inches deep (91 centimeters). Burrowing owl typically do not nest in dense or tall vegetation that creates a visual obstruction.

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<sup>2</sup> Haug, E.A., B.A. Millsap, and M.S. Martell. 2011. Burrowing owl (*Athene cunicularia*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed online at: <http://bna.birds.cornell.edu/bna/species/061>

As part of ongoing support for the Project, WSP has conducted on behalf of the Applicant desktop analyses for burrowing owl that included a review of the California Natural Diversity Database (CNDDDB 2024). Following the desktop review, a protocol-level survey was conducted based on the California Department of Fish and Wildlife 2012 Staff Report (CDFW 2012). Field studies also included incidental observations during other protocol-level surveys. The following studies were performed as part of the burrowing owl presence surveys:

- 2023: BUOW focused protocol-level surveys for the WRESC site, P1, the Villa Haines Property, and portions of the transmission line corridor
- 2024: BUOW focused protocol-level surveys and habitat assessment for P2N, P2S and transmission line route options

No burrowing owls were present in the Project Area during the 2023 and 2024 protocol surveys. Low quality habitat and unoccupied burrows were documented throughout the site and buffer zones; however, only portions of the with open habitat with limited vegetative cover and fewer Joshua trees that reduce visual obstructions were considered higher quality habitat, such as portions of P2N (USFWS n.d.<sup>3</sup>). No burrowing owl sign (droppings, pellets, feathers), or indication of burrowing owl burrow use were observed in this area. Burrowing owl was also not incidentally observed in the Project area during other biological studies conducted.

Burrowing owl were observed foraging in 2024 within the 500-foot buffer area approximately 200 feet from the northern boundary of the potential temporary construction laydown area P2N, suggesting transient use of the broader landscape rather than active nesting within the Project Area. While burrowing owl use of the Project Area is possible as the area provides some elements of foraging habitat, none were observed during the protocol-level surveys and field work described above, and it is unlikely that burrowing owl occur within the Project Area.

### **Crotch's Bumble Bee**

Crotch's bumble bee primarily occurs in California's pacific coast, western desert, and adjacent foothills throughout most of the state's southwestern region, where it inhabits grasslands and shrublands and requires a hotter and drier environment than other bumble bee species. Crotch's bumble bee typically nests underground in abandoned burrows or other cavities and forage on a number of annual flowers, including plants in the following floristic families: Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, Boraginaceae, and Hydrophyllaceae. Genera include *Antirrhinum*, *Asclepias*, *Chaenactis*, *Clarkia*, *Dendromecon*, *Eschscholzia*, *Eriogonum*, *Lupinus*, *Medicago*, *Phacelia*, and *Salvia* (Hatfield et al. 2018<sup>4</sup>). Crotch's bumble bee hives are commonly found in areas that have extensive annual flowers throughout to provide nectar sources for the duration of the flight season.

As part of ongoing support for the Project, WSP has conducted on behalf of the Applicant desktop analyses for Crotch's bumble bee which included a review of the California Natural Diversity Database (CNDDDB 2024). Following the desktop review, a protocol-level survey was conducted based on the California Department of Fish and Wildlife 2023 Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee

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<sup>3</sup> U.S. Fish and Wildlife Service (USFWS). Not dated. Burrowing Owl. Accessed online at: <https://www.fws.gov/species/burrowing-owl-athene-cunicularia>.

<sup>4</sup> Hatfield, R., S. Jepsen, S. Foltz Jordan, M. Blackburn, and A. Code. 2018. A Petition to the State of California Fish and Game Commission to List the Crotch bumble bee (*Bombus crotchii*), Franklin's bumble bee (*Bombus franklini*), Suckley cuckoo bumble bee (*Bombus suckleyi*), and western bumble bee (*Bombus occidentalis occidentalis*) as Endangered under the California Endangered Species Act. The Xerces Society for Invertebrate Conservation, Portland, OR, USA.

Species (CDFW 2023<sup>5</sup>). Field studies included species-specific studies and recording of incidental observations during other field programs. The following studies were performed as part of the CBB presence studies:

- 2023: CBB focused protocol-level surveys for the WRESC site, P1 and the Villa Haines Property, and portions of the transmission line corridor
- 2024: CBB focused protocol-level surveys and habitat assessment for P2N, P2S and transmission line route options

No Crotch's bumble bee hives were recorded in the Project Area during the 2023 and 2024 protocol surveys.

The region received above average rainfall in both 2023 and 2024 resulting in a "super bloom" of annual flowers. This also resulted in a delay in the flight season, as weather conditions were not suitable for Crotch's bumble bee until after the Queen flight season (February to March). Queens were not observed flying until mid-late April. Although there was a large diversity of annual plants, the Project Area contained limited diversity with respect to nectar sources used by Crotch's bumble bee for foraging. Individual queens and workers were observed foraging in P2N and P2S; however, activity was limited to patches of tansy-leafed phacelia (*Phacelia tanacetifolia*), which was the only substantial nectar source identified in the Project Area. Additional bees were observed along the proposed transmission line corridor options. The early senescence of nectar sources suggest the Project Area has limited capacity to support Crotch's bumble bee throughout its active period (April to August).

Decomposed granite soils and the presence of small animal burrows throughout the Project Area could offer potential nesting and overwintering substrates; however, the absence of nests during surveys and the absence of nesting behavior and hive establishment suggest transient use of the Project Area for foraging rather than active nesting. Results of the literature review and record search indicate the closest known active Crotch's bumble bee hive was recorded on Edward's Air Force Base over seven (7) miles to the east of the Project Area (CDFW 2024<sup>6</sup>). While establishment of a hive in the Project Area is possible, the likelihood of Crotch's bumble bee establishing a hive on the Project Area is extremely low.

### Regional Precedent for Mitigation Ratios of 2:1 or Less

**Table 1** provides a review of available Environmental Impact Reports (EIRs) submitted in Kern County to document mitigation ratios accepted to manage impacts to vegetation and wildlife resources, specifically ratios proposed for sensitive species including burrowing owl and Crotch's bumble bee.

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<sup>5</sup> CDFW. 2023. Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species. Accessed Online at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=213150&inline>

<sup>6</sup> CDFW. 2024. California Natural Diversity Database (CNDDB) RareFind 5 records of sensitive elements. Accessed online at: <https://wildlife.ca.gov/Data/CNDDB>.



Mitigation ratios for other, similarly situated projects in this area typically range from 0.5:1 to 2:1 as follows:

**Table 1. Mitigation Ratios for Similar Situated Projects**

Project <sup>7</sup>	Project Size (acres)	Distance from Willow Rock	Target Species/Feature	Ratio	Date Received by State Reviewing Agency (including CEC)
Mohave Micro Mills	174	1 mile NE	Burrowing owl	No ratio required (see text following Table 1)	11/17/2023
Bullhead solar Project	1,343	44.5 miles NW	Desert tortoise occupied habitat	1:1	11/30/2023
			Burrowing owl and American badger occupied burrows	1:1 new burrow	
			Swainson's hawk nesting and foraging habitat	0.5:1	
			Alkali mariposa lilies and recurved larkspur: impacts to individuals	3:1	
			Mulefat thicket, scale broom scrub	2:1	
EAFB Solar	4,000	3.5 miles NE	Burrowing owl occupied burrow	replacement burrows at a 2:1	6/7/2019
			Desert tortoise	1:1	
Enterprise Solar	2,320	8 miles NE	Burrowing owl burrow	replacement burrows at a 1:1 ratio	11/21/2023

<sup>7</sup> CEQA documents available at <https://ceqanet.lci.ca.gov/> or from lead agencies.

Project <sup>7</sup>	Project Size (acres)	Distance from Willow Rock	Target Species/Feature	Ratio	Date Received by State Reviewing Agency (including CEC)
			Alkali mariposa lily	1:1 for impacted individuals	
			Swainson's hawk foraging habitat	0.5:1	
AVEP Solar	1,406	10.3 miles SW	Desert tortoise	1:1 for occupied habitat	1/11/2021
			Alkali Mariposa Lily	1:1 for impacted individuals	
Pelican's Jaw Hybrid Solar Project	3,371	105.7 miles NW	Burrowing owl	1:1 burrow replacement	8/18/2023
			Crotch's bumble bee	0.5:1	
			Swainson's hawk nesting and foraging	0.5:1	
			Sensitive plants	1:1 direct loss of populations 0.5:1 for indirect loss of populations	
Rosamond South Solar Project	1,292	12.2 miles SW	Swainson's hawk foraging	0.5:1	7/13/2022
Bellefield Solar	8,371	8.7 miles NW	Sensitive Plants	1:1	7/2/2021
Jasmine Solar	493	56.1 miles NW	Sensitive Plants	1:1	10/18/2023
Sandrini Solar	3,469.87	45.5 miles W	Burrowing Owl	1:1 burrow replacement	9/17/2021

Project <sup>7</sup>	Project Size (acres)	Distance from Willow Rock	Target Species/Feature	Ratio	Date Received by State Reviewing Agency (including CEC)
			Sensitive Plants	2:1	
Aratina Solar	2,554	27.4 miles E	Sensitive Plants	1:1	5/28/2021
Raceway Solar 2.0	1,330	8.3 miles SW	Sensitive Plants	1:1	3/24/2021
Sanborn Solar Project	2,006	9 miles N	Sensitive Plants	1:1	2/14/2020
Clean Harbors WMU Solid Waste Disposal Facility	640	88.5 miles NW	Burrowing Owl	2:1	3/28/2024

Consistent with the projects listed in Table 1, the Mojave Micro Mill Project is a project recently submitted for review in Kern County that is located approximately one mile NE of the WRESC.<sup>8</sup> Given the proximity, the Mojave Micro Mill Project location may also support burrowing owl and Crotch's bumble bee. Mitigation measures listed in the Environmental Impact Report includes habitat mitigation for burrowing owl and pre-construction surveys to document Crotch's bumble bee and determine whether an Incidental Take Permit would be required.

The Environmental Impact Report does not recommend habitat mitigation ratios, rather requires that the owner provide compensatory mitigation for lost breeding and / or wintering habitat, should burrowing owls be found on the site. Compensation habitat would be provided in accordance with the Staff Report on Burrowing Owl Mitigation guidance (CDFW 2012<sup>9</sup>). No mitigation lands are required for Crotch's bumble bee for this similarly situated project, located less than one mile away from WRESC.

## Proposed Mitigation

The PSA rationalizes the application of a 3:1 mitigation ratio, which was developed in consultation with CDFW. Fish and Game Code, section 2081(b) requires that mitigation must be roughly proportional in extent to the impact. Based on the site-specific species surveys, literature review data, and relevant regional precedent presented in this testimony, the proposed 2:1 and 1:1 mitigation ratios for permanent and temporary impacts more accurately reflect the nature and scale of habitat disturbance associated with the WRESC project.

<sup>8</sup> <https://ceqanet.lci.ca.gov/2022100646/2>

<sup>9</sup> CDFW. 2012. Staff Report on Burrowing Owl Mitigation. Accessed Online at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83843&inline=true>

## Burrowing Owl

The PSA recommends a 3:1 mitigation ratio for all permanent and temporary impacts to account for the long-term temporal loss of burrowing owl habitat function within the project footprint. However, the results of the 2023 and 2024 surveys support the application of a 2:1 mitigation ratio for permanent impacts due to the following biologically relevant facts:

- the general lack of high-quality habitat within the Project Area;
- the absence of active burrows within the Project Area and adjacent 500-foot buffer zones; and
- the absence of burrowing owl observations within the Project Area, and
- infrequent and transient nature of burrowing owl observations outside of the project footprint.

CDFW further suggests that a 3:1 ratio would offset potential indirect impacts from noise and vibration, that may cause owls to abandon adjacent habitat. However, the basis for quantifying or delineating "adjacent habitat" for mitigation purposes remains unclear.

In contrast, the Project's burrowing owl evaluation established a 500-foot buffer to account for potential impacts to habitat adjacent to the Project Area. As no active burrows were identified within this buffer, it is therefore unlikely that the Project would result in burrowing owl abandonment due to noise and vibration. As potential burrowing owl habitat outside of the Project footprint and buffer was not surveyed or characterized in this analysis, it is unclear how the FSA's proposed mitigation requirements for such areas would be calculated or justified. Therefore, a 2:1 mitigation ratio for permanent impacts and 1:1 ratio for temporary impacts would more accurately reflect the site-specific conditions and limited potential for direct or indirect impacts to burrowing owl.

The CDFW Staff Report on Burrowing Owl Mitigation provides clear guidance distinguishing between permanent and temporary impact mitigation requirements, stating:

*"Where habitat will be temporarily disturbed, restore the disturbed area to pre-project condition including decompacting soil and revegetating. Permanent habitat protection may be warranted if there is the potential that the temporary impacts may render a nesting site (nesting burrow and satellite burrows) unsustainable or unavailable depending on the time frame, resulting in reduced survival or abandonment." (CDFW 2012)*

In alignment with the CDFW, a 1:1 mitigation ratio for temporary impacts to burrowing owl is appropriate for this project as temporarily impacted areas will be revegetated with native grass and forb species as per COC BIO-8. BIO-8 requires the owner to salvage and respread topsoil, recontour temporarily disturbed areas, decompact soils, and manage for invasive plant species. As burrowing owls can occupy modified habitats (e.g. road verge, agricultural fields) and given the revegetation of temporarily disturbed areas as required by BIO-8, temporarily disturbed areas would be available to burrowing owls during Project Operation. With the implementation of BIO-8 and a 1:1 mitigation ratio for temporarily impacted areas it is expected that the Project will result in a net gain in burrowing owl habitat.

Application of a 2:1 ratio for permanent habitat loss and a 1:1 ratio for temporary habitat loss is also consistent with previously permitted projects in Kern County as summarized in Table 1.

## Crotch's Bumble Bee

Crotch's bumble bee was recently identified as a candidate species for listing under the California Endangered Species Act (CESA) and as such there are few projects that have been required to mitigate for this species.

Notwithstanding, the results of the 2023 and 2024 surveys support the application of a 2:1 mitigation ratio for permanent impacts due to:

- the limited diversity and early senescence of nectar sources within the Project Area;
- the absence of hive establishment or nesting behavior within the Project Area;
- the transient and localized nature of observed foraging activity.

The Vegetation Management Plan (BIO-8) requires revegetation of temporarily disturbed areas and sets success criteria for native cover and weed control. In compliance with BIO-8, all temporarily impacted areas will be recontoured, scarified, and stabilized with a seed mix consisting of local natives, including grasses and wildflowers preferred by Crotch's bumble bee. Salvaged topsoil, seed bank and woody debris will be respread on temporarily disturbed areas, supporting the recovery of Crotch's bumble bee forage plants and promoting the development of complex microhabitats necessary for diversity.

With the application of BIO-8, temporarily disturbed areas are expected to be available for Crotch's bumble bee during the Operational phase of the Project. The application of COC BIO-8 in conjunction with providing mitigation habitat at a ratio of 1:1 is expected to provide a net increase in available Crotch's bumble bee habitat regionally during the operational phase of the project.

Although few projects have been required to mitigate for Crotch's bumble bee, application of a 2:1 ratio for permanent habitat loss and a 1:1 ratio for temporary habitat loss would be consistent with previously permitted projects in Kern County for other listed species, as summarized in Table 1.

## Conclusion

Based on the analysis above, the Applicant concludes that a 2:1 mitigation ratio for permanent impacts and 1:1 mitigation ratio for temporary impacts to burrowing owl and Crotch's bumble bee would reflect site-specific conditions and habitat restoration commitments. Further these ratios are consistent with recently approved projects in the region that could support similarly listed species. These ratios are supported by current protocol-level survey data demonstrating the limited presence and habitat quality for both species within the Project Area, as well as the measures required under BIO-8 that are expected to support revegetation of temporarily disturbed areas such that these areas are available to burrowing owl and Crotch's bumble bee during the Operational phase. This approach is consistent with CDFW guidance on burrowing owl distinguishing between permanent and temporary impacts, aligns with regional precedent for similar projects, and provides mitigation proportional to the scale and nature of disturbance.

## IV. Proposed Licensing Conditions

The FSA proposes 24 Conditions of Certification for this subject matter. We agree with the Conditions of Certification set forth in the FSA for Biological Resources, except as set forth below.

### A. Proposed Revisions to Verification for Condition [BIO-1 Designated Biologist Selection]

The project owner shall submit to the CPM resumes and any other relevant documentation for Designated Biologist(s) approval at least ~~75~~ **30** days prior to the start of site mobilization and/or construction-related ground disturbance activities. No site mobilization or construction related activities shall commence until a Designated Biologist has been approved by the CPM.

**B. Proposed Revisions to verification for Condition [BIO-3 Biological Monitor Selection]**

The project owner shall submit the specified information to the CPM for review and approval at least ~~15~~ 30 days prior to the start of any site mobilization activities. Within 10 days of completion of training, the Designated Biologist shall submit a written statement to CPM confirming that individual Biological Monitor(s) have been trained including the date when training was completed. If additional biological monitors are needed during construction or for species specific surveys, the specified information shall be submitted to the CPM for approval at least 10 days prior to their first day of monitoring activities.

**C. Proposed Revisions to Condition [BIO-14 Habitat Management Land Acquisition for Crotch's Bumble bee and Western Burrowing Owl]**

To mitigate for impacts to Crotch's bumble bee and western burrowing owl the project owner shall fulfill the following requirements:

Mitigation of permanent and temporary loss of Crotch's bumble bee and western burrowing owl habitat shall be mitigated at a 2:1 ratio for permanent loss of habitat and 1:1 ratio for temporary habitat loss. Mitigation can be achieved by the project owner purchasing Crotch's bumble bee and western burrowing owl mitigation or conservation bank credits, at a location ~~within the Antelope Valley or Western Mojave Desert~~ approved in advance by the CPM, in coordination with CDFW, or providing for both the permanent protection and management of Habitat Management (HM) lands pursuant to Item 3 (Habitat Management Lands Acquisition and Protection) and the calculation and deposit of the management funds pursuant to Item 5 (Endowment Fund). The amount of mitigation required shall be calculated based on the project's final direct permanent and temporary loss of suitable Crotch's bumble bee and western burrowing owl habitat, as approved by the CPM, in consultation with CDFW.

The purchase of mitigation or conservation bank credits or permanent protection and funding for perpetual management of HM lands must be complete before starting project activities, or within 18 months of the date of the site mobilization, if Security is provided pursuant to the Security (Item 11) below for all uncompleted obligations

The purchase of mitigation or conservation bank credits or permanent protection and funding for perpetual management of HM lands must be complete before starting project activities, or within 18 months of the date of the site mobilization, if Security is provided pursuant to the Security (Item 11) below for all uncompleted obligations

Text under item #1 would be removed as these costs would vary depending on the final mitigation acreage calculation.

2. Mitigation Bank Credits. If the project owner elects to purchase credits to complete Crotch's bumble bee and western burrowing owl compensatory mitigation obligations, then project owner shall purchase acreage of Covered Species credits from a mitigation or conservation bank approved in advance by the CPM prior to initiating project activities, or no later than 18 months from the start of site mobilization, if Security is provided pursuant to Item 11 (Security) below. Prior to the purchase of credits, the project owner shall obtain CPM approval to ensure the mitigation or conservation bank is appropriate to compensate for the impacts of the project. The project owner shall submit to the CPM a copy of the Bill of Sale(s) and Payment Receipt prior to initiating site mobilization or \*\*\* Text omitted due to length\*\*\*



11. Security: The project owner may proceed with project activities only after the project owner has ensured the funding (Security) to complete any activity required by the Item 3 (Habitat Management Land Acquisition and Protection) that has not been completed before project activities begin. Permittee shall provide Security as follows:

a. Security Amount. The Security shall be calculated based on the project's final direct permanent and temporary loss of suitable Crotch's bumble bee and western burrowing owl habitat. This amount will be approved by the CPM and be based on cost estimates which are sufficient for the CEC or its contractors to complete land acquisition, property enhancement, startup costs, initial management, long-term management, and monitoring.

\*\*\* Text omitted due to length\*\*\*

#### **D. Proposed Revisions to Condition [BIO-11 Special Status Plant Avoidance Measures]**

Update BIO-11 item 2, paragraph 4 on pg 5.2-285 of the FSA to read:

The project owner shall provide compensation lands at the following minimum ratios:

- 3:1 for any state or federally listed plants and ~~CRPR 1 or 2 ranked species~~
- 2:1 ratio for CRPR 1 or 2 ranked species that are not state or federally listed

#### **E. Proposed Revisions to Condition [BIO-15 Special-Status Reptile Avoidance and Minimization Measures]**

Update BIO-15 item 1 paragraph 3 on page 5.2-307 to read:

The Designated Biologist(s) and/or Biological Monitor(s) shall conduct preconstruction surveys for special-status reptiles, including coast horned lizard and multiple species of legless lizards. Surveys shall be conducted by qualified biologists, approved by the CPM pursuant to BIO-1 and BIO-3.

- A. Surveys. Prior to ground-disturbing or vegetation removal activities, including during site mobilization and construction, within 100 feet of habitat that has the potential to support legless or horned lizards, the Designated Biologist(s) and/or Biological Monitor(s) shall conduct surveys to detect this species. An annual survey plan shall be submitted to the CPM for review and approval.

One week prior to any ground disturbance and within 24 hours of beginning work in suitable habitat, the Designated Biologist and/or Biological Monitor(s) shall conduct surveys for these species, unless an alternate timeframe approved by CPM. Survey methods may include the placement of cover boards prior to the surveys and gently raking in soft friable soils, leaf litter, and debris piles, or other methods approved by the CPM.

The surveys shall be timed to coincide with the time of day when these species are typically detected. Prior to conducting the surveys, the biologist shall locate the microhabitats for these species and determine a location to place cover boards or rake soils. A map of proposed survey areas shall be provided to the CPM for review and approval prior to initiating the surveys.

\*\*\* Text omitted due to length\*\*\*

## 4.3 Cultural and Tribal Cultural Resources

### I. Introduction

**A. Names:** Clint Helton and Laurel Lees

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
- Exhibit 1032, Willow Rock Energy Storage Center SAFC - Volume 1, Part B (TN #254805), March 1, 2024
- Exhibit 1033, Willow Rock Energy Storage Center SAFC - Volume 1, Part A (TN #254806), March 1, 2024
- Exhibit 1038, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendices 5.2A-5.3B (21-AFC-02) (TN-#\_254811), March 4, 2024.
- Exhibit 1069, Confidential Cultural Resources Information (TN #256493), March 7, 2024
- Exhibit 1070, Willow Rock Data Adequacy Response (TN 256622), May 31, 2024
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN #264316), June 16, 2025
- Exhibit 1079, Willow Rock Energy Storage Center Cultural Resources Phase II Testing Plan (TN #260664), November 26, 2024
- Exhibit 1090, Willow Rock Data Request Set 1 Response Report (TN #258681), August 23, 2024
- Exhibit 1131, Willow Rock Energy Storage Center Cultural Resources Phase II Testing Plan (TN #257813), June 18, 2024
- Exhibit 1154, Phase II Cultural Resources Testing and Evaluation for WRESC (TN 262705), March 17, 2025
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025
- Willow Rock Energy Storage Center Supplemental AFC Volume II - Confidential Appendix 5.3B Cultural Resources Assessment (Exhibit number and TN to be assigned)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

### II. Summary of Testimony

#### A. Affected Environment

Research on potential impacts to cultural resources has been conducted through literature reviews, record searches, field surveys, testing, and consultations with affiliated Native American entities. This background information served to establish an initial cultural resources assessment, identify gaps in information, and guide the

design and interpretation of subsequent field research to complete the inventory and documentation of existing conditions within the Project study area.

The cultural resources inventory in the Project Area of Analysis (PAA) was the result of archival and literature research, tribal consultation, discussions with local governments and public interest groups, and field investigations by the applicant. These efforts identified 165 cultural resources, comprising 35 archaeological sites, 82 built-environment resources, and 48 isolated artifacts. Of the 35 archaeological sites, 23 dated to the historic era, nine were Native American, and three were multi-component. Isolates included 20 Native American artifacts and 29 historic-period artifacts, predominantly domestic cans.

A key part of the background research involved a records search and literature review, aimed at collecting and interpreting documented evidence of known cultural resources within the PAA. The Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System (CHRIS) was the primary source for this search. The applicant conducted searches at the SSJVIC on May 17, 2023 (SSJVIC No. 23-185), and a supplementary search on September 6, 2023 (SSJVIC No. 23-380). These searches encompassed the proposed WRESC project area and a one-mile buffer around all proposed project elements. The records searches included examining the SSJVIC's base maps of previous cultural resource studies and known cultural resources. The CEC staff augmented these searches by reviewing their internal holdings of cultural resource studies and known resources, as well as online sources such as the National Register of Historic Places (NRHP) listings, California Register of Historical Resources (CRHR) listings, California Historical Landmarks listings, and California Points of Historical Interest listings.

The literature review and records search revealed that 292 previous cultural resource studies had been conducted within one mile of the proposed project site. Sixty-four of these studies were within or adjacent to the archaeological and historic built environment portion of the PAA. Additionally, 767 cultural resources had been previously documented in the records search area, with 29 of them located in or directly adjacent to the PAA.

A review of historic maps provided further insights into the development of the area. By 1917, several mining claims, including the Lida Mine, were established on Tropico Hill, and isolated homesteads were present along Rosamond Boulevard. The 1915 U.S. Geological Survey (USGS) Elizabeth Lake map showed Sierra Highway in its current alignment, but portions of Mojave Tropico Road and Rosamond Boulevard were still undeveloped and did not follow their present-day routes. By 1943, a network of dirt roads had been developed in the Hidden Valley area, connecting isolated homesteads to Rosamond, and Mojave Tropico Road aligned with its modern route. The neighborhood south of Tropico Hill was constructed by this time, and development along Rosamond Boulevard increased, though it extended little beyond 67th Street West, as most areas west of Willow Springs and north of Rosamond Boulevard were designated as a state game refuge. Homesteads began to appear beyond this point around 1948. The 1956 USGS Rosamond, California, 15-minute quadrangle map indicated a structure in the area now occupied by the WRESC Site. This structure and an ancillary building were visible in the 1959 historic aerial survey, along with several dirt roads bordering the WRESC Site to the south and west, which remain extant today. By 1965, more rural dirt roads emerged west of Willow Springs, and by 1972, SR 14 and Dawn Road followed their current alignments. The structure and ancillary building on the WRESC Site appeared to have been destroyed by 1972. Development in the Hidden Valley area gradually increased from that time until the late 1980s. In 1994, several parcels west of SR 14 were graded but remained undeveloped. A water tank on a parcel owned by the California State Lands Commission appeared at this time and is still present.

Native American consultation was another critical component of the assessment. Governor's Executive Order B-10-11, issued on September 19, 2011, mandated state agencies to engage in meaningful consultation with

California Indian Tribes on matters potentially affecting tribal communities. The California Natural Resources Agency adopted a Final Tribal Consultation Policy on November 20, 2012, promoting informed decision-making through collaborative efforts with tribes to achieve positive, achievable, and durable outcomes. In February 2024, the CEC published an updated Tribal Consultation Policy consistent with the Governor's Executive Order B-10-11 and the CNRA's Tribal Consultation Policy.

In addition to agency requirements, the CEC's Siting Regulations require applicants to contact the California Native American Heritage Commission (NAHC) for information on Native American sacred sites and a list of interested Native Americans in the project vicinity. The applicant must then notify those on the NAHC's list about the project, including copies of all correspondence with the NAHC and Native Americans, written responses received, and a summary of any oral responses in the application for certification (AFC).

Throughout this proceeding, the applicant has worked closely with California Native American tribes with respect to the Project. On December 21, 2023, the applicant requested a Sacred Lands File search and a contact list of California Native American tribes affiliated with the WRESC area from the NAHC. On December 27, 2023 the applicant received a response identifying 14 Native American tribes or tribal representatives who possessed knowledge of tribal cultural resources in or around the project area and should be contacted for assistance. The applicant used this list to send outreach letters via certified mail and email on January 12, 2024, providing a project description and maps, and requesting information on cultural and tribal cultural resources. Follow-up phone calls were made on February 7 and 15, 2024. The applicant continually consulted with tribal representatives during this proceeding, including having a tribal monitor present during geotechnical exploratory work, and in the development of a plan for additional fieldwork, as described later in this testimony.

### **Cultural Resources Inventory Fieldwork**

The cultural resources inventory fieldwork involved the applicant's pedestrian archaeological survey, historic built-environment survey, and Phase II evaluations. The Phase II evaluations were conducted consistent with a Final Phase II Testing Plan that was developed in collaboration with tribal representatives and CEC staff.

For the pedestrian archaeological survey, qualified archaeologists from WSP conducted an intensive survey of the archaeological study area between June 5, 2023, and February 28, 2024. Surveys of the Project Boundary used transect intervals no wider than 15 meters. For linear facilities, one or two archaeologists were spaced equidistantly on each side of improved public right-of-way (ROW), where private property boundaries and topography allowed, with an additional archaeologist on the centerline of unimproved public ROWs when safety permitted. Linear facilities on natural desert terrain were surveyed by two archaeologists at a time, with transect intervals no wider than 15 meters on each side of the gen-tie routes. WSP archaeologists prepared new and updated California Department of Parks and Recreation (DPR) 523 Series forms for each identified resource using photos and notes from the survey. Previously recorded sites and isolates that were revisited and relocated received updated DPR 523 forms detailing survey dates, resource characteristics, and status, while newly recorded sites and isolates were documented with new forms.

A historic architecture windshield survey was completed from the public ROW for the project site and along all linear gen-tie routes. In accordance with CEC Data Adequacy Worksheet requirements, the built-environment study area (BESA) extended 0.5 miles from all proposed plant facility sites and aboveground gen-tie routes in rural areas, and one parcel's distance from proposed WRESC Site and aboveground gen-tie routes in urban and suburban areas. During the field survey, WSP's architectural historian used high-resolution digital photography and geographic information system mapping to document resources in the BESA that were 45 years old or older,

or that appeared to be potentially exceptionally significant regardless of age. Resources previously determined ineligible were not resurveyed. After the field survey, WSP architectural historians prepared new and updated DPR 523 forms for each surveyed resource. Eighty-one identified built environment resources were evaluated using the CRHR criteria, including significance and integrity, with full evaluations recorded on DPR 523 forms.

The WRESC Site was surveyed by WSP archaeologists from June 6 to 9, 2023, with good ground visibility of approximately 70 percent. The site is mostly flat with a mix of Quaternary alluvial sand and younger Holocene shallow aeolian deposits, and primarily features creosote bush vegetation with sporadic western Joshua trees. Previously disturbed areas included portions of Dawn Road, an unnamed dirt road entering from the west, and another north-to-south trending dirt road bisecting the parcel. A short two-track dirt road at the northeast corner led to remnants of a historic-period homestead. All roads on the parcel had large dumps of modern trash. Two areas within the WRESC Site had been cleared for geotechnical investigations, with monitoring by WSP archaeologist Allegría García and Tejon Tribe representatives. Within the WRESC Site, two new historic sites (WRESC-ZEV-HIST-SITE-1 and WRESC-ZEV-HIST-SITE-2) and two new Native American archaeological sites (WRESC-ZEV-PRE-SITE-1 and WRESC-ZEV-PRE-SITE-2) were identified, along with eight Native American archaeological and nine historic-era isolated artifacts. The isolates included flakes, church key opened cans, a sardine can, a matchstick filler can, and a glass bottle. Isolates are generally not considered eligible for the CRHR unless they possess unique or substantial qualities, and those found at the WRESC Site did not meet this distinction.

Most of the P1 Staging Area was surveyed by WSP archaeologist Michael Amorelli on June 5 and 6, 2023, and January 19, 2024. Ground visibility was very good (approximately 80 percent) with a lower concentration of creosote scrub and western Joshua trees. Soils were generally more compact and lighter in color, ranging from light tans to light pinks, with coarse surface sand and gravel indicating previous alluvial action. The terrain was mostly flat and at a higher elevation than the WRESC Site, with intermittent shallow ephemeral washes. Approximately 18 percent of this staging area near Sierra Highway was not surveyed due to safety concerns regarding unauthorized occupied motorhomes. Modern illegal dumping was less prevalent here due to distance from major roads. Sites identified in this area included two sparse flake scatters, WRESC-P1-PRE-SITE-1 and WRESC-P1-PRE-SITE-2, along with seven flake isolates, a historic-period metal jerry can, and a church key opened beverage can. As noted, isolates are generally ineligible for listing unless they possess significant or unique characteristics.

The P2 Staging Area was divided into northern and southern sections, both surveyed by WSP archaeologist Michael Amorelli on January 19, 2024, and February 28, 2024. P2 North, north of the P1 Staging Area, was bordered by an unnamed dirt road, with more compacted soils indicative of earlier alluvial action and sparse vegetation, resulting in approximately 85 percent ground visibility. P2 South, south of Dawn Road, was more densely vegetated with softer tan sands and recent alluvial washes, and roughly 60 percent ground visibility. Both P2 sections were heavily impacted at their margins by illegal dumping. An unnamed dirt road from Sierra Highway to a dirt frontage road east of SR 14 had large concentrations of modern refuse. P2 South was bordered by Dawn Road to the north and unnamed dirt roads to the south, east, and west, with modern trash throughout. No sites were identified in the P2 Staging Area, but four isolates were found: one rhyolite flake in P2 South and an oil can, an oil filter, and a church key opened beverage can in P2 North. These isolates were deemed ineligible for CRHR inclusion.

The Preferred Gen-Tie Route was surveyed by WSP archaeologists Allegría García, Michael Amorelli, and Grant Conley from July 11–14, 2023, with subsequent gap surveys by Michael Amorelli on July 29 and 31, 2023.

Several portions of the route remained unsurveyed due to lack of entry permission, including areas in Section 31 and the western half of Section 32 of Township 10 North, Range 12 West, north of Dawn Road, and a segment between Dacite Avenue and 65th Street West along Felsite Avenue. Areas west of 170th Street West at the SCE Whirlwind Substation were also not surveyed as no access clearance was given for SCE property. The route begins north of Dawn Road, with an option for undergrounding along the Dawn Road alignment. Dawn Road is mostly an unimproved dirt road, paved only within 1,000 feet of either side of SR 14. East of SR 14, near the WRESC site, Dawn Road has high concentrations of modern illegal dumping. West of SR 14, Dawn Road is a wide rural residential dirt road with dense creosote scrub vegetation, ephemeral washes, and occasional rhyolite outcrops among small clusters of rural homes. The area immediately north of Dawn Road is mostly intact native desert terrain, with sharply inclining and declining hills and occasional exposures of quartz monzonite and rhyolite bedrock. The route extends south along Mojave Tropico Road, a paved rural road with elevations varying from 2,488 feet above mean sea level (AMSL) at its intersection with Dawn Road to 2,292 feet AMSL at the intersection with Felsite Avenue. Higher-elevation portions of the road have rolling hills to the east and west, with fanglomerate surface exposures along Fiss Hill and igneous tuff and breccia exposures on Tropico Hill's north side. The road shoulders are highly disturbed and maintained dirt shoulders with soil windrows up to 1 foot tall. South of Tropico Hill, both sides of the road are highly disturbed for residential development. Single-family residences line Felsite Avenue to the north, and a graded parcel borders the road to the south. West of Dacite Avenue, "No Trespassing" and "Private Road" signs are posted on Felsite Avenue. The route extends west on Rosamond Boulevard, which is mostly flat, level graded, and highly disturbed by former and current agricultural and residential development. Rosamond Boulevard has wide, highly disturbed, and maintained shoulders with large soil windrows. Much of Rosamond Boulevard has seen recent development for solar energy, with wood pole transmission alignments following both sides from Mojave Tropico Road to SCE Rosamond Substation at 60th Street West. Wood pole alignments continue only on the north side to 110th Street West, where large steel pole gen-tie alignments for solar facilities begin and continue to the SCE Whirlwind Substation at 170th Street West and Rosamond Boulevard. Three historic-period sites (WRESC-PREF-HIST-SITE-1, WRESC-PREF-HIST-SITE-2, and WRESC-PREF-HIST-SITE-3) and four isolates (one rhyolite reduction flake and three church key opened beverage cans) were recorded along the Preferred Gen-Tie Route.

The portion of Alternative A alignment not overlapping the Preferred Gen-Tie Route was surveyed by WSP archaeologist Michael Amorelli on September 29, 2023, and the entire Alternative A route was surveyed. The route exits the WRESC site at Sierra Highway, extends south, and then turns west on Rosamond Boulevard, meeting the Preferred Gen-Tie Route at Mojave Tropico Road. Vegetation along the route is creosote scrub community, and the elevation change is gradual, ranging from 2,528 feet AMSL at Dawn Road and Sierra Highway to 2,343 feet AMSL at Sierra Highway and Rosamond Boulevard. The route passes through the Rosamond Hills and parallels the Southern Pacific Railroad (CA-KER-2050H). The road varies from on grade to built grade with drainage features. The southeast portion of the route has been highly impacted by development in Rosamond. No newly recorded resources were identified along Alternative A.

The portion of Alternative B alignment not overlapping the Preferred Gen-Tie Route or Alternative A was surveyed by WSP archaeologists Michael Amorelli and Allegría Garcia on September 28–29, 2023, and the entire route was surveyed. The route follows Dawn Road west from the WRESC site, turning south along a paved frontage road west of SR 14. Vegetation is creosote scrub community. Terrain slopes gradually from Dawn Road to approximately the township survey line, then takes a steeper decline at the face of the Rosamond Hills to Felsite Avenue. Ground disturbance between Dawn Road and Felsite Avenue is minimal, mostly related to historic mining and various dirt roads and trails. Below Felsite Avenue, areas along the route have been disturbed by road



development and commercial construction. The route meets Alternative A at Rosamond Boulevard. During the Alternative B survey, one very large historical can scatter (WRESC-ALTB-HIST-SITE-1) was identified south of 30th Street West/Rattlesnake Road. This site, measuring 840 feet by 133 feet, contained more than a dozen small groupings of cans, with a high concentration of at least 300 knife-opened Quaker State and Texaco oil cans dating to the 1930s, along with glass fragments and other historic-period artifacts. Due to the mounded cans and potential for subsurface constituents, surface collection and subsurface testing would be necessary to evaluate the site's CRHR eligibility. Ten historic-period isolates, including bottle glass fragments and various diagnostic can types, were also observed along Alternative B. Six additional cans and two bottle glass fragments were observed but not recorded as they lacked diagnostic features.

The portion of Alternative C alignment diverging from the Preferred Gen-Tie Route was surveyed along Sweetser Road from 65th Street West to Mojave Tropico Road by WSP archaeologists Michael Amorelli, Allegría García, and Grant Conley on July 11, 2023. The segment along 65th Street West from Sweetser Road to Rosamond Boulevard was not surveyed due to "Private Road" and "No Trespassing" signs. If Alternative C is pursued, a supplemental survey of 65th Street West with landowner permission would be necessary. Sweetser Road between 60th Street West and Mojave Tropico Road is a poorly maintained asphalt road with graded shoulders. The area between 60th Street West and 65th Street West has been impacted by rural residential development. Vegetation is primarily creosote scrub community with sporadic western Joshua trees. No new sites or isolates were recorded.

The intensive pedestrian survey resulted in the identification of 10 new archaeological sites (four Native American and six historic) and an additional 45 isolates (18 Native American and 27 historic). One previously recorded site, Tropico Gold Mine (P-15-007591), was determined eligible for CRHR inclusion. All isolates were considered ineligible. Areas within the Rosamond Hills near the WRESC site and the origin point of the Preferred Gen-Tie Route and Alternatives B and C are highly sensitive for both prehistoric resources and sites associated with historic-period mining.

During the initial investigation, WSP recorded six newly discovered sites within the power plant facility footprint and revisited four sites along the gen-tie development path. These included four lithic scatters (WRESC-ZEV-PRE-SITE-1, WRESC-ZEV-PRE-SITE-2, WRESC-P1-PRE-SITE-1, and WRESC-P2-PRE-SITE-2), a historic homestead (WRESC-ZEV-HIST-SITE-1), a historic period dirt road (WRESC-ZEV-HIST-SITE-2), a historic prospect mine (CA-KER-3816H), a historic farmhouse (CA-KER-8324H), a historic agricultural standpipe (CA-KER-8325H), and a historic tamarisk windbreak (CA-KER-8328H).

Following the initial data adequacy review of the Phase I assessment, CEC staff requested that several sites be evaluated for CRHR eligibility and that some evaluations be supported by a testing program. The applicant prepared a Phase II Testing Plan and conducted outreach to tribal representatives to develop the plan, including in-field meetings, and incorporated specific guidance from tribal representatives regarding the treatment of finds. The Phase II Testing Plan was finalized after incorporation of comments and questions from both CEC staff and tribal representatives. Fieldwork began on November 18, 2024 for non-tribal resources and in December 2024 for both non-tribal and tribal resources. The Phase II testing program was completed on February 6, 2025. Memorandums and summaries regarding the Phase II testing program was provided to CEC staff throughout the process. Following completion of the Phase II cultural testing program, a Final Phase II Report was prepared and provided to CEC staff.

The Phase II methodology for testing involved several excavation techniques, including surface test units (STUs), shovel test pits (STPs), test excavation units (TEUs), and resurvey when necessary, depending on factors like site

type and soil type. For Native American sites in wind-blown soils (WRESC-ZEV-PRE-SITE-1, WRESC-ZEVPRE-SITE-2, WRESC-P1-PRE-SITE-1, and WRESC-P1-PRE-SITE-2), STUs were used for initial excavation and discovery. All STUs measured 2 meters by 2 meters and were excavated at arbitrary 5-centimeter levels. STUs were spaced approximately 15 meters apart to determine the presence of subsurface resources within and beyond surface-recorded site boundaries, avoiding surface-identified resources where possible. Excavation of STUs continued until culturally sterile soils were encountered or hardpan soils prohibited manual excavation. A wood lath was driven at the northwest corner of each STU, with a string line attached 10 centimeters above ground surface to ensure consistent depth measurements.

Testing of historic period sites used STPs, which did not exceed 0.5 meters by 0.5 meters and were excavated at arbitrary 20-centimeter levels to a depth of one meter or until hardpan refusal. Upon encountering culturally sterile soils in an STU, an STP was excavated within the STU in the area yielding the highest quantity of resources. If subsurface resources were found in an STP, the test pit was expanded to a TEU. Depth measurements in STPs were taken from the ground surface. TEUs were excavated to investigate surface-identified historic resources and built environment features, and when STP findings warranted further investigation. TEUs measured 1 meter by 1 meter and were excavated at 10-centimeter arbitrary levels until culturally sterile soil or hardpan refusal. A wood lath and string line were used in TEUs for consistent depth measurements. All excavated soil was collected in 5-gallon buckets and screened through 1/8-inch mesh. Excavation was paused between levels to prevent cross-contamination and ensure proper documentation of recovered resources regarding their horizontal and vertical provenience. Provenience for in-situ resources was recorded by submeter GPS and analog measurements from a unit datum and X and Y measurements from the nearest corner of the unit. Historic period resources were bagged in archival quality bags with artifact tags and processed offsite. Native American resources were photographed with a metric photo scale before bagging, analyzed in the field, placed in film capsules padded with cotton, and temporarily reburied within their recovery units. Offsite analysis of Native American cultural resources was limited to photographic records, which are retained on WSP's confidential cultural resources server.

Phase II archaeological investigations led to revisions and rerecording of several site boundaries. WRESC-ZEV-HIST-SITE-1 and WRESC-ZEV-PRE-SITE-1 were combined into a single multicomponent site: WRESC-ZEV-MULTI-SITE-1. The boundary of WRESC-ZEV-PRE-SITE-2 was expanded to 0.59 acres. WRESC-P1-PRE-SITE-1 and WRESC-P1-PRE-SITE-2 were determined to be a single continuous lithic scatter, combined into a larger 3.1-acre boundary subsumed as WRESC-P1-PRE-SITE-1. Based on subsurface testing and data evaluation, four sites (WRESC-ZEV-MULTI-SITE-1, WRESC-ZEV-PRE-SITE-2, WRESC-ZEV-PRE-SITE-3, and WRESC-P1-PRE-SITE-1) were recommended eligible for CRHR listing under Criterion 4, due to their potential to yield data significant to understanding Antelope Valley's pre-contact history. Two resources, CA-KER-8325H and CA-KER-8328H, were recommended ineligible for CRHR listing under all criteria. Two additional resources, CA-KER-3816H and CA-KER-8324H, were outside the area of direct impact and not further evaluated.

WRESC-ZEV-MULTI-SITE-1, initially recorded as two separate sites (WRESC-ZEV-PRE-SITE-1 and WRESC-ZEV-HIST-SITE-1) in 2023, was combined into one three-acre site due to overlapping features discovered during testing. The Native American component featured a lithic scatter with 16 rhyolite flakes, and subsurface testing yielded an additional 66 flakes of various materials, including worked pieces. A groundstone fragment was also found on the surface. The historic component was a homestead ruin with a debris field, including a concrete structure pad and an outbuilding ruin. Diagnostics indicated occupation between the 1950s and early 1970s. The site was not recommended eligible under CRHR criteria 1, 2, or 3 due to lack of association with significant events or persons, or distinctive architectural features. However, due to the potential for significant subsurface data, it was recommended eligible under CRHR Criterion 4 and considered a historical resource under CEQA.

WRESC-ZEV-PRE-SITE-2, a sparse prehistoric lithic scatter, was initially identified on June 7, 2023, and its full size determined on July 29, 2023. Monitoring of pad development revealed no subsurface flakes, and surface flakes were relocated. Phase II testing recovered an additional 26 rhyolite flakes. The site was not recommended eligible under CRHR criteria 1, 2, or 3 due to lack of association with significant periods or individuals, or distinguishing features. However, the presence of additional subsurface artifacts indicated potential for significant resources, leading to a recommendation of eligibility under CRHR Criterion 4 and designation as a historical resource under CEQA.

WRESC-ZEV-HIST-SITE-2 was an unnamed historic dirt road with no associated features. It appeared on 1948 and 1953 USGS quadrangles. The site was not associated with significant events or individuals, and Phase II excavations found no historic subsurface deposits. It was not recommended eligible under any CRHR criteria or as a unique archaeological resource under CEQA.

WRESC-ZEV-PRE-SITE-3, a lithic scatter, was discovered during subsurface testing of WRESC-ZEV-HIST-SITE-2. It could not be associated with significant events or individuals and displayed no unique lithic resources, leading to a recommendation of ineligibility under CRHR criteria 1, 2, and 3. However, due to the presence of associated subsurface lithic materials in adjacent test pits, it was recommended eligible under CRHR Criterion 4.

WRESC-P1-PRE-SITE-1, originally two separate sites, was combined into one larger site during Phase II evaluations. The initial recording described WRESC-P1-PRE-SITE-1 as a small, sparse flake scatter of 16 rhyolite flakes, one bifacially worked, indicating a lithic reduction site. WRESC-P1-PRE-SITE-2 was a small, sparse flake scatter of five mixed material flakes. Soils in the area were primarily alluvial sand overlaid by coarse quartz sand. Lacking diagnostic materials and associations, WRESC-P1-PRE-SITE-1 was not recommended eligible under CRHR criteria 1, 2, or 3. However, Phase II excavations recovered additional subsurface artifacts, suggesting potential for significant subsurface resources, thus recommending the site eligible under CRHR Criterion 4 and as a historical resource under CEQA.

WRESC-PREF-HIST-SITE-1 was a historic-period mining prospect with tailings and a can scatter. The site was not associated with important individuals or events, nor was it unique in the context of local mining history. It was not likely to retain significant information, thus recommended ineligible under all CRHR criteria and not a unique archaeological resource under CEQA.

WRESC-PREF-HIST-SITE-2 was a historic-period can and bottle glass scatter dating to the 1960s. The site was not associated with important individuals or significant events, and its constituents were not unique or significant. It was deemed unlikely to yield important information and thus recommended ineligible under all CRHR criteria and not a unique archaeological resource under CEQA.

WRESC-PREF-HIST-SITE-3 was the remnant of a historic-period farm complex, first appearing on a 1959 aerial survey. Preliminary research could not associate it with important individuals or events. The site was in ruins and lacked integrity of style or craftsmanship. However, due to the potential for buried features or deposits, it was assumed eligible and would be treated as a historical resource, protected by Conditions of Certification (COCs).

P-15-003359/CA-KER-3359, a lithic scatter recorded in 1992, was not surveyed due to lack of landowner permission. It was assumed eligible for this project, with additional work required if impacts were anticipated.

Tropico Gold Mine (P-15-007591) was established as a clay mine in 1888 and later struck gold. It was the first California Point of Historical Interest in Kern County. The site was encountered during archaeological survey on July 11, 2023, and revisited on September 29, 2023. The fence line of the property was within the survey buffer,

but no structures were within the buffer. Direct physical impacts to built environment features were not anticipated, but visual impacts from overhead transmission lines were possible. The mine was associated with important individuals and significant events in California history (Criterion 1 and 2). Although the historic landscape retained integrity of feeling, association, and location, modern additions and disrepair diminished architectural integrity, making it ineligible under Criterion 3. However, due to the potential for valuable information, it was eligible under Criterion 4 and considered a historical resource under CEQA.

P-15-008677 was recorded as a potential multi-component site in 1993, consisting of a scatter of cans along a quartz outcrop. It had not been revisited due to lack of landowner permissions. The site was assumed eligible and would be treated as a historical resource, with additional work required if impacts were anticipated.

P-15-017221/CA-KER-9431H, a large historic debris scatter dating to the 1930s-1940s, could not be relocated during a revisit on July 11, 2023. Therefore, it was not considered a historical or unique archaeological resource for CEQA purposes.

CA-KER-3816H was a historic period mining prospect site recorded in 1993, including prospect pits and a stone and cement structure. Historic debris dated to the 1920s and 1930s. It was recommended likely ineligible for listing due to lack of integrity and commonality. Recorded features would not be impacted, and test excavations for subsurface materials were negative, so no impacts were anticipated.

P-15-012725/CA-KER-7183H was a large historic debris scatter, potentially associated with the First Los Angeles Water District. The applicant could not revisit it due to lack of landowner permission. It was outside current project impacts, but assumed eligible for the CRHR, requiring additional work if plans changed.

P-15-012793/CA-KER-7214H was a large historic debris scatter near the SCE Whirlwind Substation. Previous evaluations in 2010 determined it ineligible for NRHP or CRHR, a determination with which CEC staff concurred. It also lacked the ability to answer scientific questions or exhibit special qualities, thus not qualifying as a unique archaeological resource under CEQA.

P-15-014023/CA-KER-11218H, Mojave Tropico Road, was a previously recorded two-lane road, originally a dirt road from 1915 to support the Tropico Mine, paved in 1943. Although it followed its original alignment, improvements degraded its historic integrity. It was not directly tied to significant individuals or events of the mine, and its original grade and surface were destroyed by maintenance. Therefore, it was recommended ineligible for individual CRHR listing, though it might contribute to the Tropico Gold Mining District. Impacts to the road would not affect the mine's eligibility or the road's integrity as a contributing element.

P-15-014896, originally recorded as a historic bunkhouse and farm complex, was destroyed and replaced by a large solar field. Therefore, it was not considered a historical or unique archaeological resource for CEQA purposes.

P-15-014902/CA-KER-8324H was the remnant of a stone house, likely from the 1920s or 1930s. It was in ruins with fewer features than previously reported. There was no evidence of association with important individuals or events, and it lacked structural integrity. Subsurface testing was not conducted due to distance from the transmission route and low likelihood of intact deposits. No impacts were anticipated. Because the site boundary intersected construction, it was assumed eligible under CRHR Criterion 4 and would be treated as a historical resource.

P-15-014903/CA-KER-8325H was a large concrete agricultural standpipe. It could not be associated with important individuals or events, and its style was not unique. Phase II excavations found no features or archaeological deposits, and it was unlikely to yield important information. Therefore, it was recommended ineligible under all CRHR criteria and not a unique archaeological resource under CEQA.

P-15-014906/CA-KER-8328H was a historic tamarisk windbreak. It was revisited multiple times, and the associated berm was disturbed and overgrown. The tamarisk trees were recently cut, and associated structures demolished for the North Rosamond Solar Project, leaving the site with little integrity. No associations could be made with significant events or individuals, and it was unlikely to yield additional data. Therefore, it was not recommended eligible under any CRHR criterion or as a unique archaeological resource under CEQA.

P-15-018681/CA-KER-10204H was the LADWP Owens Gorge 230 kV transmission line, built between 1950 and 1952. It was not associated with important individuals or significant events, and its standard steel suspension towers lacked distinctive style or engineering innovations. It was not expected to answer important questions about the regional past. Therefore, it was not recommended eligible under any CRHR criterion.

P-15-020596 was a historic access road to the SCE Big Creek Hydroelectric System Vincent 220 kV Transmission Line. It was evaluated as ineligible for CRHR or NRHP in 2020, a determination with which CEC staff concurred. It lacked diagnostic materials, association with significant events or individuals, and unique qualities. It was unlikely to yield significant data. Therefore, it was not eligible under any CRHR criterion or as a unique archaeological resource under CEQA.

P-15-000756/CA-KER-756, a lithic scatter with rock ring features, could not be relocated in 2011, 2018, or 2023 despite remapping efforts. For this project, it was not considered a historical, unique archaeological, or tribal cultural resource under CEQA.

P-15-002314/CA-KER-2314, a sparse flake scatter and lithic workshop, was re-recorded in 1995 with an expanded boundary. A revisit in 2023 found no lithic materials in the revisited portion. It appeared the site did not extend into the project area, but extended Phase I test excavation would be necessary if Alternative A became viable.

P-15-002487/CA-KER-2487/H, the Santiago Spring Site, consisted of a lithic scatter and amethyst glass. A revisit in 2023 found none of the originally noted features. If this alternative was pursued, an extended Phase I test excavation would be needed.

P-15-002572/CA-KER-2572 was a burial site with associated lithic material and projectile points. Although no surface remnants were found during a 2023 revisit of the western locus, subsurface remnants might exist. Due to the previously discovered burial, the site was assumed eligible for the CRHR. More archaeological work would be needed if Alternative B was selected.

P-15-004783/CA-KER-4424, a lithic scatter, had no subsurface deposits found during 1997 testing, and all surface flakes were collected. A 2023 revisit found no remnants, and the area was graded for truck parking. The absence of artifacts indicated it was not a historical or unique archaeological resource for CEQA purposes.

P-15-004784/CA-KER-4425, a small scatter of three rhyolite flakes, had no subsurface deposits found in 1997. A 2023 revisit found no lithic materials, and the area was a graded shoulder. The absence of artifacts indicated it was not a historical or unique archaeological resource for CEQA purposes.

P-15-004785/CA-KER-4426H was a large historic debris scatter dating to the early to mid-twentieth century. Testing in 1997 found no intact deposit and deemed it ineligible. A 2023 revisit relocated the site, observing numerous historic cans and bottle glass. The site was not associated with important individuals or events, nor were its constituents unique. Further testing was unlikely to yield significant data. Both 1997 and current evaluations concluded it was ineligible under all CRHR criteria and not a unique archaeological resource under CEQA.

P-15-018655/CA-KER-10180H was a historic open pit mining operation with prospect pits, concrete footings, a slag heap, and refuse scatter. Artifacts indicated continuous dumping. A 2023 revisit found evidence of recent recreational use, and the site extended beyond its originally recorded boundary, impacted by road development. Without additional research and test excavation, its eligibility was unknown. Therefore, it was assumed CRHR-eligible for the project, requiring additional work if Alternative B became viable.

WRESC-ALTB-HIST-SITE-1 was a very large can scatter, primarily from the 1930s. A cave, potentially a mineshaft associated with the scatter, was observed nearby. If Alternative B became viable, surface collection and subsurface testing would be necessary to evaluate its CRHR eligibility. For the proposed project, CEC staff assumed it was a historical resource for CEQA purposes.

P-15-012160, a historic-period metal barn, was no longer extant during a 2023 revisit. The possibility of encountering buried deposits during construction was noted, requiring additional work if Alternative A or B were selected.

P-15-012542, a historic-period farmhouse with a full basement, was no longer extant during a 2023 revisit, but the possibility of encountering buried deposits was high. For this project, CEC staff assumed it was a historical resource, requiring additional archaeological work if Alternatives A or B were selected.

P-15-012653, the Biscaichapy Ranch House, was demolished, but the concrete structure pad remained. The possibility of encountering buried deposits existed, and CEC staff assumed it was a historical resource, requiring additional archaeological work if Alternatives A or B were selected.

P-15-002753/CA-KER-2753H, a historic refuse scatter, could not be relocated during a 2023 revisit. If Alternative C was selected, extended Phase I studies would be needed to determine if an intact deposit remained.

Of the 81 built environment resources found in the PAA, six were recommended eligible for the CRHR and thus considered historical resources for CEQA. These eligible resources were within the PAA of the proposed preferred Gen-Tie route or alternative Gen-Tie routes, none within the project facility PAA. These included Willow Springs International Raceway, Rosamond Palms Motel, the Chuck Yeager house within the Prudential Mobile Home Park, the Tropico Gold Mine Historic District, and a segment of the Vincent 220 kV Transmission Line/Big Creek Hydroelectric Historic District.

The Willow Springs International Raceway, built in 1953, was the first road racing track in the United States and was deemed eligible under CRHR Criterion 1 for its significant associations with Willow Springs' development and its pioneering design. Although its owners contributed significantly to the raceway, their contributions did not warrant listing under Criterion 2. Its architectural significance as a distinctive design could not be fully evaluated due to a lack of documentary evidence on its intent or specifics, and no record of a builder or architect was found, thus it was recommended not eligible under Criterion 3. It was also not significant under Criterion 4 as an above-ground property unlikely to yield important historical information.



The Rosamond Palms Motel, with eastern and central buildings from 1955 and a western building added around 1970, was recommended eligible under CRHR Criterion 3. This was due to its distinctive Spanish Colonial Revival style features, including stucco exteriors, flat roofs with terra cotta tile coping, arcaded facades, and raised stucco frieze and architrave. It retained good integrity as a 1950s motel in Rosamond and was representative of its type. It was not significant under Criteria 1, 2, or 4.

The Chuck Yeager house, a 1920s Spanish Revival style residential building within the Prudential Mobile Home Park, was home to Chuck Yeager in 1947 when he broke the sound barrier. It was recommended eligible for CRHR listing under Criterion 2 for its direct association with an individual important to both national and Californian history. However, the mobile home park itself and other buildings were not found to be associated with significant persons, events, or architectural distinction, and thus were not recommended eligible under CRHR criteria 1, 3, or 4.

The Tropico Gold Mine Historic District, dating to circa 1880, was previously evaluated as an archaeological site and recommended eligible for its representation of a gold mine and associations with the statewide mining industry, the Great Depression, and tourism. It was also designated a California Point of Historical Interest in 1968. WSP considered the significance of the mine and associated workers' housing as a potential historic district. It was found eligible as an archaeological resource under Criterion 4 and was considered a historical resource under CEQA.

A segment of the Vincent 220kV Transmission Line, built between 1925-1927, was part of the Southern California Edison (SCE) Big Creek Hydroelectric System, which is a NRHP/CRHR historic district, and the line was deemed eligible as a contributor to the district. The design of its towers became known as the Vincent Type. The segment was considered a historical resource for CEQA purposes. It was not associated with significant events or historical figures, nor did it embody distinctive architectural characteristics or represent the work of a master. Therefore, it was not recommended eligible under CRHR criteria 1, 2, 3, or 4 for individual listing.

Interpretation of the archaeological survey results indicated that none of the isolates were eligible for the CRHR, and no further CEQA consideration was necessary for them. Of the 35 archaeological sites, nine were not relocated, confirmed outside the project boundary, or no longer existed. Ten sites were recommended ineligible and did not qualify as unique archaeological resources. Five sites were eligible for the CRHR, with an additional 11 assumed eligible and treated as historical resources. Alternatives A, B, C, and part of the original Preferred Gen-Tie route were no longer being considered for development. Archaeological sites in these areas that could not be evaluated were assumed eligible for this project only, requiring additional cultural resources work if project plans changed. A total of 16 sites were recommended or assumed eligible and had the potential to be affected, with seven of these in the project's selected alternative and the other nine not impacted. Conditions of Certification (COCs), including avoidance, would be implemented to prevent significant impacts. If avoidance was not possible, data recovery before construction would be necessary to reduce impacts. These sites were considered historical resources under CEQA, and potential impacts needed to be considered. The proposed WRESC had a moderate to high sensitivity for buried Native American and historic archaeological resources.

CEC staff concurred with the applicant's recommendation that 5 of the 82 historic built environment resources in the PAA were eligible for the CRHR and should be considered historical resources under CEQA. All these eligible resources were within the PAA of the proposed preferred Gen-Tie route or alternative Gen-Tie routes, with none in the project facility PAA. These historical resources included the Willow Springs International Raceway, Rosamond Palms Motel, Chuck Yeager House, Tropico Gold Mine Historic District, and a segment of the Vincent 220kV Transmission Line.

The Willow Springs International Raceway was within the PAA of the preferred Gen-Tie route and Alternatives A, B, and C, approximately 0.3 miles from the nearest alignment. Impacts to its integrity of setting would be less than significant as they would not measurably affect its historical significance. The Rosamond Palms Motel was within the PAA of Alternative Routes A and B, about 145 feet from the closest proposed alignment for Alternative A. While this would impact integrity of setting and feeling, the impacts would be less than significant given the motel's architectural significance and the minimal alteration to the area's setting or feeling. The Chuck Yeager house was within the PAA of the preferred Gen-Tie Route and Alternatives A and B, approximately 500 feet from the nearest alignment. The transmission lines would be partially obscured by the mobile home park, resulting in relatively minimal impacts to setting and feeling, especially considering existing impacts from the park itself. Thus, impacts to this resource would be less than significant. The Tropico Gold Mine Historic District was within the PAA of the preferred Gen-Tie route. The transmission line would be built within the existing roadway, so physical impacts to material elements were not anticipated. However, concerns existed regarding potential impacts to the viewshed and integrity of setting and feeling. A segment of the Vincent 220 kV Transmission Line was within the PAA of all proposed transmission line routes and was a contributing resource to the Big Creek Hydroelectric Historic District. While no physical impacts to material elements were anticipated, there would be some impacts to the resource's integrity of setting. However, given the 224-mile length of the historic district, the addition of a transmission line would not significantly interfere with the resource's ability to convey historical significance. As such, impacts to this resource would be less than significant.

## **B. Potential Construction and Operational Impacts**

### **Construction Impacts**

The WRESC project is expected to have a less than significant impact on historical resources with implementation of mitigation. The PAA contains the following archaeological and historic built environment resources:

Archaeological resources:

- WRESC-ZEV-MULTI-SITE-1
- WRESC-ZEV-PRE-SITE-2
- WRESC-ZEV-PRE-SITE-3
- WRESC-P1-PRE-SITE-1
- WRESC-PREF-HIST-SITE-3
- P-15-003359
- P-15-007591
- P-15-008677
- P-15-012725
- P-15-014902
- P-15-002572
- P-15-018655

- WRESC-ALTB-HIST-SITE-1
- P-15-012160
- P-15-012542
- P-15-012653

Built environment resources:

- Willow Springs International Raceway (Map ID 16)
- Rosamond Palms Motel (Map ID 31)
- Chuck Yeager House (Map ID 75)
- Tropico Gold Mine Historic District (Map ID 91–96)
- Segment of the Vincent 220kV Transmission Line (Map ID 103)

The archaeological PAA has a moderate to high probability of containing buried archaeological resources that could qualify as historical resources under CEQA. Damage to these buried resources during construction would be a significant impact. To reduce this potential damage, staff proposes Conditions of Certification (COCs) CUL/TRI-1 through CUL/TRI-8, which would establish a construction monitoring program and plans to reduce impacts to archaeological historical resources to a less-than-significant level.

Identified built environment historical resources are located within the PAA of the preferred and alternative Gen-Tie line routes. These include the Willow Springs International Raceway, the Rosamond Palms Motel, the Chuck Yeager House, the Tropico Gold Mine Historic District, and a segment of the Vincent 220kV Transmission Line. Impacts to these resources would primarily affect their integrity of setting and feeling. However, only the Tropico Gold Mine Historic District is expected to incur significant impacts requiring additional mitigation due to the proposed Gen-Tie routes.

Specifically, the Willow Springs International Raceway, approximately 0.3 miles from the nearest proposed alignment, would experience less-than-significant impacts to its integrity of setting. The Rosamond Palms Motel, about 145 feet from the closest Alternative A alignment, would have less-than-significant impacts on its setting and feeling due to its architectural significance and the minimal alteration by the transmission line route. The Chuck Yeager house, roughly 500 feet from the nearest alignment and partially obscured by a mobile home park, would also experience less-than-significant impacts to its setting and feeling.

The Tropico Gold Mine Historic District, located within the preferred Gen-Tie route, is not expected to have physical impacts to its material elements since the transmission line would be built within existing roadways. However, potential impacts to its viewshed and integrity of setting and feeling, which are character-defining features, are a concern, prompting the applicant's consultant to propose several mitigation measures. A segment of the Vincent 220 kV Transmission Line, a contributing resource to the Big Creek Hydroelectric Historic District, would also experience less-than-significant impacts to its integrity of setting, despite very minor viewshed alteration, due to the historic district's 224-mile length.

To specifically address impacts to the Tropico Gold Mine Historic District, the applicant agrees that COCs CUL/TRI-9 and CUL/TRI-10, will reduce any potential impacts to less than significant. The remaining five historical resources will not require mitigation.

### **Operations Impacts**

No impact will occur from ongoing operations.

### **C. Summary of Potential Cumulative Impacts**

The assessment has documented several historical and Native American sites within the WRESC PAA. The applicant agrees with CEC staff's determination that any adverse effects from the proposed WRESC can be reduced to an acceptable level through mitigation. The analysis also explores whether past, present, and future projects could lead to combined, or cumulative, impacts.

A significant cumulative impact occurs when an individual project's effects, though perhaps minor on their own, become substantial when considered alongside other past, current, and future projects. The geographical scope of this cumulative analysis is detailed in Appendix A, which also provides a list and map of relevant projects, categorized as: 11 Energy Projects, 12 Residential/Housing Projects, 12 Commercial Projects, and 2 Mining Projects.

The applicant agrees with CEC staff conclusion that the evidence demonstrates that there is no indication that impacts to cultural and tribal resources from the proposed WRESC would combine with those from other cumulative projects. This is attributed to the distant locations of these other projects from the WRESC, as well as the specific nature of the impacts. Archaeological sites within the WRESC are eligible or assumed eligible based on their potential to yield data. Therefore, for any cumulative effects on this data potential to occur, the additional projects would need to involve direct ground-disturbing activities. Furthermore, with the exception of the Tropico Gold Mine, which is both an archaeological and historic built environment resource, none of the other sites are part of larger districts or recognized cultural landscapes, meaning they would not experience cumulative effects from these other projects. In these cases, the primary concern is the integrity of setting and feeling, which necessitates close proximity between the cultural resource, the WRESC, and the cumulative project.

Considering the distance and characteristics of the listed cumulative projects, the applicant agrees with CEC staff's conclusion that these projects will not combine their impacts with the WRESC's effects on the integrity of setting and feeling. If any form of impact combination were to occur, the impacts from the WRESC would be further reduced by implementing mitigation measures. Similarly, for other eligible historic built environment resources within the PAA, including the Tropico Gold Mine, cumulative impacts would not reach a significant level due to the distance and nature of the projects on the cumulative list.

In summary, the potential impacts to cultural and tribal cultural resources are less than significant with mitigation incorporated. Further, the WRESC will not result in potentially significant cumulative impacts.

### **D. Avoidance and Minimization Measures**

Archaeological resources have been identified within the PAA. The PAA is considered to have a moderate likelihood of containing additional buried archaeological resources that could meet the criteria for "unique archaeological resources" under CEQA. Should these resources be inadvertently damaged during construction, it would likely lead to significant impacts. To mitigate these potential significant impacts to unique buried archaeological resources, implementation of Conditions of Certification (COCs) CUL/TRI-1 through CUL/TRI-8, as outlined in the Final Staff Assessment and modified as described below, are considered appropriate and

adequate. The adoption and execution of COCs CUL/TRI-1 through CUL/TRI-10 will reduce cultural and tribal impacts to less than significant.

### E. Summary of Compliance with Applicable LORS

The adoption and execution of Conditions of Certification CUL/TRI-1 through CUL/TRI-10 as proposed in the FSA and as modified below will reduce cultural and tribal impacts to less than significant and will ensure compliance with all applicable LORS.

#### **Federal:**

- **National Historic Preservation Act, Section 106:** Applies to among other things, a project, activity, or program funded in whole or in part by a federal agency, those carried out with federal financial assistance and those requiring a federal permit, license or approval that has the potential to cause adverse effect to historic properties listed on or eligible for the National Register of Historic Places. The lead federal agency must consider ways to avoid, minimize and mitigate these adverse effects and provide the Advisory Council on Historic Preservation an opportunity to comment, prior to the issuance of permits or funding of the undertaking.

#### **State:**

- **Pub. Resources Code, § 5097.98:** Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until they confer with the NAHC-identified MLDs to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to future disturbance.
- **Pub. Resources Code, § 5097.99:** Prohibits the acquisition, possession, sale, or dissection with malice or wantonness of Native American remains or artifacts taken from a Native American grave or cairn.
- **Health and Safety Code, § 7050.5:** Prohibits the disturbance or removal of human remains found outside a cemetery. It also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.

#### **Local:**

- **Kern County General Plan: Policy 25:** The County will promote the preservation of cultural and historic resources which provide ties with the past and constitute heritage value to residents and visitors.
- **Willow Springs Specific Plan:** Cultural Resources Goal 1 Policy 1. To preserve cultural resources contained on sensitive sites within the Willow Springs Specific Plan area.

### III. Response to Certain Issues Raised in the FSA

The applicant appreciates the incorporation of the changes to the conditions of certification proposed by tribal representatives and is in agreement with the inclusion of the new provisions. With respect to COC CUL/TRI-3, the applicant has proposed a change to recognize that there is more than one consulting tribe, and that tribes should be given the discretion of whether to participate or not in the preparation and review of the Cultural and Tribal Resources Mitigation and Monitoring Plan (CTRMMP).

With respect to COC CUL/TRI-5, the applicant proposes a clarification that monitoring should only be required for ground disturbance in native soils. The language in the FSA seems to indicate that CEC staff was not necessarily opposed to the change, but stated that this issue could be addressed in the CTRMMP. However, proposed COC CUL/TRI-3 clearly states that it is the language of the condition *as written* that controls and supersedes any summarization, description, or interpretation of the condition in the CTRMMP. As a result, the applicant believes

that this change should be made up front in the language of the COC and not reserved for inclusion in the CTRMMP.

## IV. Proposed Licensing Conditions

The Applicant agrees with the Cultural Resources Conditions of Certification CUL/TRI-1 through CUL/TRI-10 as proposed in the FSA, with the exception of the following proposed changes to, CUL/TRI-3, CUL/TRI-4, CUL/TRI-5 and CUL/TRI-9. Proposed additions are shown in bolded and underlined text, proposed deletions are shown in strikethrough and bolded text.

COC CUL/TRI-4 CULTURAL RESOURCES WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP),  
Verification

“At least ~~30~~ **15** days prior to the beginning of ground disturbance, the CRS shall provide the draft text and/or training video for the cultural and tribal cultural resources WEAP, including Native American participation, and graphics and the informational brochure to the CPM for review and approval”.

COC CUL/TRI-3 CULTURAL AND TRIBAL RESOURCES MITIGATION AND MONITORING PLAN (CTRMMP)

Prior to the start of ground disturbance, the project owner shall submit the CTRMMP, as prepared by or under the direction of the CRS in coordination with the consulting tribes (Yuhaaviatam of San Manuel Nation, Tejon Indian Tribe, and Kern Valley Indian Community), to the CPM ~~along with letters or statements of support of the CTRMMP from the consulting tribes~~ for review and approval. **The project owner shall also provide documentation demonstrating consultation efforts and results of consultation with consulting tribes in the development of the CTRMMP.**

Ground disturbance may be initiated only after approval of the CTRMMP by the CPM. The CTRMMP shall follow the content and organization of the draft model CTRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CTRMMP. The CTRMMP shall identify measures to minimize potential impacts on cultural and tribal cultural resources. Implementation of the CTRMMP shall be the responsibility of the CRS and the project owner. Copies of the CTRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CTRMMP, unless such activities are specifically approved by the CPM. Portions of the CTRMMP that describe or map the location(s) of cultural and tribal cultural resources shall be designated as confidential.

CUL/TRI-5 UNDISCOVERED CULTURAL RESOURCES

The project owner shall ensure that a CRS, alternate CRS, or CRM and Native American Monitor shall be on site for any ground disturbance **in native soils** associated with construction of the project. Prior to the start of ground disturbance, the project owner shall notify the CPM and all interested California Native American tribes of the date on which ground disturbance will begin. Where excavation equipment is actively removing dirt **from native soils** and hauling the excavated material farther than 50 feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation, and a second monitor shall inspect the dumped material.



## COC CUL/TRI-9 CREATE A TROPICO GOLD MINE HISTORIC DISTRICT HISTORY AND MANAGEMENT GUIDELINES DOCUMENT

Verification: At least 15 days prior to the start of ground disturbance for the Gen Tie Line route along Mojave Tropico Road and its connecting route options to Rosamond Boulevard, the project owner shall provide a brief written statement to the CPM with a schedule concerning the creation of the Tropico Gold Mine Historic District history and management guidelines document. This schedule must include coordination opportunities with the county of Kern and with CEC staff. Upon completion of the Tropico Gold Mine Historic District history and management guidelines document the project owner shall make it available to the public as well as provide a copy to both CEC staff and the county of Kern.

### 4.4 Efficiency and Energy Resources

#### I. Introduction

- A. Names:** David Stein, Curt Hildebrand, Cavan Lee, Andrew McGillis, Victor Grille
- B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.
- C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
- Exhibit 1005, Att DA20-1 A-CAES Historical Operational Summary (TN 242799), April 25, 2022.
  - Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024
  - Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806 ), March 1, 2024
  - Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024
  - Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

#### II. Summary of Testimony

##### A. Affected Environment

The proposed project would be located in the southeastern portion of Kern County on an undeveloped site that is appropriately zoned for the proposed project.

##### B. Potential Construction and Operational Impacts

The proposed project would consume energy (both fossil fuels and electricity) during an approximately 60 month construction period to operate various construction equipment. Local and regional supplies are sufficient to meet construction energy needs and will have a less than significant impact on local and regional energy supplies.

During operation, the project is designed to deliver up to 500 megawatts (MW) for up to eight hours or up to 4,000 megawatt-hours (MWh) in the electricity discharge mode using Hydrostor's proprietary advanced compressed air energy storage technology. In the charge mode, the facility is expected to consume electricity

from the power grid for up to 13.5 hours to achieve a full charge. The system is expected to have a roundtrip efficiency of approximately 60 percent. As a result, the project would provide efficient energy storage and help satisfy the State's need for long-duration energy storage to provide both grid efficiency and reliability benefits.

In addition, during normal operation the facility would need to operate three diesel-fuel fired 2.5 MW emergency backup generators and one diesel-fuel fired 345 kilowatt emergency fire pump engine for short maintenance and reliability testing periods. This emergency backup equipment will not operate except if needed in an emergency loss of facility power. The quantity of fossil fuel consumed to maintain the emergency equipment is miniscule and would have an insignificant impact on available fossil fuel supplies.

We therefore concur with the CEC Staff assessment that the project will have an insignificant impact on energy resources during construction and operation.

### **C. Summary of Potential Cumulative Impacts**

In comparison with statewide energy supply, the project is expected to have an insignificant cumulative impact.

### **D. Avoidance and Minimization Measures**

During construction the project will minimize equipment idling to reduce diesel fuel consumption. During operation, the project will consume diesel fuel only when needed to perform reliability and maintenance testing for emergency backup equipment.

### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with applicable LORS.

## **III. Response to Certain Issues Raised in the FSA**

We have reviewed the CEC Staff's assessment for this subject area and are in general agreement with its findings and conclusions.

## **IV. Proposed Licensing Conditions**

No Conditions of Certification are proposed for this subject area.

### **4.5 Geology, Paleontology, and Minerals**

#### **I. Introduction**

- A. Names:** George Wegmann, Matt Sauter, Curt Hildebrand, Andrew McGillis, Victor Grille and Lucas Thexton
- B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.
- C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
  - Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
  - Exhibit 1032, Willow Rock Energy Storage Center SAFC - Volume 1, Part B (TN 254805), March 1, 2024
  - Exhibit 1033, Willow Rock Energy Storage Center SAFC - Volume 1, Part A (TN 254806), March 1, 2024
  - Exhibit 1026, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.4A-Part VI (TN 254799), March 1, 2024

- Exhibit 1027, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.4A-Part V (TN 254800), March 1, 2024
- Exhibit 1028, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.4A-Part IV (TN 254801), March 1, 2024
- Exhibit 1029, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.4A-Part III (TN 254802), March 1, 2024
- Exhibit 1030, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.4A-Part II (TN 254803), March 1, 2024
- Exhibit 1031, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.4A-Part I (TN 254804), March 1, 2024
- Exhibit 1031, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.4A-Part I (TN 254804), March 1, 2024 Exhibit 1050, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.11A-Part II (TN 254828), March 4, 2024
- Exhibit 1051, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.11A-Part I (TN 254829), March 4, 2024
- Exhibit 1060, Appendix 5-8A Paleo Records Search Results-CONFIDENTIAL (TN 256450)
- Exhibit 1112, Willow Rock CURE Data Request Set 1 Response (TN 259338), September 27, 2024
- Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315), January 27, 2025
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.
- Willow Rock CURE Data Request Set 1 Response, Attachment DR103-1
- Willow Rock CURE Data Request 2 Response, Attachment DR136-1 (Exhibit number and TN to be assigned)
- Willow Rock CURE Data Request 2 Response Attachment DR144-1 (Exhibit number and TN to be assigned)
- Willow Rock CURE Data Request 2 Response Attachment DR168-1(Exhibit number and TN to be assigned)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

**Geology:** The WRESC Project Area is located within the Mojave Desert geomorphic province of California (CGS 2002). The Mojave Desert province is a broad region of isolated mountain ranges that are separated by desert plains. The western edge of this geomorphic province is wedged between the Garlock Fault and the San Andreas Fault. The proposed site is located within the Rosamond 15-minute quadrangle in the Rosamond Hills. The

Rosamond Hills are covered mainly by alluvial gravel and sand of the Quaternary Period. The alluvial deposits within the valley are underlain mostly by a quartz monzonite bedrock (USGS 1959).

The tectonic setting of Southern California is complex and is made up of numerous fault systems, including strike-slip, oblique, thrust, and blind thrust faults. Therefore, any given area is subject to seismic hazards of varying degrees, dependent on the proximity to and the length of nearby active faults, potentially active faults, and the local geologic and topographic conditions. Seismic hazards include primary hazards such as seismic shaking and ground rupture along the fault trace, and secondary hazards resulting from strong ground shaking such as liquefaction and lateral spreading. The Project Area is characterized as an active seismic area, with the potential for large-magnitude earthquakes to occur.

**Mineral Resources:** The geology throughout the Project Area mostly includes alluvial deposits with igneous intrusions. These deposits are not unique in terms of recreational or scientific value, and they occur throughout southeastern Kern County. The California Department of Conservation Division of Mines and Geology published a mineral land classification map for Southeast Kern County in 1999 (CDOC 1999). The mineral land classification map evaluates areas based on the presence of gold, limestone, borates, dimension stone, silica, and pozzolan deposits. The Project Area is in an area with no known mineral occurrences; therefore, a loss of availability of any known valuable mineral resources is not anticipated.

**Paleontology:** WSP reviewed publicly available paleontological resource databases for recorded collections of paleontological resources either collected from the vicinity surrounding the Study Area or from outside the Project Area but from geologic units that occur within the Project Area, including the University of California Museum of Paleontology (UCMP) Collections – Locality Database and Paleobiology Database. In summary, searches in both databases for named formations in the Project Area (Fiss Fanglomerate and Gem Hill Formation, endemic to the Study Area) did not return any locality results as searched within Kern County. In addition, online record searches did not return any fossil localities collected from unnamed Pleistocene-aged geologic units in the Project Area.

A museum record search was conducted with the Natural History Museum of Los Angeles County, including the areas covered by USGS 7.5-minute quadrangle maps that contain the Project Area. The record search did not return any records of fossil localities recovered from the Tertiary-aged Gem Hill Formation or Fiss Fanglomerate but did return localities from Pleistocene-aged geologic units similar to those occurring in the Project Area.

WSP performed a combination pedestrian and windshield survey of the WRESC Project Area, applying the windshield survey methodology for the proposed gen-tie line, as the entire route is located along existing public ROWs. In addition to the overarching windshield survey, focused pedestrian survey of the portions of the gen-tie line that will cross or be located close to geologic units mapped as Tertiary-aged deposits to ground-truth their presence in the Project Area was conducted to ground-truth the geologic mapping of the area. The field assessment of non-Quaternary-aged units matched confirmed the geologic mapping of the area.

Special attention was paid to road cuts and washes with stratigraphic exposure, as well as known and mapped exposures of geological significance. Visibility ranged from 50 percent to 90 percent, mostly impeded by dry grasses and other vegetation. The surficial sediments within the power plant facility footprint are consistent unconsolidated massive silt to gravel. Surficial sediments over the gen-tie line right-of-way are also consistent, although several exposures of quartz monzonite, rhyolite, breccia, and fanglomerate deposits were identified and evaluated adjacent to the route, and all were determined to have low to no potential for paleontological sensitivity.

The paleontological sensitivity analyses used both the SVP Standard Procedures and the Bureau of Land Management's (BLM) Potential Fossil Yield Classification Systems to assess paleontological sensitivity and the level of effort required to manage potential impacts to significant fossil resources.

The publicly available BLM PFYC GIS layer for the Project Area did not include any geologic units with a PFYC assignment greater than Class 2 or Low, which corresponds to Quaternary-aged alluvium. Portions of the Project Area contain geologic units that have an Unknown PFYC assignment. These Unknown areas correspond to areas mapped as the Fiss Fanglomerate. Because no paleontological resources have been recovered from the Fiss Fanglomerate, these units were treated as having Low Sensitivity.

As a point of comparison, the nearest area to which the BLM has assigned a PFYC rating of greater than PFYC 2 is the PFCY 4, or High Sensitivity, associated with the Rosamond Lake beds over 3.5 miles southeast of the Project Area.

Based on the reviews of paleontological literature, online locality databases, museum record search, and BLM PFYC classifications, and as verified by the site visit, all of the geologic units present in the Project Area were assigned Low Sensitivity or No Sensitivity (i.e., igneous or metamorphic rocks) and the potential for paleontological resources to be present in the Project Area is low.

## **B. Potential Construction and Operational Impacts**

**Geology:** The Project would be constructed and operated in a seismically active geologic environment. Several potential geologic hazards could impact construction and operation of the WRESC, architectural berm, and temporary laydown sites, including strong seismic ground shaking, seismically induced ground failure, unstable geologic units and soils, and soil erosion. In addition to the above hazards, the preferred gen-tie line may be susceptible to landslides, primarily in two locations.

Implementation of proposed COCs would ensure that construction of the WRESC, including related components such as the architectural berm and gen-tie line would reduce potential impacts from geologic hazards on the project to less than significant.

**Paleontology:** Direct impacts to paleontological resources would potentially result through construction activities that would directly affect the surface and subsurface geology as a result of excavation or other ground-clearing activities, including transmission tower site clearing or access road grading. During construction, grading and excavation would occur throughout the Project Area, including footings for structures, surface reservoir, and evaporation pond. Gen-tie tower construction consists of excavation tower footings, placing concrete in the footings, erection of the tower, and installation of lines.

The proposed WRESC will impact geologic units assessed as having Low Sensitivity for paleontological resources by construction activities that would generally occur in the uppermost geologic units (e.g., sedimentary units), and potential impacts are expected to be Less than Significant. Further, the implementation of mitigation measures, as summarized below, would ensure that any unanticipated discoveries of paleontological resources would be protected and the potential significant impact to the uncovered paleontological resource would be immediately mitigated. Therefore, direct impacts to paleontological resources would be less than significant.

While maintenance would need to be performed intermittently on the WRESC site and along the gen-tie line access road based on usage and storm events. Intermittent maintenance is not expected to disturb areas beyond those impacted during Project construction. Therefore, no additional impacts beyond those assessed for

construction are anticipated to occur for paleontological resources as a result of operation and maintenance activities.

### **C. Summary of Potential Cumulative Impacts**

**Geology:** Most areas of Kern County are considered seismically active, to a less or greater extent depending on their proximity to active regional faults. The Project would be constructed and operated in an active seismic geologic environment. Potential geologic hazards include ground rupture, seismic ground shaking, seismically induced ground failure, landslides, unstable geologic units and soils, expansive soils, and soil erosion. Cumulative projects would also be subject to similar seismic hazards since they

are in the vicinity. However, the effects of these projects are not of a nature to cause cumulatively significant effects from geologic impacts because such impacts are site-specific. Implementation of mitigation measures would reduce the potential impacts associated with geology and soils resulting from the project.

As noted by CEC staff, no unique surface or near surface geologic features nor resources of commercial, scientific, and recreational value, including mineral resources, were identified in the Project Area. Development of this project is not expected to lead to a significantly cumulative effect on geologic and mineral resources in the project area.

**Paleontology:** Potential cumulative impacts on paleontological resources could result from the sum of various ground-disturbing projects that occur within a specific region, especially projects that would impact the same geologic units. As the total ground disturbance of a specific geologic unit increases, the potential for the paleontological resources contained in that unit to be impacted, if present, increases. This principle also applies to indirect cumulative effects: the greater the development that occurs within fossil-bearing geologic units, the greater the increased exposure of those units to unauthorized collection that would remove paleontological resources from their source rock and deprive them of their critical context, provenance, and usefulness to science. The geology of the project area, namely the Quaternary-aged alluvial material, is common to the region as a whole and the potential for any future project that would impact this geology would likewise have low potential for adversely impacting buried paleontological resources. Further, future projects that proceed through the CEQA process are subject to the requirements for mitigation measures and/or conditions of approval to address potential impacts to paleontological resources should they be disturbed during future ground disturbing activities.

### **D. Avoidance and Minimization Measures**

**Geology:** CEC staff proposed COCs GEO-1 through GEO-3 to mitigate potential geologic hazards in the project area. COC GEO-1 requires the project owner to complete and submit a geotechnical and geohazard report to the CEC for review and approval. The report would include final grading and facility design refinements to mitigate the impacts of geologic hazards on the project, and the project's impacts on geologic hazards, to less than significant. The refinements shall be incorporated into the project's final design. COC GEO-2 requires the proposed underground structures, the cavern and vertical shafts, to be designed, excavated, and constructed with appropriate civil and structural design criteria provided, including LORS. COC GEO-3 requires inspections and maintenance of the proposed underground structures.

**Paleontology:** CEC staff proposed COCs PAL-1 through PAL-8 to address potential impacts to paleontological resources during construction activities to ensure that impacts to paleontological resources would be less than significant. PAL-1 and PAL-2 would ensure that the paleontological resource specialist (PRS) would have sufficient information to develop the Paleontological Resources Monitoring and Mitigation Plan (PRMMP) and the



paleontological resource component of the Worker Environmental Awareness Program (WEAP) as specified in PAL-3 and PAL-4 respectively. The PRMMP will specify how, where, and when paleontological monitoring of construction-related grading and excavation will occur, how monitoring will be logged, and how any paleontological resources encountered during construction and grading will be addressed (PAL-6). Following construction, the PRS will prepare a paleontological resources report and include an analysis of any collected fossil materials and how they were curated (PAL-7) as paid for by the project owner (PAL-8).

#### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with LORS applicable to geologic hazards and geologic and mineral resources in the Project Area.

The WRESC will comply with all LORS applicable to paleontological resources including the Antiquities Act; National Environmental Policy Act; Paleontological Resources Protection Act; California Public Resources Code §5097.5; California Environmental Quality Act; Kern County General Plan Archaeological, Paleontological, Cultural, and Historic Preservation Policy, and Society of Vertebrate Paleontology Standard Procedures.

### **III. Response to Certain Issues Raised in the FSA**

The applicant has a minor clarification to page 5.6-22 of the FSA, which states that the paleontological consultant reviewed the online database of the Natural History Museum of Los Angeles County. The records search was conducted by the Natural History Museum of Los Angeles County, with the results provided to the applicant.

### **IV. Proposed Licensing Conditions**

The Applicant agrees with the Geology Conditions of Certification (GEO-1 through GEO-3) as proposed in the FSA.

The Applicant agrees with the Paleontology Conditions of Certification (PAL-1 through PAL-8 as proposed in the FSA.

## **4.6 Hazards, Hazardous Materials/Waste, and Wildfire**

### **I. Introduction**

**A. Names:** Betsy Mitton, Curt Hildebrand, Andrew McGillis, Laurel Lees and Victor Grille

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Supplemental Application for Certification, Willow Rock Energy Center Volume I, Parts A and B (21-AFC-02) (TN #254806 and 254805), March 1, 2024.
- Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendices (21-AFC-02) (TN #254812), March 1, 2024.
- Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024.
- Exhibit 1111, Willow Rock Data Request Set 2 Response, Willow Rock Energy Center, (TN 259220), September 19, 2024.
- Exhibit 1112, Willow Rock CURE Data Request Set 1 Response (TN 259338), September 27, 2024
- Exhibit 1090, Willow Rock Data Request Set 1 Response Report (TN #258681), August 23, 2024

- Exhibit 1132, Willow Rock Data Request Set 5 Responses Report (TN 260808), December 23, 2024
- Exhibit 1119, Willow Rock Data Request Set 3 Response (TN 259675), October 23, 2024
- Exhibit 1120, Willow Rock Data Request Set 4 Responses (TN 259736), October 28, 2024.
- Exhibit 1132, Willow Rock Data Request Set 5 Responses Report (TN 260808), December 23, 2024
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025
- Willow Rock Data Request Set 3 Response, Attachment DR54-1 (Exhibit number and TN to be assigned)
- Willow Rock Data Request Set 3 Response, Attachment DR54-2 (Exhibit number and TN to be assigned)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

The WRESC will be located about 3.5 miles north of Rosamond, California. As discussed in Section 5.6, Land Use, the immediate vicinity is dominated by what appears to be undeveloped or empty lots of land. The nearest residence is approximately 1 mile northwest of the WRESC Site. No schools or medical facilities are present within a 3-mile radius of the WRESC Site. A small landing airport (Rosamond Skypark) is located approximately 3.5 miles southwest of the WRESC Site, and businesses are present in central Rosamond approximately 3 miles southwest of the WRESC Site.

### **B. Potential Construction and Operational Impacts**

Hazardous materials will be used during construction and operation of the WRESC; the facility will comply with all applicable laws and regulations. Proper use and storage of hazardous materials will minimize potential for accidental release. Additionally, the Applicant will conduct an emergency response planning session to address public health concerns regarding hazardous materials storage and use.

### **C. Summary of Potential Cumulative Impacts**

Less than significant.

### **D. Avoidance and Minimization Measures**

General industry health, safety and environmental Best Management Practices will be implemented, in addition to the conditions of certification proposed in the FSA.

### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with all applicable laws, ordinances, regulations and standards, (LORS).

## **III. Response to Certain Issues Raised in the FSA**

No comments on the FSA

## IV. Proposed Licensing Conditions

The Applicant agrees with the Hazards, Hazardous Materials/Waste and Wildfire Conditions of Certification HAZ-1 through HAZ-8 as proposed in the FSA.

### 4.7 Land Use, Agriculture, and Forestry

#### I. Introduction

- A. Names:** Kyralai Duppel, Jeremy Paris, Curt Hildebrand, Victor Grille and Cody Niehus
- B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.
- C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
- Exhibit 1004, Gem Data Adequacy Master Response No. 1 (TN 242776), April 25, 202
  - Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
  - Exhibit 1032, Willow Rock Energy Storage Center SAFC - Volume 1, Part B (TN 254805), March 1, 2024
  - Exhibit 1033, Willow Rock Energy Storage Center SAFC - Volume 1, Part A (TN 254806), March 1, 2024
  - Exhibit 1039, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendix 1A-51F (TN 254812), March 4, 2024.
  - Exhibit 1034, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendix 56A-510A (TN # 254807), March 4, 2024.
  - Exhibit 1034, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendices 5.6A-5.10A (21-AFC-02) (TN 254807), March 4, 2024
  - Exhibit 1040, Hi Res Figures V1 File 1 of 2 (TN 254813), March 4, 2024
  - Exhibit 1041, High Resolution Figures WRESC SAFC 2 of 2 (TN 254814), March 4, 2024
  - Exhibit 1058, Appendix 1D Site Related Property Owners and Relationship to Project Owner (TN 256448) March 4, 2024
  - Exhibit 1059, Appendix 1B Property Owner's Addresses and Map (TN 256449) March 4, 2024
  - Exhibit 1074, Attachment ES-1 Property Owners List (TN 256860) May 31, 2024
  - Exhibit 1111, Willow Rock Data Request Set 2 Response, Willow Rock Energy Center, (TN 259220), September 19, 2024
  - Exhibit 1138, Willow Rock CEC Docket Data Request Set 6 Attachment DR124-1 Cover Sheet (TN 261515), January 31, 2025
  - Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.
  - <https://efiling.energy.ca.gov/GetDocument.aspx?tn=264316&DocumentContentId=101033>

## **D. Additional Exhibits**

In addition to the above filings, the following additional exhibits are provided:

- Attachment LU-1 Kern County Planning and Natural Resources Department Staff Report, Amendment of Zoning Map 213, Case No. 66, February 11, 2025
- Attachment LU-2 County of Kern – Board of Supervisors, Summary of Proceedings, Regular Meeting, Item CA-6) Request of Gem A-CAES LLC by Victor Grille for a change in zone classification from Limited Agriculture to Exclusive Agriculture on an approximate 108.5-acre parcel located on the north side of Dawn Road, east of Highway 14, in the Rosamond area (APN: 431-022-13) (S.D. #2)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

The Willow Rock Energy Storage Center, or WRESC, is in unincorporated Kern County, just north of Rosamond, California. The site falls within the boundaries of the Kern County General Plan but is not within any specific plan area. However, the proposed generation tie-line, or gen-tie, which will connect the WRESC to Southern California Edison's Whirlwind Substation approximately 19 miles to the southwest, does intersect the Rosamond and Willow Springs Specific Plan areas. The Rosamond Specific Plan covers over 17,000 acres and includes a mix of land uses such as agriculture, mineral extraction, open space, and urban development. The area remains largely undeveloped, with scattered rural residential parcels and a desert climate characterized by extreme temperature ranges. Similarly, the Willow Springs Specific Plan encompasses over 50,000 acres and includes a mix of open desert, sparse development, renewable energy projects, and occasional agricultural uses. Much of this area is held by absentee landowners, with parcels varying in size from one to over twenty acres.

The WRESC site itself consists of approximately 88.6 acres of undeveloped land zoned as Exclusive Agriculture (A) west of Sierra Highway and north of Dawn Road. The surrounding landscape is predominantly open desert with low population density and very limited commercial or institutional development. The gen-tie line study area includes mostly vacant parcels, scattered single-family homes, renewable energy facilities, and utility corridors. There are no important farmlands, Williamson Act lands, or recreational facilities in the immediate vicinity. While the project lies roughly half a mile from Edwards Air Force Base and several miles from Rosamond Skypark Airport, the project's infrastructure is expected to remain under 100 feet in height, and therefore no impacts to airspace operations are anticipated.

A portion of the WRESC gen-tie line passes along Mojave-Tropico Road within approximately 0.9 miles west of the closest runway edge at Rosamond Skypark. This segment of the gen-tie line is near the border and within Zone B2 of the Comprehensive Land Use Plan for Rosamond Skypark. According to the Kern County Airport Land Use Consistency Plan, the power lines located in Zone B2 are considered "potentially compatible with restrictions." The WRESC lies approximately 14 miles west of the majority of facilities at EAFB.

The broader planning and environmental context includes the project's location within the West Mojave Plan area, which is part of a regional Habitat Conservation Plan focused on preserving sensitive species and desert habitats.

The land use designation under the Kern County General Plan for the WRESC site is Resource Management, which is intended to preserve natural resources and open space. Zoning throughout the gen-tie corridor varies but supports utility infrastructure development either by right or with conditional use permits. The area does not contain scenic highways, nursing homes, or religious institutions, and only one school and one child care facility fall within the broader gen-tie study area. Overall, the project is sited in a sparsely developed area that is compatible with utility-scale infrastructure, with appropriate access routes, and few sensitive land uses or land use conflicts.

## **B. Potential Construction and Operational Impacts**

The construction and operation of the WRESC will not physically divide any established community. The project site and gen-tie line are located primarily on vacant parcels or within existing rights-of-way, minimizing any potential for community disruption. Although the gen-tie line will pass near a few single-family residences along Mojave-Tropico Road and Rosamond Boulevard, the area is characterized by scattered rural development and an increasing number of renewable energy projects. The area's current zoning—mainly Limited Agriculture (A-1) and Exclusive Agriculture (A)—permits uses compatible with energy infrastructure, and dense residential development is not allowed. As a result, the WRESC will not displace existing neighborhoods or interfere with community access or cohesion.

In terms of land use policies and regulations, the WRESC is consistent with applicable zoning and planning frameworks. The California Energy Commission (CEC), which has jurisdiction under the Warren-Alquist Act, will coordinate with Kern County to ensure compliance with local rules, including the conditional use permit (CUP) process. A rezone of the WRESC site from Limited Agriculture (A-1) to Exclusive Agriculture (A) was approved by the Kern County Board of Supervisors on February 11, 2025 to align the zoning designation with Kern County's General Plan designation for the site. This rezone supports the project's conformance with land use designations while enabling energy development without conflicting with existing policies or regulations. Therefore, land use impacts will be less than significant.

The WRESC is not located within any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or similar regional conservation strategy. As such, there will be no impact on such protected areas. Additionally, neither the WRESC site nor the gen-tie line corridor involves the conversion of active farmland. The affected lands are classified by the California Department of Conservation as Non-agricultural and Natural Vegetation and are not currently used for agricultural purposes. Thus, the project will not convert farmland to nonagricultural use or induce future land use changes that would lead to such conversions.

With respect to overall land use compatibility, the WRESC aligns with Kern County's long-term planning goals. The County's General Plan and Zoning Ordinance aim to guide growth and development in a consistent manner. With the rezone to Exclusive Agriculture, the zoning and general plan designations are fully aligned. The WRESC is consistent with all applicable land use LORS.

Temporary construction activities—such as parking and material laydown—may occur on parcels zoned General Commercial (C-2) and Highway Commercial (CH). These parcels are not intended for permanent WRESC facilities, and any temporary use that falls outside of permitted land uses could require a General Plan amendment. However, established procedures are in place within Kern County for such amendments, including environmental review and public hearings, if such actions are needed in the future.

Overall, the WRESC will not divide communities, conflict with land use plans or conservation goals, or convert agricultural lands. Through appropriate rezoning, permitting, and coordination with Kern County and the CEC, the

project is compatible with existing and planned land uses, resulting in no significant environmental impacts related to land use.

### **C. Summary of Potential Cumulative Impacts**

Under the CEQA, cumulative impacts refer to the combined effects of two or more projects that, when considered together, may result in significant environmental change. For the WRESC, cumulative land use impacts were assessed based on how the project's incremental effects could interact with those of other past, present, or reasonably foreseeable developments. The spatial setting for the analysis of cumulative impacts is roughly equal to the western Antelope Valley portion of Kern County and the temporal setting occurs between the known past and the life of the Project (estimated 50 years).

Within this setting, various foreseeable projects—including industrial facilities like the Mojave Micro Mill, quarry operations, new energy developments, and limited residential growth—will contribute to an overall increase in urbanization and a gradual reduction of open space across the region. However, despite these broader trends, the WRESC itself is not expected to result in significant cumulative land use impacts. The project is located in an area that is already transitioning to accommodate utility-scale infrastructure, and its effects are limited by existing transportation corridors, such as Sierra Highway, State Route 14, and Dawn Road. Furthermore, the proximity of Edwards Air Force Base restricts incompatible development and helps maintain broader land use stability. The WRESC has been demonstrated to be consistent with applicable land use plans and compatible with neighboring land uses. Therefore, when considered with other regional projects, the WRESC's incremental contribution to cumulative land use impacts is not cumulatively considerable and does not represent a significant environmental concern.

### **D. Summary of Compliance with Applicable LORS**

The Project is consistent with the following applicable LORS relating to land use:

- California Environmental Quality Act, Public Resources Code (PRC), Sections 21000-21178.1, including Guidelines for implementation of CEQA are codified in the CCR Sections 15000-15387
- Warren-Alquist Act, PRC, Section 25000 et seq.
- California Lands Conservation Act (Williamson Act)
- County of Kern General Plan
- County of Kern Willow Springs Specific Plan
- County of Kern Zoning Ordinance
- County of Kern Rosamond Specific Plan
- Airport Land Use Compatibility Plan
- Application for Transportation and Utility Systems and Facilities on Federal Lands (SF-299 Form)

## **III. Response to Certain Issues Raised in the FSA**

Page 5.8-27 to 28, COC **LAND-1**, remains unchanged relative to the Applicant's comments on the PSA, and would require the Applicant to obtain permits from Kern County for use of any temporary laydown and parking areas for the WRESC. As described in the Applicant's comments, the CEC's certification is in lieu of any permit,



certification, or similar document required by any state, local, or regional agency for the construction and operation of the WRESC and related facilities. The CEC "stands in the shoes" of Kern County to issue all necessary permits, so there are not required Kern County "permits", given the CEC's preemption; however, it is routine for project owners to pay local fees for permits, ostensibly to cover the costs of the local government's review and comment confirming compliance with local requirements.

For this reason, the Applicant proposes that COC LAND-1 as set forth in the FSA be modified as shown in Section IV, below.

## **IV. Proposed Licensing Conditions**

The FSA incorporates changes to the Conditions of Certification for this subject matter in response to comments. The Applicant concurs with Conditions of Certification LAND-2, LAND-3, and LAND-4 as proposed in the FSA. However, the Applicant proposes the following changes to COC LAND -1 set forth below.

### **Proposed Revisions to Condition LAND-1:**

COC **LAND-1**, second paragraph:

Prior to the commencement of construction, the project owner shall ~~obtain any necessary permits from~~ **pay Kern County fees for review and comment and demonstrate compliance with requirements of** the Kern County Planning and Natural Resources Department, or other relevant departments, for development of temporary laydown and parking areas. \*\*\*

Verification: At least 30 days prior to development of any temporary laydown and parking areas, the project owner shall provide to the CPM ~~the required approved permits from~~ **documentation showing payment of Kern County fees for review and comment and demonstrating compliance with requirements of** the Kern County Planning and Natural Resources Department, or any other relevant departments.

## **ATTACHMENT A**

### **Kern County Planning Dept Staff Report Supporting Site Zone Change**

**KERN COUNTY PLANNING AND NATURAL RESOURCES DEPARTMENT**

**Board of Supervisors**

**STAFF REPORT**

**Date:** February 11, 2025

**FILE:** ZCC #66, Map 213

**S.D.:** #2 – Parlier

**TITLE:** Amendment of Zoning Map 213, Zone Change Case No. 66

**PROPOSAL:** A change in zone classification from A-1 (Limited Agriculture) to A (Exclusive Agriculture) or a less restrictive district on an approximate 108.5-acre parcel

**APPLICANT:** Gem A-CAES LLC by Victor Grille (PP22149)

**PROJECT SIZE:** Approximately 108.5-acres

**LOCATION:** North side of Dawn Road, approximately 1,808 feet east of Highway 14 in the Rosamond area (APN: 431-022-13)

**GENERAL PLAN DESIGNATION/ZONE CLASSIFICATION:** 8.5 (Resource Management – Min. 20 Acres) (Kern County General Plan) / A-1 (Limited Agriculture)

**SURROUNDING LAND USE/ZONING:** North, East, South, West – Vacant land / A-1 (Limited Agriculture)

**PROJECT ANALYSIS:** The project is a request for a change in zone classification from A-1 (Limited Agriculture) to A (Exclusive Agriculture) to be consistent with the General Plan designation for a future energy storage facility. The project site is located on the north side of Dawn Road, approximately 1,800 feet east of Highway 14 in the Rosamond area.

The project site is a 108.5-acre parcel of record with a map code designation of 8.5 (Resource Management – Min. 20 Acres) by the Kern County General Plan and a zone classification of A-1 (Limited Agriculture). The project parcel is bisected by Sierra Highway and is currently vacant with native vegetation. Access to the project site is provided via Sierra Highway. The surrounding area to the north, south, east, and west is vacant land with native vegetation. The following **Table** is a summary of land uses adjacent to the project site:

**Surrounding Land Uses**

Location	Kern County General Plan	Zone Classification	Property Use
Project Site	8.5	A-1	Vacant with native vegetation
North	8.5	A-1	Vacant with native vegetation
East	1.1	A-1	Vacant land – Edwards Air Force Base
South	5.6	A-1	Vacant with native vegetation
West	8.5	A-1	Vacant with native vegetation
<u>Land Use Designations:</u> 1.1 – State or Federal Land 5.6 – Minimum 2.5 Gross Acres/Unit 8.5 – Resource Management (Min. 20 Acre Parcel)		<u>Zone Classifications:</u> A-1 – Limited Agriculture	

### **Proposed Project**

The proposed project is a request for a change in zone classification from A-1 (Limited Agriculture to A (Exclusive Agriculture) on an approximate 108.5-acre parcel to be consistent with the General Plan designation. The future proposed project site use is for the Willow Rock Energy Storage Center, an advanced compressed air energy storage facility. Any water and sewer needs would be determined at the time of future site development.

### **Notification and Request for Comments**

During the course of processing this request, Staff notified surrounding property owners within 1,000 feet of the project site, affected agencies and County departments. As of this writing, seven (7) “no comment” and one (1) comment responses have been received. These responses are from Kern County Public Works – Development Review Department, Kern County Public Works - Sewer and Water Division, Kern County Public Works – Floodplain Management Division, Kern County Public Works – CSA Division, Kern County Public Health – Environmental Health Division, and California Department of Transportation (DOT), California Department of Conservation (CalGEM).

- (1) **Southern California Gas Company (SoCalGas)** commented, the Transmission Department does not operate any facilities within the proposed project. However, SoCalGas states the Distribution Department may maintain and operate facilities within the project scope and instructs the applicant to contact this Department to prevent potential conflicts with and development of the site.

All correspondence received are attached for reference. Zone Change cases do not include recommended conditions as new development has not been proposed at this time. However, the project site will be subject to all rules, permits and regulations required for future development, including potential road developments, future water, and sewer needs and would be reevaluated for any proposed expansion on-site.

### **Environmental Review**

In reviewing the proposal, Staff has considered the applicable provisions of the California Environmental Quality Act (CEQA) and the State CEQA Guidelines. Section 15271(a)(1) states CEQA does not apply to actions undertaken by a public agency relating to any thermal power plant site or facility, including the expenditure, obligation, or encumbrance of funds by a public agency for planning, engineering, or design purposes, or for the conditional sale or purchase of equipment, fuel, water (except groundwater), steam, or power for such a thermal power plant, if the thermal power plant site and related facility will be the subject of an EIR or negative declaration or other document or documents prepared pursuant to a regulatory program certified pursuant to Public Resources Code Section 21080.5, which will be prepared by the State Energy Resources Conservation and Development Commission.

This project does not propose changes to the existing map code designation established by the Kern County General Plan and will in fact implement a zone district that is consistent with the previously adopted map code designation. It is Staff’s conclusion the project qualifies as one that can be found to be categorically exempt from the requirement for preparation and review of an environmental document pursuant to Sections 15271(a)(1) of the State CEQA Guidelines.

## **Planning Commission Hearing – December 12, 2024**

This request was considered by the Planning Commission on December 12, 2024, consent agenda. There being no one wishing to speak on the matter, the item remained on consent and the Planning Commission adopted Resolution No. 129-24 by a vote of four to one with Commissioner Nance recusing himself from the vote.

## **General Plan and Zoning Consistency Summary**

### *General Plan Consistency*

The project site area is located within the Kern County General Plan with an 8.5 (Resource Management – Min. 20 Acres) map code designation. The 8.5 designation is primarily for open space lands containing important resource values such as wildlife habitat, scenic values, or watershed recharge areas. Other lands with this resource attribute are undeveloped, non-urban areas that do not warrant additional planning within the foreseeable future because of current population (or anticipated increase), marginal physical development, or no subdivision activity.

The proposed change in zone classification from A-1 (Limited Agriculture) to A (Exclusive Agriculture) is consistent with the land use element of the Kern County General Plan through the following policies:

- *Goal No. 4 (Resource) – Encourage safe and orderly energy development within the County, including research and demonstration projects, and to become actively involved in the decision and actions of other agencies as they affect energy development in Kern County (page 53).*
- *Goal No. 6 (Resource) – Encourage alternative sources of energy, such as solar and wind energy, while protecting the environment (page 53).*
- *Policy No. 1 (Resource) – Appropriate resource uses of all types will be encouraged as desirable and consistent interim uses in undeveloped portions of the County regardless of General Plan designation (page 55).*
- *Policy No. 16 (Resource) – The County will encourage development of alternative energy sources by tailoring its Zoning and Subdivision Ordinances and building standards to reflect Alternative Energy Guidelines published by the California State Energy Commission (page 57).*

The proposed zone classification change to A (Exclusive Agriculture) District will correct the inconsistent A-1 (Limited Agriculture) zoning on-site that is not consistent with the existing General Plan designation. The proposed zone classification change will allow for various energy development uses that are consistent with the existing General Plan designation. The existing 8.5 (Resource Management – Min. 20 Acres) would be consistent with the proposed A (Exclusive Agriculture) District and would permit the future proposed advanced compressed air energy storage facility.

### *Zoning Consistency*

The purpose of the A (Exclusive Agriculture) District is to designate areas suitable for agriculture uses and to prevent the encroachment of incompatible uses onto agricultural lands and the premature conversion of such lands to non-agricultural uses. Uses in the A District are limited primarily to agricultural uses and other activities compatible with agricultural uses.

The requested zone classification change to A (Exclusive Agriculture) District would correct the inconsistent zoning for the parcel as it relates to the existing land use designation. Additionally, the requested zone classification change would support the applicant's intent to develop the parcel for an advanced compressed air energy storage facility.

### **Staff Recommendation**

It is Staff's determination that the requested A (Exclusive Agriculture) District is consistent with the existing 8.5 (Resource Management – Min. 20 Acres) map code designation of the Kern County General Plan due to the existing agriculture designation in the area. The current A-1 (Limited Agriculture) zoning of the parcel is inconsistent with the 8.5 (Resource Management – Min. 20 Acres) designation and requires correction to match the resource nature of the area. Approval of the Zone Change will satisfy the requirements of California Government Code Sections 65860 and 65862, which specify consistency be maintained between local Zoning Ordinances and the General Plan they implement.

This project does not propose any changes to the existing map code designations established by the Kern County General Plan and will in fact implement a zone district that is consistent with the previously adopted map code designation. The proposed change in zone classification to A (Exclusive Agriculture) will prompt consistency with both the General Plan and Zone District as it will be compatible with the intent to develop an energy storage center.

Based upon the information in the record to date, approval of the request would allow the reasonable development of the property while ensuring compatibility with the standards and requirements of the A (Exclusive Agriculture) zone classification and the Kern County General Plan.

Therefore, Staff recommends the Board of Supervisors approve the Zone Change as recommended by the Planning Commission, enact ordinance, and adopt the suggested findings as set forth in the attached draft resolution.

**PUBLIC INQUIRY OR CORRESPONDENCE:** Kern County Public Works – Development Review Department, Kern County Public Works – Sewer and Water Division, Kern County Public Works - Floodplain Management Division, Kern County Public Works – CSA Division, Kern County Public Health – Environmental Health Division, California Department of Transportation (DOT), California Department of Conservation (CalGEM), Southern California Gas Company (SoCalGas)

**CEQA ACTION:** Environmental Review: Categorically Exempt, Section 15271(a)(1)

**PLANNING COMMISSION RECOMMENDATION:** Adopt resolution, recommended findings and enact ordinance approving the Zone Change as requested



**BASIS FOR APPROVAL AND RECOMMENDED FINDINGS FOR ZONE CLASSIFICATION CHANGE:**

- (1) The applicable provisions of the California Environmental Quality Act, the State CEQA Guidelines, and the Kern County Guidelines have been duly observed in conjunction with said hearing in the consideration of this matter and all of the previous findings relating thereto.
- (2) This Board has found the project qualifies as one that can be found to be categorically exempt from the requirements for preparation of environmental documents pursuant to Public Resources Code Section 21080.5 and Section 15271(a)(1) of the State CEQA Guidelines.
- (3) The Zone Change is consistent with the applicable provisions of the Kern County General Plan with Goals No. 4 and 6, and Policies No. 1 and 16.
- (4) The Zone Change from A-1 (Limited Agriculture) to A (Exclusive Agriculture) will prompt consistency with both the General Plan and Zone District and will be compatible with the proposed use of an energy storage center.

KB:AB:mr







Attachments

# Maps

# ZCC 66 Map No. 213

## Vicinity Map

Gem A-CAES LLC  
by Victor Grille

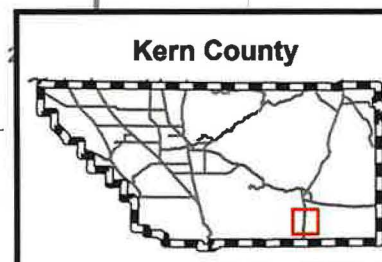
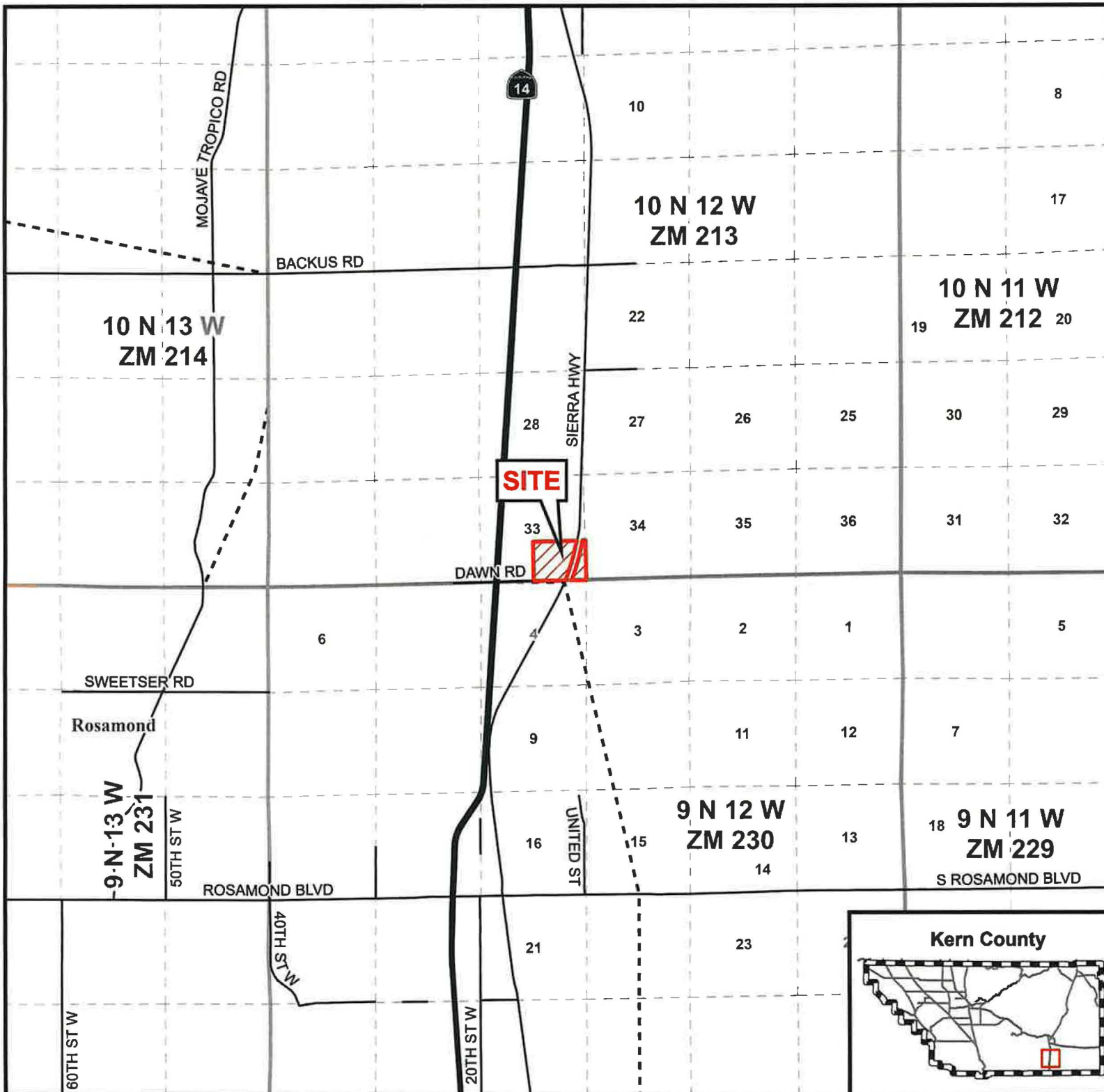
-  Site
-  State Hwy
-  Arterials
-  Township/Range
-  Sections
-  Unincorporated Cities

APN: 431-022-13  
Sec. 33 - T10N/R12W  
Created on: 10/24/2024

0 6,000 12,000 ft



Kern County  
Planning & Natural  
Resources Department





# ZCC 66

## Map No. 213

### Existing General Plan Map

Gem A-CAES LLC  
by Victor Grille

Site

State Hwy

Arterials

**Specific Plans**

Rosamond

**General Plan Boundaries**

- 1.1 - State and Federal Land
- 4.1 - Accepted County Plan Areas
- 6.3 - Highway Commercial
- 8.5 - Resource Management (Min. 20- or 80-acre parcel size)
- 5.1 - MAXIMUM 29 UNITS/NET ACRE (1502 SQ. FT. SITE AREA/UNIT)
- 5.3 - MAXIMUM 10 UNITS/NET ACRE (4356 SQ. FT. SITE AREA/UNIT)
- 5.6 - Minimum 2.5 gross acres/unit
- 6.2 - General Commercial
- 2.5 - Flood Hazard

APN: 431-022-13  
Sec. 33 - T10N/R12W  
Created on: 10/24/2024

0 1,000 2,000 ft

**Kern County**  
Planning & Natural  
Resources Department

**Kern County**



# ZCC 66 Map No. 213

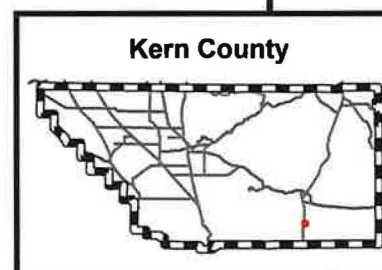
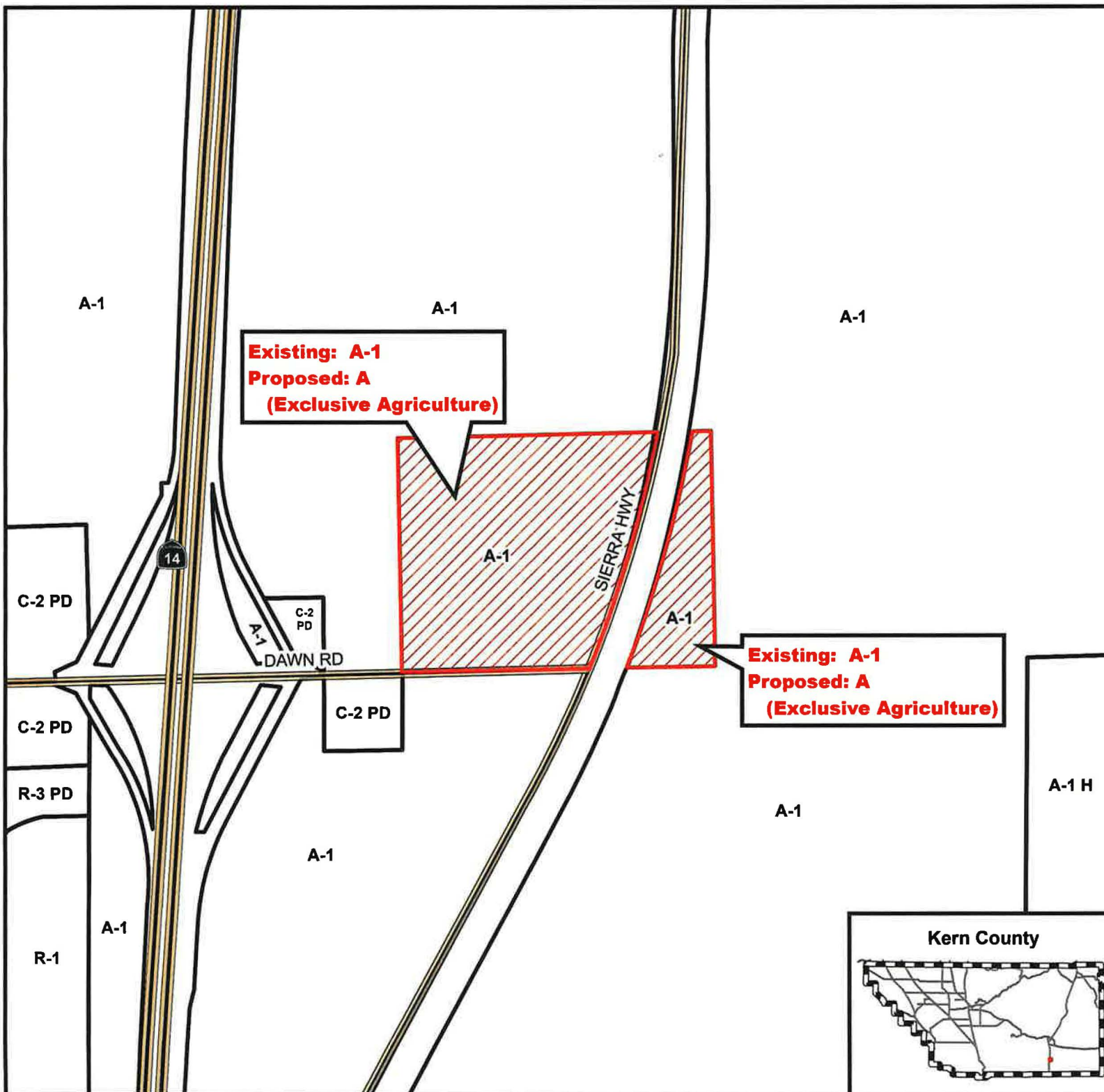
## Existing Zone Classifications

Gem A-CAES LLC  
by Victor Grille

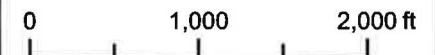
-  Site
-  State Hwy
-  Arterials
- KERN COUNTY ZONING DESIGNATIONS**
-  A-1 - Limited Agriculture
-  C-2 - General Commercial
-  R-1 - Low Density Residential
-  R-3 - High Density Residential
-  H - Airport Approach Height
-  Combining
-  PD - Precise Development Combining

**Existing: A-1  
Proposed: A  
(Exclusive Agriculture)**

**Existing: A-1  
Proposed: A  
(Exclusive Agriculture)**







APN: 431-022-13  
Sec. 33 - T10N/R12W  
Created on: 10/24/2024



**Kern County  
Planning & Natural  
Resources Department**

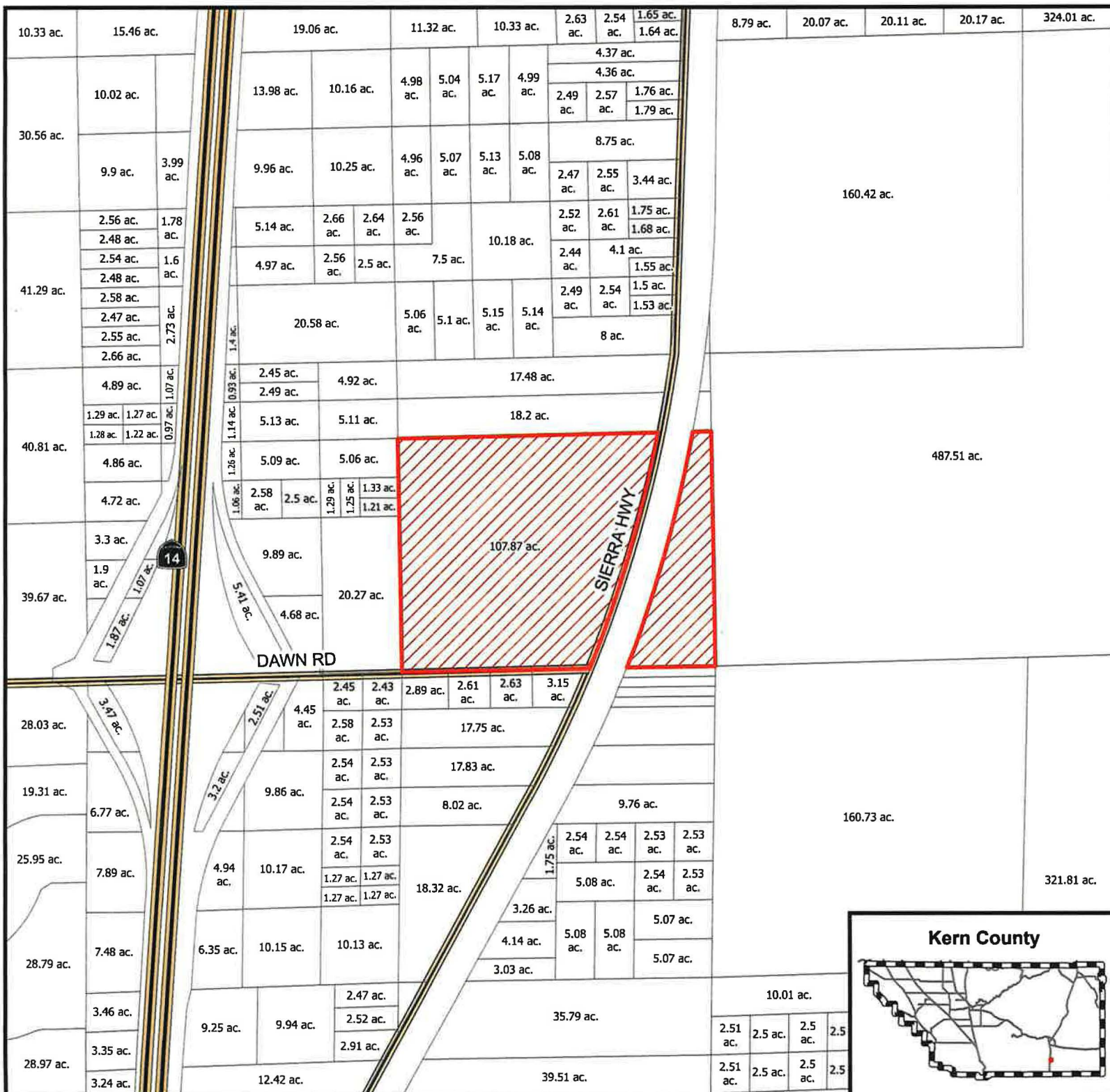
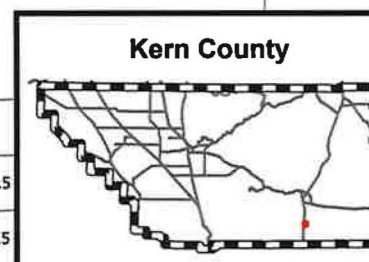


## Assessor's Parcelization Map

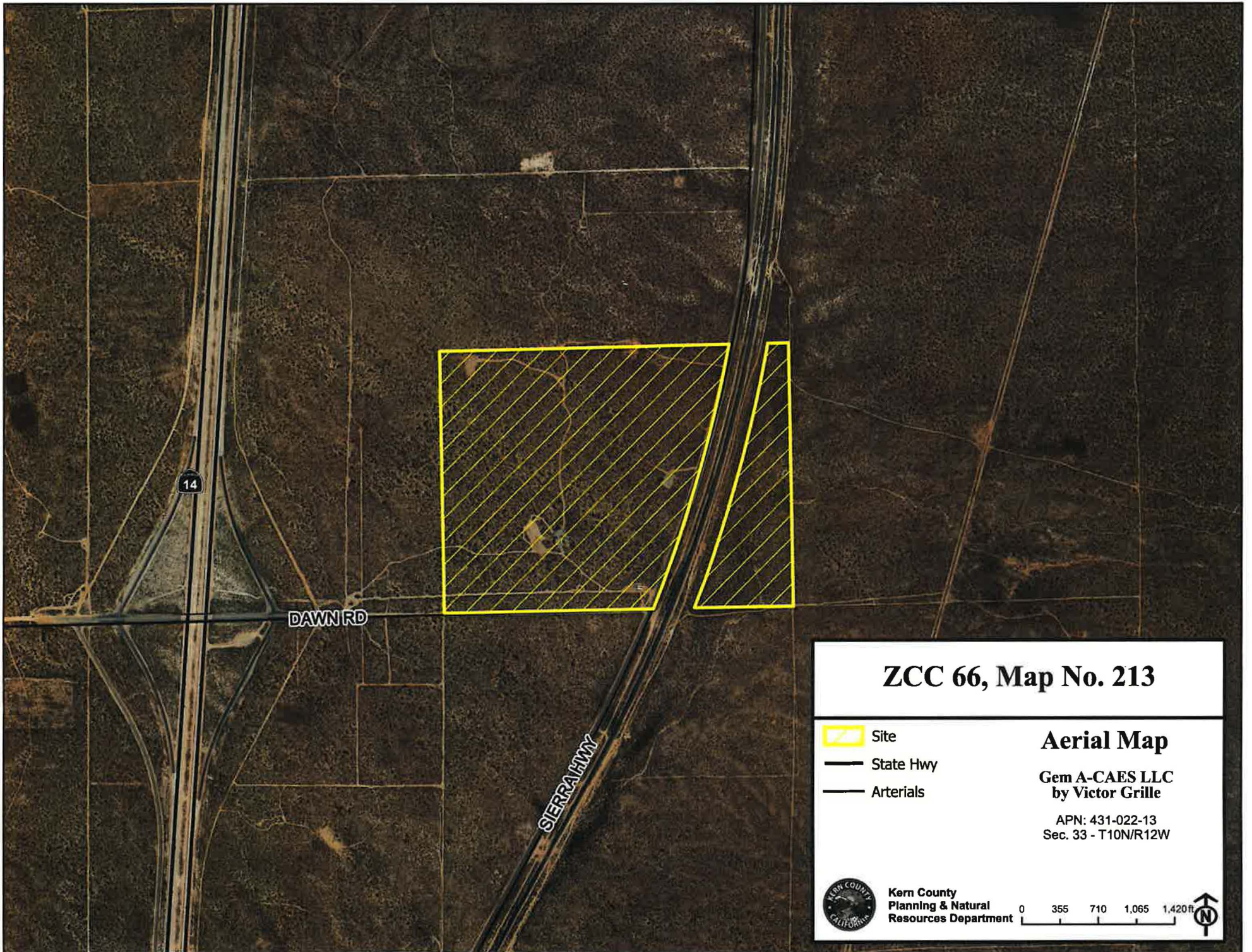
 Site  
 Parcel Boundaries  
 State Hwy  
 Arterials



**Kern County  
Planning & Natural  
Resources Department**








# Comments



**Office Memorandum**

To: Lorelei Oviatt, Director  
Planning and Natural Resources Department  
Attn: Angelica Benavides, Planner II

From: Cesar Ayon, Engineering Manager   
Public Works Department/Development Review Division

Subject: 7-5.3 ZCC 66 Map 213  
Location; North side of Dawn Road and bisected by Sierra Highway to the east,  
approximately 1,808' east of Highway 14 in the Rosamond Area (APN 431-022-13).

November 21, 2024

**Development Review Division**

This Division has reviewed the subject project and has no comment.

Thank you for the opportunity to comment on this project. If you have any questions or comments, please contact Rodd Parke of this Department at (661) 862-8848.

**Sewer and Water Division**

This Division has reviewed the subject project and has no comment.

Thank you for the opportunity to comment on this project. If you have any questions or comments, please contact Kyle Perez of this Division at (661) 862-8852.

**Floodplain Management Division**

This Division has reviewed the subject project and has no comment.

Thank you for the opportunity to comment on this project. If you have any questions or comments, please contact Brian Blaise of this Division at (661) 862-5098.

**CSA Division**

This Division has reviewed the subject project and has no comment.

Thank you for the opportunity to comment on this project. If you have any questions or comments, please contact Miguel Munoz of this Division at (661) 862-8908.

## INTEROFFICE MEMORANDUM

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To: Angelica Benavides, Planner II  
From: Dayana Torres, REHS  
Subject: ZCC 66, Map 213

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Date: December 2, 2024

The Kern County Environmental Health Division has reviewed the above referenced project. This Division has the local regulatory authority to enforce state regulations and local codes as they relate to waste discharge, water supply requirements, and other items that may affect the health and safety of the public or that may be detrimental to the environment.

The design of the project or the type of improvement is not likely to cause serious public health problems; therefore, this Division has no comments or recommendations and does not wish to impose any conditions on the subject project.

*Grounded in Health*

2700 M St., Suite 300, Bakersfield, CA. 93301 | 661.862.8740 | [www.kernpublichealth.com](http://www.kernpublichealth.com)

## Angelica Benavides

---

**From:** Isla, Nicholas@DOT <Nicholas.Isla@dot.ca.gov>  
**Sent:** Tuesday, January 14, 2025 10:48 AM  
**To:** Angelica Benavides  
**Cc:** Padilla, Dave@DOT  
**Subject:** KER-14\_ZCC #66 Map #213

**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 Angelica,

We've reviewed the proposed zone change and have no comment.

Thank you,

Nicholas Isla  
Associate Transportation Planner  
Local Development Review Branch  
California Department of Transportation  
1352 West Olive Avenue  
(559) 981-7373

**BE WORK ZONE ALERT**

## Angelica Benavides

---

**From:** Peppard, Daniel@DOC <Daniel.Peppard@conservation.ca.gov>  
**Sent:** Wednesday, December 11, 2024 2:33 PM  
**To:** Angelica Benavides  
**Subject:** APN: 43102213, North side of Dawn Road and bisected by Sierra Highway to the East

**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.

Good Afternoon,

The construction site well review for APN 43102213 has no wells on the site.

Thanks



### Daniel Peppard

Associate Oil and Gas Engineer | Central

#### California Department of Conservation

Geologic Energy Management Division

11000 River Run Boulevard

Bakersfield, CA 93311

T: (661) 858-7094

E: [Daniel.peppard@conservation.ca.gov](mailto:Daniel.peppard@conservation.ca.gov)





Transmission Technical  
Services Department

9400 Oakdale Ave  
Chatsworth, CA 91311  
SC9314

*December 9, 2024*

Angelica Benavides  
Kern County  
Abenavides@kerncounty.com

**Subject: ZCC #66, Map 213**

**DCF: 2313-24NC**

The Transmission Department of SoCalGas does not operate any facilities within your proposed improvement. However, the Distribution Department of SoCalGas may maintain and operate facilities within your project scope.

To assure no conflict with the Distribution's pipeline system, please e-mail them at:

[NorthwestDistributionUtilityRequest@semprautilities.com](mailto:NorthwestDistributionUtilityRequest@semprautilities.com)

Best Regards,  
Nerses Papazyan  
SoCalGas Transmission Technical Services  
[SoCalGasTransmissionUtilityRequest@semprautilities.com](mailto:SoCalGasTransmissionUtilityRequest@semprautilities.com)

# **PLANNING COMMISSION RESOLUTION**

**BEFORE THE PLANNING COMMISSION  
COUNTY OF KERN, STATE OF CALIFORNIA**

---

In the matter of:

**RESOLUTION NO. 129-24**

**APPLICATION FOR ZONE CHANGE CASE NO. 66, MAP 213**

North side of Dawn Road, approximately 1,808 feet east of Highway 14 in the Rosamond area (APN: 431-022-13)  
Gem A-CAES LLC by Victor Grille (PP22149)

**FINDINGS AND DETERMINATION**

I, Lorelei H. Oviatt, Secretary of the Planning Commission of the County of Kern, State of California, do hereby certify that the following resolution, proposed by Mr. Oliver, seconded by Mr. Dunbar, was duly passed and adopted by said Planning Commission at an official meeting hereof this **12th**, day of **December, 2024**, by the following vote, to wit:

**AYES:** Ashley, Dunbar, Oliver, Skidmore

**NOES:** None

**ABSTAINED:** Nance

**ABSENT:** None

  
\_\_\_\_\_  
**SECRETARY OF THE PLANNING COMMISSION  
COUNTY OF KERN, STATE OF CALIFORNIA**

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**R E S O L U T I O N**

**SECTION 1. WHEREAS:**

(a) Pursuant to the California Government Code, Title 7, Section 65000, et seq. (known as the Planning and Zoning Law), the Kern County Board of Supervisors has adopted the Official Land Use and Zoning Ordinance for the County of Kern (Ordinance Code of Kern County, Chapter 19.02, et seq.), herein called the Zoning Ordinance; and

(b) The Zoning Ordinance establishes various classes of zones, prescribes land uses and regulations for the various zones, and adopts zoning maps for the purposes of dividing the County into zones and showing the zone boundaries; and

(c) The Zoning Ordinance regulates the use of buildings, structures, and land, as between agriculture, industry, business, residence, and other purposes, and other uses more specifically set forth in Section 65850 of said Government Code; and

(d) The Kern County Planning and Natural Resources Department has received an application pertaining to a parcel of real property which is located within that portion of the unincorporated area of the County for which an official Zoning Map has been adopted under Section 7297.228 of said Ordinance Code and for which precise land use and zoning regulations are in effect; and

(e) Said parcel of real property is described as follows:

APN: 431-022-13

Section 33 of Township 10 North, Range 12 West, MDB&M, County of Kern, State of California (A complete legal description is on file with the Kern County Planning and Natural Resources Department); and

(f) Said application has been made pursuant to provisions of Chapter 19.112 of said Ordinance Code, and requests a Zone Change insofar as said requirements are applicable to the aforescribed parcel of real property, and more particularly a change in zone classification from A-1 (Limited Agriculture) to A (Exclusive Agriculture) or a more restrictive district on an approximate 108.5-acre parcel; and

(g) Said application has been made in the form and in the manner prescribed by said Zoning Ordinance and is on file with the Secretary of this Commission, designated as above, and reference is hereby made thereto for further particulars; and

(h) The Secretary of this Commission has caused notice to be duly given of a public hearing in this matter in accordance with law, as evidenced by the affidavit of publication and the affidavit of mailing on file with the Secretary of this Commission; and

(i) Said notice of hearing stated that the Planning and Natural Resources Department has determined that the activity in question is included on the list of classes of projects which have been determined not to have a significant effect on the environment and this Commission concurs with this determination and that, therefore, under the provisions of

Section 15271(b) of the State CEQA Guidelines, it is categorically exempt from the provisions of the California Environmental Quality Act; and

(j) Said public hearing has been duly and timely conducted, during which the proposal was explained by a representative of the Planning and Natural Resources Department and all persons so desiring were duly heard; and

(k) During said hearing and prior to consideration of the merits of said matter, this Commission called for any objections to the dispensing with an environmental impact report; and

(l) This Commission has considered the recommendation of the Planning and Natural Resources Department and all the testimony presented during said public hearing, after which said public hearing was concluded.

**SECTION 2. NOW, THEREFORE, BE IT HEREBY RESOLVED** by the Planning Commission of the County of Kern, as follows:

(a) This Commission finds that the facts recited above are true and that this Commission has jurisdiction to consider the subject of this resolution; and

(b) After careful consideration of all facts and evidence as presented at said hearing, it is the decision of the Planning Commission that the application herein described be recommended for **APPROVAL**, as recommended by Staff, by the Board of Supervisors, for the reasons specified in this Resolution; and

(c) The findings of this Commission upon which its decision is based are as follows:

- (1) The applicable provisions of the California Environmental Quality Act, the State CEQA Guidelines, and the Kern County Guidelines have been duly observed in conjunction with said hearing in the consideration of this matter and all of the previous findings relating thereto.
- (2) This Commission has found the project qualifies as one that can be found to be categorically exempt from the requirements for preparation of environmental documents pursuant to Public Resources Code Section 21080.5 and Section 15271(a)(1) of the State CEQA Guidelines.
- (3) The Zone Change is consistent with the applicable provisions of the Kern County General Plan with Goals No. 4 and 6, and Policies No. 1 and 16.
- (4) The Zone Change from A-1 (Limited Agriculture) to A (Exclusive Agriculture) will prompt consistency with both the General Plan and Zone District as it will be compatible with the proposed use of an energy storage center; and

(d) The Secretary of this Commission shall cause copies of this resolution to be transmitted to the following:

Gem A-CAES LLC by Victor Grille (PP22149) (applicant/owner) (1)  
LiUNA (1)  
File (3)

**ATTACHMENT B**

**Kern County Board of Supervisors February 11 Approval of Project Site  
Zone Change**



# SUMMARY OF PROCEEDINGS

## BOARD OF SUPERVISORS - COUNTY OF KERN

1115 Truxtun Avenue  
Bakersfield, California

Regular Meeting  
Tuesday, February 11, 2025

2:00 P.M.

**Note:** Members of the Board of Supervisors may have an interest in certain contracts that the Board considers where the member holds a position on a non-profit corporation that supports the functions of the County. Supervisors are assigned to these positions as part of annual committee assignments by the Chairman of the Board. These interests include, with the Supervisor holding the position, the following: California State Association of Counties (Supervisors Peters and Perez); Community Action Partnership of Kern (Supervisor Parlier); Kern County Network for Children (Supervisor Peters); Kern Economic Development Corporation (Supervisors Peters, Couch and Flores); Southern California Water Coalition (Supervisors Couch and Flores); Tobacco Funding Corporation, Kern County (Supervisors Couch and Perez); Kern County Foundation, Inc. (Supervisor Perez); and Kern Medical Center Foundation (Supervisors Couch and Flores).

### BOARD RECONVENED

Supervisors: Peters, Parlier, Flores, Couch, Perez

ROLL CALL: 4 Present; 1 Absent - Flores

NOTE: The vote is displayed in bold below each item. For example, Flores-Perez denotes Supervisor Flores made the motion and Supervisor Perez seconded the motion.

CONSENT AGENDA/OPPORTUNITY FOR PUBLIC COMMENT: ALL ITEMS LISTED WITH A "CA" OR "C" WERE CONSIDERED TO BE ROUTINE AND APPROVED BY ONE MOTION.

### BOARD ACTION SHOWN IN CAPS

#### REPORT ON ACTIONS TAKEN IN CLOSED SESSION

Item 43 concerning a CONFERENCE WITH LABOR NEGOTIATORS - Agency designated representatives: Chief Administrative Officer Nancy Anderson, and designated staff - Employee organizations: Service Employees' International Union, Local 521 and Unrepresented Employees (Government Code Section 54957.6) - HEARD; NO REPORTABLE ACTION

Item 44 concerning PUBLIC EMPLOYEE PERFORMANCE EVALUATION - Title: Chief Administrative Officer (Government Code Section 54957) - HEARD; NO REPORTABLE ACTION

Item 45 concerning a CONFERENCE WITH LEGAL COUNSEL - FORMALLY INITIATED LITIGATION (Government Code Section 54956.9(d)(1) and (g)) Name of case: Mickel Lewis, et al. v. Kern County, et al., United States District Court (Eastern) Case Number: 1:21-CV-00378-KES-CDB - WITHDRAWN

Item 46 concerning a CONFERENCE WITH LEGAL COUNSEL - FORMALLY INITIATED LITIGATION (Government Code Section 54956.9(d)(1) and (g)) Name of case: Julie Meek, et al. v. DOD Construction, et al. - HEARD; NO REPORTABLE ACTION

Item 47 concerning a CONFERENCE WITH LEGAL COUNSEL - FORMALLY INITIATED LITIGATION (Government Code Section 54956.9(d)(1) and (g)) Name of case: William Brickey v. Kern County Sheriff's Office, Workers' Compensation Appeals Board Case Number ADJ15480885 - HEARD; NO REPORTABLE ACTION

Item 48 concerning a CONFERENCE WITH LEGAL COUNSEL - ANTICIPATED LITIGATION (Government Code Section 54956.9(d)(2) and 54956.9(e)(1)) Number of cases: One (1) Significant exposure to litigation in the opinion of the Board of Supervisors on the advice of legal counsel, based on: Facts and circumstances that might result in litigation against the County but which the County believes are not yet known to a potential plaintiff or plaintiffs, which facts and circumstances need not be disclosed - HEARD; NO REPORTABLE ACTION

Item 49 concerning a CONFERENCE WITH LEGAL COUNSEL - ANTICIPATED LITIGATION (Government Code Section 54956.9(d)(2) and (e)(3)) Number of cases: Two (2) Significant exposure to litigation in the opinion of the Board of Supervisors on the advice of legal counsel, based on: The receipt of a claim pursuant to the Government Claims Act or some other written communication from a potential plaintiff threatening litigation, which non-exempt claim or communication is available for public inspection - HEARD; NO REPORTABLE ACTION

ADJOURNED AS BOARD OF SUPERVISORS; RECONVENED AS FORD CITY-TAFT HEIGHTS SANITATION DISTRICT

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

FORD CITY-TAFT HEIGHTS SANITATION DISTRICT

- C-1) Contract No. 25026, Plans, Specifications, and Notice to Bidders for Ford City-Taft Heights sewer segment replacements (Fiscal Impact: \$438,838; Ford City-Taft Heights Fund; Budgeted; Discretionary) - MADE FINDING PROJECT IS CATEGORICALLY EXEMPT FROM FURTHER CEQA REVIEW, PER SECTION 15301 OF STATE CEQA GUIDELINES; APPROVED; AUTHORIZED CHAIRMAN TO SIGN; AUTHORIZED PUBLIC WORKS TO PUBLISH NOTICE TO BIDDERS IN A NEWSPAPER OF GENERAL CIRCULATION, PURSUANT TO SECTION 20392 OF PUBLIC CONTRACT CODE; BID OPENING TO BE WEDNESDAY, MARCH 12, 2025, AT 11:00 A.M.

**Peters-Couch: 4 Ayes; 1 Absent - Flores**

ADJOURNED AS FORD CITY-TAFT HEIGHTS SANITATION DISTRICT; RECONVENED AS BOARD OF SUPERVISORS

**Peters-Couch: 4 Ayes; 1 Absent - Flores**

PUBLIC PRESENTATIONS

- 2) This portion of the meeting is reserved for persons to address the Board on any matter not on this agenda but under the jurisdiction of the Board. Board members may respond briefly to statements made or questions posed. They may ask a question for clarification, make a referral to staff for factual information or request staff to report back to the Board at a later meeting. Also, the Board may take action to direct the staff to place a matter of business on a future agenda. SPEAKERS ARE LIMITED TO TWO MINUTES. PLEASE STATE AND SPELL YOUR NAME BEFORE MAKING YOUR PRESENTATION. THANK YOU!

NO ONE HEARD

BOARD MEMBER ANNOUNCEMENTS OR REPORTS

- 3) On their own initiative, Board members may make an announcement or a report on their own activities. They may ask a question for clarification, make a referral to staff or take action to have staff place a matter of business on a future agenda (Gov. Code Sec. 54954.2[a][2]) –

NO ONE HEARD

CONTINUED HEARINGS

PLANNING AND NATURAL RESOURCES DEPARTMENT

- 4) **Request of Kern County Planning and Natural Resources Department to update the Housing Element of the Kern County General Plan and Metropolitan Bakersfield General Plan covering the 2024 through 2031 planning period, Countywide (All S.D.s)**

Specific Request:

An update to the Housing Element of the Kern County General Plan and Metropolitan Bakersfield General Plan covering the 2024 through 2031 planning period. The Housing Element is designed to address the projected housing needs of current and future county residents who live in the unincorporated area of Kern County (GPA #160, Map 500)

(Environmental Review: Negative Declaration; Published Bakersfield Californian; Daily Independent; Taft Midway Driller; Kern Valley Sun; Mojave Desert News; Mountain Enterprise; Rosamond News; Tehachapi News; El Popular (Continued from 3/19/2024, 4/23/2024, 7/16/2024, 8/6/2024, 11/5/2024, and 1/28/2025) - WENDELL WESLEY; EMMA DE LA ROSA, LEADERSHIP COUNSEL FOR JUSTICE AND ACCOUNTABILITY; AND ASHE HAUNG, AMERICAN CIVIL LIBERTIES UNION (ACLU) OF SOUTHERN CALIFORNIA, HEARD; CONTINUED TO TUESDAY, MAY 13, 2025 AT 2:00 P.M.

**Peters-Couch: 4 Ayes; 1 Absent - Flores**

HEARINGS

PLANNING AND NATURAL RESOURCES DEPARTMENT

- CA-5) **Request of Steven Ernest by Nelms Surveying, Inc., for a change in zone classification from 2 1/2-acre Estate Residential to 1-acre Estate Residential on a 2.51-acre parcel located on the south side of East McKee Road, east of South Union Avenue, in the Bakersfield area (APN: 518-090-07) (S.D. #2)**

Specific Request:

A change in zone classification from E (2 1/2) RS (Estate - 2 1/2 acres - Residential Suburban Combining) to E (1) RS (Estate - 1 acre - Residential Suburban Combining) or a more restrictive District on a 2.51-acre parcel (ZCC #6, Map 124-32)

(Environmental Review: Special Situation, Section 15183 of the State CEQA Guidelines; Published Bakersfield Californian) - OPENED HEARING; NO ONE HEARD; CLOSED HEARING; PER PLANNING COMMISSION RECOMMENDATION, ADOPTED RESOLUTION 2025-035, RECOMMENDED FINDINGS, AND ENACTED ORDINANCE G-9332 APPROVING ZONE CHANGE AS REQUESTED, NOT TO BECOME EFFECTIVE UNTIL THE RECORDATION OF THE FINAL SUBDIVISION OR PARCEL MAP

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-6) **Request of Gem A-CAES LLC by Victor Grille for a change in zone classification from Limited Agriculture to Exclusive Agriculture on an approximate 108.5-acre parcel located on the north side of Dawn Road, east of Highway 14, in the Rosamond area (APN: 431-022-13) (S.D. #2)**

Specific Request:

A change in zone classification from A-1 (Limited Agriculture) to A (Exclusive Agriculture) or a more restrictive district on an approximate 108.5-acre parcel (ZCC #66, Map 213)

(Environmental Review: Categorically Exempt, Section 15271(b) of the State CEQA Guidelines; Published Mojave Desert News) - OPENED HEARING; NO ONE HEARD; CLOSED HEARING; PER PLANNING COMMISSION RECOMMENDATION, ADOPTED RESOLUTION 2025-036, RECOMMENDED FINDINGS AND ENACTED ORDINANCE G-9333 APPROVING ZONE CHANGE AS REQUESTED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-7) **Request of Clayton Houchin and Morgan Houchin to include approximately 25.56 acres within the boundaries of Agriculture Preserve No. 9 on property located at State Route 58, west of Palomas Avenue, in the Buttonwillow area (APN: 100-120-14) (S.D. #4)**

Specific Request:

Inclusion of approximately 25.56 acres within the boundaries of Agriculture Preserve No. 9 (Ag-Incl 9, Map 98)

(Environmental Review: Common Sense Exemption, Section 15061(b)(3) of the State CEQA Guidelines; Published Bakersfield Californian) - OPENED HEARING; NO ONE HEARD; CLOSED HEARING; PER PLANNING COMMISSION RECOMMENDATION, ADOPTED RESOLUTION 2025-037 AND RECOMMENDED FINDINGS, APPROVING INCLUSION OF APPROXIMATELY 25.56 ACRES INTO THE BOUNDARIES OF AGRICULTURAL PRESERVE NO. 9 AS REQUESTED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

#### DEPARTMENTAL REQUESTS

##### PLANNING AND NATURAL RESOURCES DEPARTMENT

- CA-8) Proposed rescission of existing Williamson Act Land Use Contract, and simultaneous approval of proposed Williamson Act Land Use Contracts 24-03 and 24-04 with Mike Brancato, Successor Trustee of the Brancato Family Revocable Trust and Bruce W. Cox and Madaline D. Cox, Trustees of the Bruce and Madaline Cox Family Trust; 85 acres; Agricultural Preserve No. 12; Implementing in 2026 calendar year; Environmental Review: Categorically Exempt, pursuant to Section 15317 of the State CEQA Guidelines (Fiscal Impact: None) (S.D. #4) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN; DIRECTED CLERK OF THE BOARD TO RECORD

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

##### PUBLIC WORKS DEPARTMENT

- CA-9) Proposed establishment of 40-mile-per-hour speed limit on Bodfish Canyon Road, between Lake Isabella Boulevard and Piute Street, a distance of approximately 12,250 feet, Lake Isabella (Fiscal Impact None) (S.D. #1) - APPROVED; REFERRED TO COUNTY COUNSEL FOR PREPARATION OF ORDINANCE

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-10) Proposed Contract No. 25024, identify apparent low, responsive, and responsible bid and approve contract with Innovative Engineering Systems, Inc., dba Agilitech, for airfield gate security project at Meadows Field Airport, Bakersfield in the amount of \$856,118.17 (Fiscal Impact: \$856,118.17; Federal Aviation Administration (FAA) Grant; Budgeted; Discretionary) (S.D. #1) - IDENTIFIED APPARENT LOW, RESPONSIVE, AND RESPONSIBLE BID; APPROVED CONTRACT; AUTHORIZED DIRECTOR OF PUBLIC WORKS OR DESIGNEE TO SIGN; AUTHORIZED PUBLIC WORKS TO RELEASE ALL OTHER BID GUARANTEES

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-11) Contract No. 24022, Notice of Completion with Granite Construction Company for job order contract (Fiscal Impact: None) (All S.D.s) - RECEIVED AND FILED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-12) Contract No. 24029, Notice of Completion with Bowman Asphalt, Inc., for road rehabilitation on Grant Drive and Lincoln Avenue, Bakersfield (Fiscal Impact: None) (S.D. #3) - RECEIVED AND FILED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-13) Report regarding contract change orders (Fiscal Impact: None) (All S.D.s) - RECEIVED AND FILED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-14) Proposed Agreement with Genfare, LLC, to upgrade existing transit fare collections data server to a cloud-based platform effective February 11, 2025, in the amount of \$83,273 (Fiscal Impact \$83,273; Transit Intercity Rail Capital Program (TRICP) SB 125; Budgeted; Discretionary) (All S.D.s) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 072-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-15) Proposed Utility Agreement and Joint Use Agreement with Southern California Edison (SCE) to reimburse SCE for the relocation of utility facilities existing in SCE property near Lake Isabella Boulevard into County Right-of-Way, Lake Isabella effective February 11, 2025, in the amount of \$44,000 (Fiscal Impact: \$44,000; Road Fund; Not Budgeted; Discretionary) (S.D. #1) (Continued from 1/28/2025) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENTS 073-2025 AND 074-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-16) Proposed Amendment No. 9 to Agreement 084-2013 with Paintcare Inc., providing management of used paint collected through County's Household Hazardous Waste program, extending the term through February 12, 2027 and increasing revenue rates in the amount of \$15,000 (All S.D.s) (Fiscal Impact: \$15,000 Estimated Revenue; Solid Waste Enterprise Fund; Budgeted; Discretionary) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 075-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-17) Request to approve non-standard terms and conditions with Foundation Building Materials for acquisition of replacement ceiling tiles and supplies, in the amount of \$1,000 (Fiscal Impact \$1,000; Public Works Internal Services Fund; Budgeted; Discretionary) (All S.D.s) - APPROVED; AUTHORIZED PURCHASING AGENT TO ISSUE PURCHASE ORDER

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-18) Request to approve non-standard terms and conditions with Aurigo Software Technologies, Inc., to provide subscription services for construction management software, in the amount of \$109,191 (Fiscal impact \$109,191 Annually; Road Fund; Budgeted; Discretionary) (All S.D.s) - APPROVED; AUTHORIZED PURCHASING AGENT TO ISSUE PURCHASE ORDER

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-19) Request to approve non-standard terms and conditions with Mitchell Repair Information Company LLC, dba Mitchell 1, for the acquisition of fleet maintenance software through February 11, 2026, in the amount of \$2,880 (Fiscal impact \$2,880; Road Fund; Budgeted; Discretionary) (All S.D.s) - APPROVED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-20) Request for mid-year capital asset acquisition for computer aided dispatch/automatic vehicle locator system for Kern Transit, in the amount of \$1,000,000 (Fiscal Impact \$1,000,000; Public Transportation Enterprise Fund; Budgeted; Discretionary) (All S.D.s) - APPROVED; AUTHORIZED AUDITOR-CONTROLLER TO PROCESS THE SPECIFIED BUDGETARY ADJUSTMENTS AND ACCOUNTING TRANSACTIONS

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-21) Request for cancellation of designation and approval to increase appropriations for the purchase of a skid steer mower for sump maintenance, in the amount of \$8,000 (Fiscal Impact: \$8,000; County Service Area No. 60.2; Not Budgeted; Discretionary) (S.D.s #1, 3, & 4) - APPROVED; AUTHORIZED AUDITOR-CONTROLLER TO PROCESS THE SPECIFIED BUDGETARY ADJUSTMENTS AND ACCOUNTING TRANSACTIONS

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-22) Request for approval of exemption of Land Use Fees for solid waste disposal services (based on allowable exemptions) by Marcelyn White Aguilar, Parcel No. 095-012-22-00-3 for Fiscal Years 2021-2024, in the total amount of \$435.46 (Fiscal Impact: \$435.46 Revenue Decrease; Solid Waste Enterprise Fund; Not Budgeted; Discretionary) (S.D. #1) - APPROVED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-23) Request for approval of exemption of Land Use Fees for solid waste disposal services (based on allowable exemptions) by Marcelyn White Aguilar, Parcel No. 095-012-24-00-9 for Fiscal Years 2021-2024, in the total amount of \$435.46 (Fiscal Impact: \$435.46 Revenue Decrease; Solid Waste Enterprise Fund; Not Budgeted; Discretionary) (S.D. #1) - APPROVED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

COUNTY ADMINISTRATIVE OFFICE

- 24) Report on Transparent Online Permitting System Review and proposed recommendations for implementation (Fiscal Impact: None) - HEARD PRESENTATION; DAVE DMOHOWSKI, HOME BUILDERS ASSOCIATION OF KERN COUNTY, AND MARISA FOLSE, HEARD; RECEIVED AND FILED

**Peters-Couch: 4 Ayes; 1 Absent - Flores**



- CA-25) Request to appropriate unanticipated revenue from the State of California 2011 Public Safety Realignment Fiscal Year 2023-2024 Growth Funds for the Citizen's Option for Public Safety (COPS) Program in the amount of \$2,670,477 to transfer to law enforcement agencies (Fiscal Impact: \$2,670,477; 2011 Realignment; Not Budgeted; Discretionary) - APPROVED; AUTHORIZED AUDITOR-CONTROLLER TO PROCESS THE SPECIFIED BUDGETARY ADJUSTMENTS AND ACCOUNTING TRANSACTIONS

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-26) Proposed retroactive Agreement with Kern County Museum Foundation in the amount of \$25,000 for Fiscal Year 2024-2025 contribution (Fiscal Impact: \$25,000; General Fund; Budgeted; Discretionary) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 076-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-27) Proposed contributions to Mountain Communities in the amount of \$1,500 to support programs and services, and Tehachapi High School in the amount of \$250 to support the Future Farmers of America educational program (Fiscal Impact: \$1,750; General Fund; Budgeted; Discretionary) - APPROVED; AUTHORIZED AUDITOR-CONTROLLER TO PAY

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-28) Proposed contributions to Friends of Mercy Foundation in the amount of \$1,000 to support health care in the community, and enPOWERment Dess Perkins Foundation in the amount of \$500 to support programs for human trafficking victims (Fiscal Impact: \$1,500; General Fund; Budgeted; Discretionary) - APPROVED; AUTHORIZED AUDITOR-CONTROLLER TO PAY

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-29) Proposed contributions to Kern County Sheriff's Activities League in the amount of \$1,000 to support programs and services, and North High School Athletic Booster Club in the amount of \$750 to support educational and recreational programs (Fiscal Impact: \$1,750; General Fund; Budgeted; Discretionary) - APPROVED; AUTHORIZED AUDITOR-CONTROLLER TO PAY

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

COUNTY COUNSEL

- CA-30) Public hearing on Resolution of Necessity to determine the public interest and necessity for acquisition of certain real property by eminent domain for the State Route 43 (Enos Lane) and 7th Standard Road Project, subject property identified as Assessor's Parcel No. 090-310-63 located near State Route 43 and 7th Standard Road in Bakersfield (Fiscal Impact: None) - OPENED HEARING; NO ONE HEARD; CLOSED HEARING; ADOPTED RESOLUTION 2025-038; AUTHORIZED COUNTY COUNSEL TO INITIATE AND PURSUE LEGAL PROCEEDINGS ON BEHALF OF THE COUNTY OF KERN AND TAKE OTHER ACTIONS REASONABLY NECESSARY IN ORDER TO ACQUIRE REAL PROPERTY AS FURTHER DESCRIBED IN THE RESOLUTION OF NECESSITY

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

COUNTY ADMINISTRATIVE OFFICE - General Services Division

- CA-31) Proposed Amendment No. 3 to Lease Agreement 219-2013 with the State of California for use of a portion of Kern Valley Regional Administrative Center located in Lake Isabella, to extend the term from May 1, 2025 through April 30, 2029 (Fiscal Impact: None) (S.D. #1) - MADE FINDING THAT PROJECT IS EXEMPT FROM FURTHER CEQA REVIEW PURSUANT TO SECTIONS 15061(b)(3) AND 15301 OF STATE CEQA GUIDELINES; APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 077-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-32) Public hearing on proposed Resolution and Ordinance granting a new 20-year non-public utility pipeline franchise to Western Acres Mutual Water Company (Fiscal Impact: \$1,200 Administrative Fee; \$1,000 Estimated Annual Revenue; Not Budgeted; Discretionary) (S.D. #4) - OPENED HEARING; NO ONE HEARD; CLOSED HEARING; MADE FINDING ACTION IS EXEMPT FROM FURTHER CEQA REVIEW PER SECTIONS 15301 AND 15302(c) OF STATE CEQA GUIDELINES; ADOPTED RESOLUTION 2025-039; ENACTED ORDINANCE F-711

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-33) Update on emergency project for building improvements at the Mary K. Shell Mental Health Center located at 2151 College Avenue in Bakersfield (Fiscal Impact: None) (S.D. #5) - MADE FINDING THERE IS A NEED TO CONTINUE EMERGENCY PROJECT; RECEIVED AND FILED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-34) Proposed Amendment No. 2 to Agreement with Soils Engineering, Inc., providing engineering services for projects throughout Kern County, to increase compensation by \$100,000, for a new total amount not to exceed \$299,999 (Fiscal Impact: \$100,000; Budgeted; Discretionary) (All S.D.s) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 078-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-35) Proposed Amendment No. 1 to Agreement 100-2023 with Kitchell CEM, Inc., providing program management services at various locations throughout Kern County, to increase compensation by \$1,100,000, for a new total amount not to exceed \$1,400,000 (Various Projects) (Fiscal Impact: \$1,100,000; Budgeted; Discretionary) (All S.D.s) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 079-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-36) Proposed Amendment No. 2 to Agreement with BSK Associates providing engineering services for projects throughout Kern County, to increase compensation by \$100,001, for a new total amount not to exceed \$300,000 (Fiscal Impact: \$100,001; Budgeted; Discretionary) (All S.D.s) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 080-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-37) Proposed Amendment No. 1 to Agreement 018-2023 with AP Architects providing architectural consulting services for major maintenance and capital projects throughout Kern County, to increase compensation by \$200,000, for a new total amount not to exceed \$500,000 (Various Projects) (Fiscal Impact: \$200,000; Budgeted; Discretionary) (All S.D.s) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 081-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

COUNTY ADMINISTRATIVE OFFICE - Human Resources Division

- CA-38) Proposed selection of CVS Health, as the successful vendor in response to the Request for Proposal (RFP) for pharmacy benefits management services for County of Kern Legacy Health Plans (Fiscal Impact: None) - APPROVED; AUTHORIZED CHIEF HUMAN RESOURCES OFFICER TO NEGOTIATE AGREEMENTS

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-39) Proposed Side Letter Agreement to Agreement 447-2023 with Kern County Sheriff's Command Association to establish a designated starting and advance step, including eligibility for POST Supervisory Certificate Pay for Sheriff's Lieutenant and Commander classifications, effective February 22, 2025 (Fiscal Impact: \$396,249; Not Budgeted; Discretionary) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 082-2025; DIRECTED COUNTY ADMINISTRATIVE OFFICE, HUMAN RESOURCES DIVISION, AND AUDITOR-CONTROLLER-COUNTY CLERK TO IMPLEMENT

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-40) Proposed Side Letter Agreement to Agreement 449-2023 with Kern County Sheriff's Command Association III to include eligibility for POST Supervisory Certificate Pay, effective February 22, 2025 (Fiscal Impact: \$226,475; Not Budgeted; Discretionary) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 083-2025; DIRECTED COUNTY ADMINISTRATIVE OFFICE, HUMAN RESOURCES DIVISION, AND AUDITOR-CONTROLLER-COUNTY CLERK TO IMPLEMENT

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-41) Proposed new classifications titled Kern360 Human Capital Management Analyst, Item No. 2326, at salary range 64.0; Senior Kern360 Human Capital Management Analyst, Item No. 2325, at salary range 67.0; Kern360 Financial Analyst, Item No. 2329, at salary range 64.0; Senior Kern360 Financial Analyst, Item No. 2327, at salary range 67.0; and Kern360 Information Systems Analyst, Item No. 2439 at salary range 68.6 to Auditor-Controller, Budget Unit 1110, effective February 11, 2025 (Fiscal Impact: \$511,666; General Fund; Not Budgeted; Discretionary) - APPROVED; DIRECTED HUMAN RESOURCES DIVISION TO AMEND THE DEPARTMENTAL POSITIONS AND SALARY SCHEDULE

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

COUNTY ADMINISTRATIVE OFFICE - Information Technology Services  
Division

- CA-42) Proposed Amendment No. 2 to Personal/Professional Services Agreement (PPSA) 2407789 with General Data Tech for professional technical services, to increase the compensation by \$150,000 for a new total amount not to exceed \$350,000 (Fiscal Impact: \$150,000; Budgeted; Discretionary) - APPROVED; AUTHORIZED CHAIRMAN TO SIGN AGREEMENT 084-2025

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

MATTERS FOR EXECUTIVE APPROVAL

- CA-43) Budget Transfers - APPROVED NOS. 128 THROUGH 140

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-44) Minutes for week of January 6, 2025 - APPROVED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-45) Miscellaneous Letters and Documents - FILED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-46) Letters Received and Referred by Clerk of the Board - APPROVED AND FILED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

- CA-47) Claims and Lawsuits Filed with and Referred by Clerk of the Board - APPROVED AND FILED

**Couch-Peters: 4 Ayes; 1 Absent - Flores**

ADJOURNED TO TUESDAY, FEBRUARY 25, 2025 AT 9:00 A.M.

**Peters**

/s/ Kathleen Krause  
Clerk of the Board

/s/ Leticia Perez  
Chairman, Board of Supervisors

45) MISCELLANEOUS LETTERS AND DOCUMENTS - FILED

Auditor-Controller-County Clerk

- A) Information Report on 2024-2025 Project Tax Administration Costs per Revenue and Taxation Code 95.2
- B) Report on refunds (Government Code Section 26906) of erroneous deposits pursuant to Board Resolution 71-4
- C) Statement of Money in the County Treasury for the quarter ended September 30, 2024

Clerk of the Board

- D) Received, certified, and transmitted to Recorder for recordation as follows:
  - 1) Parcel Map 12161 S.D. #2
  - 2) Tract Map 7401 S.D. #2
- E) Letter from Charlie Van De Voorde resigning from the Golden Empire Transit District Board of Directors (Copies to each Supervisor and CAO)
- F) Letter from Jose J. Hernandez resigning from North Kern Cemetery District (Copies to each Supervisor and CAO)

Employers' Training Resource

- G) Workforce Innovation and Opportunity Act On-the-Job Training Agreements:
  - 1) Independent Fire and Safety Inc., WIOA Title 2088, dated January 6, 2025, Agt. D259118
  - 2) Bakersfield Family Medical Group, Inc., WIOA Title 501, dated January 7, 2025, Agt. D259126
  - 3) Bakersfield Family Medical Group, Inc., WIOA Title 201, dated January 10, 2025, Agt. D259132
  - 4) Bakersfield Family Medical Group, Inc., WIOA Title 201, dated January 10, 2025, Agt. D259133
  - 5) Mi Casita Services, Inc., DBA Mi Casita Taxes + Services, WIOA Title 201, dated January 10, 2025, Agt. D259134

Human Services

- H) Letter from California Department of Social Services re review conducted of Kern County's Work Incentive Nutritional Supplement (WINS) work participation rate

Kern County Hospital Authority

- I) Reports of Independent Auditors and Financial Statements for Kern County Hospital Authority as of June 30, 2024 (Copies to each Supervisor, CAO and County Counsel)

Treasurer-Tax Collector

- J) Cash Receipts and Disbursements for December 2024
- K) Pooled Cash Portfolio Reporting for Month Ended December 31, 2024

Miscellaneous

- L) Letter from Sierra Club Kern-Kaweah Chapter re Kern River riverbank in Hart Park (Copies to each Supervisor, CAO, County Counsel, and General Services)
- M) Letter from Kern County Farm Bureau re traffic situation caused by Granite Construction Company on Valpredo Avenue (Copies to each Supervisor, CAO, Planning, and County Counsel)
- N) Notices from California Highway Patrol re Hazardous Materials Incident Report on January 1, 2025, State Route 14, south of Meyer Road, Mojave; and January 1, 2025, Oak Creek Road, east of Tehachapi Willow Springs Road, Mojave (Copies to Fire and Environmental Health Services)
- O) Notice from Mojave Unified School District re fourteen day notice of proposal for public hearing to implement developer fees (Copies to each Supervisor and CAO)
- P) Email from Ron Fox re Wage Proposal/SEIU Contract (Copies to each Supervisor, CAO, Human Resources, and County Counsel)
- 46) LETTERS RECEIVED AND REFERRED BY CLERK OF THE BOARD - APPROVED AND FILED
  - A) Arvin-Edison Water Storage District Resolution No. 25-01 requesting the Board of Supervisors to appoint persons to office as Directors of Arvin-Edison Water Storage District - REFERRED TO COUNTY COUNSEL
  - B) Buena Vista Water District Resolution No. 4445 requesting the Board of Supervisors to appoint persons to office as Directors of Buena Vista Water Storage District - REFERRED TO COUNTY COUNSEL
  - C) Rosedale-Rio Bravo Water Storage District Resolution No. 545 requesting the Board of Supervisors to appoint persons to office as Directors of Rosedale-Rio Bravo Water Storage District - REFERRED TO COUNTY COUNSEL
  - D) Tejon Industrial Corp. (TIC) petition pursuant to California Vehicle Code (CVC) Section 21107.7(a) requesting Board of Supervisors adopt a resolution to enforce CVC section on property owned by TIC - REFERRED TO PUBLIC WORKS (Copies to each Supervisor, CAO, and County Counsel)
- 47) CLAIMS AND LAWSUITS FILED WITH AND REFERRED BY CLERK OF THE BOARD - APPROVED AND FILED
  - A) Claim in the matter of Yvette Adkins - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
  - B) Claim in the matter of Jose Rodrigo Aguilera - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
  - C) Claim in the matter of Carlos Castillo Ayon - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
  - D) Claim in the matter of Cesar Castillo Ayon - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)



- E) Claim in the matter of Cristina Castillo Ayon - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- F) Claim in the matter of Eduardo Castillo Ayon - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- G) Claim in the matter of Emma Easley by and through guardian ad litem Tina Easley individually and on behalf of Courtney Easley - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- H) Claim in the matter of James Easley - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- I) Claim in the matter of Tina Easley - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- J) Claim in the matter of David James Fluhart - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- K) Claim in the matter of Daniel Latam - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- L) Claim in the matter of Sophia Valerie Lopez - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- M) Claim in the matter of Zenith Insurance Company - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- N) Claim in the matter of Yvonne Nortey - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- O) Claim in the matter of Anahi Orozco - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- P) Claim in the matter of Pacific Hydrotech Corporation - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- Q) Claim in the matter of Amalia Ramos individually and as guardian of the estate of Alejandro Perez Jr. - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- R) Claim in the matter of Lasharon Riley - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- S) Two claims in the matter of Maria Alicia Rios by Jose Rios - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- T) Application for Permission to Present a Late Claim in the matter of Rolando Rivera individually and as legal guardian of E.P., a minor - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- U) Claim in the matter of Laura Schultz - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- V) Claim in the matter of Christina Sparks - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- W) Claim in the matter of Gracynn Yerena and Jacob Duford - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)

- X) Claim in the matter of Joe Young - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- Y) Application for Leave to Present a Late Government Tort Claim for Damages in matter of C.B. v. County of Kern, et al. - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- Z) Summons and Complaint in the matter of David Amaya v. County of Kern, et al. (Superior Court Case No. BCV-24-103650) - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- AA) Summons and Complaint in the matter of Melva Hodge v. County of Kern, et al. - (Superior Court Case No. BCV-25-100081) - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- BB) Summons and Complaint in the matter of Diane Reese v. County of Kern, et al. (Superior Court Case No. BCV-24-103284 - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- CC) Summons and Complaint in the matter of Cayetana Elena Hernandez Juarez v. County of Kern, et al. (Superior Court Case No. BCV-25-100098) - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)
- DD) Cross-Defendant 209 Trucking, Inc.'s Answer to Cross-Complainant's Cross-Complaint in the matter of Coleen Van Tassel, individual and successor-in-interest of Robert Van Tassel, et al. v. County of Kern, et al. (Superior Court Case No. BCV-24-100702) - REFERRED TO COUNTY COUNSEL (Copy to Risk Management)

## 4.8 Noise and Vibration

### I. Introduction

- A. Names:** Victor Young, Curt Hildebrand, Andrew McGillis, Laurel Lees and Victor Grille
- B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.
- C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024.
  - Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024.
  - Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
  - Exhibit 1034, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendices 5.6A-5.10A (21-AFC-02) (TN 254807), March 4, 2024.
  - Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315), January 27, 2025
  - Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315), January 27, 2025.
  - Willow Rock Preliminary Staff Assessment Comments Report (21-AFC-02) (TN # 264316), June 16, 2025.
  - Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

### II. Summary of Testimony

#### A. Affected Environment

The terrain surrounding the WRESC Site is mostly flat at an elevation of approximately 2,500 feet with slight increases to elevation at distances greater than 1 mile from the WRSEC site in multiple directions. The Project Area is sparsely populated with some residential land use accessed from roadways. Land-use in the Project's vicinity is primarily undeveloped and unoccupied private land located within the regional State Route (SR) 14 and Sierra Highway transportation corridors. The impact area for the noise study included receptors located within 2 miles of the Project because the immediate area is sparsely populated, and noise attenuates with distance.

The receptors most sensitive to noise typically include residences, hospitals, schools, parks, and churches. These receptors are identified as noise sensitive area (NSA) locations in the *Kern County General Plan, Noise Element, 3.2 Noise Sensitive Areas*. There are no hospitals, schools, parks, or churches in the immediate Project Area. The closest NSA locations are all residences; no other NSA locations are located within 2 miles of the WRESC Site.

Existing sources of noise in the Project Area include highway noise from SR 14 and Sierra Highway, local roadway noise, railroad operations, and sounds of nature typical to the high desert area. The existing noise environment (baseline) was quantified during a field noise survey where ambient noise was measured and recorded.

## **B. Potential Construction and Operational Impacts**

Construction of the Project is expected to be typical of other conventional power plants in several aspects, including the schedule, equipment used, and other types of activities. In addition to these aspects, there will be atypical construction phases for power plant construction. These atypical activities include the removal and hauling of overburden and the digging/drilling of shafts like that of a mine. The noise level will vary during the construction period depending on the construction phase. To avoid underestimating potential impacts, the noise assessment modelled the construction stage of the Project based on the largest planned equipment fleet (i.e., maximum planned noise emissions).

Construction of the Project will require the excavation of a compressed air storage cavern at a target depth of approximately 2,000 to 2,500 feet below the ground surface in hard bedrock. Conventional excavation using mechanical excavators will be used for at least the first 50 to 65 ft of depth until hard rock is encountered.. Below 50ft, controlled detonation may be used to supplement conventional shaft drilling. Once the vertical shafts have been drilled down to the target depth, controlled detonation of explosives is expected to be used to complete the excavation of the storage cavern. This will include controlled detonations to excavate the main cavern, as well as controlled detonations for benching.

Operation of the Project is expected to be typical of other conventional power plants, including schedule, equipment used, and other types of activities. To avoid underestimating potential impacts, the noise assessment modelled the operation stage of the Project based on continuous operation of all major equipment (i.e., maximum planned noise emissions).

Potential noise and vibration impacts from construction and operation of the Project could include general annoyance, interference with outdoor speech comprehension, and sleep disturbance. However, as discussed below, these potential noise and vibration impacts have been mitigated to an acceptable level.

## **C. Summary of Potential Cumulative Impacts**

Potential cumulative impacts were assessed by summing predicted noise levels from Project construction and operations with existing ambient noise levels (established via baseline measurements) to obtain cumulative noise levels at NSA locations during future Project construction and operations. Cumulative noise levels were then compared to existing ambient noise levels to quantify the Project-related change to the existing acoustic environment. At all NSA locations, the Project-related increase to existing noise levels was found to be less than the 5 A-weighted decibel (dBA) threshold that is typically considered a significant impact.

## **D. Avoidance and Minimization Measures**

The following measures will be implemented to avoid and mitigate potential noise and vibration impacts.

- Establish a telephone number for use by the public to report any significant undesirable noise and/or vibration conditions associated with construction and operation of the Project. If the telephone line is not staffed 24 hours per day, it will include an automatic answering feature with date and time stamp recording to answer calls when telephone line is unattended. The telephone number will be posted at the WRESC Site during

construction in a manner visible to passerby. The telephone number will be maintained until the Project has been operational for at least one year.

- Throughout Project construction and operation, the Project owner will document, investigate, evaluate, and attempt to resolve all legitimate noise and/or vibration complaints. The Project owner (or authorized agent) will:
  - Make use of the Noise Complaint Resolution Form suggested by CEC (or a functionally equivalent procedure) to document and respond to complaints.
  - Attempt to contain the complainant within 24 hours.
  - Investigate to determine the specific source of noise or vibration that has triggered the complaint.
  - If the complaint is found to be legitimate, take all feasible measures to reduce the noise and/or vibration at its source.
- Heavy equipment operation and noisy construction work relating to any Project features, including linear facilities and pile driving within 1,000 feet of any occupied residential dwelling, and controlled detonations shall be restricted to:
  - Mondays through Fridays: 6 am to 9 pm
  - Saturdays and Sundays: 8 am to 9 pm
- Use a biological monitor to observe wildlife behavior during Project construction to determine if sensitive wildlife species and/or nesting birds protected under the Migratory Bird Treaty Act are noticeably affected by construction noise or vibration. If required, implement mitigation measures to reduce impacts to sensitive wildlife and/or nesting birds. Wildlife mitigation measures could include limiting the amount of time loud equipment is used, creating no-work buffer zones around sensitive species/active bird nests, and/or reducing activity periods to avoid working at dusk and dawn.

#### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with all applicable laws, ordinances, regulations, and standards (LORS).

### **III. Response to Certain Issues Raised in the FSA**

No comments on the FSA.

### **IV. Proposed Licensing Conditions**

The FSA proposes six Conditions of Certification for this subject matter. We agree with the Conditions of Certification as set forth in the FSA for noise and vibration, except as set forth below.

#### **A. Proposed Revisions to Condition NOISE-4**

This condition requires a survey to measure noise levels at NSA-1 and NSA-7 once the Project achieves a sustained output of 85 per cent or greater of rated capacity.

At NSA-1, condition NOISE-4 establishes noise thresholds for the survey at “ambient + 5 dBA” (i.e., noise from Project operations should not increase existing noise levels by more than 5 dBA) since increases greater than 5

dBA are typically considered a significant impact. More specifically, the daytime threshold for NSA-1 is 55 dBA (i.e., 50 dBA ambient + 5 dBA) and the nighttime threshold is 54 dBA (i.e., 49 dBA ambient + 5 dBA).

At NSA-7, condition NOISE-4 establishes noise thresholds of 46 dBA (daytime) and 43 dBA (nighttime). It is not clear if or how the FSA considered existing ambient noise levels at NSA-7 when establishing these specific thresholds. Given that Section 5.9.2.2 of the FSA indicates the “...*estimated long-term ambient noise level at NSA-7 [is] approximately 44 dBA Leq during daytime and 39 dBA Leq during nighttime*” (see page 5.9-9), we recommend that the thresholds for NSA-7 in condition NOISE-4 be adjusted to 49 dBA during the daytime period (i.e. 44 dBA ambient + 5 dBA) and 44 dBA during the nighttime period (i.e., 39 dBA ambient + 5 dBA).

In summary, we recommend the following adjustments to the first two paragraphs of NOISE-4:

The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that noise due to the operation of the project **plus ambient** will not exceed 55 dBA Leq during daytime hours of 7 A.M. to 10 P.M. and 54 dBA Leq during nighttime hours of 10 P.M. to 7 A.M. at NSA-1.

The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that noise due to operation of the project plus ambient will not exceed ~~46~~ **49** dBA Leq during daytime hours ~~of~~ 7 A.M. to 10 P.M. and ~~43~~ **44** dBA Leq during nighttime hours of 10 P.M. to 7 A.M. at NSA-7.

## 4.9 Public Health

### I. Introduction

- A. **Names:** Gregory Darwin, Curt Hildebrand, Victor Grille and Andrew McGillis
- B. **Qualifications:** The panel’s qualifications are as noted in their resumes contained in Appendix A.
- C. **Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
  - Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
  - Exhibit 1032, Willow Rock Energy Storage Center SAFC - Volume 1, Part B (TN 254805), March 1, 2024
  - Exhibit 1033, Willow Rock Energy Storage Center SAFC - Volume 1, Part A (TN 254806), March 1, 2024
  - Exhibit 1034, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendices 5.6A-5.10A (21-AFC-02) (TN 254807), March 4, 2024.
  - Exhibit 1070, Willow Rock Data Adequacy Response (TN 256622), May 31, 2024
  - Exhibit 1111, CEC Data Response Set 2, Willow Rock Energy Center, (TN 259220), September 19, 2024
  - Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

### II. Summary of Testimony



#### **A. Affected Environment**

The Willow Rock site is situated in Kern County census tract 5514, which has a population value of 5964 individuals per the 2020 estimate from the United States Census Bureau. Section 2, Project Description, contains a detailed project description, location maps, and other related technical data.

The Draft 2022 Annual AB 2588 Air Toxics Report for EKAPCD dated September 12, 2022, identifies that there is only one Category 1 (high-level risk) facility in the EKAPCD that has a cancer risk exceeding 10 per million or a total hazard index exceeding 1.0. Twelve facilities are listed as Category 2 (intermediate level risk) and 12 facilities are listed as Category 3 (low-level risk). No facilities pursuant to the 2022 draft report have been required to prepare risk reduction and audit plans.

#### **B. Potential Construction and Operational Impacts**

During construction, toxic air emissions in the form of diesel particulate matter (DPM) will be emitted to the atmosphere due to combustion of fuel in reciprocating internal combustion engines (off-road and on-road mobile sources), traffic on internal site unpaved roads, bulldozing, grading, rock crushing, a cement batch plant, and material movement. These construction impacts will be temporary and finite in duration. Construction impacts to public health were determined by air dispersion modeling and the use of the California Air Resources Board (CARB) health risk model, which demonstrated compliance with the applicable significant impact levels. The construction health risk impacts were determined to be insignificant.

During operations, the WRESC will not routinely operate combustion units or emit regulated toxics (DPM) into the atmosphere. Regulated emissions of toxics will only occur from the stationary internal combustion engines for maintenance and readiness testing or in the emergency event of a fire or power outage. Only two of the 2.5 MW engines are required to support critical loads. The third engine is redundant and only one engine is assumed to operate at any given time for purposes of maintenance and readiness testing. There will also be a diesel fuel-fired fire pump engine. This diesel pump is a backup to an all-electric pump. Operational impacts to public health were determined by air dispersion modeling and through the use of the CARB health risk model, which demonstrated compliance with the applicable significant impact levels. The operational health risk impacts were determined to be insignificant.

#### **C. Summary of Potential Cumulative Impacts**

There are no existing sources within six miles of the project boundary that would require a cumulative impact assessment.

#### **D. Avoidance and Minimization Measures**

None in addition to those incorporated into the project design.

#### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with all applicable laws, ordinances, regulations and standards (LORS).

### **III. Response to Certain Issues Raised in the FSA**

No comments on the FSA.

### **IV. Proposed Licensing Conditions**

The Applicant agrees with the Air Quality Conditions of Certification PH-1 as proposed in the FSA.

## 4.10 Socioeconomics and Environmental Justice

### I. Introduction

- A. Names:** Jeremy Paris, Jimena Cadillo-Aldama, Kyralai Duppel, Bakai Ruslanbek Uulu, Curt Hildebrand, Victor Grille and Andrew McGillis
- B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.
- C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
  - Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024.
  - Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
  - Exhibit 1034, Supplemental Application for Certification, Willow Rock Energy Center Volume II, Appendices 5.6A-5.10A (21-AFC-02) (TN 254807), March 4, 2024.
  - Exhibit 1090, Willow Rock Data Request Set 1 Response Report (TN #258681), August 23, 2024
  - Exhibit 1070, Willow Rock Data Adequacy Responses (TN 256622), May 31, 2024
  - <https://efiling.energy.ca.gov/GetDocument.aspx?tn=264316&DocumentContentId=101033>
  - Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

### II. Summary of Testimony

#### A. Affected Environment

The area surrounding the WRESC is sparsely populated, with approximately 24,376 residents living within a 10-mile radius of the project site, based on U.S. EPA EJScreen Mapper data. Of this total population, about 60 percent identify as people of color (POC), according to the 2020 Decennial Census. Within this 10-mile buffer, six census tracts meet the Council on Environmental Quality (CEQ) threshold for identifying minority or POC populations, meaning more than half of the residents in those tracts identify as POC.

In terms of income distribution, American Community Survey (ACS) data from 2017–2021 estimate that roughly 31,776 people within the same 10-mile area have poverty status determined, and approximately 35 percent of that population is considered low-income. While federal environmental justice (EJ) guidance does not provide a definitive threshold for identifying low-income populations, this analysis used the same 50 percent benchmark applied to POC populations. Based on this metric, no census tracts within the 10-mile radius meet the criteria for being classified as a low-income population under this analysis.

Overall, the project area includes several census tracts that qualify as POC communities under CEQ guidance, though no tracts exceed the threshold for low-income population concentration. These demographic conditions inform the environmental justice context for the WRESC and helped guide the evaluation of potential effects.

Based on the skilled labor requirements and the existing workforces in Kern County, local labor pools will be adequate to fulfil WRESC's non-specialized construction labor requirements. Furthermore, the Los Angeles-Long Beach-Glendale Metropolitan Division and the Riverside-San Bernardino-Ontario Metropolitan Statistical Area maintain large construction workforces and are located within 2 hours of the WRESC.

## **B. Potential Construction and Operational Impacts**

There are no anticipated disproportionately high and adverse human health or environmental effects from the construction and operation of the WRESC project. Therefore, none of the impacts of this project are high and adverse in the context of EO 12898. As such, no disproportionately high and adverse human health or environmental effects will fall disproportionately on POC or low-income populations.

## **C. Summary of Potential Cumulative Impacts**

Cumulative impacts on socioeconomics could occur if the effects from the development of the WRESC and other past, present, and reasonably foreseeable probable projects impact the study area's social cohesion. The spatial setting for the analysis of cumulative impacts is roughly equal to the western Antelope Valley portion of Kern County, and the temporal setting is defined as the time between the known past and the life of the Project (estimated 50 years). Types of foreseeable developments within the spatial setting include new industrial facilities such as the Mojave Micro Mill project, Gem Hill Quarry project, new energy facilities, residential development, and various development projects.

While potential cumulative impacts to socioeconomics from the WRESC may occur when combined with past, present, and reasonably foreseeable projects, they are not anticipated to be significant. For instance, the surrounding communities maintain well-established workforces and sufficient permanent and temporary housing to support the Project. The conducted analysis of socioeconomics has demonstrated that the Project will represent an economic benefit for the study area and that the study area maintains adequate available housing and skilled workforces. For these reasons, the WRESC will not cause a significant cumulative impact on socioeconomics within the study area.

## **D. Avoidance and Minimization Measures**

A key component of compliance with EO 12898 is outreach to the potentially affected POC and/or low-income population to identify issues of importance that may not otherwise be apparent. As part of the AFC process, the Applicant and the CEC have provided information to residents in the area and provide opportunities for their involvement.

The CEC and/or the Applicant have in this case:

- Mailed written notice to all property owners within 1,000 feet of the site and within 500 feet of the centerline of all linear corridors.
- Published notice in the local newspaper announcing public workshops and hearings.
- Provided access to information by submitting copies of key documents to local libraries and providing materials via a web page.

- Held hearings and workshops in the local community.
- Coordinated with the Public Advisor to assist the public in participating in the process.

#### **E. Summary of Compliance with Applicable LORS**

The following LORS are found to be applicable to the Project and the socioeconomics assessment has been conducted in conformance with all applicable LORS.

- Executive Order 12898 - Note: President Trump signed Executive Order 14173, titled "Ending Illegal Discrimination and Restoring Merit-Based Opportunity," on January 21, 2025. This EO explicitly rescinded Executive Order 12898. The analysis for Socioeconomics in the SAFC remains consistent with the data adequacy requirements stated in Appendix B (g) (7) (B) (xiii) of the CEC's siting regulations. California Education Code, section 17620
- California Code Government Code, sections 65995-65998
- Mojave Unified School District Board Policy

### **III. Response to Certain Issues Raised in the FSA**

No comments on the FSA.

### **IV. Proposed Licensing Conditions**

The Applicant agrees with the Socioeconomics Conditions of Certification SOCIO-1 and SOCIO-2 as proposed in the FSA.

#### **4.11 Solid Waste Management**

##### **I. Introduction**

- A. Names:** Betsy Mitton, Curt Hildebrand, Andrew McGillis and Victor Grille
- B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.
- C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
  - Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024.
  - Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024.
  - Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
  - Exhibit 1037, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.13A-5.14A (TN 254810), March 1, 2024
  - Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025
  - Willow Rock Data Request Set 1 Response Report, Attachment DR2-5 (Exhibit number and TN to be assigned)

- Willow Rock Data Request Set 1 Response Report, Attachment DR2-6 (Exhibit number and TN to be assigned)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

The WRESC will be located about 3.5 miles north of Rosamond, California. As discussed in Section 5.6, Land Use, the immediate vicinity is dominated by what appears to be undeveloped or empty lots of land. The nearest residence is approximately 1 mile north of the WRESC Site. No schools or medical facilities are present within a 3-mile radius of the WRESC Site. Businesses are present in central Rosamond, approximately 3.5 miles south of the WRESC Site, many along Rosamond Boulevard.

### **B. Potential Construction and Operational Impacts**

Nonhazardous waste, hazardous waste, and wastewater will be generated during the pre-construction, construction, operation, and decommissioning phases. The disposal of nonhazardous waste, including construction waste, municipal waste, and operational garbage, will be disposed of at a Class III landfill. When practical, nonhazardous waste will be recycled to the extent possible. What cannot be recycled will be disposed of at any of the permitted landfills. The facility will comply with all applicable laws and regulations for the management and disposal of nonhazardous waste.

Hazardous waste, including both construction and operational waste, will be recycled or disposed of at a permitted treatment, storage, and disposal facility. Hazardous waste generated at the WRESC facility will not be stored onsite for more than 90 days following its generation date and will be transported offsite by a permitted hazardous waste transporter.

Proper use and storage of nonhazardous and hazardous wastes will minimize potential for accidental release. Additionally, the Applicant will conduct an emergency response planning session to address public health concerns regarding hazardous management.

### **C. Summary of Potential Cumulative Impacts**

None identified.

### **D. Avoidance and Minimization Measures**

General industry health, safety and environmental Best Management Practices will be implemented for the proper handling and disposing of nonhazardous and hazardous wastes including approved procedures for proper recording, labeling, storage, and packaging.

### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply all applicable laws, ordinances, regulations and standards (LORS).

## **III. Response to Certain Issues Raised in the FSA**

No comments on the FSA

## IV. Proposed Licensing Conditions

The Applicant agrees with the Solid Waste Management Conditions of Certification Solid Waste-1 as proposed in the FSA.

### 4.12 Transmission Line Safety and Nuisance

#### I. Introduction

- A. Names:** David Stein, Curt Hildebrand, Andrew McGillis, Cavan Lee, Victor Grille and Cody Niehus
- B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.
- C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024.
  - Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
  - Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024.
  - Exhibit 1040, Hi Res Figures V1 File 1 of 2 (TN 254813), March 4, 2024
  - Exhibit 1041, High Resolution Figures WRESC SAFC 2 of 2 (TN 254814), March 4, 2024
  - Exhibit 1115, Attachment DR26-1-Utility Pole Locations Map Book (TN 259490), September 27, 2024
  - Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025
  - Exhibit 1127, Attachment DR84-1\_Confidential (TN 260240) [includes - Project components, proposed access roads and proposed transmission line poles], October, 28, 2024
  - Exhibit 1070, Willow Rock Data Adequacy Response (TN 256622), May 3, 2024
  - Willow Rock Data Adequacy Response, Attachment TSSN-1 (Exhibit number and TN to be assigned)
  - Willow Rock Data Request Set 2 Response, Attachment DR35-1 (Exhibit number and TN to be assigned)
  - <https://efiling.energy.ca.gov/GetDocument.aspx?tn=259675&DocumentContentId=95818>
  - <https://efiling.energy.ca.gov/GetDocument.aspx?tn=260808&DocumentContentId=97119>

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

#### II. Summary of Testimony

##### A. Affected Environment



The WRESC will be a nominal 520-megawatt (MW) gross (500 MW net) and 4,160 megawatt-hour (MWh) gross (4,000 MWh net) facility using Hydrostor, Inc.'s proprietary, advanced compressed air energy storage (A-CAES) technology. Energy stored at the WRESC will be delivered to Southern California Edison's (SCE's) Whirlwind Substation located southwest of the WRESC at the intersection of 170th Street W and Rosamond Boulevard, via a new approximately 19-mile 230-kilovolt (kV) generation-tie (gen-tie) line.

The proposed gen-tie would consist of a single-circuit, double-bundle gen-tie line connection, which would require overhead and underground line segments. The overhead line segment would construct with 60 to 140-foot steel transmission poles, spaced approximately 200 to 800 feet apart.

The gen-tie line overhead line segment would be built with aluminum conductor steel reinforced (ACSR) double bundle 1590 thousand circular mils (kcmil) 54/19 "Falcon" conductors. The conductor's current carrying capacity is approximately 1,359 amperes per conductor. One shield wire with an integrated fiber optic cable will be installed with the new gen-tie line associated with the project. The fiber optic cable will be used for any necessary communications within SCE's transmission system. The underground line segment of the gen-tie will be constructed with 2000 kcmil parallel single conductor copper shielded cables. The cable's current carrying capacity is approximately 885 amperes per cable.

The electrical system is protected (protection schemes by utilizing Supervisory Control and Data Acquisition (SCADA)) against ground faults that result in unit ground potential rises.

## **B. Potential Construction and Operational Impacts**

The Federal Aviation Administration (FAA) has established standards and a process for assessing whether structures pose a potential hazard to navigable airspace. The process commences with the mandatory filing of a FAA Form 7460-1 Notice of Construction (NOC) for any proposed structures that exceed 200 feet in height of penetrate imaginary navigable airspace boundaries defined in the regulations.

The closest airport to the project is a small privately-owned, public use airport, Rosamond Skypark, located at 400 Knox Avenue, approximately two miles west of Rosamond.

The WRESC Site is located approximately 3.75 miles northwest of the closest runway edge at Rosamond Skypark. All of the WRESC site structures are less than 100 feet. And at this distance, none of the proposed WRESC site structures would penetrate the imaginary airspace boundaries that would trigger the requirement for filing a FAA NOC. However, a portion of the WRESC gen-tie line passes along Mojave-Tropico Road within approximately 0.9 miles west of the closest runway edge at Rosamond Skypark. NOCs were filed for these poles and the Applicant received a Determination of No Hazard for them. Depending on the final placement of transmission poles in this area, there may be some transmission structures that would require new or revised FAA NOCs. If new or revised NOCs are required, due to the distance from the airport, it is expected that FAA would issue a Determination of No Hazard.

The Applicant completed an assessment of electromagnetic field (EMF) strength, corona noise, and TV/IR interference associated with the gen-tie line that demonstrates that these would pose an insignificant public safety or nuisance concern.

## **C. Avoidance and Minimization Measures**

The Applicant will file new or revised NOCs to the FAA for any structure that triggers the FAA NOC requirement as required by proposed condition LAND-4. Due to the distance of the gen-tie line from the airport, it is expected that FAA will issue a Determination of No Hazard if NOCs are required to be filed.

#### **D. Summary of Compliance with Applicable LORS**

The WRESC will comply with applicable LORS.

### **III. Response to Certain Issues Raised in the FSA**

The FSA incorrectly states that the nearest airport to the project site is Meadows Field Municipal Airport (28 miles). This leads to an inaccurate assessment that FAA NOC requirements may not apply. The FSA analysis of FAA requirements and potential for air navigation hazard is, however, correctly reflected in the Land Use, Agriculture and Forestry section of the FSA and the Applicant is in agreement with that analysis and condition LAND-4, which directs the Applicant to file FAA NOCs for any new transmission or relocated pole that triggers the FAA NOC requirement.

The Applicant is otherwise in agreement with the findings and conclusions of this section of the FSA.

### **IV. Proposed Licensing Conditions**

The Applicant is in agreement with the Transmission Line Safety and Nuisance conditions of certification as proposed in the FSA.

#### **4.13 Transportation**

##### **I. Introduction**

**A. Names:** Vamshi Akkinapally, Laurel Lees, Curt Hildebrand and Victor Grille

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
- Exhibit 1032, Willow Rock Energy Storage Center SAFC - Volume 1, Part B (TN 254805), March 1, 2024
- Exhibit 1033, Willow Rock Energy Storage Center SAFC - Volume 1, Part A (TN 254806), March 1, 2024
- Exhibit 1070, Willow Rock Data Adequacy Response (TN 256622), May 31, 2024
- Exhibit 1089, Willow Rock Traffic Study Report (TN 258518), August 15, 2024
- Exhibit 1077, Summary of the Level of Service (LOS)- Based Traffic Study Methodology to be Implemented for the Willow Rock Energy Storage Center (TN 257525), June 28, 2024
- Exhibit 1111, Willow Rock Data Request Set 2 Response (TN 259220), September 19, 2024
- Exhibit 1153, Consolidated Email Responses to CEC Staff on Lahontan's February 26, 2025, Request for Additional Information (TN# 261932), (TN 262349), March 25, 2025
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN #264316), June 16, 2025
- Willow Rock Data Adequacy Response, Attachment TRAN-1 (Exhibit number and TN to be assigned)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

The Willow Rock Energy Storage Center (WRESC or Willow Rock) will be located on approximately 88.6 acres of private land north of Dawn Road between State Route 14 (SR 14) and Sierra Highway in unincorporated southeastern Kern County, California. The primary access to the WRESC site will be from Dawn Road. Temporary access during construction will be crushed rock driveways from both Dawn Road and Sierra Highway.

### **B. Potential Construction and Operational Impacts**

The construction of the facility from site preparation and grading to full-scale operation is expected to take approximately 60 months. The peak construction related trips are expected to occur in month 34 with an estimated construction traffic of 1,498 employee vehicles one-way trips or 799 vehicle round trips and 364 trucks one-way trips or 182 round trips per day. It is assumed that 15% of workforce will be locally recruited non-specialized workers and the remaining 85% of the workforce with special skills will be recruited from areas outside of the county and will reside in hotels in nearby communities. They are all expected to arrive in personal vehicles. All workers are expected to arrive during the AM peak hour and depart during the PM peak hour. 95% of the total workforce and rock hauling trucks are expected to use SR 14 and the remaining 5% of workers and haul trucks are expected to use Sierra Highway to access the site. Water delivery trucks to the site are expected to use SR 14. A level of service (LOS) analysis was conducted to evaluate the existing (2024), year 2028 before construction, and year 2028 during construction traffic operations at the study area intersections. Traffic counts were collected on June 25, 2024, and traffic forecasts for year 2028 were developed using a growth factor of 2% per year. All study intersections are projected to operate at LOS D or better under year 2028 During Construction traffic conditions, except for the SR 14 SB Ramps & Dawn Road intersection. The intersection is projected to operate at LOS F during the PM peak hour. Vehicles making southbound left-turn from SR 14 off-ramp on to Dawn Road would experience delays during the PM peak hour due to the additional construction-related traffic on Dawn Road.

During project construction, the daily trips made by the workers and other construction vehicles would result in an increase in vehicle miles traveled (VMT). However, this increase in VMT would be temporary, only for the duration of the construction phase.

During project operations, it is estimated that the project will generate 80 daily trips and 30 trips during AM and PM peak hours, each. The operations trips are significantly lower than the estimated construction trips, and therefore the effects of operations traffic would be significantly lower than construction conditions. The daily trips generated during operation of the WRESC project will result in an insignificant increase in VMT.

### **C. Summary of Potential Cumulative Impacts**

The proposed project would lead to a less than significant cumulative impact on the local transportation system when considered in the context of past, present and reasonably foreseeable future projects.

### **D. Avoidance and Minimization Measures**

The project applicant would develop a Construction Traffic Management Plan (CTMP), which would include traffic control measures such as providing flaggers during peak hours at the SR 14 SB Ramps & Dawn Road

intersection. Using flagger, the intersection would operate like an all-way stop control and can result in reduced average intersection delay.

#### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with all applicable laws, ordinances, regulations and standards (LORS).

### **III. Response to Certain Issues Raised in the FSA**

The Applicant is proposing a modification to COC TRANS-2 as proposed in the FSA to be consistent with commitments made to Kern County regarding the timing of road improvements on Dawn Road.

### **IV. Proposed Licensing Conditions**

The Applicant agrees with the Transportation Conditions of Certification (TRANS-1, TRANS-3, and TRANS-4) as proposed in the FSA. The applicant requests the following modifications to TRANS-2:

**TRANS-2** The project owner shall provide an irrevocable offer of dedication to Kern County for the following roadways:

- Dawn Road: 55 feet from the centerline along the entire subject property and the off-site portion from the westerly project boundary to the westerly boundary of Lot 3 of County Parcel Map No. 260.
- Sierra Highway: 45 feet from the centerline on both sides, totaling 90 feet in width.

**Concurrent with the site mobilization and grading activities,** ~~Prior to construction,~~ the project owner shall also **commence construction of** ~~construct~~ an asphalt concrete paved road approach at the proposed Dawn Road entrance at Sierra Highway, extending 200 feet into the project site.

Prior to the commencement of operations, the project owner shall pave Dawn Road from the project entrance westerly to the Caltrans boundary at SR 14. The paving shall meet Type B Standards, including:

- 60-foot-wide roadway with paved shoulders
- Structural sections suitable for heavy truck traffic
- Asphalt concrete surfacing and necessary tie-ins

The project owner shall ensure that site access intersections and corresponding roadway and parking improvements are designed according to standards adopted by Kern County and, where applicable, Caltrans, to ensure safe ingress and egress at the project access intersections during the construction and operation phases.

**Verification:** The project owner shall ensure that all proposed on-site access and parking improvement plans for both the construction and operation phases are submitted to Kern County and Caltrans for review and comment, and to the CPM for review and approval before construction begins.

The project owner shall offer right-of-way dedication for the segments of Dawn Road and Sierra Highway adjacent to the project site prior to the start of construction.

**Concurrent with the site mobilization and grading activities,** ~~Prior to construction,~~ the project owner shall obtain an encroachment permit from the Kern County Public Works Department to construct an asphalt concrete paved road approach at the proposed Dawn Road entrance at Sierra Highway, extending 200 feet into the project site.

Prior to the commencement of operations, the project owner shall obtain an encroachment permit from the Kern County Public Works Department and pave Dawn Road from the project entrance west to the Caltrans right-of-way at SR 14.

The project owner shall also obtain an encroachment permit from Caltrans prior to construction for any site access improvements within Caltrans right-of-way.

## 4.14 Visual Resources

### I. Introduction

- A. Names:** Daryl Harrison and Laurel Lees
- B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.
- C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:
- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024.
  - Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024.
  - Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806), March 1, 2024.
  - Exhibit 1037, Willow Rock Energy Storage Center Supplemental AFC Volume II-Appendix 5.13A-5.14A (TN 254810), March 1, 2024
  - Exhibit 1040, Hi Res Figures V1 File 1 of 2 (TN 254813), March 4, 2024
  - Exhibit 1041, High Resolution Figures WRESC SAFC 2 of 2 (TN 254814), March 4, 2024
  - Exhibit 1070, Willow Rock Data Adequacy Response (TN 256622), May 3, 2024
  - Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025
  - Willow Rock Data Adequacy Response, Attachment VIS-2 (Exhibit number and TN to be assigned)

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

### II. Summary of Testimony

#### A. Affected Environment

The Project will be located in unincorporated Kern County, north of Rosamond, California. The regional landscape surrounding the Project is characterized by the flat and gently sloping upper desert terrain of the Antelope Valley region of the western Mojave Desert, bounded by the Tehachapi Mountains to the northwest and the Liebre-Sawmill Mountains to the southwest. Regional topographical features include several small hills in proximity to the Project (i.e., Rosamond Hills, Tropico Hill, and Soledad Mountain, Willow Springs Butte). Vegetation in the area is dominated by a mixture of grasses, cacti and desert scrub habitats.

Evident land use patterns in the region are primarily rural residential, commercial, and industrial land uses (e.g., wind and solar facilities) in addition to large areas of open space and agricultural land uses. Mining activity is also visible within the landscape (e.g. Golden Queen Mine on Soledad Mountain). Communities within the region include Willow Springs, Rosamond, Lancaster, and Mojave.

No eligible or designated scenic highways have been identified within the vicinity of the Project. No designated scenic vistas or scenic resources have been identified surrounding the Project.

The landscape surrounding the Project has limited sources of artificial light at nighttime. The nighttime viewing conditions are influenced by existing lighting from rural residences, industrial facilities, and ambient lighting from nearby communities (i.e., Rosamond). No street lighting exists along local roadways, although cars and trucks on SR 14 are a potential source of temporary light.

## **B. Potential Construction and Operational Impacts**

The Project site covers approximately 86 acres of currently undeveloped land with vegetated landcover consisting of scrub and grassland species. An additional 133 acres of private land surrounding the Project site will be allocated for potential temporary staging and laydown area during construction, or the construction of a permanent architectural berm constructed from the material excavated during cavern construction. Land clearing, landform modifications, and the installation of built structures (i.e., site facilities, reservoir, and an overhead gen-tie line) may result in visual alterations to the existing landscape conditions during construction and operation.

### *Construction:*

During the construction period, materials, large equipment, trucks, and parked vehicles will be present in laydown areas. Nighttime construction is anticipated primarily for the cavern excavation process and some intermittent and localized 24-hour construction activities.

When nighttime construction activity is required, all necessary temporary lighting will be directed on work areas and away from nearby residences. This would result in a temporary increase in perceivable light sources and light levels at viewing locations adjacent to the Project. As a result, it is anticipated that there will be a short-term impact to skyglow and light pollution.

### *Operations:*

Visual impacts were assessed based on photo-composite images at seven key observation point (KOPs) presented in Appendix 5.13A, representing the viewing conditions at 1-year post construction, and technical visual analysis methods. The predicted visual impact for a majority of KOPs identified that the introduction of Project components would be evident and may partially change the existing landscape character for viewers, primarily motorists, where the Project is visible.

At KOP 3 and KOP 7, anticipated visual effects may be most evident due to the elevated or relatively close observer position to the Project site respectively. At KOP 6, which represents views of the gen-tie line, the visual impacts are anticipated to be a minor alteration to the existing landscape as visible Project components are inconspicuous or compatible within the existing landscape conditions that includes existing transmission lines. An optional waste rock architectural berm is expected to be visible from KOP 3 and KOP 7 and is anticipated to result in an increase in the Projects overall visual impact from both viewpoints.

The overall assessment of visual impacts indicates that the Project would be visually evident to potential motorists or recreational viewers travelling through the region and represents a minor or partial alteration to the existing landscape that would not degrade the existing visual character or quality of the landscape setting for most viewing locations. Therefore, Project effects on the existing visual character of the site and its surroundings would be less than significant.

Based on psychometric analysis, the conditions for visible steam plume are unlikely to occur. In the unlikely event that plumes are present, they would be relatively small and temporary and would not likely result in a noticeable impact to visual resources.

Operation of the Project will require onsite lighting for safety and security and approach lighting for the substation, control equipment enclosures, and operator interface locations. Lighting from the Project during operations is predicted to be a minor contributor to increased light levels and is not anticipated to change the overall existing light environment during nighttime viewing. While lighting required during Project operations would create new sources of light, Project effects from light and glare on day or nighttime views would be less than significant.



## **C. Summary of Potential Cumulative Impacts**

Mojave Micro Mill is a proposed steel mill about 1 mile north of the Project site which is anticipated to be visible in the middle-ground viewing distance from KOP 3 but will not be visible from any of the other KOPs. It is anticipated that the Project, in combination with Mojave Micro Mill, will result in potential cumulative visual impacts from KOP 3 only. Because the majority of Project KOPs will be unaffected by the proposed Mojave Micro Mill, the Project will not cause significant cumulative effects to visual resources.

## **D. Avoidance and Minimization Measures**

No mitigation measures beyond those incorporated into the Project design were determined to be necessary. The Project design did include elements of lighting design. All new lighting will include shielding and will be directed downward to minimize the potential for glare, light pollution, and skyglow. Project lighting will use dimmable motion-sensitive and scheduling controls to minimize the use of the lights. Light levels will comply with recommendations of the Illuminating Engineering Society, as well as CEC and local jurisdictions' ordinances or codes, to ensure lighting is no brighter than necessary.

No specific landscaping is required in the current A zone, however, the Applicant will collaborate with Kern County on landscaping, consistent with the sparsely vegetated upper desert environment and scarcity of water, where required.

As the Project design at the time of submission of the Supplemental AFC did not include detailed exterior color selection, simulations focused on showing the form and character of the Project components to support the visual assessment. The color of the Project components' exterior surface in these simulations was presented as a monochromatic palette of light tan. As part of the Applicant's comments on the Preliminary Staff Assessment, the simulations for the KOPs were provided that included exterior surface treatments of Project facilities and transmission components that would blend with the existing landscape (TN 264316, Appendix C). These were provided in response to proposed Condition of Certification (COC) VIS-1 and demonstrating how effective it may be at mitigating potential visual impacts.

## **E. Summary of Compliance with Applicable LORS**

No federal visual resource LORS exist relevant to the Project assessment area.

The current Kern County General Plan consists of goals and policies pertaining to a number of elements that guide the long-term outlook for development in Kern County. The Land Use, Open Space, and Conservation Element, Section 1.10.7 Light and Glare focuses on ensuring that light and glare from new development projects are minimized in urban and rural areas and encourages the use of low-glare lighting to minimize nighttime effects on neighboring properties. The Land Use, Open Space, and Conservation Element, Section 1.8 includes the following policies related to visual character.

- Policy 6 encourages upgrading the visual character of existing industrial areas through the use of landscaping, screening, or buffering.
- Policy 7 requires that industrial uses provide design features such as screen walls, landscaping, increased heights and/or setbacks, and lighting restrictions between the boundaries of adjacent residential land use designations so as to reduce impacts on residences.

Title 19 of the Kern County Code of Ordinance describes permitted uses and design standards within various zones of the County, including the following pertaining to visual resources or lighting.

- Chapter 19.74, establishes a Scenic Corridor Combining District intended to protect areas with unique visual and scenic resources from disturbance as viewed from major highways or freeways and to safeguard the

scenic qualities of the natural environment of primary entranceways into the county. The WRESC Site is not located in or near a designated Scenic Corridor.

- Chapter 19.81, Dark Skies Ordinance (Outdoor Lighting) is established to maintain the natural dark skies of Kern County by requiring a minimal approach to outdoor lighting to avoid excessive illumination that may obscure the night sky and or may constitute a nuisance. The ordinance provides requirements for outdoor lighting within specified unincorporated areas of Kern County. The Project will comply with local ordinance for lighting including requirements for lighting plans, light fixtures, maintenance, and hours of operation.

The policies of the Willow Springs Specific Plan encourage the visual aesthetics of new commercial, industrial, and residential construction. Implementation measure for commercial development highlights the screening of outdoor storage of materials from public view.

### **III. Response to Certain Issues Raised in the FSA**

The FSA and PSA include an evaluation of the Project's potential visual impacts using an adapted methodology that CEC Staff has developed and applies internally for the purposes of assessing visual impacts. The FSA highlights that CEC Staff's analysis is focused on effects related to adverse change in any of the physical conditions within the area affected by a project and the visual properties or characteristics of the environment of the project site. This system is one method for conducting a visual assessment under CEQA, but is not set forth in either statute, regulations, or published guidance.

The technical approach for analysis provided in Section 5.13 of the AFC was based on established guidance for conducting visual impact assessments to characterize the potential for Project-related change to the existing visual character as assessed from views of the Project site and adjacent landscape. The approach used is identified in Section 5.13.3.2.5 of the AFC as combining factors of viewer sensitivity and visual change to determine the visual impact at identified viewing locations (known as KOPs), which is a common approach used in many established visual assessment systems within the U.S. and internationally.

To respond to regulatory requirements, the analysis provided in Section 5.13 of the AFC also followed CEC guidelines for preparing visual impacts (California Code of Regulations Title 20) and CEQA guidelines related to aesthetics. These highlight the need for the assessment to address visually sensitive areas related to recreational and residential use that would be affected by the project and evaluate the potential for degrading the existing character or quality of views of the project site experienced from publicly accessible locations.

As a result, the Applicant's assessment reasonably considers visual impacts related not just to visual change resulting from the visual properties of the Project, but how the visual contrast of the Project components interacts with a viewer's experience at identified KOP locations. In contrast, CEC Staff's analysis focuses on the change in visual properties of the Project site visible from KOPs and does not take into consideration the interaction of the potential changes to a viewer's experience in determining the potential visual impacts.

This difference in approach to the assessment of visual impacts of the Project provides context for the disparity between the findings by CEC staff within the FSA (Section 5.15) and the Applicant's visual assessment (Section 5.13) relative to the assessment of visual impacts and significance of effects. While CEC staff concluded that the level of Project visual effects under the CEQA Guidelines would constitute a "significant effect on the environment" that would be unmitigable at specific KOPs, the evidence provided by the Applicant, particularly the

Applicant's comments on the PSA in TN 264316, Appendix C, demonstrates that the Project would not substantially degrade the existing visual character or quality of the landscape setting for viewers at most KOPs and that Project effects on the existing visual character of the site and its surroundings for viewers and would be less than significant with mitigation.

Section 5.14.5 of the FSA indicates the Applicant's original visual assessment in Section 5.15 of the Supplemental AFC was largely based on the U.S. Department of Transportation Federal Highway Administration (FHWA) prepared Guidelines for the Visual Impact Assessment of Highway Projects. This characterization is not accurate.

For clarification, Section 5.13.3.2.5 of the Supplemental AFC highlights that the analysis draws on components of the U.S. Department of Interior Bureau of Land Management (BLM) Visual Resource Management program of which the use of the Visual Resource Inventory process and data, and the Contrast Rating system constitute a main basis of the assessment approach. The FHWA system is referenced specifically in Section 5.13.3.2.4 to provide descriptions of the types of viewers identified in the assessment based on established definitions from the FHWA system (i.e., motorists, residential viewers, tourists/recreational viewers). In addition, the Applicant's visual assessment also includes established international lighting guidelines (e.g., International Commission on Illumination or CIE) to support the lighting assessment.

In Section 5.15.4 of the FSA, CEC Staff highlights that the Applicant's discussion and analysis in TN 264316, Appendix C addresses only the exterior surface color of the Project facilities and does not consider other basic design elements or the visual absorption capacity. However, because CEC Staff identifies color as a key element of visual contrast in their assessment in the PSA Visual Resources section, a change in the color of the Project components is anticipated to have a pronounced effect on reducing the visual contrast of the Project.

For clarification, the images presented in TN 264316, Appendix C are intended to illustrate the potential effectiveness of color as a tool for visual mitigation of predicted Project visual effects and are provided in direct response to COC VIS-1 described by CEC staff which details the use of exterior surface coatings, colors, finishes, materials, and a gloss level that minimize contrast with the existing physical landscape. In essence, Appendix C demonstrates the effectiveness of proposed COC VIS-1 in mitigating the potential visual impacts of the Project to less than significant.

In Section 5.15.4 of the FSA, CEC staff concluded that, consistent with the original determinations in the PSA Visual Resources section, the level of visual effect under the CEQA Guidelines would constitute a "significant effect on the environment" that would be unmitigable at specific KOPs. Within the PSA Visual Resources section, it is asserted that the Project cannot be effectively camouflaged, disguised, or treated with exterior coatings, colors, or finishes to mitigate the degrading of the existing visual character or quality of the public view given the physical environment of the Project site.

While the information presented TN 264316, Appendix C details the influence of the color of exterior surface color of the Project facilities on potential visual impacts, the information provided was not intended as a re-evaluation of visual effects or significance. Instead, the information clearly illustrates that with the potential application and influence of COC VIS-1, the Project's visual impacts could be mitigated to the degree that the visual contrast of Project facilities within the existing landscape conditions can be effectively reduced. As a result, the Project could be effectively treated with exterior coatings, colors, or finishes to mitigate the degrading of the existing visual

character or quality of the public view by blending with the general hues of the natural physical environment of the Project site.

With respect to the proposed COC VIS-1 language, CEC staff expressed a preference to prioritize input from the affected local government (County of Kern), rather than limit colors to the four shown from the list of BLM standard environmental colors. It is proposed that COC VIS-1 includes the identification of colors through an onsite study that may reference the existing BLM Standard Environmental Color Chart. For clarification, the BLM standard colors were provided to assist in color selection and not as a proposal by the Applicant to limit color treatments to these specific colors. It is further described in the proposed COC VIS-1 language that color choices be tested under field conditions, a process that will provide the opportunity to refine the color selection as localized visual conditions may warrant different color variations to maximize effectiveness.

**Methodology:** In summary, the findings from analyses of the Staff and the Applicant diverge due to differing methodologies. Staff's analysis, while consistent with their own methodology, does not take into consideration the interaction of predicted visual changes from the Project within the context of viewer's experience at KOPs in determining the significance of visual effects. In contrast, the Applicant's assessment reasonably considers visual impacts related not just to anticipated visual change resulting from the visual properties of the Project, but how the visual contrast of the Project may interact with a viewer's experience.

**Significance:** In terms of mitigation of potential visual impacts to a level of less than significant, Staff finds that the potential impacts cannot be mitigated to a level of less than significant. In contrast, the Applicant's analysis finds instead that the visual impacts can be mitigated to a level of less than significant precisely by implementing the measures agreed to by both parties in the language of Staff's proposed COC VIS-1. The agreed to VIS-1 is expected to be effective at mitigating potential impacts to less than significant.

## IV. Proposed Licensing Conditions

The Applicant agrees with the Visual Resources Conditions of Certification VIS-1 through VIS-3 as proposed in the FSA.

### 4.15 Water Resources

#### I. Introduction

**A. Names:** George Wegmann, Curt Hildebrand, Andrew McGillis, Laurel Lees and Victor Grille

**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statement herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN 254774), March 1, 2024.
- Exhibit 1032, Willow Rock Energy Storage Center SAFC - Volume 1, Part B (TN 254805), March 1, 2024
- Exhibit 1033, Willow Rock Energy Storage Center SAFC - Volume 1, Part A (TN 254806), March 1, 2024
- Exhibit 1035, Willow Rock Energy Storage Center SAFC Volume II-Appendix 515A-Part II (TN 254808), March 1, 2024
- Exhibit 1036, Willow Rock Energy Storage Center SAFC Volume II-Appendix 515A-Part I (TN 254809), March 1, 2024

- Exhibit 1046, WRESC Jurisdictional Delineation (TN 254819), March 4, 2024
- Exhibit 1070, Willow Rock Data Adequacy Response (TN 256622), May 31, 2024
- Exhibit 1080, Willow Rock Jurisdictional Waters Delineation Report (TN 258308), August 5, 2024
- Exhibit 1093, 31406639-000\_01\_06\_FX-X-06\_Rev1\_AllJurisdictionalDelin\_CONFIDENTIAL\_Mapbook (TN 258870), August 5, 2024
- Exhibit 1100, 31406639-000\_01\_04\_F07-04\_Rev1\_JD\_HydrologyMap\_CONFIDENTIAL\_Mapbook (TN 258877), August 5, 2024
- Exhibit 1102, 31406639-000\_01\_06\_F07-06\_Rev1\_JD\_NWI\_Map\_CONFIDENTIAL\_Mapbook (TN 258879), August 5, 2024
- Exhibit 1103, 31406639-000\_01\_07\_F07-07\_Rev1\_JD\_USDA\_Soils\_CONFIDENTIAL\_Mapbook (TN 258880), August 5, 2024
- Exhibit 1104, 31406639-000\_01\_08\_F07-08\_Rev1\_JD\_JurisdictionalDelin\_CONFIDENTIAL\_Mapbook (TN 258881), August 5, 2024
- Exhibit 1112, Willow Rock CURE Data Request Set 1 Response (TN 259338), September 27, 2024
- Exhibit 1116, Attachment DR33-1 – Survey Area and Drainages Map Book (TN #259491), October 28, 2024
- Exhibit 1119, Willow Rock Data Request Set 3 Response (TN 259675), October 23, 2024
- Exhibit 1123, Attachment DR87-1\_Confidential (TN 260236), October 28, 2024
- Exhibit 1133, Willow Rock Center for Biological Diversity Data Request Set 1 Response (TN 260809), December 23, 2024
- Exhibit 1134, Willow Rock Data Request 6 Response (TN 261314), January 27, 2025.
- Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315), January 27, 2025
- Exhibit 1136, Willow Rock CEC Docket Data Request Set 6 Attachment DR121-1 (TN 261500), January 31, 2025
- Exhibit 1137, Willow Rock CEC Docket Data Request Set 6 Attachment DR123-1 Cover Sheet (TN 261501), January 31, 2025
- Exhibit 1143, Willow Rock Jurisdictional Waters Delineation Report Appendix B (TN 261991), February 26, 2025
- Exhibit 1144, Willow Rock Jurisdictional Water Delineation Report Appendix A Part 3 (TN 261992), February 26, 2025
- Exhibit 1145, Willow Rock Jurisdictional Water Delineation Report Appendix A Part 2 (TN 261993), February 26, 2025
- Exhibit 1146, Willow Rock jurisdictional Water Delineation Report Appendix A Part 1 (TN 261994), February 26, 2025

- Exhibit 1147, Willow Rock Jurisdictional Water Delineation Report Text (TN 261995), February 26, 2025
- Exhibit 1148, Follow-up Responses on Biological and Water Resources, Drilling Cuttings, and DSOD Info for Willow Rock Energy Storage Center (TN 262180), March 13, 2024
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- Exhibit 1150, Willow Rock Jurisdictional Drainages Additional Information Attachment (TN 262243), March 19, 2025
- Exhibit 1151, Willow Rock Jurisdictional Drainages Additional Information Text (TN 262244), March 19, 2025
- Exhibit 1152, Willow Rock NOI Application Rev (TN 262295) March 19, 2025
- Exhibit 1153, Consolidated Email Responses to CEC Staff on Lahontan's February 26, 2025 Request for Additional Information (TN# 261932), (TN 262349), March 25, 2025
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report Comments - Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## **II. Summary of Testimony**

### **A. Affected Environment**

The project would be in the Town of Rosamond watershed, which drains into the dry Rosamond lakebed approximately four miles to the southeast. No impaired waterbodies are present within the vicinity of the site as defined by Section 303 (d) of the Clean Water Act.

The WRESC will not use groundwater from the site as a water source. Water for the project would be provided by the Antelope Valley-East Kern Water Agency (AVEK) for construction, operational process, and sanitary uses. The WRESC will enter into a water supply agreement with AVEK. The proposed project area is within Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) Kern County Unincorporated Areas Zone X. Zone X is defined as areas determined to be outside the 0.2 percent (or 500-year) annual chance floodplain (FEMA 2008).

During operations, onsite stormwater flows will be retained in an onsite retention pond to be constructed on the southeast portion of the site and designed to not discharge offsite. Offsite stormwater flow would be diverted around the project facility by drainage channels that would be constructed to the north and west. Drainage channels would be sized to carry more than the discharge of a 100-year storm event. Lined drill cutting ponds would be constructed to contain drill cuttings produced during construction of the underground cavern.

The project area is not near the coast or a large body of water; therefore, there is no danger of a tsunami, seiche, or vulnerability to sea level rise. The hydrostatic compensation reservoir embankment would be designed and monitored during construction and operation in accordance with Division of Safety of Dams (DSOD) requirements.

### **B. Potential Construction and Operational Impacts**



The entire proposed project including linear tasks and support areas would disturb approximately 88.6 acres and portions of an approximately 19 mile corridor for linear facilities during construction. The WRESC site grading and drainage will be designed to comply with all applicable LORS.

The greatest excavation depth during construction of surface facilities would be the hydrostatic compensating reservoir at a maximum anticipated depth of 45 feet below grade. The hydrostatic compensating reservoir was designed to be above the water table; therefore, it is unlikely that groundwater dewatering would not be necessary.

The lined drill cuttings ponds would be subject to Waste Discharge Requirements (WDRs). During project construction, temporary toilet and sanitary facilities would be provided and served by a third-party contractor.

Potential impacts on soil resources during construction and development can include increased soil erosion. The magnitude, extent, and duration of construction-related impacts depend on the erodibility of the soil; the proximity of the construction activity to the receiving water; and the construction methods, duration, and season. Because conditions that could lead to excessive soil erosion via water are not present at the WRESC site, relatively little soil erosion from rain events is expected during the construction. Additionally, construction BMPs will be implemented during construction in accordance with Water Resource, Attachment A. The CEC also requires project owners to develop and implement a drainage, erosion, and sediment control plan (DESCP) to reduce the impact of runoff from the construction site. Monitoring will involve inspections to ensure that the BMPs to be described in the DESCP and confirm with Water Resource, Attachment A are properly implemented and effective. Therefore, impacts from soil erosion are expected to be less than significant.

During project operation, stormwater would be collected and retained onsite. Offsite stormwater flow will be diverted around the project site perimeter by drainage channels along the north and west. Drainage channels would be sized to carry more than the discharge of a 100-year storm event. The DESCP will ensure no significant offsite changes in drainage patterns. Therefore, operational impacts on drainage patterns are less than significant.

During the construction period, sanitary waste will be collected in portable toilets supplied by a licensed contractor for collection and disposal at an appropriate receiving facility resulting in no onsite discharge. Equipment wash water will be collected and disposed of offsite. During project operation, industrial related wastewater would be contained in tanks and periodically disposed offsite by a third-party vendor. Sanitary waste from the administration/control building would be collected in a septic tank and either dispersed by a standard leach-line system, or periodically pumped out and disposed off-site by a third-party vendor.

The WRESC will not pump groundwater and will have no effect on groundwater quantity or quality.

The site is not in the 100-year floodplain as defined by FEMA. Therefore, project implementation will not result in any structures that will impede or redirect flood flow and no impacts will occur. The hydrostatic reservoir would be constructed to DSOD requirements.

### **C. Summary of Potential Cumulative Impacts**

The WRESC would have little or no adverse impact on water quality, flooding potential, or groundwater resources. Therefore, the project would be very unlikely to cause cumulative impacts when its effects are considered in combination with those of other projects.

### **D. Avoidance and Minimization Measures**

The project would not be expected to violate water quality standards or waste discharge requirements during construction or operation, and impacts would be less than significant with mitigation.

The design and engineering of the WRESC will meet applicable LORS, including those related to flood protection, such as California and federal building code requirements, DSOD requirements, Water Board requirements, and applicable LORS of Kern County.

### **E. Summary of Compliance with Applicable LORS**

The WRESC will comply with all applicable laws, ordinances, regulations and standards (LORS).

## **III. Response to Certain Issues Raised in the FSA**

WATER-1, I, Best Management Practices (BMP) Plan. WATER-1 requires the development of a DESCP, including a BMP Plan; however, WATER-1 does not reference Attachment A, which includes stormwater management guidance during construction.

To ensure consistency, we request that Attachment A be referenced under WATER-1, Section I, “Best Management Practice Plan.”

WATER-1, we suggest moving “Verification” to reflect the measures as implementing provisions of the Condition.

Page 5.16-24, WATER-2, WATER-2 is titled Waste Discharge Requirements for Drill Cutting Ponds and references WDRs established in Attachment A. The draft WDRs included as Attachment A state that the WDRs are applicable to the following types of wastes: boring wastes generated during shaft construction, fill and excavation wastes discharged to surface waters during gen-tie construction, and stormwater generated during construction.

In addition to the drill cuttings pond, WATER-2 refers to the fill and excavation discharges of wastewater associated with construction of the Gen-tie line but does not reference Attachment A and incorrectly refers to excavation discharges of wastewater. For consistency with Attachment A, we request that “For Drill Cuttings Pond”, “for fill and excavation discharges of wastewater”, and “discharge of wastewater associated with” are stricken and “to ephemeral streams from fill and excavation” is added as noted below.

On Page 5.16-22, Response to TN 264316, COC WATER-8 (now WATER-7), it is noted that the applicant proposes modifications to the text of COC WATER-8 (now WATER-7) that would clarify use of AVEK water supply during construction and omit the requirement for reporting water use. It was noted that the CEC staff has altered the COC text regarding annual limits of water use during project construction, but water use reporting requirements was not modified. Upon review of current WATER-7, the annual limits of water use were not modified. We are requesting that WATER-7 is revised to delete the 350 AFY annual limit as this limitation does not reflect the flexibility provided under the water use agreement that will be established with the Antelope Valley-East Kern Water Agency (AVEK). Removal of the 350 AFY annual limit will better align the condition with the terms of the AVEK agreement and ensure constructability without imposing unnecessary administrative or operational constraints.

Page 4.1-14, CIVIL-1 incorrectly references a construction SWPPP. Since the project does not discharge stormwater to waters of the United States, no NPDES permit would be required. However, in order to mitigate potential water quality impacts during construction and operation of the project, a DESCP would be prepared as described in WATER-1.

The Applicant’s proposed revisions are based on the above.

## IV. Proposed Licensing Conditions

The FSA proposes seven Conditions of Certification for this subject matter. We agree with the Conditions of Certification set forth in the FSA for Water Resources, except as set forth below.

### B. Proposed Revisions to Condition WATER-1, Section I

**I. Best Management Practices Plan** – The DESCP shall identify on the topographic site map(s) the location of the site specific BMPs to be employed during each phase of construction (initial grading, Project element excavation and construction, and final grading/stabilization). BMPs shall include measures designed to control dust, stabilize construction access roads and entrances, and control storm water runoff and sediment transport. **The construction BMPs will follow Attachment A as guidance.**

### C. Proposed Revisions to Condition WATER-2

#### **WASTE DISCHARGE REQUIREMENTS FOR DRILL CUTTING PONDS**

WATER-2: The project owner shall comply with the Waste Discharge Requirements (WDRs) established in Attachment A. These requirements relate to discharges, or potential discharges, of waste that could affect the quality of waters of the state, and were developed in consultation with the State Water Resources Control Board and/or the applicable California Regional Water Quality Control Board (hereafter "Water Boards"). The WDRs established in Attachment A serve as if they were prescribed under Water Code section 13263 by the Water Boards. These requirements are enforceable by both the Commission and the Water Boards. The Water Boards are authorized to verify compliance of these WDRs, including conducting investigations and inspections and requiring technical and monitoring reports. The Water Boards are also authorized, in coordination with the Commission, to enforce the WDRs pursuant but not limited to Water Code sections 13300, 13301, 13304, and 13350. The Commission and the Water Boards shall confer with each other and coordinate, as needed, in the enforcement of the requirements, consistent with Public Resources Code section 25532. The project owner shall pay the annual waste discharge permit fee associated with this facility to the Water Boards. The project owner shall make payments to the State Water Resources Control Board, based upon a fee schedule in California Code of Regulations, Title 23, section 2200 for a Discharge to Land with a Threat to Water Quality Rating of 2 and Complexity Rating of C.

**Verification:** At least sixty (60) days prior to construction, the project owner shall submit to LRWQCB all necessary information and applicable fees, submitting copies of all application submittals to the CPM. At least thirty (30) days prior to construction of the Gen-tie line, the project owner shall submit to the CPM and LRWQCB for review and approval all plans to control the potential impacts **to ephemeral streams from fill and excavation activities** ~~for fill and excavation discharges of wastewater~~ associated with construction of the Gen-tie line. Within ten (10) days of its mailing or receipt, the project owner shall submit to the CPM any correspondence with the SWRCB or the LRWQCB regarding ~~discharge of wastewater associated with~~ this activity. The project owner shall notify the CPM in writing of any violations and include these in the annual compliance report. Any monitoring documentation associated with the SWRCB Order shall be included in the annual compliance report.

### D. Proposed changes to JURISDICTIONAL DAM CONSTRUCTION REQUIREMENTS:

## CONDITIONS WATER-5 AND WATER-6

**Note to Reviewers:** The changes proposed by the Applicant to COCs WATER-5 and WATER-6 below are related to the scope of the CEC's authority and delegation of compliance verification. The Applicant expects this issue to be a legal matter for briefing, rather than expert testimony, and is including this in its testimony to ensure that all parties and the Committee are able to review the proposed changes.

**WATER-5** The **Commission has determined that the** outer embankment of the hydrostatic compensation reservoir (HC- reservoir) meets the definition of a jurisdictional dam per California Water Code (CWC) Sections 6002 and 6003. Therefore, the HC-reservoir embankment is subject to ~~the review and approval of~~ all design and specifications **that would be administered by the Department of Water Resources, Division of Safety of Dams (DWR-DSOD) but for the Commission's exclusive jurisdiction over thermal powerplants and related facilities.** The **Commission has determined that the** project owner is an "owner" under Water Code section 6005.

As it relates to this project (HC-reservoir embankment), the project owner shall comply with the requirements set forth in Division 3, Part 1 of the Water Code and California Code of Regulations, Title 23, Division 2, Chapter 1 (collectively referred to as "Dam Safety Program Requirements") and any **applicable** design specifications ~~directed by DWR-DSOD which will administer the Dam Safety Program Requirements on behalf of the CEC~~ **set forth therein.** The Project Owner shall comply with any future changes to **applicable** statute or regulations of the Dam Safety Program Requirements.

To facilitate the project and project owner's compliance with the Dam Safety Program Requirements, the following requirements are identified. These Dam Safety Program Requirements are identified to provide information and do not limit or otherwise impact the project and project owner's obligation to comply with all Dam Safety Program Requirements.

- Construction, enlargement, alteration, repair, modification, and removal of dams and reservoirs are subject to the requirements in Division 3, Part 1, Chapter 5 of the California Water Code and California Code of Regulations, Title 23, Division 2, Chapter 1.
- Construction inspection requirements, final approval, and post-construction documentation requirements are set forth in Division 3, Part 1, Chapter 7 of the California Water Code.
- The project owner shall not, through action or inaction, impound water in the Project's dam or reservoir until DWR-DSOD has **reviewed and the CPM has reviewed and approved** ~~issued~~ a certificate of approval, as provided in Water Code section 6355 **that DWR-DSOD would have issued but for the Commission's exclusive jurisdiction over thermal powerplants and related facilities.**
- The project owner shall pay ~~application and~~ **an amount it would have paid to DWR-DSOD** ~~in~~ annual fees, in accordance with the Dam Safety Program Requirements **but for the Commission's exclusive jurisdiction over thermal powerplants and related facilities.**
- This project and project owner shall be subject to the requirements in Water Code section 6102.5, which addresses periodic inspections, and dam owner obligations to perform maintenance, provide information, and fully operate any critical outlet and spillway control features as determined by **the CPM in consultation with** DWR-DSOD.
- The project and project owner shall comply with the inundation map and emergency action plan requirements as provided in Division 3, Part 1, Chapter 4, Article 6 of the California Water Code and California Code of Regulations, Title 23, Division 2, Chapter 1.

- The project and project owner shall be subject to the enforcement **by the Commission in consultation with DWR-DSOD for compliance with the** provisions set forth in Division 3, Part 1, Chapter 8 of the California Water Code and California Code of Regulations, Title 23, Division 2, Chapter 1. ~~The CEC also retains its enforcement authority over this component of the project.~~

The project owner shall obtain **Commission approval in consultation with DWR-DSOD** approval of dam plans and specifications prior to commencing construction of the HC-reservoir in accordance with CWC Section 6200. The project owner shall provide the **Commission in consultation with DWR-DSOD** with information to achieve the following milestones of the design approval process:

~~1. Application for construction of a dam and filing fee (per CWC section 6300), and geology/geotechnical reports and data.~~

~~21.~~ Additional geology/geotechnical reports and data if data gaps or concerns are identified by **the CPM in consultation with DWR-DSOD** staff.

~~32.~~ Design report, criteria and guidelines for dam, spillway, and emergency outlet.

~~43.~~ 30% Design plans/concept.

~~54.~~ 60% Design plans/specifications.

~~65.~~ 90% Design plans/specifications.

~~76.~~ 100% Design plans/specifications and draft inundation map.

Following the conclusion of milestone **76**, **the CPM in consultation with DWR-DSOD** would approve the design application and conditions of the HC-reservoir, ~~with CPM concurrence~~, after all CWC provisions and applicable engineering standards have been demonstrated.

~~Construction of the HC-reservoir embankment will commence within one year of DSOD approval (CWC Section 6265).~~

The inundation map approved by the **Commission in consultation with DWR-DSOD**, would be included with a draft emergency action plan (EAP) submitted to the California Office of Emergency Services (CalOES) prior to the reservoir being certified.

Any change to the design, construction, or operation of the HC-reservoir embankment shall be requested by the project owner in writing to the CPM for approval, in consultation with the **DWR-DSOD**, prior to the initiation of any construction and/or operation changes. Such changes may be approved by the CPM after consultation with the **DWR-DSOD** if the changes do not result in a new significant impact.

Consistent with ~~DSOD's~~ existing statutory and regulatory enforcement authority regarding the design, construction, and operations of the HC-reservoir embankment, the ~~DSOD and CEC~~ **and DWR-DSOD** will confer with each other and coordinate, as needed, in the **Commission's** enforcement of the requirements, **consistent with the Commission's exclusive jurisdiction over thermal powerplants and related facilities.**

**Verification:** Any documents submitted ~~to the DSOD~~ including but not limited to application materials, geotechnical reports, design drawings, pictures, soil studies, or hazards analysis, shall be provided contemporaneously to the CPM **and DWR-DSOD** for review.

Documents, including notices of violation or other documents issued by the **Commission in consultation with DWR-DSOD** to comply with the Dam Safety Program Requirements, shall be provided to CPM project owner, **consistent with the Commission's exclusive jurisdiction over thermal powerplants and related facilities.**

~~The project owner shall provide evidence to the CPM of payment to DWR-DSOD of all fees required under the Dam Safety Program Requirements within 10 days of payment.~~

**WATER-6** The CEC delegates **compliance verification for** the dam safety related construction inspection of the HC- reservoir embankment and related dam safety components approved by the ~~DSOD~~**Commission**, to the **DWR-DSOD**, with onsite consultation with the DCBO and ongoing guidance from the CPM.

The DCBO shall have regulatory oversight responsibility of the entire project. ~~but shall defer regulatory oversight of~~ **Compliance verification for** the hydrostatic compensation reservoir system **may be delegated** to the **DWR-DSOD** inspection team.

## **E. Proposed Revisions to Condition WATER-7**

### **WATER USE AND REPORTING**

**WATER-8** Supply of fresh water for the project construction shall be provided by the Antelope Valley-East Kern Water Agency (AVEK). The project owner shall enter into a water agreement with AVEK. ~~Annual water use during project construction shall be limited to 350 AFY and t~~ Total water use during the 5-year construction period shall not exceed 1,400 acre-feet (AF). Project operation water use shall not exceed 4 acre-feet per year (AFY). The project owner shall record daily water use for the project's construction and operation. The project owner shall comply with the water use limits and reporting requirements described below.

**Verification:** Within ten (10) days of its mailing or receipt, the project owner shall submit to the CPM any correspondence with the AVEK concerning construction and operations water supply. This shall include the water agreement with AVEK. During project construction, the MCR shall include a summary of monthly water use. The project's annual compliance report shall include a monthly and annual summary of water use identifying construction or operations and water source.

## **F. Proposed Revisions to Condition CIVIL-1**

CIVIL-1 The project owner shall submit to the DCBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. A ~~an~~ **drainage**, erosion and sedimentation control plan **per WATER-1**;
3. ~~A construction storm water pollution prevention plan (SWPPP);~~ (
4. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
5. Soils, geotechnical, or foundation investigations reports required by the 2022 CBC.

## **5.0 ALTERNATIVES**

### **I. Introduction**

**A. Names:** Curt Hildebrand, Andrew McGillis, Victor Grille and David Stein



**B. Qualifications:** The panel's qualifications are as noted in their resumes contained in Appendix A.

**C. Prior Filings:** In addition to the statements herein, this testimony incorporates by reference the following documents submitted in this proceeding:

- Exhibit 1000, Section 6\_Alternatives\_Gem Energy Storage Center (TN 240751-23), December 1, 2021.
- Exhibit 1002, Joint Response of Pecho and Gem Supporting NOI Exemption and Request for Committee Order (TN 241503), February 9, 2022.
- Exhibit 1003, Joint Reply to CEC Staff's Response to Applicants' Filing Requesting Exemption from the NOI Process (TN 242224), March 8, 2022.
- Exhibit 1004, Gem Data Adequacy Master Response No. 1 (TN 242776), April 25, 2022.
- Exhibit 1006, Order and Final Commission (TN 243543), June 15, 2022.
- Exhibit 1033, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part A (21-AFC-02) (TN 254806 ), March 1, 2024.
- Exhibit 1032, Supplemental Application for Certification, Willow Rock Energy Center Volume I, Part B (21-AFC-02) (TN 254805), March 1, 2024. Exhibit 1025, Supplemental AFC Cover Letter and Data Adequacy Worksheets (TN # 254774), March 1, 2024.
- <https://efiling.energy.ca.gov/GetDocument.aspx?tn=240751-23&DocumentContentId=74174> Exhibit 1090, Willow Rock Data Request Set 1 Response Report (TN 258681), August 23, 2024.
- Exhibit 1135, Willow Rock CURE Data Request 2 Response (TN 261315) January 27, 2025.
- Exhibit 1155, Willow Rock Preliminary Staff Assessment Comments Report (TN 264316), June 16, 2025.

All of the facts contained in this testimony (including all referenced documents) are true and correct to the best of our knowledge and belief. To the extent this testimony contains opinions, such opinions reflect our best professional judgement. We make these statements and render these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

## II. Summary of Testimony

### A. Project Objectives

The WRESC will be a nominal 520-megawatt (MW) gross (500 MW net) and 4,160 megawatt-hour (MWh) gross (4,000 MWh net) facility using Hydrostor, Inc.'s (Hydrostor's) proprietary, advanced compressed air energy storage (A-CAES) technology located in unincorporated Kern County (County), approximately four miles north of Rosamond, California. The WRESC site is within the southeast quarter of Section 33 of Township 10 North, Range 12 West. Energy stored at the WRESC will be delivered to Southern California Edison's (SCE's) Whirlwind Substation located southwest of the WRESC at the intersection of 170th Street W and Rosamond Boulevard, via a new approximately 19-mile 230-kilovolt (kV) generation-tie (gen-tie) line.

The WRESC has been designed to deliver energy and reliability services with no fossil fuel combustion or related air quality impacts. The Project will be one of the first commercial applications of Hydrostor's Advanced Compressed Air Energy Storage (A-CAES) technology at this scale. The WRESC will combine dispatchable, operationally flexible, and efficient energy generation with state-of-the-art A-CAES technology to facilitate the integration of variable renewable energy sources on the grid and to meet the needs of California and the region for reliability services.

The WRESC basic project objectives are the following:

1. Provide 500 MW of quick-starting, flexible, controllable generation with the ability to ramp up and down through a wide range of electrical output to facilitate the integration of renewable energy into the electrical grid in satisfaction of California's Renewable Portfolio Standard and climate objectives, by displacing older and less efficient generation.
2. Interconnect the project to the CAISO-controlled SCE Whirlwind Substation, a major substation in or near the Tehachapi Renewable Wind Resource Area, to facilitate the integration of onshore and offshore renewable energy development.
3. Implement a proven sustainable energy storage technology that provides improved technological diversity, non-combustible energy storage, minimal residual hazardous waste at asset retirement, a long-term commercial lifespan of 30 years or greater, and non-degrading energy storage.
4. Use A-CAES technology to provide dispatchable long-duration storage and energy delivery for a minimum of 8 hours; fossil fuel and greenhouse gas emissions-free operation; flexible capacity with minimal response time; provide long-duration storage to avoid curtailment through energy storage and to facilitate the further integration of renewable resources; peaking energy for local contingencies; voltage support and primary frequency response, including synchronous power output to support grid resiliency without the need for fossil fuel; superior transient response attributes, including synchronous power output; and superior round-trip thermodynamic efficiency.
5. Locate the facility on a site with adequate geologic characteristics for the underground facilities for compressed air storage, including suitable overburden characteristics (limited thickness, constructable soil type); deep subsurface geological formation (2,000 to 2,500 feet below ground surface) of sufficient quality and definition at the required depth for construction of the excavated storage cavern; ultra-low hydraulic conductivity and permeability in deep subsurface geological formation to retain water and air under pressure within the excavated storage cavern; and competent geological structural integrity to sustain an excavated storage cavern at depth intact indefinitely, allowing for repeated compressed air injection and discharge cycles over the life of the project without eroding or collapsing.
6. Site the project on land with acceptable constructability and with adequate access and size for construction of aboveground facilities—at least approximately 80 acres.
7. Site the project near adequate water supply for construction.
8. Locate the project on a site that is available to provide adequate site control, through long-term lease or purchase.
9. Minimize additional supporting infrastructure needs and reduce potential environmental impacts by locating the facility near existing and planned infrastructure, including access to an existing substation with available transmission capacity.
10. Create jobs in Kern County and the state of California through both construction and operation of the facility.
11. Be a good corporate citizen and respected member of the community through the lifecycle of the project.

## **B. Siting Criteria**

The WRESC requires specific siting criteria to be feasible. The location of the WRESC requires geologic characteristics for the underground facilities for compressed air storage, including:

- Suitable overburden characteristics (limited thickness, constructable soil type);
- Deep subsurface geological formation (2,000 to 2,500 feet bgs) of sufficient quality and definition at the required depth for construction of the excavated storage cavern;
- low hydraulic conductivity and permeability in deep subsurface geological formation to retain water and air under pressure within the excavated storage cavern;
- Competent geological structural integrity to sustain an excavated storage cavern at depth intact indefinitely, allowing for repeated compressed air injection and discharge cycles over the life of the Project without eroding or collapsing. To minimize additional supporting infrastructure needs and reduce potential environmental impacts, locating

the WRESC near existing and planned infrastructure, including access to an existing substation with available transmission capacity, was also considered a priority.

The search for alternate sites focused on sites meeting the above criteria based on screening level desktop review of mapped geologic characteristics, and was refined to the following micro-siting criteria:

- Identify sites that are available to provide adequate site control, through long-term lease or purchase,
- It is preferred that the WRESC be sited on land with acceptable constructability and with adequate access and size for construction of aboveground facilities— approximately 80 acres.
- Due to the initial need for water to fill the reservoir, the WRESC Site should be near an adequate water supply for use during construction.

The siting criteria relating to preferred geologic characteristics for finding potential Project sites initially focused on selecting sites located on or directly adjacent to quartz monzonite outcroppings. The presence of quartz monzonite at the surface was expected to be a strong indicator for suitable geologic conditions at the cavern construction depth. In addition to presence of quartz monzonite, it was later determined that suitable sites should not be located near volcanic outcroppings. The presence of volcanic outcroppings are associated with deleterious incongruities in the quartz monzonite formation that are undesirable for subsurface A-CAES cavern construction and operation.

### **C. Site Selection**

GEM A-CAES LLC (GEM, the Applicant) considered nine alternative sites for the WRESC: the proposed WRESC Site and eight alternatives.

The Applicant initiated a search for an alternative Project site that would fulfill the Project's objectives, targeting areas meeting the siting criteria. Priority was placed on selecting locations closest to the SCE Whirlwind Substation as possible and met the preferred geologic characteristics. The initial screening limited the spatial search to an approximate 10-mile radius from the SCE Whirlwind Substation. This

screening, described in the original Project application for certification (AFC) (docket number TN 240751), resulted in the identification of four site alternatives: Sweetser Road Site (the original WRESC Site), and three alternatives.

An exploratory drilling program completed at the Sweetser Road Site revealed that the quartz monzonite adjacent to the Gem Hill Volcanics exhibited a high degree of alteration that would not be suitable for cavern development at the target depth. To improve the probability of finding geologic conditions suitable for cavern development, it was determined that the preferred site should not be located in proximity to any volcanic outcroppings. The refined geologic

characteristic criteria eliminated the Sweetser Road Site and other previously identified alternatives from consideration since all were located in close proximity to volcanic outcroppings.

The site selection radius was expanded as necessary to locate the closest quartz monzonite outcroppings that are not proximate to volcanic outcroppings. A large quartz monzonite deposit located east of the Rosamond Hills Site was identified from desktop analysis. Additional alternative sites were identified in this area.

The Applicant focused on private landowners in order to expedite the Project development timeline and the concern that securing site control for government-owned property would not be compatible with Project development timeline constraints. Five privately owned sites were identified that met the new geologic criteria, were potentially available for purchase, and were of sufficient size to warrant further consideration.

These five sites were then assigned ratings based on geology risk, constructability considerations (overburden thickness, topography), and site access to rank them subjectively in order of Project development preference, with a strong emphasis on geology risk and compared with the original four sites. The geology risk for all of the original alternative sites, including the original Sweetser Road Site, is unacceptably high due to the proximity to volcanic outcroppings. Of the five remaining sites, the proposed WRESC Site is rated the highest when geology risk is considered in conjunction with other risk factors.

Land use agreements were reached for two of the potential sites. It was determined that the WRESC Site was preferable for Project development for several reasons— the WRESC Site exhibits much flatter topography, it has lower geologic risk and it satisfies all of the project objectives.

Details of the rankings, alternate site mapping and descriptions, and a comparative assessment of fulfillment of project objectives are provided in Table 6-2: Site Selection Summary set forth in Section 6 – Alternatives of the Supplemental AFC (TN #254805). As demonstrated in Table 6-2, the WRESC Site is the only site of those considered capable of both meeting all site selection criteria and most of the project objectives.

#### **D. Transmission Gen-Tie Alternatives**

The Preferred Gen-Tie Route is described in the Supplemental AFC (TN #254806) Three alternative routes were developed that deviate significantly from the Preferred Gen-Tie Route alignment. All three were determined infeasible due to one or more major constraints or constructability issues.

#### **E. Water Supply Alternatives**

The Project will utilize a new connection to the Antelope Valley East Kern (AVEK) Water Agency. Alternative water supply alternatives that were evaluated and rejected due to infeasibility for greater environmental impact, infeasibility, and/or excessive capital cost include: ocean water,

reclaimed water, and new onsite groundwater wells.

## **F. Excavated Rock Waste Alternatives**

Construction of the WRESC Project will result in the excavation of approximately 1.3 million cubic yards of rock that is expected to be of aggregate quality. As a result, the Applicant will recycle excavated material for site grading and construction of the earthen berms for the surface compensation reservoir to extent feasible and either haul the remaining excavated rock to select offsite third-party off-takers or store unused excavated rock onsite in the form of an architectural berm to the north and west of the main facility.

The Applicant engaged an independent waste rock broker to assist in a comprehensive identification of possible third-party off-takers for the excavated rock within 30 to 40 miles of the site. The search identified three potential off-takers who can beneficially recycle or re-use 100 percent of the excavated rock including:

- Holiday Rock
- Robertson's Ready Mix
- Vulcan Materials

Each third-party off-takers has expressed interest in potentially reusing 100 percent of the rock material for commercial purposes and will have the appropriate permits in place to import material from third parties.

## **G. Technology Alternatives**

The Applicant evaluated a number of alternative generation technologies including:

- Conventional and renewable generation
- Battery Storage Systems
- Pumped Hydro Storage
- Traditional Compressed Air Energy Storage

None of the alternative technologies satisfy basic objectives of the project and were rejected in favor of the proposed project.

## **H. No Project Alternative**

If the Project were not constructed, none of the WRESC's basic Project objectives would be met, nor any of the significant Project benefits, realized. In particular, grid reliability, job creation, investments in the local and regional communities, and environmental and policy benefits, as identified above and throughout this Testimony, from this highly dispatchable and flexible project, would not be realized.

The WRESC would provide a significant carbon-free contribution to the state's ambitious renewable energy and storage needs. The no project alternative would deprive the state and the area of this significant contribution. The no project alternative would also not be consistent with California's environmental policy goals of encouraging development and deployment of long lead time, long-duration energy storage resources, such as the WRESC, as articulated in CPUC Decision 21-06-035 and other state policy objectives focused on long-duration storage and renewable integration.

The no project alternative could result in inadequate system reliability (more blackouts), greater fuel consumption, increased greenhouse gas emissions, more air pollution, and contributions to climate change and other environmental impacts in the state because older, less efficient plants or emergency generation facilities with

higher air emissions would continue to supply transitional power instead of being replaced with cleaner, more flexible, curtailment of renewable generation, and more efficient energy storage such as the WRESC. The no project alternative would also deprive the area of a significant multi-year construction employment opportunity with associated purchases of local goods and services, as well as permanent jobs associated with the operation of the facility, ongoing property tax revenue, and other community benefits. Therefore, because the no project alternative would not satisfactorily meet the Project objectives specified above, the no project alternative was rejected in favor of the proposed project.

### **III. Response to Certain Issues Raised in the FSA**

The Applicant has reviewed the Alternatives section of the FSA and has no comments.

### **IV. Proposed Licensing Conditions**

There are no proposed conditions of certification for Alternatives



APPENDIX A

Resumes

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# JEREMY PARIS, PWS

## LAND USE, AGRICULTURE, AND FORESTRY/ SOCIOECONOMICS/ EJ

Jeremy is a senior environmental planner with WSP. Jeremy has 19 years professional consulting experience leading projects in support of the energy, maritime, transportation, and government sectors. Jeremy has been responsible for each stage of project delivery including project conception, design and development, planning and permitting, and construction or implementation.

Jeremy has prepared high level National Environmental Protection Act (NEPA) documents, Endangered Species Act Biological Assessments (BA), International Finance Corporation (IFC) Performance Standards compliant Environment and Social Impact Assessments (ESIA), California Environmental Quality (CEQA) compliant documents, and Master Plans for water quality improvement programs. Additionally, Jeremy has been responsible for leading large scale environment and construction compliance programs for complex infrastructure projects.

Currently, Jeremy manages a team of scientists, engineers, and architects focused on assisting private clients and government agencies with the transition to clean energy and mitigating the impacts of climate change.

## PROJECT EXPERIENCE

**Hydrostor, Inc. California Energy Commission Application for Certification (AFC), Kern County California:** Program Manager. The Applicant, Hydrostor Inc., proposed to construct and operate an Advanced Compressed Air Energy Storage (A-CAES) facility in unincorporated Kern County, CA. Mr. Paris manages WSP's team of subject matter experts that support the preparation of Hydrostor's Application for Site Certification.

**Confidential Client, WA:** Program Manager. Responsible for WSP's contract since 2021. His experience involves 13 projects ranging from the review of energy facility applications to construction oversight. Examples of his project experience include:

- Horse Heaven Wind Farm Environmental Impact Statement. 2021-2023. Horse Heaven Wind Farm consists of wind turbines, solar arrays, substations, and battery energy storage systems. The Horse Heaven Wind Farm is the largest renewable energy facility in history of Washington State. Mr. Paris served as WSP's project manager overseeing a team of subject matter experts from 15 different disciplines.
- Badger Mountain Solar. Application Review and SEPA Scoping. 2022-Ongoing. Project Manager. Badger Mountain Solar consists of solar arrays, substations, and battery energy storage systems. Mr. Paris is the Project Manager from WSP's preparation of the EIS.
- Statewide Programmatic Environmental Impact States for High Voltage Transmission Line Development in Washington. Mr. Paris is the Project Director for the preparation of statewide PEIS focused on 230KV or higher transmission lines in the State of Washington. The PEIS focuses on 16 difference resource topics.



## EDUCATION

- MS, Biogeochemistry, University of Florida
- BS, Biosystems Engineering, University of Tennessee

## LICENSES/REGISTRATIONS

- Society of Wetland Scientist: Professional Wetland Scientist (PWS)

# 04

Years with WSP

# 20

Years of Experience

## Jeremy Paris, PWS (Continued)

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- Additional EFSEC Projects. Mr. Paris's EFSEC program involves 13 projects ranging from the review of energy facility applications to construction oversight.

**USDA/NRCS, Watershed Hazard Mitigation, California:** Program Manager:

- Bouquet Canyon Creek Pre-Impact Feasibility Report 2024-2025. On behalf of the NRCS, Mr. Paris's team reviewed the LA Public Work's grant application for funds to restore 8 miles of Bouquet Canyon Creek in Angeles National Forest. The project was intended to support hazard mitigation for a watershed that has experienced fire and flooding in recent years.
- San Luis Rey River (San Diego County, CA) Plan EA/EIS: On behalf of the NRCS, Mr. Paris's team prepared a hydraulic and hydrologic analysis and environmental and cultural assessment of the middle reach of the San Luis Rey River in San Diego County, CA. The project was intended to support hazard mitigation for a watershed that has experienced fire and flooding in recent years.

**California Public Utilities CEQA, California:** Program Manager. Multiple Projects.

**Santa Barbara County, Plains Pipeline Joint CEQA/NEPA Environmental Impact Report (EIR) / Environmental Impact Statement (EIS):** Jeremy was the technical review/deputy project manager. The Applicant is proposing to replace an existing 146 mile pipeline that extends from coastal Santa Barbara County to Kern County. Jeremy supported WSP's effort by providing final technical review and guidance.

**Hydrostor, Inc. California Energy Commission Application for Certification. San Luis Obispo County, California:** Senior Environmental Planner. The Applicant, Hydrostor Inc., proposes to construct and operate an Advanced Compressed Air Energy Storage (A-CAES) facility in unincorporated San Luis Obispo County, CA. Mr. Paris has been tasked with preparing multiple sections of the AFC document and conducting the associated impact analysis in accordance with California Environmental Quality Act standards.

**Astra Space, Inc.:** Project Manager. Mr. Paris' team supported Astra in the development of an initial Description of Proposed Action and Alternatives (DOPAA) package as part of the client's compliance with the FAA and the National Environmental Policy Act.

**Federal Emergency Management Agency, Hurricane Maria Response – San Juan Puerto Rico:** Senior Project Manager / Senior NEPA Specialist. Mr. Paris was tasked with leading the preparation of NEPA compliant Environmental Assessments (EAs) and Programmatic Environmental Assessment (PEAs) for the recovery of Puerto Rico post Hurricane Maria. Mr. Paris was tasked with preparing the following documents:

2020 Public Utilities PEA: Repair, Replacement, and Realignment (FONSI signed 2021); 2020 Transportation PEA: Bridges, Culverts, Roads, and Landslides (FONSI signed 2021); 2021 Maritime PEA: Maritime Facilities Recovery; 2021 Education PEA: Repair, Renovation, Replacement, and Relocation; 2021 Public Buildings PEA: Repair, Replacement, and

## Jeremy Paris, PWS (Continued)

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Relocation; and 2018 Draft EA Vieques and Culebra Energy Grid Repair, Upgrade, and Replacement.

**United States Air Force, Demolition of Defence Fuel Support Point (DFSP) – Ozol, California:** Senior Planner. Mr. Paris led the evaluation of protected biological resources for the site's fuel pier, tank farm, pipeline, and related infrastructure from Ozol, California to Martinez, California.

**United States Department of Commerce, First Net Environmental Impact Statement. Nationwide:** Principal Biologist. Five Programmatic Environmental Impact Assessments covered 5 geographies across the United States. First Net was initiated by Congress to establish a Nationwide Public Broadband Safety Network. Mr. Paris was responsible for principal reviewing documentation regarding the Endangered Species Act and marine species covered under the Endangered Species Act.

**USEPA Grant Water Quality Improvement, Monroe County, Florida:** Project Manager/Senior Biologist. On behalf of Monroe County and the NOAA Water Quality Canal Subcommittee, Mr. Paris wrote a grant to fund the collection of sediment and water quality data from within the Florida Keys National Marine Sanctuary. The EPA awarded the grant in August 2016. Conducting two separate scopes of work for the purpose of characterizing water quality and sediment quality in the Florida Keys canals located within sanctuary boundaries. Mr. Paris's team completed the following scopes of work:

Collection of Sediment cores from residential canals using a piston core sampler deployed from a mini-barge. The sediment cores were characterized, sampled, and analysed for a host of parameters to determine the presence or absence of contamination; and Collection of water quality data from 312 canals. Dissolved oxygen, temperature, salinity, and conductivity were measured to determine the locations of anoxic zones within the marine sanctuary.

**Canal Management Master Plan (Phase I, II, and III) and Guidance Document, Monroe County, Florida:** Senior Biologist and Principal Author. Mr. Paris was the primary author of the Canal Management Master Plan and Guidance Document. The documents presented existing condition data for water quality from residential canals throughout the Florida Keys as well as, presented recommendations for potential solutions. The information presented in the CMMPs were used to develop the Canal Water Quality Restoration Program that resulted in the restoration of 15 canals.

**Inter-American Development Bank. Environmental and Social Impact Assessment:** Project Manager. Mr. Paris's team developed a Category II ESIA compliant with Panamanian standards on behalf of the Inter-American Development Bank. The ESIA was prepared as part of the permitting requirements for the construction of a potable water generation facility in Panama. The study was inclusive of an Environmental Baseline Study, public scoping, and the development of mitigation plans. The study complied with all applicable IFC performance standards related the development of water treatment facilities and the intake of water.

**BHP Billiton Environmental Base Study, Trion Block – Mexican Gulf of Mexico:** Deputy Project Manager. Mr. Paris served the project as the

## Jeremy Paris, PWS (Continued)

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deputy project manager in charge of logistics, sample management, and oversight of the deployment of a remotely operated vehicles (ROV) to depths in excess of the 2,500 meters. Mr. Paris was the primary author of the following project deliverables:

Trion Health and Safety Plan bridging document, Trion Waste Management Plan, Emergency Response Plan, and Management of change document for the deployment of the ROV; and Underwater Survey and Marine GPS report.

**Gulf of Mexico Regional Environmental Baseline Study – Phase I, AMEXHI:** Senior Biologist/Project Manager. Assisted in the management of the project and was responsible for reviewing deliverables before their submittal to the group's members. In addition, was the primary author of the Gap Analysis performed on the Preliminary Environmental Baseline Study Report.

**Ecological Evaluations and Permitting Services, All Aboard Florida High Speed Passenger Rail, South Florida:** Project Management Team Member. Led a team of scientists, engineers, and public policy experts for the purpose of completing the permitting phase of the high speed passenger rail project. Responsible for obtaining permits from the United States Coast Guard, United States Army Corps. Of Engineers, South Florida Water Management District, and St. Johns Water Management District. Conducted in-water benthic surveys for 16 railroad bridges along Florida's east coast for the purpose of identifying sensitive aquatic resources and assessment of the North South corridor. Mr Paris was responsible for preparing the following documents:

**Fort Lauderdale-Hollywood International Airport (FLL) 9R-27L Runway Expansion, Broward County Aviation Department, Florida:** Senior Scientist. Provided ecological services and permit compliance monitoring for the expansion of the 9R-27L runway at Ft. Lauderdale-Hollywood International Airport (FLL). Mr. Paris was responsible for performing the following services:

Verifying that the project complied with the mitigation requirements outlined in the expansion's EIS; Implementation and review of daily inspection reports for compliance as well as oversight of the manatee and indigo snake protection education plan and migratory bird nest removal activities; Representing the Broward County Aviation Department in discussions with State and Federal regulators; The development an environmental and construction permit matrix for the purpose of tracking environmental regulatory requirements and building permits for the project.



## DAVID STEIN, PE

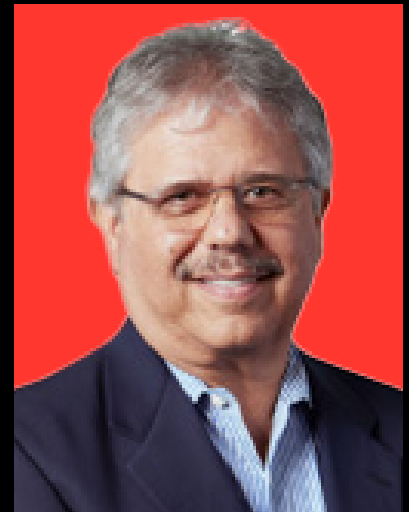
### PROJECT DESCRIPTION; ALTERNATIVES; FACILITY DESIGN; FACILITY RELIABILITY; TRANSMISSION SYSTEM ENGINEERING; EFFICIENCY AND ENERGY RESOURCES; TRANSMISSION LINE SAFETY AND NUISANCE

Dave has over 45 years of environmental management and permitting experience working with major gas and electric utilities, independent power plant developers (both renewable and fossil), major oil and petrochemical conglomerates, refiners, chemical plants, mining facilities, and various other industries. He has led complex multidisciplinary EAs, compliance/due diligence audits, both focused discipline-specific and multifaceted regulatory permitting for a wide range of projects with an emphasis on power plants and related linear infrastructure. He has a broad understanding of California regulatory permitting, including local conditional use permitting, CEQA and National Environmental Policy Act compliance, and myriad permits required by major California agencies, and federal agencies. Aside from project below his experience includes PG&E development of tidal or wave energy development in Humboldt County, wind generation development near the PG&E Diablo Canyon Nuclear Power Plant, compressed air energy storage in San Luis Obispo County, and decommissioning of PG&E's Humboldt nuclear plant.

David has spent his career leveraging teams, relationships, knowledge and experience in the energy field primarily in California to develop and implement strategies for successfully streamlining and expediting regulatory approvals and resolving complex multidisciplinary challenges encountered with myriad agency review processes, saving applicants' time and millions of dollars in development and mitigation costs.

### PROJECT EXPERIENCE

**Hydrostor Inc., Willow Rock (formerly Gem) Energy Storage Center, Kern County, CA:** Managed California Energy Commission CEQA-equivalent siting process, including preparation of an Application for Certification (AFC) for a 500-MW advanced, long duration compressed air energy storage project to be located near Rosamond, CA. Coordinated detailed studies in the areas of facility design, air quality, biological resources, cultural resources, land use, public health, noise, worker health and safety, socioeconomics, agriculture and soils, traffic and transportation, visual resources, hazardous materials management, waste management, water resources, geologic resources and hazards, and paleontologic resources. Led presentations at site visits, workshops, and agency meetings. The AFC was deemed data adequate and is currently in the Discovery phase. Future phases of work will include preparation of data responses, review and preparation of comments on preliminary and final staff assessments, testimony strategy in contested areas, written testimony, participation in evidentiary hearings, and review and preparation of



#### EDUCATION

- MS, Environmental Engineering, University of Texas
- MS, Environmental Health Engineering, University of Texas
- BS, Environmental Engineering, University of California
- BS, Biological Science, University of California

#### LICENSES/REGISTRATIONS

- Professional Engineer (PE): CA #4285

05  
Years with WSP

45  
Years of Experience

## David Stein, PE (Continued)

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comments on Presiding Member's Proposed Decision and Final Decision.

**Hydrostor Inc, Pecho Energy Storage Center, San Luis Obispo County, CA:** Managed California Energy Commission CEQA-equivalent siting process, including preparation of an Application for Certification (AFC) for a 400-MW advanced, long duration compressed air energy storage project to be located near Morro Bay, CA. Coordinated detailed studies in the areas of facility design, air quality, biological resources, cultural resources, land use, public health, noise, worker health and safety, socioeconomics, agriculture and soils, traffic and transportation, visual resources, hazardous materials management, waste management, water resources, geologic resources and hazards, and paleontologic resources. Led presentations at site visits, workshops, and agency meetings. The AFC is currently undergoing data adequacy review. Future phases of work will include preparation of data responses, review and preparation of comments on preliminary and final staff assessments, testimony strategy in contested areas, written testimony, participation in evidentiary hearings, and review and preparation of comments on Presiding Member's Proposed Decision and Final Decision.

**Confidential Client, Numerous Sites and Counties, WA:** Performed environmental assessments for several large-scale wind, solar and battery storage projects in the State of WA on behalf of the Client. Scope of work included review of developer's Application for Site Certificate (ASC) for proposed facility, preparation of data requests, review of data responses, preparation of the Draft Environmental Impact Assessment (DEIS) including development of air quality sections addressing existing environmental setting and environmental impacts (including development of recommended mitigation measures), review of applicant supplemental filings, review of public comments, and preparation of response to comments.

**GWF Energy LLC, Henrietta Solar Project, Kings County, CA:** Managed preparation of CEQA Initial Study and Conditional Use Permit application for 125 MW solar power plant located in close proximity to Lemoore Naval Air Station ("Top Gun" flight school). Project was approved by Kings County in a record 3 months' time.

**GWF Power LLC (now Alta Gas Ltd.), Tracy Peaker Plant, San Joaquin County, CA:** Managed California Energy Commission (CEC) CEQA-equivalent siting process including preparation of an Application for Certification (AFC) for a 169 MW peak load power plant in San Joaquin County, CA. Coordinated detailed studies in the areas of facility design, air quality, biological resources, cultural resources, land use, public health, noise, worker health & safety, socioeconomics, agriculture & soils, traffic & transportation, visual resources, hazardous materials management, waste management, water resources, geologic resources & hazards, and paleontologic resources. Led presentations at site visits, workshops, and agency meetings. Led development of data responses, review of preparation of comments on preliminary and final staff assessments, testimony strategy in contested areas, written testimony, participation in evidentiary hearings, review and preparation of comments on Presiding Member's Proposed Decision and Final Decision.

**GWF Power LLC (now Alta Gas, Ltd), Torrance Petroleum Coke-Fired Power Plant, Los Angeles, CA:** Prepared conditional use permit application and CEQA Exemption for modifications to the start-up burner system at a 10-MW petroleum coke fired small power plant.

**Confidential Client, Emergency Standby Engine Feasibility, CA and NV:** Evaluated regulatory and permitting options for implementation of emergency standby engines to support continuing operations at numerous existing landfills and transfer stations in California and Nevada.

**IBM, San Jose Emergency Power Plant, Santa Clara, CA:** Preparation of air quality permit application for a 49.5 MW peakload power plant consisting UTC FT4 twin-pak combustion turbines for submittal to the Bay Area Air Quality Management District (BAAQMD). Also coordinated with IBM's legal counsel to confirm the determination of California Energy Commission jurisdictional and requirement for a Small Power Plant Exemption (SPPE).

**IBM, United Airlines Cogeneration, San Francisco, CA:** Managed preparation of air quality permit application for a 28 MW cogeneration plant consisting of General Electric LM 2500 combustion turbine (one at each site) for submittal to the Bay Area Air Quality Management District (BAAQMD). This was the 1st domestic commercial installation of selective catalytic reduction (SCR) technology for control of oxides of nitrogen (NOx). The application included a detailed project description, emissions characterization, demonstration of Best Available Control Technology (BACT), air quality impact assessment compliance, and demonstration for all applicable rules and regulations. Permit applications were tracked through agency review, including review and negotiation of final permit conditions.

**Confidential Client, Stockton Cogeneration, San Joaquin County, CA:** Provided strategic support and air quality permitting for the potential conversion of a 49-MW coal-fired power plant to petroleum coke. Support included agency liaison, technical review of air quality permit application and preparation of a comprehensive health risk assessment for several alternate fuels using the ISCST and ACE2588 programs.

**Confidential Client, Corn Products Corporation Cogeneration Plant, CPC International, San Joaquin County, CA:** Managed permitting effort for 49-MW coal and petroleum coke-fired circulated fluidized bed cogeneration plant in San Joaquin Valley, including local air permit application and PSD permit to EPA Region IX. Application included detailed emissions characterization, BACT analysis, and dispersion modeling. Prepared technical support for banking of emission reduction credits for the existing boiler displaced by cogeneration plant. Prepared air quality and noise portions of the documented initial study used by the Lead Agency to issue a Negative Declaration.

### EXPERT WITNESS

**Various Clients, California Energy Commission Siting Cases, CA:** Program management, written and expert witness testimony in the areas of air quality, public health, waste, noise, need, and power plant alternatives

## David Stein, PE (Continued)

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on numerous power plant siting cases processed by the CEC under an administrative law process where all technical analysis is ultimately adjudicated in evidentiary hearings.

**GWF Power, Kings County Farm Bureau v. City of Hanford, Kings County, CA:** Provided pretrial consultation, strategy support, depositions in Superior and Appellate Courts, expert witness testimony in Superior Court in the areas of air quality and public health for a landmark California Environmental Quality Act (CEQA) law suit involving the adequacy of an Environmental Impact Report prepared for the siting of a power plant. The lawsuit was successfully settled. Served on the settlement negotiation team as well as providing strategic and technical support to the settlement process. Served as an initial liaison to the Environmental Oversight Committee created during the settlement process.

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**GREGORY S. DARVIN**  
**Meteorologist**

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***Summary of Experience***

Mr. Darwin has specialized in the meteorological aspects of air quality issues for the last 34 years. He has extensive experience in air quality management, dispersion modeling, meteorological modeling, greenhouse gas emission inventories, monitoring, major source permitting, complex terrain model development and implementation, emission inventory and health risk assessments. His experience spans more than 25 different states and several countries.

He has been actively involved with PSD and environmental permits for many large-scale solid fuel, gaseous fuel, solar, and geothermal projects across the United States in addition to supporting oil, gas and mining operations and permits. Mr. Darwin has performed the following in the management and support of PSD and environmental applications: baseline air quality and air quality modeling analyses (including preparation and negotiation of the modeling protocol), prepared the PSD and air permit regulatory applicability analyses and permits, managed the preparation of the air quality emissions inventories, and prepared the Best Available Control Technology (BACT) evaluations.

Specific project experience includes emissions calculations, modeling of impacts, evaluation of regulatory applicability and compliance, New Source Review (NSR) and Prevention of Significant Deterioration (PSD) permitting, and minor source permitting. He has used and is thoroughly familiar with a number of air quality models, including AERMOD, ISC3, CALPUFF, CALMET, COMPLEX I AND II, IGM, FDM, RTDM, CTSCREEN, CTDMPPLUS, UAM, DEGADIS, SPILLS, VISCSCREEN, PLUVUEII, MESOPUFF, INPUFF, BLP, PAL, CAMEO, CALINE4, OCD5, RAM, TRACE, MM5, WRF, MPAS, SLAB, and the Paris Airshed Model. These models have been used in scientific and development settings as well as in regulatory settings.

***Education***

M.S. Atmospheric Science, 1993

B.A. Physical Geography/Meteorology, 1985

***Select Project Experience***

*High Desert Power Project, (MDAQMD).* Air Quality Project Manager and lead air quality modeler for preparation of the PSD and MDAQMD permits for a turbine performance upgrade to the 1,000 MW combined cycle power plant. Project included developing new emission inventories, BACT, dispersion modeling and the preparation of a health risk assessment.

## **GREGORY S. DARVIN**

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### ***Select Project Experience (continued)***

*Roseville Electric Project (PCAPCD).* CEC license amendment and air permit modification for replacing the combined cycle turbines with a performance upgrade turbine design.

*Palmdale Energy Project, (MDAQMD).* Air Quality Project Manager and lead air quality modeler for preparation of the project AFC and MDAQMD permits for a 850 MW combined cycle power plant. Project included permit negotiation, ERC review, and preparation of vertical velocity plume analyses.

*Intel Corporation, (MCAPCD and EPA).* Air Quality Project Manager for preparation of the PSD and MCAPCD permits for the major expansion of the Ocotillo foundry which will more than double chip production. Prepared the permit application including the BACT/LAER assessment, emissions inventory, modeling analyses, and regulatory review.

*Malburg Generating Station (SCAQMD).* Prepared the CEC license amendment and SCAQMD permit for installing turbine upgrades for the increase generation capacity for the combined cycle project.

*Stanton Electric Reliability Center (SCAQMD).* Prepared the air quality and public health analyses for the CEC license and SCAQMD permit application for the construction of two simple cycle turbines equipped with battery storage systems.

*Pico Power Project AFC, City of Santa Clara. (BAAQMD).* Air Quality Project Manager and lead air quality modeler for permitting a 180 MW power plant in the City of Santa Clara, Ca. Prepared and negotiated air quality permit with BAAQMD and prepared air section(s) of AFC for the California Energy Commission.

*Russell City Energy Center AFC, Calpine (BAAQMD).* Air Quality Project Manager for obtaining PSD permit and AFC for a large natural gas fired power plant, located near Hayward, Ca. Project required detailed emission calculations, air quality modeling, combined impact assessments, BACT analysis and demonstration, Title IV compliance, and Title V compliance issues. Project established first GHG BACT in the U.S.

*Metcalf Energy Center AFC, Calpine. (BAAQMD).* Lead air quality modeler for modeling a large natural gas fired power plant, located near San Jose, Ca. Project included CEQA, using refined modeling techniques to determine nitrogen deposition impacts, Class I analysis, and downwash analysis.

*Quail Brush Power Project PSD Permit Application, Cogentrix (SDAPCD).* Prepared air quality and public health sections for PSD and AFC permit applications for eleven (11) Wartsila 20V34SG-C2 engines. Tasks also included developing emissions inventory, including toxics and criteria pollutant/GHG BACT sections.



### ***Select Project Experience (continued)***

*Pacific Gas and Electric Gateway Generating Station (BAAQMD).* Ongoing support for preparation of major source BAAQMD permits to construct and operating permit applications. Support for PSD compliance plans as well as preparation of modeling assessment and BACT.

*Watson Cogeneration Project AFC and PSD Permit, British Petroleum (SCAQMD).* Project manager for preparing air and public health sections for the PSD and AFC process. The project included adding additional cogeneration capacity at the Carson Refinery. Prepared mitigation programs, offsets, and SCAQMD permit application. Developed plan for adding new source without the requirement for new PM offsets.

*Mountainview Power Plant – SCE (SCAQMD).* Project Manager for preparing an air quality permit modification related to commissioning activities and plant startup/shutdown. Ongoing work involves compliance monitoring for plant operations as well as permitting new activities and performing dispersion modeling analyses.

*Delta Energy Center AFC and PSD Permit, Calpine. (BAAQMD.)* Project manager for modifying a large natural gas fired power plant, located near San Jose, Ca. Project included BACT, PSD permitting and utilized refined modeling techniques to determine nitrogen deposition impacts, Class I analysis, and downwash analysis.

*Humboldt Bay Generating Station PSD Permit Application, Updated HRA and ATIR and Air Quality Compliance, PG&E (NCUAPCD).* Prepared PSD increment analysis for ten (10) natural gas-fired Wartsila 18V50DF 16.3 megawatt (MW) reciprocating engine-generator sets and associated equipment with a combined nominal generating capacity of 163 MW. Project analyzed both natural gas and backup fuel oil. Currently under contract with PG&E to provide ongoing air quality compliance consulting including updating the permit to allow for more hours of operation on fuel oil, assisting with monitoring plans, and preparing Title V permits.

*Oakley Generating Project AFC, Radback Energy (BAAQMD).* Project manager and lead modeler for preparing air and public health sections of the AFC and SDAPCD Permit Application in San Diego. Project included developing Carl Moyer mitigation program to satisfy CEC requirements.

*Mojave Solar AFC, Abengoa. (MDAQMD).* Air quality and public health project manager for permitting a 250 MW solar power plant which utilizes parabolic troughs to heat a transfer fluid. Project impacts included construction modeling, toxics inventory and HRA, operational modeling impacts, BACT, and permitting.

*Caithness Blythe II AFC and PSD Permit Applications (MDAQMD).* Project manager and lead modeler for the preparation of the air quality permits for a 600 MW combined cycle power plant in Blythe, California. Project included Class I impact assessments, BACT and secondary impact assessments.

**GREGORY S. DARVIN**

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***Select Project Experience (continued)***

*Calpine Geysers Wildhorse and Buckeye PSD Permit Applications (NSAPCD).* Air quality modeling in support of ongoing permitting for both criteria pollutants and toxics. Performed wind field analyses in support of upgrading the Geysers Air Monitoring Program for use with AERMOD.

*CalEnergy Blackrock Geothermal Expansion.* Lead Meteorologist for permitting three geothermal power plants in the Salton Sea area. Project was in support of a CEC license as well as local District Permits.

*East Altamont Energy Center AFC (BAAQMD, 2000-2002)* Lead Meteorologist for permitting large power plant, located near Tracy, Ca. Project included meteorological data set assessments, criteria pollutant and toxics impacts analysis, and construction impact modeling. Modeling was used to prepare PSD permit application as well as the AFC application for submittal to the CEC.

## KATE MOSS, PB

### BIOLOGICAL RESOURCES

Kate is a Principal terrestrial biologist in WSP's Greater Vancouver office with twenty years of experience with technical specialization in the fields of terrestrial and aquatic biology and impact assessment. As a senior biologist, Kate provides technical reviews, manages multi-disciplinary teams, designs and oversees the implementation of field programs, and liaise with regulators and Indigenous Groups. Through her career Kate has developed a portfolio of projects that include bio-inventories, biodiversity studies, invasive species studies, wildlife salvages, Species at Risk (SAR) surveys, impact assessments, and habitat compensation/mitigation design. Specifically, Kate is experienced in designing and conducting surveys for amphibians, birds, terrestrial gastropods, mammals, fish, ecosystem classification, annual population monitoring, and relative abundance analysis. Her technical field skills include fish/ wildlife salvages, amphibian surveys, trapping, and marking, amphibian egg mass surveys, small mammal trapping, aquatic invertebrate/ vertebrate surveys, species at risk habitat inventories, taxa specific species at risk surveys, breeding bird surveys, and remote camera mammal studies.

Kate has experience with environmental permitting in British Columbia including under the British Columbia Environmental Assessment Act (British Columbia EAA), Water Sustainability Act, Wildlife Act, federal Impact Assessment Act (previously CEAA), Fisheries Act, and Species at Risk Act. In her role, Kate has led multi-disciplinary teams through the provincial and federal assessment certificate processes both as the lead wildlife biologist and Project Manager. Kate has experience working with regulators to develop application information requirements and project conditions and respond to Information Requests as well working with Indigenous Groups to understand and incorporate various perspectives.

### PROJECT EXPERIENCE

#### **British Columbia Hydro, Transmission Line Pre-Clearing Wildlife Services, Merritt to Coquitlam, British Columbia :** Technical Lead.

Responsible for pre-clearing wildlife services along a new transmission line from Merritt to Coquitlam. Role included managing, coordinating, and conducting pre-clearing amphibian breeding surveys and aerial stick nest surveys along the new alignment. Amphibian surveys targeted all pond-breeding amphibians with a particular focus on designated species. In addition, coordinated other pre-clearing surveys for nesting birds, snakes, bats, rare plants, mountain beaver, and band-tailed pigeon on portions of the alignment. Also responsible for providing input and review to environmental protection plans and auditing of implementation of mitigation measures to protect terrestrial wildlife species.

**British Columbia Hydro, Peace Region, British Columbia:** Authored Amphibian, Avifauna, and Large Carnivore Manage Plans for the Peace Region Electrical Supply Project.

#### **British Columbia Hydro, Vancouver Island, British Columbia:**

Conducted an overview assessment for restoration work proposed for the Puntledge Penstock. Work included identifying potential Species at Risk



#### EDUCATION

- BS, Biology, University of Victoria

#### LICENSES/REGISTRATIONS

- Professional Biologist

# 21

Years with WSP

# 22

Years of Experience

## Kate Moss, PB (Continued)

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presence, applying for environmental permits, and overseeing species specific studies prior to Project implementation.

**Zero Energy Emissions Development, Various locations, British Columbia:** Compiled available background information regarding existing conditions at five potential wind farm development sites across British Columbia, including sites on Vancouver Island, Okanagan, and North eastern British Columbia. In addition, conducted aerial surveys for eagle, osprey and heron nests on the proposed Vancouver Island site.

**British Columbia Hydro, Terrace, British Columbia:** Designed, managed, and coordinated pre-clearing western toad breeding surveys along the portions of project alignment being cleared within the breeding and migration periods. Conducted aerial stick nest surveys for raptor and heron along 350 km of proposed transmission line.

**British Columbia Hydro Site C, Fort St John, British Columbia:** Conducted diurnal raptor nest searches, nocturnal owl call-playback surveys and pre-clearing bird nest surveys.

**ATCO, Alberta, Canada:** Conducted raptor stick nest surveys focusing on documenting rare raptor species. Conducted burrowing owl play-back surveys in native prairie habitat.

**AltaGas, Boston Bar, British Columbia:** Assessed terrestrial wildlife resources, including habitat characterization, potential species at risk occurrence and habitat use, and possible key habitat areas as part of an overview environmental assessment for two proposed independent hydroelectric projects

**British Columbia Transmission Corporation, Vancouver Island, British Columbia:** Assessed terrestrial wildlife resources, including available habitat, overview species inventory, potential species at risk and possible movement corridors, along five potential transmission line corridors on Vancouver Island.

**WesPac Midstream, City of Delta, British Columbia:** Project Manager and Wildlife Component Lead. Responsible for the environmental impact assessment application of an Liquefied Natural Gas delivery system on the Fraser River, Lower Mainland. As Project manager, responsibilities included scope and budget management, communication with regulators and stakeholders, communication and management of a large multidisciplinary team. Additionally, supported consultation with Indigenous Groups, managed providing responses to Information Requests, and worked with the British Columbia EAO to develop project conditions. Responsibilities as wildlife component lead include managing, coordinating and conducting baseline surveys for terrestrial resources including wildlife habitat, and rare species presence and developing the wildlife environmental assessment chapters. Prepared responses to information requests from Working Group members and the British Columbia EAO/IAAC. Also responsible for the development of non-technical chapters of the application document.

**Confidential Client, Horse Heaven Wind Power Project, WA:** Provided reviews of the wildlife and wildlife habitat sections of the Application for Site Certification for the State of WA Energy Facility Site Evaluation

## Kate Moss, PB (Continued)

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Council. Review included an initial review against the State Environmental Policy Act (SEPA) checklist followed by a more detailed review against the WA Administrative Code (WAC). Drafted the Wildlife and Habitat section for the Client's Environmental Impact Statements (EIS). Reviewed public comments on the draft EIS to incorporate into the final statement. Supported the Client in meetings with the Applicant and WA State departments to develop the final EIS.

**Confidential Client, Badger Mountain Solar Facility, WA:** Provided reviews of the wildlife and wildlife habitat sections of the Application for Site Certification for the State of WA Energy Facility Site Evaluation Council. Review included an initial review against the SEPA checklist followed by a more detailed review against the WAC. Drafted the Wildlife and Habitat section for the Client's EIS. Supported the Client in meetings with the Applicant and WA State departments.

**Confidential Client, Carriger Solar Facility, WA:** Provided senior review and oversight of the SEPA review and supported the Client in meetings with the Applicant and WA State departments.

**Confidential Client, High Top and Ostrea Solar Project, WA:** Provided reviews of the wildlife and wildlife habitat sections of the Application for Site Certification by the Client. Review included an initial review against the SEPA checklist.

**Confidential Client, Wautoma Solar Project, WA:** Provided reviews of the wildlife and wildlife habitat sections of the Application for Site Certification by the Client. Review included an initial review against the SEPA checklist. Supported the Client in meetings with the Applicant and WA State departments.

**Confidential Client, Hop Hill Solar, WA:** Provided reviews of the wildlife and wildlife habitat sections of the ASC by the Client. Review included an initial review against the SEPA checklist.

**Fraser River Tunnel Crossing, Lower Mainland, British Columbia:** Lead wildlife biologist responsible for design and implementation of baseline studies including selection of study method, identification of sampling locations, management of field staff, and reporting review and oversight. Contribute to British Columbia Environmental Assessment Process documents including the detailed project description, Valued component selection, and application information requirement.

**Barkerville Gold, Wells, British Columbia:** Lead wildlife biologist responsible for design and implementation of baseline studies including selection of study method, identification of sampling locations, management of field staff, and reporting review and oversight. Also responsible for responding to technical information requests from Indigenous Groups and regulators on baseline conditions.

**Woodfiber LNG, Howe Sound, British Columbia:** Responsibilities as the terrestrial component lead included providing input to pre-application documents (Valued Component Rational and Application Information Requirement), designing and collecting terrestrial baseline data, and developing the vegetation and wildlife technical chapters of the Environmental Impact Assessment.

## Kate Moss, PB (Continued)

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**BURNCO Rock Products, Howe Sound, British Columbia:** Led the terrestrial component for the environmental impact assessment application. Responsibilities include managing, coordinating and conducting baseline surveys for terrestrial resources including vegetation composition, wildlife habitat, and rare species presence and developing the vegetation and wildlife environmental assessment chapters. Baseline surveys include terrestrial ecosystem mapping, rare plant surveys, breeding bird surveys, amphibian surveys and species-specific surveys for provincially/ federally designated species.

**British Columbia Hydro, Lower Mainland, British Columbia:** Terrestrial lead for the Metro North Transmission Line upgrade project. Project did not require application through the British Columbia EAO or CEA Agency; however, did follow an enhanced Overview Environmental Assessment process to mirror an effects assessment conducted to the level required under British Columbia EAA/ CEAA. Role included designing and managing baseline surveys, conducting an assessment of effects, designing mitigation strategies, and developing a cumulative effects assessment.

**Shxw̓ha:y Village First Nation, City of Chilliwack, British Columbia:** Conducted a Screening level environmental assessment for the closure of a landfill situated at Shxw̓ha:y Village. Suitable Oregon Forestsnail habitat was identified within the Project footprint during surveys conducted subsequently to the assessment. Mitigation measures were developed to avoid effects to suitable Oregon forestsnail habitat and information on the occurrence was provided to federal and provincial agencies.

**West Coast LNG, Prince Rupert, British Columbia:** Designed and led presence/ not detected surveys for western toad surveys as part of baseline data collection for the WC LNG impact assessment.

**Kitimat LNG, Kitimat, British Columbia:** Conducted call-playback surveys for western screech-owl as part of baseline data collection

**MetroVancouver, Township of Langley, British Columbia:** Conducted an Environmental Overview Assessment and produced an Environmental Management Plan (EMP) for the expansion of the Northwest Langley Wastewater Treatment Plant.

**Public Works and Government Services Canada, Gabriola Island, British Columbia:** Conducted a screening level environmental assessment under the Canadian Environmental Assessment Act for wharf decommissioning/ restoration on Gabriola Island.

**Public Works and Government Services Canada, British Columbia, Canada:** Conducted a screening level environmental assessment of training and target exercises undertake by the Department of National Defence off the west coast of Canada. Tasks involved assessing the baseline environment and potential effects to the environment and local communities due to the works.

**Public Works and Government Services Canada, Pritchard, British Columbia:** Conducted a screening level environmental assessment under the Canadian Environmental Assessment Act for demolition works associated with a wharf structure situated on the Thompson River.



## Kate Moss, PB (Continued)

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Managed pre-clearing surveys for American badger and olive clubtail.

**Ahousaht First Nation, Flores Island, British Columbia:** Conducted a screening level environmental assessment under the Canadian Environmental Assessment Act for closure of a landfill site for the Ahousaht First Nation on Flores Island.

**Tla-o-qui-aht First Nation and Indian and Northern Affairs Canada, Meares Island, British Columbia:** Conduct a screening level environmental assessment under the Canadian Environmental Assessment Act for closure of a landfill site for the Tla-o-qui-aht First Nation on Meares Island.

**Shelterwood and Kyuquot - Checlesseht First Nation, Kyuquot, British Columbia:** Conducted a screening level environmental assessment under the Canadian Environmental Assessment Act for remediation of contamination on the Kyuquot reserve including several sites situated near marine habitat.

**Mount Polley Mining Corporation, Williams Lake, British Columbia:** Designed and managed an Amphibian Management Program as part of the tailings dam breach reclamation program. Designed a habitat isolation plan to minimize interactions between reclamation works and migrating and breeding amphibians. Managed salvages of amphibians from within the working area as required.

**Trend Roman Mine, Tumbler Ridge, British Columbia:** Collected eggs from riverine bird species from reference creeks (i.e., background) and creeks affected by the mine development for chemical analysis. Collection targeted spotted sandpiper. Results were used to provide input to mine selenium management.

**Peace River coal, Tumbler Ridge, British Columbia:** Collected eggs from riverine bird species from reference creeks (i.e., background) and creeks affected by the mine development for chemical analysis. Collection targeted spotted sandpiper. Results were used to provide input to mine selenium management.

**Quinsam Coal, Vancouver Island, British Columbia:** Conducted bird and amphibian surveys within the mine expansion footprint. Bird presence was sampled using point-count methods. Amphibian presence and habitat use surveys were completed by conducting systematic searches along transects within wetlands and adjacent upland habitat. Conducted an amphibian salvage in wetlands located within the proposed mine expansion footprint.

**Coal Creek, Fernie, British Columbia:** Managed and designed biological studies to identify important habitat features within and near the proposed mine footprint. Conducted a habitat assessment and search for amphibian breeding habitat in and adjacent to the prospective project footprint. Conducted breeding bird point count surveys and northern goshawk call playback surveys in and adjacent to the prospective project footprint. Collected eggs from riverine bird species from reference (i.e. background) creeks and creeks within the proposed mine footprint (i.e. affected). Collection targeted spotted sandpiper. Results were used to provide input to selenium management.

## Kate Moss, PB (Continued)

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**Western Canadian Coal, Tumbler Ridge, British Columbia:** Collected amphibian egg masses and bird eggs to analyse selenium levels in background and mine affected wetlands. Collection targeted palustrine bird species. Results were used to provide input to mine selenium management.

### PIPELINES

**TC Energy, Coastal GasLink, Peace Region, British Columbia:**

Acted as Wildlife Qualified Professional (QP) during the implementation phase of the Coastal GasLink Project. Responsibilities included supporting Coastal GasLink with implementation of the commitments in the Environmental Management Plan and responding to requests from the Environmental Inspector. Specifically, responsible for developing technical memos, managing amphibian salvages, conducting annual pre-construction surveys for bear dens, fisher dens, and amphibian breeding.

**TransMountain Pipeline LP, Port Coquitlam, British Columbia:** Acted as Project Manager and Senior Technical Reviewer for development of an Overview Environmental Assessment, Environmental auditing during construction, and water quality monitoring at the Sapperton Yard.

**East Langley Water Supply Project, Township of Langley, British**

**Columbia:** Assessed the suitability of the habitat within the Project area for red-legged frogs and Pacific water shrew. Designed, managed and conducted a salvage for red-legged frogs and small mammals. Managed and conducted pre-clearing bird nest surveys along portions of the alignment being cleared outside of the least risk bird breeding window.

**Port Mann Main North No. 2, Port Coquitlam, British Columbia:**

Provided environmental services during the preliminary and detailed design phase of the Project including developing an environmental management plan, environmental permitting, pre-clearing bird nest surveys and Oregon forest snail salvage. Developed a riparian habitat compensation plan to offset effects to a fish bearing watercourse.

**WPE, Alberta, Canada:** Conducted surveys for active bird nests prior to project area clearing and construction. Bird nests were identified using bird auditory and behavioural cues.

**North American Pipeline Inc., Delta, British Columbia:** Managed and coordinated environmental monitoring. Coordinated as needed water and soil quality sampling. Provided environmental input to permit applications associated with groundwater dewatering issues.

### OIL & GAS

**Confidential Client, Northwest, British Columbia:** Designed and managed pre-clearing nest surveys and a large-scale amphibian salvage during geotechnical and geoenvironmental drilling investigations. Amphibian salvages included salvaging at-risk species.

**Confidential Client, Port Moody, British Columbia:** Provided senior technical review and oversight of a Japanese knotweed management plan.

**Confidential Client, Port Moody, British Columbia:** Provided senior technical review and oversight of the assessment habitat suitability using

## Kate Moss, PB (Continued)

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existing or new models for four species at risk: trowbridge's shrew, Pacific water shrew, coastal tailed frog, and red-legged frog.

**PetroCanada, Alberta, Canada:** Conducted surveys for nesting birds, with a focus on rare species, at proposed natural gas well head, access road, and pipeline routes. Surveys were conducted in prairie, ranch, and agricultural land. Surveys for burrowing owls were conducted using call playback followed by pedestrian searches. Other tasks included documenting general and sensitive habitat features, active and inactive nests, bird activity, and key wildlife features (i.e., rattlesnake hibernacula).

**Canadian Natural Resources Ltd., Alberta, Canada:** Field coordinated and conducted programs initiated to deter waterfowl and water associated bird from nesting on tailings ponds prior to the introduction of tailings. Tasks included developing possible deterrent methods, consulting with CNRL staff and Alberta Sustainable Resource Development staff regarding recommended deterrent methods, coordinating field crews, collecting data on waterfowl and water associated bird site usage, and implementing deterrent methods.

**CPC Surmont and CNRL Kirby, Alberta, Canada:** Conducted nocturnal owl call-playback surveys.

### TRANSPORTATION

**Alaska Highway, Fort Nelson, British Columbia:** Provided senior oversight and review of environmental overview assessments and management plans for multiple remediation sites along the Alaska Highway. The sites overlapped populations of at risk species.

**Vancouver Fraser Port Authority, Tsawwassen, British Columbia:** Participated in juvenile crab surveys for the Vancouver Fraser Port Authority.

**Ministry of Transportation and Infrastructure, Lower Mainland, British Columbia:** Assessed habitat suitability for Pacific water shrew. Design and led live trapping program to survey for shrew presence in the Project area. Designed a salvage program at isolated locations where Pacific water shrew presence was identified.

**Translink, Richmond, British Columbia** Conducted and coordinated pre-development wildlife surveys within lots proposed to be developed as a bus centre. Surveys included: monitoring of nesting raptors, pre-clearing breeding bird nest surveys, and Pacific water shrew salvage. Completed a bird management plan to guide project construction during the bird breeding period.

**Focus Engineering, Fort Nelson, British Columbia:** Assessed terrestrial wildlife resources, including characterization of available habitat, potential species at risk occurrence, and possible key habitat areas as part of an environmental assessment for expansion of the SYD Road, east of Fort Nelson. Assessment of species at risk potential habitat included assessment of possible interactions between the project and Boreal caribou.

**Hatfield Consulting, Vancouver to Whistler, British Columbia:** Managed and coordinated amphibian salvages at a variety of locations

## Kate Moss, PB (Continued)

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along the Sea-to-Sky corridor. At-risk focal species included Red-legged frog and Coastal tailed frog. Salvaging methods included pit fall trapping, coverboards, aquatic traps, and active searches. Captured individuals were marked with elastomer dye prior to release. Role included crew coordination, data collaboration, weekly reporting, and budgeting.

**Hatfield Consulting, Pinecrest, British Columbia:** Coordinated and led a fall post-salvage amphibian monitoring program along a new portion of the upgraded Sea-to-Sky highway. The program involved conducting active searches for red-legged frog and other amphibians at sites where amphibians salvaged prior to the highway construction were released. The purpose of this program was to document the presence of previously salvaged amphibians (denoted by an elastomer dye marking) at salvage release sites.

**Hatfield Consulting, Vancouver to Whistler, British Columbia:** Managed field crews and coordinated breeding bird surveys along the Sea-to-Sky corridor. Tasks included documenting and reporting bird activity such as auditory cues, nest building, and feeding young, and searches for active and inactive nests.

**British Columbia Ministry of Transportation, Gateway Program, Lower Mainland, British Columbia:** Conducted an assessment of wildlife and fish passage through culverts within the Gateway alignment. Delineated key locations for improvement of wildlife and fish passage. Made recommendations regarding general culvert design requirements to encourage fish and wildlife use.

**British Columbia Ministry of Transportation, Gateway Program, Lower Mainland, British Columbia:** Coordinated the responses from public and government agencies to the Port Mann/Highway 1 EA Certification application. Tracked comments provided by the public and government agencies regarding fisheries and wildlife resources and shaped responses within the context of the application.

**British Columbia Ministry of Transportation, Gateway Program, Lower Mainland, British Columbia:** Participated in baseline data collection, species at risk presence assessment, and reporting regarding terrestrial resources along the Port Mann/Highway 1 alignment. Tasks included field studies, impact assessment, assessment of overview potential mitigation and compensation options, and compilation of the terrestrial resources impact assessment package.

**Delcan Ltd., Vancouver, British Columbia:** Collected baseline water quality and fish data from the Ministry of Water, Land and Air Protection library and other sources (including contacting respective agencies and societies). Wrote watercourse assessments, impact assessments, and mitigation plans for watercourses affected along the project. Co-ordinated and conducted several wildlife surveys and studies, include an assessment of fish and wildlife passage through culverts, habitat suitability modelling, and assessment of project impacts, potential compensation and mitigation.

**UMA Group Ltd., Surrey, British Columbia:** Aided in the design of the habitat compensation plan in Peacock Brook. This involved evaluating the site and potential compensation plans, creating a detailed compensation

## Kate Moss, PB (Continued)

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plan, and creating respective drawings. Took water quality readings in Peacock Brook and documented the surrounding site.

**City of Coquitlam, Coquitlam, British Columbia:** Set up and monitored trap lines for the Pacific water shrew. Setup involved co-coordinating placement of pit fall traps and fence line. Visited the traps daily and recorded trapped species. Conducted electrofishing and stream assessments. Provided environmental monitoring services at various locations along the road alignment. Provided Environmental Monitoring services for roadway and bridge construction associated with the David Avenue Connector.

**Flatiron, Kicking Horse Canyon, British Columbia:** Prepared permit applications for the works involved in the upgrade of Highway 1 through Kicking Horse Canyon. Permits included application under the Fisheries Act, Navigable Waters Act, and Water Act.

**TransLink, Maple Ridge, British Columbia:** Coordinated and led several pre-development programs at a TransLink property in Maple Ridge. Programs included pre-condition survey, water conveyance survey, Pacific water shrew salvage, fish salvage, and environmental monitoring. Tasks included staff coordination, site surveys, Pacific water shrew trap line set up and checks, fish salvages using passive and active trapping techniques, environmental monitoring, reporting, and management.

### GOVERNMENT

**Fisheries and Oceans Canada, Cultus Lake, British Columbia:** Conducted an overview habitat assessment focusing on federally listed Species at Risk and Migratory birds at the Department of Fisheries and Oceans Cultus Lake Laboratory site. Conducted habitat surveys and searches for Oregon Forestsnail, habitat surveys for Pacific giant salamanders, northern goshawk call playback surveys, and acoustic surveys for bats, including little brown myotis. The field data was used to identify sensitive and unique habitats. The results of the habitat assessment were used to develop a Management Plan to guide future site development and construction.

**Kwaw-kwaw-Apilt First Nation, Chilliwack, British Columbia:** Conducted a habitat assessment for Oregon Forestsnail prior to initiation of a drilling program. Applied for a federal SARA permit to translocate Oregon Forestsnail prior vegetation clearing.

**Defence Construction Canada, Victoria, British Columbia:** Conducted an overview environmental assessment of a proposed development at the Canadian Forces Base - Esquimalt Colwood base. Conducted a survey for rare gastropods using Artificial Cover Objects (ACOs) and active search methods.

**MetroVancouver, Coquitlam, British Columbia:** Conducted salvages for Pacific water shrew and red-legged frog prior to the construction of fish enhancement habitat. Trained MetroVancouver staff to participate in the salvages

**PWGSC, Colwood, British Columbia:** Managed the removal of invasive plant species and restoration of ecologically sensitive (i.e. Garry oak ecosystem) areas and areas used for military training at CFB Esquimalt

## Kate Moss, PB (Continued)

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- Albert Head. Removal was conducted using mechanical methods and material disposed of off site

**PWGSC, Metchosin, British Columbia:** Managed the removal of invasive plant species and restoration of ecologically sensitive (i.e. Garry oak ecosystem) areas and areas used for military training at CFB Esquimalt  
- Rocky Point. Project included removal of various invasive species using mechanical and chemical methods. Plant material removed were disposed of off-site or burnt on site.

**Aboriginal Affairs and Northern Development, Klemtu, British Columbia:** Conducted a baseline assessment of aquatic and terrestrial habitat, wildlife use and fish habitat for a landfill closure plan. Data may be used to develop a screening level environmental assessment under the Canadian Environmental Assessment Act

**Fisheries and Oceans Canada, Vancouver, British Columbia:** Conduct a screening level environmental assessment under the Canadian Environmental Assessment Act for remediation at a Coast Guard station situated at Sea Island.

**Dayton & Knight Ltd., Township of Langley, British Columbia:** Conducted a review of stream and riparian habitat related to the development of a Decentralized Sewage Management Plan for the Township of Langley. The review included compiling available background data and a field review of selected stream locations.

**Public Works and Government Services Canada, Colwood, British Columbia:** Conducted surveys for rare slugs and assessed habitat potential to support a variety of rare wildlife species. Rare slug surveys were conducted using two methods: installing cover objects along transects and conducting time constraint surveys along transects.

**MetroVancouver, Coquitlam, British Columbia:** Led pre-clearing terrestrial salvages including amphibian and small mammal salvages. Trained MetroVancouver staff in salvage techniques and species identification. Developed trap line set up using pitfall traps and Sherman traps. Managed trapping program and data. In addition to salvages, conducted pre-clearing bird nest sweeps and western screech owl call playback surveys.

**Public Works and Government Services Canada, Port Hardy, British Columbia:** Managed and conducted a natural resource inventory of the Port Hardy Airport. Tasks included conducting species specific surveys (red-legged frog, northern goshawk and marbled murrelet), general wildlife surveys, updating terrestrial ecosystem mapping, breeding bird surveys, and fish habitat surveys. The Natural Resource Inventory also included a review of background information and previously conducted surveys.

**Justice Institute of British Columbia, Maple Ridge, British Columbia:** Conducted a review of a proposed off-road driving facility development including project components and overview site assessment to determine possible environmental issues.

**Public Works and Government Services Canada, Aldergrove, British Columbia:** Managed and led a study to investigate effectiveness of two forms of American bullfrog (an invasive amphibian species in western



## Kate Moss, PB (Continued)

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Canada) removal from wetlands at Maintenance Detachment Aldergrove. Methods investigated included shooting and electroshocking bullfrogs. The effectiveness of the methods was statistically compared to determine the most effective. Tasks included project management, field crew coordination, field surveys, data management and analysis, and reporting.

**Public Works and Government Services Canada, Aldergrove, British Columbia:** Managed and coordinated a rare plant survey at MDA Aldergrove. The purpose of the survey was to determine rare plant presence with a focus on Vancouver Island Beggarticks.

**Public Works and Government Services Canada, Prince George, British Columbia:** Reviewed the requirements for project approval under the Canadian Environmental Assessment Act (CEAA) with regards to a proposed re-development of a hydrometric station. The purpose of this review was to determine whether an application under CEAA would be required given the location and project components. Tasks included a review of historical data, current site conditions, proposed project plans, and CEAA legislation.

**Public Works and Government Services Canada, Aldergrove, British Columbia:** Conducted systematic and auditory surveys to document American bullfrog, an invasive amphibian species, population within wetlands in Aldergrove. Tested three tadpole trapping methods and removed adults from the systems.

**Public Works and Government Services Canada, Aldergrove, British Columbia:** Coordinated and conducted rare frog breeding and egg mass surveys within wetlands in Aldergrove.

**Fisheries and Oceans Canada, British Columbia:** Conducted high-level overview assessments of habitat, potential wildlife use, and possible species at risk occurrence at eight facilities/properties owned by Fisheries and Oceans Canada (DFO). Tasks included a review of available historical data, site visit, or review of visit information, and reporting.

**Vancouver Parks Board, Vancouver, British Columbia:** Created environmental specifications and submitted permitting application to Land and Water British Columbia under Section 9 of the Water Act for trail upgrades in Vancouver's Stanley Park.

**Corporation of the District of North Vancouver, North Vancouver, British Columbia:** Participated in the fish snorkel surveys done along the Seymour River to collect data on fish biodiversity and population changes around compensation site over a period of three years.

**Public Works Government Services Canada, Aldergrove, British Columbia:** Monitored the removal of beaver dams and the construction of Oregon spotted frog habitat in sensitive wetland ecosystem. Conducted salvage at the site prior to dam removal.

**Corporation of Delta, Delta, British Columbia:** Prepared applications for approval of works by the Fraser River Estuary Management Program. Provided reporting on the environmental protection measures.

**Public Works and Government Services Canada , Aldergrove, British Columbia:** Conducted and reported biodiversity surveys in

## Kate Moss, PB (Continued)

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habitat developed for an endangered frog species. Surveys included an assessment of regeneration of invasive grass, invertebrate survey, aquatic vertebrate survey, salamander survey, frog survey, and invasive frog survey.

**Public Works and Government Services Canada, Aldergrove, British Columbia:** Conducted the second year of a study implemented to investigate reed canary grass regeneration at a re-constructed wetland. This project involved locating and documenting patches of reed canary grass at the site. Regeneration was documented by GPS patch location and enumerating plant regrowth. In addition, the work included the hand removal of reed canary plants re-invading the site.

**Public Works and Government Services Canada, Aldergrove, British Columbia:** Led a trapping program designed to remove Bullfrog, an invasive amphibian, from reconstructed wetland. Bullfrogs were trapped using a spotlight to immobilize the animal and a large dipnet to capture it. Bullfrogs captured were euthanized.

**Ministry of Environment, Vancouver Island, British Columbia:** Prepared a draft Recovery Plan as per the ROMAN guidelines for two species of endangered lamprey, Morrison Creek lamprey, and Cowichan Lake lamprey. Draft included detailing current research on the species, potential impacts to the species, and action plans to direct recovery efforts.

**Public Works and Government Service Canada, Aldergrove, British Columbia:** Conducted an environmental assessment of two rural residential properties that were scheduled for building deconstruction. The work included documenting species usage of the site, assessing potential impacts to surrounding terrestrial and aquatic systems and rare and endangered species.

### LAND DEVELOPMENT

**Wiggins Holdings Inc, Burnaby, British Columbia:** Lead Biologist. Responsible implementation of management strategies during the development of the Project. Responsibilities included technical review and management of provincial and federal permits and authorizations under the Water Sustainability Act, Wildlife Act, and federal Fisheries Act. Managed and conducted pre-construction salvages for amphibians and Pacific water shrew and pre-clearing bird nest surveys. Provided technical advice on the management of potential barn owl habitat.

**Ausenco Sandwell, Coquitlam, British Columbia:** Provided environmental services during pre-design, design, and initial construction stages of the UV Disinfection Facility project. Completed environmental assessments, conducted a regulatory review, and secured permits and authorizations; conducted wildlife and fisheries salvage and biodiversity enhancement initiatives; and developed detailed aquatic habitat compensation designs. Managed and conducted pre-clearing surveys for western screech-owl, active bird nest surveys and salvages for Pacific water shrew and amphibians.

**British Properties Development, West Vancouver, British Columbia:** Conducted surveys for Pacific tailed frog tadpoles and adults along six creeks in West Vancouver. Data was collected as part of an ongoing tailed

## Kate Moss, PB (Continued)

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frog monitoring program. Data collection included capturing tadpoles within 10 m stream transects upstream, downstream and at crossing structures. Results were compared to data collected in previous years to record changes in frog observations.

**Urban System, Tsawwassen, British Columbia:** Compiled information regarding fish, wildlife, and water quality resources as part of the Integrated Storm Management Plan developed for the Tsawwasenn First Nation. Information compilation included reviewing available background information and conducting a field review of fish and wildlife habitat. Contribution to ISMP included information on existing resources and developing goals and action plans regarding fish, wildlife, and water quality resources for future Site development.

**Stantec, Chilliwack, British Columbia:** Managed and coordinated an environmental assessment of a proposed project to develop a parking lot on land owned by the Department of National Defence. Tasks included project management, coordination of field tasks, and reporting.

**Stantec, Vernon, British Columbia:** Managed and coordinated an environmental assessment of a proposed project to develop small outbuildings on land owned by the Department of National Defence. Tasks included project management, coordination of field tasks, and reporting.

**MacDonald Corp., Squamish, British Columbia:** Collected data on wildlife movement and amphibian site usage at a proposed development site. Wildlife movement was documented using remote sensory cameras. Tasks included field coordinating and conducting remote camera data collection, time-constrained amphibian searches, and data management.

**Canadian Forest Corp., Sunshine Coast, British Columbia:** Conducted an overview environmental assessment of property owned by the Canadian Forest Corp. on the Sunshine Coast. Assessment involved an overview inventory of fisheries and wildlife resources, potential permitting requirements, and recommendations regarding habitats for retention and mitigation measures.

**TELUS Corp., Seton Portage, British Columbia:** Conducted an overview environmental assessment of a proposed fiber optic cable route from D'Arcy to Lillooet, including an overland portion through Seton Portage between Anderson and Seton lakes. Evaluated terrestrial habitat for potential usage by amphibians, birds, and mammals and addressed potential impacts to terrestrial and aquatic species. In addition, conducted Spotted owl call-playback surveys.

**Simon Fraser University, Burnaby, British Columbia:** Conducted weekly environmental monitoring of the construction of residency buildings and project-related detention pond.

**Redden Development, Richmond, British Columbia:** Monitored the construction of rock pillars along the Fraser River. Conducted bird point count surveys in the area surrounding the construction site.

**Austeville Properties Ltd., Richmond, British Columbia:** Wrote an application under section 35(2) of the Fisheries Act for the development of land by Austeville Properties. This involved creating a habitat compensation plan, taking an inventory of the habitat surrounding the

## Kate Moss, PB (Continued)

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compensation site, and modelling the compensation plan in concert with surrounding habitat. Provided environmental monitoring services of instream works.

**Britannia Properties, Britannia, British Columbia:** Conducted stream surveys along watercourse within the Britannia properties development site.

**Focus Engineering, Cobble Hill, British Columbia:** Conducted water quality and sediment sampling as part of an environmental assessment of a development site. In addition, assessed the baseline terrestrial habitat and potential impacts to terrestrial habitat quality.

**Focus Engineering, Salt Spring Island, British Columbia:** Conducted a baseline study of the terrestrial and aquatic environment as part of an assessment under the Municipal Sewer Regulations for the installation of a wastewater treatment plant. In addition, assessed the impacts of the project on the terrestrial environment.

**JJM Construction, Coquitlam, British Columbia:** Conducted a water quality (TSS and Turbidity) sampling program and environmental protection monitoring at the Coquitlam Dam during seismic upgrades. Tasks included in situ sampling, sampling for laboratory analysis, and monitoring of sediment and erosion control measures.

**TELUS Corp, Vancouver, British Columbia:** Conducted an assessment of terrestrial habitat and resources at several landing sites being considered as part of an underwater fiber optic cable project. The assessment included documenting species presence, current and potential species use of each site, and rare and endangered species site use.

**NEMI:** Sampled benthic invertebrate and periphyton on remote waterways using a Hess and a Serber sampler. Removed otoliths and determined the age of previously collected sculpins and rainbow trout.

### OTHER

**eSensor, Vancouver, British Columbia:** Researched current aquaculture markets in Europe as they relate to the need of a diagnostic tool for aquatic diseases. Researched the current and future trends of aquaculture and reported them in coordination of a worldwide market survey.

**Confidential Client, Los Monchis, Mexico:** Aided in conducting a Phase 1 inspection of an industrial plant in Los Monchis.

**Squamish First Nation, Squamish, British Columbia:** Investigated the potential for the occurrence of species at risk at several sites in the Squamish region. Potential species-at-risk presence was assessed by ranking the quality of available habitat. Tasks included conducting field assessments, ranking sites, and reporting.

**Reckitt Benckiser Group, Vanderhoof, British Columbia:** Conducted an overview Phase 1 assessment of property east of Vanderhoof, British Columbia .

# SCOTT CRAWFORD

## BIOLOGICAL RESOURCES

Scott has conducted biological resource surveys throughout California since 1994. He is experienced in conducting general biological resources assessments, feasibility studies, vegetation mapping, wetland delineations, forensic identification, protocol surveys for sensitive plant and wildlife species, regulatory permitting, and mitigation negotiations.

Scott is well-seasoned in GIS, vegetation mapping, and forensic identification and experienced in preparing biological reports, as well as biological sections for general plans, specific plans, environmental impact reports, and environmental impact statements. He participates in third-party reviews for cities and counties. Scott is a practiced technical expert for public hearings, city council meetings, planning commission meetings, and county board of supervisor meetings, and has served as an expert witness.

Scott is currently the Biology Group Manager for WSP in the Riverside office. The team consists of six full-time and as many as 20 on-call employees. Responsibilities include preparing proposals, scheduling fieldwork, managing day-to-day activities, documenting peer review, and project/client management.

## PROJECT EXPERIENCE

**Client, Lake Elsinore Advance Pump Storage, Lake Elsinore and Surrounding Areas, CA:** Scott conducted biological resources assessment and focused species surveys for 81 miles of proposed transmission lines. Surveys included general reconnaissance-level surveys as well as focused surveys for Quino checkerspot butterfly, California gnatcatcher, Least Bell's Vireo, arroyo toad, red-legged frog, spotted owl, and sensitive plants. Also participated in informal consultation with USACE, Regional Water Quality Control Board, USFWS, California Department of Fish and Wildlife, and United States Department of Agriculture Forest Service. He assisted in siting studies for the proposal transmission line to avoid biological and cultural resources associated with the project. Scott negotiated alignment changes with the United States Forest Service. An impact assessment was prepared and used as part of the application for a recognized project under the Federal Energy Regulatory Commission.

**Nevada Hydro Company, Lake Elsinore Advance Pump Storage (LEAPS), Lake Elsinore, CA:** Scott conducted biological resources assessment and focused species surveys for 81 miles of proposed transmission lines for the LEAPS project. Surveys included general reconnaissance-level surveys as well as focused surveys for Quino checkerspot butterfly, California gnatcatcher, least bell's vireo, arroyo toad, red-legged frog, spotted owl, and sensitive plants. Scott also participated in informal consultation with USACE, the Regional Water Quality Control Board, USFWS, U.S. Department of Agriculture Forest Service, and California Department of Fish and Wildlife. He assisted in siting studies for the proposal transmission line in an effort to avoid biological and cultural resources associated with the project, as well as negotiated alignment changes with the United States Forest Service. An impact assessment was



## EDUCATION

- MA, Biology, California State University
- BA, Environmental Biology, California State University

## LICENSES/REGISTRATIONS

- Federal Permit No. TE088597B- 0 California gnatcatcher. Previously permitted for Quino Checkerspot Butterfly, Listed Fairy Shrimp, and El Segundo Blue Butterfly
- Flat-Tailed Horned Lizard, No. 6- 2001

## TRAININGS

- Wetland Training Institute
- Desert Tortoise Council Workshop
- 40-hour Engineering Manual (EM) 385 1-1
- Construction Hazard Awareness Safety
- Experienced Geographic Information System (GIS) Technician
- Federal Energy Regulatory Commission Compliance
- Developing a Biological Assessment (BA)

## Scott Crawford (Continued)

prepared and used as part of the application for a recognized project under the Federal Energy Regulatory Commission. Work plans were prepared for biological resources, recreational resources, and fire resources.

**Los Angeles Department of Water and Power, Powerline Road Maintenance, Los Angeles, CA:** Scott conducted pre-construction clearance surveys for desert tortoise and sensitive plants and mapped jurisdictional drainage crossings to identify sensitive natural resource areas as part of road maintenance activities along Powerline Road from Baker to Adelanto (80 miles). Managed the team of biologists and assisted in mapping sensitive resources during the pre-construction clearance surveys. Eight desert tortoises and a single sensitive plant species were observed during the clearance surveys.

**Los Angeles Department of Water and Power, Pine Canyon Wind Turbine Project, Los Angeles, CA:** Scott conducted golden eagle surveys to document use areas within the proposed Pine Canyon Wind Turbine project site. He assisted in evaluating turbine locations based on topography and likely eagle nest locations. Helicopters were used to drop surveyors off at the correct mountain peaks. Scott used global positioning system (GPS) to navigate the helicopter.

**Los Angeles Department of Water and Power, Pine Tree Wind Turbine Project Los Angeles, CA:** Scott conducted golden eagle surveys to document presence/absence of golden eagles within the existing Pine Tree Wind Turbine project site. He assisted in evaluating nest locations and active use areas. Scott used GPS to locate bird strike areas.

**California Department of Transportation (Caltrans), District 8, On-Call Biological Contract, Location, CA:** Contract Manager. Responsible for on-call contract 08A2662 (also a portion of contract 08A2191) for biological resource assistance for standard construction, maintenance, and emergency projects throughout District 8 (Riverside and San Bernardino counties). Scott managed approximately 150 task orders, which included, but were not limited to, standard natural environmental study, multiple species habitat conservation plan consistency analysis, threatened and endangered species surveys, wetland delineations, wildlife movement corridor study, construction monitoring, regulatory permitting, and mitigation land assessments.

**Southern California Gas Company, On-call Environmental Resources Assistance Contract, Southern CA:** Scott assisted in managing standard construction, maintenance and emergency projects throughout southern California. Main activities included conducting biological resources assessments, protocol surveys, managing construction monitors, jurisdictional assessments and general contract consultation. The contract involved more than 140 projects throughout the southern California service area.

**Los Angeles County Sanitation Districts (Districts), On-call Biological Resources Assistance, Los Angeles County, CA:** Scott assisted in managing an on-call contract for biological resources assistance for standard projects throughout the districts' area of operation. Main activities included coordinating field work and client assistance. More than 15 projects were completed throughout the service area. Scott managed the

10  
Years with WSP

31  
Years of Experience



## Scott Crawford (Continued)

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San Gabriel River release reduction project and was responsible for annual monitoring report preparation and agency consultation. Resource agencies and other groups participating in the Habitat Monitoring Committee include United States Army Corps of Engineers (USACE), United States Fish and Wildlife Services (USFWS), California Department of Fish and Wildlife, Southern California Coastal Water Research Project, Los Angeles Water Keeper, Heal the Bay, Los Angeles County Public Works, Chino Basin Municipal Water District, Water Replenishment District, LAW, Main San Gabriel Basin Watermaster, Sierra Club and Council for Watershed Health.

**Ames Construction, Interstate 15/Mojave River Bridge Crossing, City, CA:** Scott managed a team of biologists to conduct construction monitoring for sensitive riparian birds, Mojave River vole and sensitive fish species. Following initial vegetation removal and soil disturbance, spot checks were completed twice a week during construction. Additional monitoring was completed for work within the active channel. Turbidity fencing and exclusion fencing were used to protect sensitive fish species. This monitoring effort was part of a Caltrans project but was contracted directly through the construction firm rather than the Caltrans on-call contract.

**San Bernardino County Department of Public Works, Needles Highway Expansion Biological Resources Assessment, San Bernardino County, CA:** Scott conducted a biological resources assessment for the proposed expansion and realignment of a portion of Needles Highway. A habitat assessment was completed for sensitive species. He also conducted a wetland delineation to determine jurisdictional limits of several braided channel systems.

**Naval Facilities Engineering Systems Command, Invasive Species Management, Edwards Air Force Base, CA:** Responsible for managing the invasive species removal and restoration program at Edwards Air Force Base in four separate priority management areas, including the Cantonment area, roadside and disturbed areas, Piute ponds, and seasonally flooded zones and evaporative ponds. He was also responsible for monthly progress reports, as well as managing the restoration crew as part of a joint venture contract. The restoration work included weed treatment and removal, and restoration of selected sites to revert to natural communities, such as grasslands and/or riparian habitat.

**Cities of Eastvale and Norco, Hamner Avenue/Santa Ana River Bridge Replacement Project, Riverside County, CA:** Scott managed a team of biological monitors for pre-construction and construction activities. The project extended from Detroit Street in the City of Norco to Citrus Street in the City of Eastvale. It included the complete replacement of the Hamner Avenue Bridge. Sensitive biological resources associated with the project included Least Bell's Vireo, Santa Ana sucker, and bats. The project included installing bird netting over the existing bridge.



**Clint J. Helton, M.A., RPA**  
**President / Owner**  
**Environmental Consulting Executive**  
**Cultural Heritage Expert**



## **Professional Qualifications**

- 30 years in Environmental Consulting in the United States and Internationally Environmental Consulting industry expert, responsible for P/L and strategic vision
- Experienced senior executive responsible for thought leadership, strategic growth, building programs, growing revenue, training, and transforming businesses
- More than 25 years' experience in client/project/program management, project delivery, business development, operations, health and safety, quality control, and regulatory consulting in Environmental Services, Energy, Utilities, Land Development, Oil & Gas, Transportation, Federal Government
- Successful experience managing P/L, operations, large programs, and driving business growth through specific recruiting, sales and marketing strategies and tactics
- Over 25 years management experience, often responsible for over 100 staff and multiple offices and/or business units domestically and internationally
- Successful record leading transformational revenue growth (300% and 500% increase in last two roles)
- Positions have included Project Manager, Managing Principal, Business Development Leader, Operations Leader, Practice Leader, Global Service Area Leader, Vice President, Senior Vice President/Owner, Partner
- Subject Matter Expert in Siting and Licensing, Cultural Resources/Cultural Heritage, National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), and state requirements of California Environmental Quality Act (CEQA) among others
- Power and Energy industry expert—highly experienced successfully permitting and licensing dozens of complex energy projects in United States
- Successfully opened new markets and new offices and led regional business operations
- Highly experienced managing environmental studies for large renewable energy (solar & wind), linear utility and transportation, and oil and gas projects
- Highly trained in Project Delivery methods and processes
- International experience in Europe, Mexico, Iraq, Algeria, Saudi Arabia contributing to Environmental Impact Assessment (EIA) and Environmental and Social Impact Assessment (ESIA) documents
- 5-year Program Leader for Federal Emergency Management Agency (FEMA) PA TACIV contract. Led 30-person team supporting disaster operations in FEMA Region II: New Jersey, New York, Puerto Rico and Virgin Islands; Region VII: Iowa, Kansas, Missouri, and Nebraska; Region IX: Arizona, California, Hawaii, Nevada, and Pacific Islands; and Region X: Alaska, Idaho, Oregon, and Washington.
- Highly analytical background and personality tested

## **Career Summary**

With 30 years of professional experience in management, operations, sales and marketing, program management, environmental consulting, and environmental analysis, Clint Helton is a respected industry leader and valuable business strategist. His career has focused on building and growing programs, honing value

propositions, improving financials, professionalizing practices, and finding and filling gaps in operational efficiency.

Clint has routinely led large teams, been responsible for overall management of multiple business units, regions, offices, staff, and financials, and has executed large complex projects requiring detailed attention to schedule, budget, and quality work product for wide range of consulting projects both in the United States and Internationally.

Mr. Helton is particularly skilled in the energy sector where he has led critical analysis in support of permitting and licensing of dozens of major projects including several of the world's largest solar and wind energy developments. Clint is known by his clients for his superior technical expertise combined with a client-focus that seeks to understand clients' unique needs before applying bespoke solutions that meet challenging schedules while achieving regulatory approvals.

Over the course of his career, Mr. Helton has held numerous leadership positions, including Managing Principal at SWCA, Global Practice Leader at CH2M/Jacobs and Senior Vice President at PaleoWest and Partner at ERM, a global environmental and sustainability consultancy based in the UK. Clint is currently a Senior Vice President at WSP, leading a team in the Earth and Environment Business Line and supervising staff and operations across the United States.

Mr. Helton has been responsible for the management of hundreds of staff, multiple offices, business units, and their financial performance, where he has always excelled. He is a highly skilled and successful leader with unique business and research acumen, adding significant value to any team.

Uniquely, Clint is one of the industry's most successful business development leaders and program managers, having secured well over \$300 million in new and repeat business. Clint leads transformational revenue growth. He is also a talented Project Manager, having successfully delivered well over a thousand projects for hundreds of valued clients in the United States and internationally.

Mr. Helton is an industry expert in environmental regulation, with emphasis on NEPA, NHPA, and CEQA. He provides expert witness testimony, directs and manages teams, performs technical studies and delivers complex environmental assessments conducted in support of a wide range of local, state, and federal environmental regulations. Clint has repeatedly developed cost effective, client-responsive and regulatory-compliant deliverables and provided senior-level oversight and critical review for project assessments and feasibility analysis, schedules, budgets, comparative performance evaluations, technical reports, and regulatory assessments. He has established a record of successful communication with project stakeholders, regulators, and decision-makers critical to project success. Mr. Helton has experience working on a multitude of project types, including energy, oil and gas, land development, water, public works, and transportation. Over the past two decades, he has supported permitting and licensing of the world's largest solar and wind energy generation projects in Kern County, CA and in Clark County, NV.

Mr. Helton has decades of experience serving federal government clients and major programs. Recently, he led a team of scientists conducting environmental due-diligence and mitigation for the Federal Emergency Management Agency (FEMA) supporting the government's response to federally declared disasters in the United States mainland, the South Pacific, and Caribbean (FEMA PA TACIV).

Clint served as Senior Vice President and Owner at PaleoWest where he played a lead role in transforming the firm from a small regional business to a nationwide industry leader over a 5-year period of dramatic growth.

Mr. Helton was brought to PaleoWest's Officer Team to lead the effort to "professionalize" the firm, and successfully did so. In addition, he led sales for the firm - responsible for over \$30 million in new business. He made broad contributions to all areas of the firm such as creating a robust safety program, teaching client service management concepts, pricing techniques, project delivery best practices, and introduced an employee recognition and reward program, to name a few. He organized and led the firm's Business Development team

and created and led the firm's Marketing Department including creation of a new website, social media, advertising campaigns, and conference sponsorship. In his marketing and sales role, Clint was tasked with creating the vision and executing it to create PaleoWest's comprehensive marketing strategy. He organized and led a focused team to create a new value proposition, new marketing media, and launched a series of innovative and tech-forward online campaigns including video informational ads, leveraging LinkedIn and Google Ads. In this role he fostered cross-marketing relationships with partners and other B2B businesses; provided marketing guidance and support to a 50+ person sales team; accelerated sales of products & services and more. Clint reported directly to the President during most of his tenure and played a pivotal role in developing the firm's brand awareness and overall sales. Clint sold his interest in the firm to a private equity investor group in 2021.

Mr. Helton is bilingual in Spanish and English and has lived, worked, and studied throughout mainland Europe, Latin America, Spain, Mexico, and the United Kingdom. Mr. Helton regularly travels to Europe and the UK. He is a trained and published Mesoamerican archaeologist.

## **Education**

- MA, Anthropology, 1997, Brigham Young University
- BA, Language and Literature, 1994, University of Utah

## ***International Studies:***

- University of Salamanca, Spain
- Center for Bilingual and Multicultural Studies Universidad Internacional, Cuernavaca, Mexico
- Croughton HS, RAF Upper Heyford, England
- Extensive travel and research throughout Mexico, Guatemala, Chile, Spain

## **Work History**

- WSP (2024-2025) **Senior Vice President / National and Global Practice Leader**
  - SVP in WSP's Earth and Environmental Business Line
  - Also serving concurrently as National Practice Leader and Global Practice Leader
  - Expert Witness and Project Delivery Leader for numerous projects
  - Supporting multiple strategic account teams
  - Direct reports include approximately 40 senior staff in the US
  - In first 6 months led growth of team achieving 3x on staff and 4x on revenue
  - Implementing step-change advancements across operations, including hiring a technology director to bring technology transformation to the business
  - Implemented a technology initiative designed to dramatically increase the use of modern and innovative approaches to data acquisition and data analysis
  - Responsible for strategic hiring
  - Serves as Project Delivery Lead for numerous projects
- ERM (2022-Present) **Partner / North America Lead / Global Practice Lead**
  - Partner, with a focus on ERM's Impact Assessment and Planning (IAP), Capital Project Delivery (CPD) and Power Sectors
  - North America Lead (~100 FTEs) and Global Practice Leader
  - Lead staff in North America and Canada
  - Created and implemented strategy to consolidate and grow ERM's North America team of IAP staff (cultural resources staff, planners, GIS specialists, and biologists) into a cohesive and effective unit

- Implemented a technology initiative designed to dramatically increase the use of modern and innovative approaches to data acquisition and data analysis
- Responsible for strategic hiring in Canada and United States
- Serves as Partner-in-Charge for numerous projects, a role at ERM designed to ensure successful project delivery and financial success
- **PaleoWest, Orange County, California (2016-2022), Senior Vice President/Partner**
  - Environmental consultancy based in the United States
  - Senior Officer/Owner
  - Led transformational growth from a small Southwest-focused business to the largest specialty firm of its kind in North America
  - Created and led 30-person sales team and marketing department
  - Managed major programs of \$30+ million
  - Delivered services for several major multi-year projects, and led domestic and international programs for key clients such as FEMA, NASA, NextEra Energy, AES, NRG, CH2M, Jacobs Engineering, and many others.
  - Sold business to private equity in 2022
  - Acted as lead advisor to private equity during operational transition
- **CH2MHILL (now Jacobs Engineering), Santa Ana, California (2004-2016), Business Development Leader/Global Practice Leader**
  - Global engineering and environmental firm
  - Led global team
  - Served as Business Development Leader, Operations Leader, Project Delivery Leader
- **SWCA Environmental Consultants, Orange County, California (1997-2004), Managing Principal**
  - US based environmental consultancy
  - P&L Responsibility for 3-office region and 100+ staff
  - Oversaw opening and operations of three new offices in CA
  - Managing Principal for all California operations, including natural resources (biology), cultural, paleontology programs
  - Managed completion and integration of acquisition in Orange County
  - Turned a \$1 million/year acquired company into a \$6 million/year program within 12 months
- **Baseline Data, Orem, Utah (1996-1997), Project Manager**
  - Regional cultural heritage consultancy
  - Managed project delivery for dozens of projects in western US

## **Languages**

- Bilingual: English and Spanish; native-level fluent

## **International Experience**

- Global Practice Leader roles at WSP, ERM, CH2MHILL/Jacobs
- Created and led International Business Unit at PaleoWest
- Supervised staff, operations, and business development outside of the continental United States, as well as overseeing project delivery in Europe, United Kingdom, Puerto Rico, Pacific Islands including Commonwealth of Northern Mariana Islands
- Conducted professional research in Mexico, Iraq, Algeria, Saudi Arabia--contributing to Environmental Impact Assessment (EIA) and Environmental and Social Impact Assessment (ESIA) documents in compliance with World Bank regulations
- Three-year residency in Oxford, England
- Two-year residency in Concepcion, Chile

- One year residency in Guatemala City, Guatemala
- Dozens of research visits and extensive travel throughout Europe, Mexico, Central America, South America

## **General Areas of Expertise**

Project/Program Management; Business Development; Strategic Planning; Training/Leadership Development; Organizational Development; Change Management; Margin Metrics and Optimization; Performance Management; Problem Solving/Decision Making; Client Service Management; Cross-Functional Leadership; Negotiation/Persuasion/Communication; P&L Management; Revenue Goal/Growth Attainment; Operational Analysis; Senior Technical Review; Expert Witness; Environmental Impact Assessment

## **Select Project Experience**

### *United States*

**FEMA TAC IV PA, Program Manager.** Mr. Helton currently serves as Program Manager for PaleoWest's FEMA Public Assistance (PA) TAC IV Program contract. Since 2019, Mr. Helton has been supporting a variety of environmental and historic preservation services to the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA). Specifically, Clint is Principal and Program Leader, assisting FEMA with the Public Assistance Technical Assistance Contract IV (PA TAC IV), which covers FEMA operations in Zone 3 and augments FEMA's capacity to respond to natural catastrophes,. Mr. Helton is supervising all work under this 5-year contract, and work includes supporting disaster operations in FEMA Region II: New Jersey, New York, Puerto Rico and Virgin Islands; Region VII: Iowa, Kansas, Missouri, and Nebraska; Region IX: Arizona, California, Hawaii, Nevada, and Pacific Islands: and Region X: Alaska, Idaho, Oregon, and Washington

**NextEra Cedar Springs Wind Project, Douglas County, WY. Project Manager.** Led this major wind permitting effort including fieldwork, tribal consultation, and reporting for the Cedar Springs Wind project in Douglas County, Wyoming. Project consisted of 208 wind turbines estimated to yield 520 MW of renewable wind energy. More than 13,000 acres were inventoried, resulting in a recording of 110 sites and 704 isolates. During the field inventory, more than 30 people across several PaleoWest offices were employed as field crew, report writers, GIS analysts, and management. A rich prehistoric and historic record was documented, including high plains hunter gatherer sites, plentiful prehistoric stone architecture (stone circles, hunting blinds, cairns, vision quest sites), and historical architectural remains related to homesteading, rural schooling, and ranching. Facilitated tribal consultation meetings and led a guided tour of the project area for THPOs of four regional tribes (Cheyenne River Sioux, Standing Rock Sioux Spirit Lake, and Three Affiliated Tribes). Under Clint's leadership the team was able to meet the client's aggressive permitting schedule, producing four reports of over 13,000 acres of inventory in just over one year. Clint's team worked closely with the Wyoming Industrial Siting Council and WYSHPO to successfully permit the project.

**Principal Investigator/Program Manager, City of Fresno "Recharge Fresno" Program.** Responsible for construction compliance activities for this large multi-year water infrastructure improvement program.

**Cultural Resources Specialist, NRG Carlsbad Energy Center, Carlsbad, CA.** Responsible for multi-year construction compliance activities during building of this new power plant on the Pacific coast near Carlsbad, CA.

**Cultural Resources Specialist, AES Huntington Beach Energy Project, Huntington Beach, CA.** Responsible for multi-year construction compliance activities during building of this new power plant on the Pacific coast in Southern California.



**Cultural Resources Specialist, AES Alamitos Energy Center, Long Beach, CA.** Responsible for multi-year construction compliance activities during building of this new power plant on the Pacific coast in Southern California.

**Principal Investigator, Union Pacific Railroad, Permitting Projects in AZ, CA, NV, WY, ID, NE, WI, LA, KY, TX.** Currently providing cultural resources assessments for UPRR including archival research, fieldwork, testing, and Native American consultation for multiple projects throughout the United States.

**Principal Investigator, City of Oshkosh, Marion Road Water Tower Permitting, Oshkosh, Wisconsin.** Conducted a cultural resources records study including search of the files of the Wisconsin Historic Preservation Database of the Wisconsin Historical Society for the location of a proposed new 750,000 gallon elevated water storage tank.

**Principal Investigator, ANR, Keystone Pipeline Permitting, Nebraska.** Currently providing cultural resources assessments including archival research, fieldwork, testing, and Native American consultation. Senior consultant for the cultural resources impact assessments.

**Principal Investigator, Dowell Schlumberger Inc, Remedial Action Permitting, Ulysses, Kansas.** Conducted cultural resources assessments including archival research at the Kansas State Historical Society.

**Principal Investigator, Terra-Gen Power, LLC GE/Windstream Project, Kern County, CA.** Senior consultant for the cultural resources impact assessment of a proposed wind generating system on 3200 acres of private land in southeastern Kern County.

**Principal Investigator, SoCalGas Pipeline Safety Enhancement Project.** Currently providing cultural resources reviews for SCG including archival research, fieldwork, testing, and Native American consultation for multiple projects throughout SCG's service area.

**Senior Technical Advisor, California High Speed Rail Projects, CA.** Senior Technical Advisor and Cultural Resources Specialist for the Merced-Fresno, San Diego to Los Angeles, and Merced-Sacramento segments of the California High Speed Rail Project. Services included both field inspection and development of permitting and environmental documentation.

**Cultural Resources Specialist, Southern California Edison (SCE), Tehachapi Renewable Transmission Project (TRTP) – Segments 4-11, Kern, Los Angeles, and San Bernardino, CA.** Provided cultural resources expertise in supporting environmental compliance on SCE's 6-year multi-billion dollar TRTP, Segments 4-11, during preconstruction, construction, and restoration/revegetation activities. The TRTP includes construction of new and upgrade of 173 miles of transmission lines, construction of one new substation, major upgrade of one existing substation, and upgrade of other substations and ancillary facilities. When complete, the TRTP will deliver up to 4,300 MW of renewable energy from Kern County, through the Angeles National Forest, to the Los Angeles Basin (Los Angeles County) and the western Inland Empire (San Bernardino County) on federal – U.S. Forest Service (USFS), public, and private lands. CH2M HILL is providing environmental compliance support in accordance with NEPA and CEQA, as well as federal (Section 401, Section 402, Section 404, Section 106, NPDES, USFS Special Use Permit, Biological Opinion), State (Section 1602, Section 2081 – Take Permit, and Section 402), and local permits.

**Cultural Resources Specialist – Devers-Palo Verde II Transmission Project (DPV2), Southern California Edison, Palm Springs, CA to Phoenix, AZ.** Provided cultural resources support during pre-

construction and construction activities on the portion of the project in Riverside County between Palm Springs and the Colorado River related to project approach/strategy/management and technical challenges; mitigation monitoring and reporting; agency coordination support, variance support, and mitigation plan preparation, as well as preparation of the Petition to Modify submitted to the CPUC to support construction of project changes. Cultural resources specialist for technical review of the Draft Environmental Impact Report/Environmental Impact Statement for project activities located on federal - BLM, tribal, public, and private lands.

**Construction Compliance, Mojave Solar Power Plant, Abengoa Solar, Harper Lake, CA.** CH2M HILL is conducting biological and cultural resources compliance monitoring during construction of this 250-MW solar thermal power plant near Harper Lake in the Mojave Desert of California. The California Energy Commission has granted a license to construct the facility and the Bureau of Land Management is acting as the lead federal agency representative to ensure compliance with National Environmental Policy Act conditions. This project uses parabolic trough solar thermal technology to produce electrical power using a steam turbine generator. Because of the large acreage required for this project (over 2,000 acres), potential impacts and mitigation for biological and cultural resources are major issues. Mr. Helton is the Principal Investigator for this project, and CH2M HILL's team includes multiple cultural and biological resources specialists and monitors. Compliance monitoring is expected to occur through July 2014.

**BrightSource Energy Hidden Hills Solar Electric Generating System, Clark County Nevada.** Senior consultant for the cultural resources impact assessment of a proposed solar generating station and transmission system entailing 54 miles of 500kV line and 28 miles of 230kV line routed through a desert landscape in southwest Nevada.

**Tuscon Electric Power Saguaro to North Loop Transmission Project, Pinal and Pima Counties, Arizona.** Senior consultant for preparation of a cultural resources assessment including Native American consultation and ethnographic studies for this proposed 14 mile, 138kV four circuit transmission line. The route traveled through an open and complexly vegetated desert landscape, passing close to several areas of residential development. The cultural analysis was designed to meet the requirements of the Arizona Corporation Commission Power Plant and Transmission Line Siting Committee, as well as Arizona State Lands Commission.

**Historic Preservation Lead, Environmental Assessments (EAs), Environmental Condition of Property (ECP) Reports, and Supporting Studies, U.S. Army Reserve Centers, Nationwide.** CH2M HILL assessed the environmental impacts associated construction of new U.S. Army Reserve Centers nationwide and documented the conditions of properties to be demolished. The team prepared environmental assessments (EAs) and NEPA decision documents, ECPs, biological evaluations (BEs), and Phase I cultural resource surveys. CH2M HILL technologists assessed impacts on cultural resources (National Historic Preservation Act [NHPA]), biological and natural resources (Endangered Species Act [ESA]), socioeconomics (executive order on environmental justice), and transportation, among others. Some projects located in coastal locations were also subject to the Coastal Zone Management Act. The team completed documentation for 10 sites over an 18-month period.

**Historic Preservation Lead, EHP Review of HMGP Applications for FEMA Region IX in California.** Currently leading historic preservation component of EHP review of HMGP grant applications in California for FEMA Region IX. Led completion of 6 Historic Property Findings Reports under Section 106 of the National Historic Preservation Act.

**Senior Technologist/Task Leader, BrightSource Energy, Ivanpah Solar Electric Generating System Project, San Bernardino County, CA.** CH2M HILL prepared an Application For Certification on behalf of this energy development client for the California Energy Commission in support of a large proposed solar power generation facility covering over 5,000 acres of land managed by Bureau of Land Management in San Bernardino County, California. Our cultural resources team conducted extensive analysis over a 3-year period including Native American consultation, geoarchaeological analysis, and helicopter surveys to identify Traditional Cultural Places. The project is currently being deployed in California's Mojave Desert and is currently the *largest solar plant under construction in the world*.

**Principal Investigator, BrightSource Energy, Ivanpah Solar Electric Generating System Project, Tortoise Protection Fencing along I40 and I15, San Bernardino County, CA.** The project is currently being deployed in California's Mojave Desert and is currently the *largest solar plant under construction in the world*. Mr. Helton has lead preparation of Caltrans District 8 technical reports to assess impacts to cultural resources within ROW of I-15 and I-140.

**Senior Technologist/Task Leader, Terra-Gen Power, Alta Wind Energy Center (AWEC), Mojave, California.** Located in the heart of one of the most proven wind resources in the United States, CH2M HILL is assisting Terra-Gen Power with permitting of California's largest wind energy project, expected to provide electricity to 275,000 homes. CH2M HILL's cultural resources experts have examined thousands of acres and prepared numerous technical reports. With several areas now under construction, our cultural team continues to assist with mitigation, monitoring, and inventory. Acting as Designated Cultural Resources Specialist and Principal Investigator during construction.

**Cultural Resources Specialist, Environmental Assessment for an Air Tour Management Plan at Golden Gate National Recreation Area (GGNRA), Muir Woods National Monument, and Point Reyes National Seashore, California.** Responsible for preparation of the Historic, Architectural, Archaeological, and Cultural Resources analysis at this National Park. There are a total of 739 documented historic structures within the GGNRA, including five National Historic Landmarks, 12 National Register-listed properties, and nine cultural landscapes. National Historic Landmarks comprise the Presidio, Fort Point, San Francisco Point of Embarkation, Alcatraz Island, and the San Francisco Bay Discovery Site.

**Chevron Richmond Refinery Power Plant Replacement Project, Contra Costa County, California.** Management of cultural resources studies for this major refinery facility reconfiguration and renewal project located in Richmond, California. The approximately 2,900-acre refinery occupies most of the Point San Pablo Peninsula. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Turlock Irrigation District Almond 2 Power Plant, Stanislaus County, California.** Task Lead and overall management of cultural resources studies for the construction of a simple-cycle peaking facility rated at a gross generating capacity of 174 megawatts. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation. Approved as Designated Cultural Resources Specialist during construction phase of project.

**Senior Technologist/Task Leader; National Science Foundation National Ecological Observation Network (NEON); Multiple Locations in Continental United States (AL, AZ, CA, CO, KS, MA, MD, MI, MN, NH, NM, FL, GA, OK, TX, WA, WI, VA) and Hawaii, Alaska, and Puerto Rico.** Task Lead and overall management of a large national cultural resources study in support of NEPA Environmental Assessment. The study is analyzing environmental impacts of a large and comprehensive network of scientific infrastructure located in a variety of ecological zones designed to monitor environmental conditions and to provide data on

climate change. Work included archival research, field visits, and coordination with applicable state archives and preparation of correspondence to multiple SHPO's.

**Senior Cultural Resources Specialist, Russell City Energy Center, Calpine, Alameda County, California.** Cultural Resources Specialist for the AFC license amendment for a 600-MW power plant located in Hayward, CA. Prepared cultural resources analysis including archival research, field survey, and report preparation. Approved as Designated Cultural Resources Specialist during construction phase of project.

**Senior Cultural Resources Specialist, Mariposa Energy Project, Alameda County, California.** Task Lead and overall management of cultural resources studies for the construction of a simple-cycle generating facility with a nominal capacity of 200-megawatts. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation. Approved as Designated Cultural Resources Specialist during construction phase of project.

**Senior Cultural Resources Specialist, Turlock Irrigation District Almond 2 Power Plant, Stanislaus County, California.** Task Lead and overall management of cultural resources studies for the construction of a simple-cycle peaking facility rated at a gross generating capacity of 174 megawatts. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation. Approved as Designated Cultural Resources Specialist during construction phase of project.

**Project Manager, Sacramento Municipal Utility District (SMUD) Cosumnes Power Plant and Gas Pipeline Project, Environmental Compliance, Sacramento, CA.** Managed interdisciplinary team of over 20 environmental specialists including archaeologists, biologists, and paleontologists during construction of 26-mile gas pipeline and associated power generation plant.

**Senior Cultural Resources Specialist, Lodi Energy Center, NCPA, San Joaquin County, California.** Cultural Resources Task Lead for the licensing of this 255-MW combined cycle power plant. Prepared cultural resources analysis including archival research, field survey, and report preparation. Approved as Designated Cultural Resources Specialist during construction phase of project.

**Senior Cultural Resources Specialist, GWF Energy Tracy Combined Cycle Conversion Project, San Joaquin County, California.** Task Lead and overall management of cultural resources studies for this conversion of an existing peaking plant to a combined-cycle baseload facility in San Joaquin County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Senior Cultural Resources Specialist, Imperial Irrigation District, Salton Sea Air Quality Monitoring Project, Imperial County, California.** Task Lead and overall management of cultural resources studies supporting development of a wide air quality monitoring network surrounding the Salton Sea. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Senior Cultural Resources Specialist, Imperial Irrigation District, Calexico Bridge Replacement Project, Imperial County, California.** Task Lead and overall management of cultural resources studies supporting re-construction of a historic bridge over the All-American Canal near the US-Mexico border destroyed by earthquake. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Task Manager; Southern California Water Company (SCWC) Water Wells Project, Archaeological Surveys; Riverside and San Bernardino County, CA.** Conducted cultural resources surveys and prepared CEQA documentation for the development of four water wells in San Bernardino County, California.

**Senior Technologist/Task Leader, Terra-Gen Power, Multiple Alternative Energy Projects, California.** As Senior Cultural Resources Specialist, leading studies to meet federal, state, and local environmental regulatory approvals including CEQA, NEPA, and NHPA documentation.

**Senior Technologist/Task Leader, North Sky River Wind Energy Project: Met Towers Phase, Kern County, California.** As Task Lead and Senior Cultural Resources Specialist, led this major cultural resources study covering nearly 7,000 acres in the Tehachapi mountains of Kern County, California. Coordinated and supervised all aspects of this study including seven weeks of intensive pedestrian field survey in this remote mountainous area and a crew of over 20 specialists at times. Supervised preparation of over 100 site records and National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) evaluations and preparation of a final technical report. Since the project included lands managed by Bureau of Land Management (BLM), executed Fieldwork Authorization with BLM Ridgecrest Field Office. As Principal Investigator for CH2M HILL's California State BLM Cultural Resources use Permit, directed work to be in accordance with all permit requirements and stipulations. Both field survey and technical report preparation were completed in record time and on-schedule notwithstanding a significant expansion of the survey area mid-way through the project. As required for any work conducted to meet National Historic Preservation Act (NHPA) requirements, Mr. Helton also meets the Professional Qualification Standards stated in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation.

**Senior Technologist/Task Leader, Wind Energy Project: Critical Issues Phase, Los Angeles County, California.** As Senior Cultural Resources Specialist, led cultural resources assessment for this critical issues analysis of a wind energy development project in Los Angeles County, California. Reviewed publicly available information including historical maps to identify cultural and historic resources within the proposed development site. Conducted an Archival Literature Search for the project area at the appropriate California Historical Resources Information System (CHRIS) archive which contains information regarding resources listed on the National Register of Historic Places (NRHP), and the California Historical Landmarks database. Prepared technical memorandum describing results of the assessment.

**Senior Technologist/Task Leader, Wind Energy Project: Critical Issues Phase, Kern County, California.** As Senior Cultural Resources Specialist, led cultural resources assessment for this critical issues analysis of a wind energy development project in Kern County, California. Reviewed publicly available information including historical maps to identify cultural and historic resources within the proposed development site. Conducted an Archival Literature Search for the project area at the California Historical Resources Information System's (CHRIS) which contains information regarding resources listed on the National Register of Historic Places (NRHP), and the California Historical Landmarks database. Prepared technical memorandum describing results of the assessment.

**Senior Technologist/Task Leader, Wind Energy Project: Data Adequacy, Los Angeles County, California.** As Senior Cultural Resources Specialist, conducted data-adequacy review of previously-conducted cultural resources studies performed at the South Central Coastal Information Center (SCCIC) of the appropriate California Historical Resources Information System archive for this Solar Photovoltaic Project located in the western Antelope Valley, in Los Angeles County, California. Mr. Helton reviewed existing Project baseline materials and provided summary of cultural resources data adequacy.



**Senior Technologist/Task Leader, North Sky River Wind Energy Project: Met Towers Phase, Kern County, California.** Conducted cultural resources assessment in compliance with Section 106 of the National Historic Preservation Act and CEQA in support of Kern County and BLM permit applications for NextEra Energy Resources, LLC to construct meteorological tower locations in advance of potential wind energy generation facility.

**Senior Technologist/Task Leader, Tonto National Forest Control Road Bridge Replacement Project, Arizona.** Conducting cultural resources study in compliance with Section 106 of the National Historic Preservation Act. Coordination with Central Federal Lands, US Forest Service, Arizona SHPO, and consultation with Gila County, Arizona. Preparation of technical report.

**Senior Technical Advisor, Fort Douglas National Historic Landmark Archaeological Resources Management Plan, Utah.** CH2M HILL is completing a cultural resource investigation for the United States Army Reserve 88th Regional Support Command (88th RSC) to support an archaeological resource management plan that will set forth a comprehensive approach for assessing and managing the archaeological resources at Fort Douglas National Historic Landmark in Salt Lake City, Utah, in compliance with Section 106 of the National Historic Preservation Act (36CFR800). The plan will set forth a process for managing the surface and subsurface archaeological resources that contribute to Fort Douglas' National Landmark status, while at the same time maintaining the Fort's operational mandate as part of the 88<sup>th</sup> RSC. The management plan will also take into account the potential for discovering subsurface prehistoric and historic archaeological resources and will present a strategy for their evaluation, management, and treatment.

**Designated Cultural Resources Specialist (CRS), Humboldt Bay Repowering Project, Humboldt County, California.** Task Lead and California Energy Commission (CEC) approved Designated Cultural Resources Specialist (CRS) during construction of the Humboldt Bay Repowering Project (HBRP). The project consisted of construction of a load-following power plant consisting of ten natural-gas fired reciprocating engine-generator sets and associated equipment with a combined nominal generating capacity of 163 MW. The project repowers the existing 105 MW Humboldt Bay Power Plant Units 1 and 2. Responsible for ensuring implementation of the cultural resources Conditions of Certification (COCs) and Cultural Resources Monitoring and Mitigation Plan (CRMMP), directly supervising on-site construction monitors, reporting to the CEC's CPM and Cultural Resources Staff, and response to cultural resources discoveries during construction. Prepared Worker Environmental Awareness Program (WEAP) training material and ensured that compliance monitors, contractors, and construction crews met the requirements described in the projects COCs. Prepared daily and monthly reports, and a final monitoring report.

**Senior Technical Advisor, Norfolk Southern Railroad Phase I Archaeological Resources Surveys of Multiple Intermodal Facilities; Jefferson County, AL, Dauphin County, PA, Fayette County, TN.** The goal of this work was to identify cultural resources for planning and permitting purposes in accordance with Section 106 of the National Historic Preservation Act. This comprehensive survey was conducted to identify cultural resources within the project tract and its Area of Potential Effect (APE), and to assess their significance for inclusion on the National Register of Historic Places (NRHP).

**Deputy Project Manager, Port of Long Beach, Cultural Resources Management Plan and Architectural Survey and Evaluation, Long Beach, Los Angeles County, CA.** Preparation of a major Port-wide long-range management plan for cultural resources including prehistoric and historic cultural resources properties and historic architectural resources located within the operating boundaries of the Port of Long Beach.



**Senior Technologist/Task Leader, Iberdrola Renewables, Solar Energy Development, AZ, NM, NV, CA.** Cultural resources assessments for solar power generation facilities in AZ, NM, NV, and CA. Mr. Helton is acting as principal investigator for several fatal flaw analyses of solar projects in Arizona, California, Nevada, and New Mexico. Five study areas of this overall project are located in Arizona; two are in Maricopa County, two are in La Paz County, and one project is located partially in La Paz and Yuma Counties. Project acreages range from 5,800 acres to 35,000 acres. Three of these study areas are located in California; two areas are in San Bernardino County and one is located in Imperial County. Project acreages range from 13,000 to 29,000. Three of these study areas are located in Nevada; two are in Nye County and one is located in Clark County. Project acreages range from 7,500 to 12,000. The remaining study area is located in Hidalgo County, New Mexico. Total acreage of this project is 25,000.

**Senior Technologist/Task Leader, Terra-Gen LLC Alta Wind Energy Project.** Task Lead, quality control manager, and overall management of cultural resources studies for this 4,000 acre plus alternative energy development project near the City of Tehachapi, California. Provide regulatory guidance, regional technical expertise in cultural resources and coordination with Kern County. Performed inventory for cultural resources and conducted Native American Consultation.

**Senior Technologist/Task Leader, US Border Patrol; Customs and Border Protection, Facilities Expansion, Multiple Locations Along United States Southern Border.** Lead preparation of numerous cultural resources studies in support of NEPA Environmental Assessments and Phase I Environmental Site Assessments in support of US Border Patrol facility expansion projects along the US/Mexico border. Included investigations for facilities in New Mexico, Texas, Arizona, and California.

**Senior Technologist/Task Leader, PPM Energy, Solar Energy Development, AZ, NV, CA.** Cultural resources assessments for solar power generation facilities in AZ, NV, and CA. Mr. Helton is acting as principal investigator for literature searches and field visits for several proposed solar energy projects in Arizona, California, and Nevada. Project acreages range from 2,000 acres to 25,000 acres.

**Senior Technologist/Task Leader, BrightSource Energy, Ivanpah Solar Electric Generating System Project, San Bernardino County, CA.** Assisted with preparation of Application For Certification for California Energy Commission in support of a large proposed solar power generation facility covering over 4,000 acres of land managed by Bureau of Land Management in San Bernardino County, California. Responsible for preparation of cultural resources component of project, including archival research, field surveys, report preparation, and conducting Native American consultation.

**Cultural Resources Specialist, Clinton Keith Road Extension Project, Riverside County, CA.** Performed cultural resources survey and report preparation for this road widening and realignment project. Project was generally located between I-215 and SR 79 in the City of Murrieta and in Riverside County

**State Route 79 Realignment Project, Riverside County, CA. Senior Technical Advisor and Cultural Resources Specialist.** Task Lead, quality control manager, and overall management of cultural and paleontological resources studies for this 19-mile highway realignment project in Riverside County, California. Provide regulatory guidance, regional technical expertise in cultural resources and coordination of subconsultants. The inventory comprises over 7,100 acres in the vicinity of the cities of Hemet and San Jacinto. Frequent consultation and coordination with Riverside County Transportation Commission (RCTC) and Caltrans District 8.

**Senior Cultural Resources Task Lead; State Route 94 PSR/PDS/EIR/EIS; San Diego County, CA.** On behalf of the SANDAG, CH2M HILL is preparing a Project Study Report-Project Development Support for the proposed State Route (SR) 94 Improvements Project (Caltrans). The project proposes to add two high occupancy vehicle (HOV) lanes along SR 94 from the I-805 interchange to downtown, and to direct HOV connectors from I-805 and I-15 to SR 94.

**Sr. Cultural Resources Task Lead; State Route 15 Mid-City Transit Project; Caltrans District 11 and SANDAG; San Diego, CA.** CH2M HILL is preparing the Preliminary Environmental Analysis Report (PEAR) to determine the required environmental technical studies, environmental document type, and permits required for two proposed transit stations on SR-15 at El Cajon Boulevard and at University Avenue. The PEAR is an element of a Project Study Report-Project Development Support and includes various preliminary resource evaluation tasks including biological resources, community impact/land use, noise, and air quality.

**Technical Specialist; Clinton Keith Road Extension Project; Riverside County, CA.** Performed cultural resources survey and report preparation for this road widening and realignment project. Project was generally located between I-215 and SR 79 in the City of Murrieta and in Riverside County, Caltrans District 8.

**Senior Technologist/Task Leader, State Route 79 Widening Project, Riverside County, CA.** Task Lead, quality control manager, and overall management of cultural resources studies for this highway widening project in Riverside County, California. Provide regulatory guidance, regional technical expertise in cultural resources and coordination of subconsultants. Frequent consultation and coordination with Riverside County Transportation Department (RCTD) and Caltrans.

**Senior Technologist/Task Leader, Carlsbad Energy Center Project, San Diego County, CA.** Assisted with preparation of Application For Certification for California Energy Commission in support of this proposed power generation facility in San Diego County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Senior Technologist/Task Leader, Chula Vista Energy Upgrade Project, San Diego County, CA.** Task Lead and overall management of cultural resources studies for this 100 MW power plant upgrade project in San Diego County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Senior Technologist/Task Leader, LS Power South Bay Energy Facility Project, San Diego County, CA.** Task Lead and overall management of cultural resources studies for this 600 MW combined-cycle power plant project in San Diego County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Senior Technologist/Task Leader, Lompoc Wind Energy Project, Santa Barbara County, CA.** Task Lead, quality control manager, and overall management of cultural resources studies for this 1,000 acre plus alternative energy development project near the City of Lompoc, California. Provide regulatory guidance, regional technical expertise in cultural resources and coordination with Santa Barbara County. Performed inventory for cultural resources and conducted Native American Consultation.

**Technical Specialist, Clinton Keith Road Extension Project, Riverside County, CA.** Performed cultural resources survey and report preparation for this road widening and realignment project. Project was generally located between I-215 and SR 79 in the City of Murrieta and in Riverside County.

**Senior Technologist/Task Leader, Southern California Water Company (SCWC) Water Wells Project, Archaeological Surveys; Riverside and San Bernardino County, CA.** Conducted cultural resources surveys and prepared CEQA documentation for the development of four water wells in San Bernardino County, California.

**Senior Technologist/Task Leader, City of Vernon, Vernon Power Plant, CA.** Assisted with preparation of Application For Certification for California Energy Commission in support of this proposed 800 MW power generation facility in Los Angeles County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Deputy Project Manager, AES Pacific Inc., Highgrove Power Plant, CA.** Preparation of environmental analysis component of Application For Certification for California Energy Commission in support of this proposed natural gas fired 300 MW peaking power generation facility in Riverside County, California. Additionally responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Senior Technologist/Task Leader, Edison Mission Energy, Walnut Creek Energy Park Power Plant, CA.** Assisted with preparation of Application For Certification for California Energy Commission in support of this proposed 500 MW power generation facility in Los Angeles County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Senior Technologist/Task Leader, Edison Mission Energy, Sun Valley Energy Center Power Plant, CA.** Assisted with preparation of Application For Certification for California Energy Commission in support of this proposed 500 MW power generation facility in San Bernardino County, California. Responsible for preparation of cultural resources component of project, including field surveys, report preparation, and conducting Native American consultation.

**Project Manager, Sacramento Municipal Utility District (SMUD) Cosumnes Power Plant and Gas Pipeline Project, Environmental Compliance, Sacramento, CA.** Managed interdisciplinary team of over 20 environmental specialists including archaeologists, biologists, and paleontologists during construction of 26-mile gas pipeline and associated power generation plant. Contract value was over \$2.0 million.

**Project Principal, Talega Residential Housing Development, Archaeological and Paleontological Compliance, Data Recovery, and Compliance Monitoring, San Clemente, CA.** Project principal for multidisciplinary team providing environmental compliance services for this 3,700-acre home development in San Clemente. Assisted with frequent agency consultation with U.S. Army Corps of Engineers (USACE).

**Project Manager, Army National Guard Cultural Resources Support Contracts, UT.** Managed cultural resources services from Army National Guard for all 29 facilities within the State of Utah. Primary goal was to assist National Guard with bringing facilities into compliance with Section 106 of NHPA. Managed archaeological survey, testing, and data recovery projects. Assisted with Native American consultation. Authored an Integrated Cultural Resources Management Plan (ICRMP) to assist the Guard in complying with Department of Defense Instructions 4715.3 and Army Regulation 200-4.

**Project Manager, 700-mile Kern River Pipeline Expansion Project, WY, UT, NV, CA.** Managed major cultural resources services contract with Williams Gas Pipeline, in support of the 700-mile Kern River Pipeline

Expansion Project, traversing Utah, Nevada, Wyoming, and California. Mr. Helton was individually sought by Williams Gas Pipeline to provide regulatory guidance, regional technical expertise in cultural resources, project management support, as well as to provide leadership as the agency and subcontractor liaison for the project, given the size, complexity, multistate and multijurisdictional challenges and aggressive schedule of the project. Assisted from project initiation with facilitation of project Programmatic Agreement and led coordination meetings with stakeholder agencies and permitting authorities in California, Utah, Nevada, and Wyoming as well as FERC. Coordinated the activities of three subconsultants as well as the internal project team. Developed creative strategy to mitigate impacts to a large number of National Register eligible cultural sites. Contract value was over \$3.0 million.

**Project Manager, Sierra Pacific Power Company, Third-Party Environmental Compliance, 630-Mile Silver State East Fiber Optic Project, Salt Lake City, UT, to Reno, NV.** Managed multiphase contract to provide staff support to Bureau of Land Management (BLM) during preparation of POD and NEPA document, as well as well as third-party environmental compliance activities during construction of the 590-mile Silver State East Fiber Optic Project by Sierra Pacific Power Company. Led agency coordination, managed the project budget and staff, and assisted with resource data extraction from agency archives. Assisted with development of MOU, Project Charter, Programmatic Agreement, and public scoping process. During 14-month construction process, managed team of 25 cultural and biological resources environmental compliance monitors and acted as point of contact for BLM and Sierra Pacific Power Company.

**Project Principal, Williams Pipeline, Rockies Expansion Pipeline Construction, WY, ID.** Provided overall management of cultural resources and paleontological resources compliance monitoring services for the Rockies Expansion pipeline construction project.

**Project Manager, Williams Communications, Third-Party Environmental Compliance, I-80 Fiber Optic Project, NV and UT.** Managed third-party construction compliance monitors and representatives of the BLM; ensured that compliance monitors, contractors, and construction crews met the requirements described in the projects construction stipulations, permits, and right-of-way grant. Was the primary liaison to the client, BLM; provided agency coordination, management of project budget and staff, supervision of field crews, and report preparation.

**Project Manager, Adesta Communications Fiber Optic Project, Grand Junction, CO to Salt Lake City, UT.** Managed all aspects of cultural and paleontological resources compliance for the 260-mile utility project. Assisted with preparation of environmental assessment (EA) for NEPA compliance. Provided project development, agency coordination, management of project budget and staff, supervision of field crews, identification and recordation of historic and prehistoric resources, laboratory analysis, and report preparation. Contract value was over \$1.0 million.

**Project Principal, Questar Pipeline Company, Mainline 104 Pipeline Project, UT.** Managed cultural resources component of the Mainline 104 natural gas pipeline project, 75 miles of 24-inch-diameter natural gas pipeline from Price to Elberta, Utah, across Carbon, Emery, Sanpete, and Utah Counties, including the Manti-LaSal and Uinta National Forests, BLM, state, and private lands. Coordinated with officials from BLM, State Trust Lands, U.S. Department of Agriculture (USDA) Forest Service, and State Historic Preservation Office (SHPO).

**Project Manager, Kennecott Rawhide Mine, On Call Cultural Resources Services; Fallon, NV:** Project development, management of project budget, agency liaison, supervision of field crews and report preparation for over 1200 acres of multiple cultural resources inventories.

**Deputy Project Manager, Confidential Southern California Power Project.** Assisted with preparation of the CEC Application for Certification including lead for required analysis of 8 miles of new gas line. Key issues included land use, water supply, air quality, cultural resources, biological resources, visual resources, and noise.

**Project Principal, Western Area Power Administration, Transmission Line Project; Imperial County, California.** Provided overall management of cultural resources services for the Parker-Blythe #1 161-kV transmission line project. The inventory extended from Blythe, California to Parker, Arizona. A total of 147 sites (136 in California and 11 in Arizona) were recorded.

**Program Manager, United States Army Dugway Proving Ground, Cultural and Biological Resources Services.** Program Manager for a 3-year on-call contract to supply cultural and biological resources services to the United States Army's Dugway Proving Ground. Served as primary point of contact for the facility's environmental lead official. Assisted facility staff with cultural resources compliance activities, including cultural resources inventories in harsh and sometimes dangerous conditions within areas known to contain UXO's and other potential hazards. Completed required background checks, safety training, range training, and other required training and preparation to work on the sensitive facility. Led crews on several large inventories within this expansive training facility in Utah's West Desert. Maintained constant communication with Range Control and base staff to avoid conflict with range training activities, while performing the required inventories.

**Project Manager, United States Army Deseret Chemical Depot, Cultural Resources Services.** As Principal Investigator for a large multi-phased cultural resources investigation of the United States Army's Deseret Chemical Depot, led initial survey design and sampling plan to determine the presence, distribution, type, and significance of cultural resources located at this sensitive chemical weapons facility.

**Project Manager, Williams Pipe Line Project, Thompson to Salt Lake City, UT.** Managed all aspects of cultural resources compliance for the 260-mile pipeline, including project development, agency coordination, management of project budget and staff, supervision of field crews, identification and recordation of historic and prehistoric resources, laboratory analysis, artifact curation, and report preparation.

**Project Manager, Qwest Fiber Optic Project; Environmental Assessment; Cove Fort, UT.** Managed preparation of Environmental Assessment for NEPA compliance. Also prepared required technical report for cultural resources. Project development; agency coordination; management of project budget and staff; supervision of field crews; report preparation.

**Project Manager, Williams Communications, Third Party Environmental Compliance, I-80 Fiber Optic Project; NV and UT.** Managed third party construction compliance monitors and representatives of the BLM; ensured that compliance monitors, contractors, and construction crews met the requirements described in the projects construction stipulations, permits, and right-of-way grant. Primary liaison to client, BLM; agency coordination; management of project budget and staff; supervision of field crews; report preparation.

**Project Manager, Questar Gas Pipeline Company Dog Valley Pipeline Project; Panguitch, UT.** Survey and recordation of 37 historic and prehistoric sites; supervision of field crews; laboratory analysis; artifact curation; report preparation.

**Field Director, Data Recovery, Salt Lake City, UT.** Directed testing and data recovery excavation at the Salt Lake International Airport for airport expansion project. Participated in laboratory analysis of ceramic, lithic, and bone artifacts.

**Field Director, Data Recovery, Legacy Highway Project, Salt Lake City, UT.** Directed field excavation of large Archaic to Late Prehistoric site. Twelve-week test pitting phase included over sixty 2-by-2-meter test pits. Consulted and participated with local Native American Tribal representatives. Laboratory analysis of ceramic, lithic, and bone artifacts. Contributed to final report.

**US EPA Eureka Mills Superfund Site, Eureka, Utah.** Managed and directed cultural resource reviews for the documentation of domestic, industrial, mill, and mine sites during Superfund remediation efforts within a large historic district. Worked on documented and orphan waste sites with open shaft, adit, pit, and structural hazards. Responsible for ensuring staff compliance with health and industrial hygiene standards for lead and arsenic workers

### **Select Project Experience**

#### *International*

**Senior Technologist/Task Leader, Punta Colonet Port Development, Baja, Mexico.** Preparation of a management plan for cultural resources impact assessment for this proposed new port construction project in Baja, Mexico. Supervised preparation of subcontractor scope of work.

**Senior Technical Advisor, SEIA for Two Seismic Surveys, Confidential Oil & Gas Client, Algeria.** Cultural Resources advisor for two Social and Environmental Impact Assessments (SEIA) for a seismic survey in the Zerafa block (22,000 km<sup>2</sup>) and Djebel Hirane-Reganne block (9,500 km<sup>2</sup>) in Algeria for a confidential oil & gas client. The seismic surveys are intended for exploration and appraisal drilling support. The SEIA sets out all local and international legislation as well as client's Guidelines applicable to the project; evaluates socio economic and cultural considerations and design of the seismic survey. Environmental baseline conditions were compiled by local subcontractors comprising physical, air, noise and biological environments and archaeology and cultural heritage. Social and environmental impacts are identified and mitigation measures are developed to minimize the impacts at the design phase.

**Senior Technologist/Task Leader, ESIA Study for Yanbu Refinery Expansion, Kingdom of Saudi Arabia.** Lead for preparation of Cultural Heritage section of Social and Environmental and Social Impact Assessments (ESIA).

**Senior Technologist/Task Leader, ESIA Study for Confidential Oil and Gas Client, Iraq.** Cultural Heritage Lead for preparation of Cultural Heritage section of Social and Environmental and Social Impact Assessments (ESIA).

**Archaeologist,** 1998 Investigaciones Preliminares en Varios Sitios entre Nakbe y Wakna, Peten, Guatemala. XI Simposio de Investigaciones Arqueológicas en Guatemala, 1997, edited by J.P. Laporte and H.L. Escobedo, pp. 87-100. Museo Nacional de Arqueología y Etnología, Ministerio de Cultura y Deportes, Instituto de Antropología e Historia, Asociacion Tikal.

#### *U.S. Department of Defense*

**Principal Investigator, U.S. Army National Guard Facility Redevelopment, Tustin, CA**



*Clint Helton, M.A., RPA*

Conducted an environmental review to specifically address potential impacts to historic properties for the Tustin US Army Reserve Center (USARC) Military Construction project. Since the Project has been defined as a federal undertaking, an assessment of potential impacts to historic properties is required, in compliance with Section 106 of the National Historic Preservation Act.

**Principal Investigator, U.S. Army Fort Irwin Solar Project, CA**

Conducted a cultural resources study in support of a NEPA EA for the construction and operation of a solar power generating facility at the United States Army's training center at Fort Irwin, California.

**Senior Technical Advisor, Armed Forces Reserve Center Pease Air National Guard Base, NH**

Provided technical assistance and oversight of subcontractor staff to conduct a Phase I Cultural Resources survey in support of a NEPA EA for Base Realignment and Closure (BRAC) and Grow the Army (GTA) Actions. Completion of the cultural resource surveys were required to support Section 106 of the National Historic Preservation Act requirements for the proposed Armed Forces Reserve Center (AFRC).

**Senior Technical Advisor, U.S. Army Fort Douglas National Historic Landmark Archaeological Resources Management Plan, UT**

Completed a cultural resource investigation for the United States Army Reserve 88th Regional Support Command (88th RSC) to support an archaeological resource management plan that will set forth a comprehensive approach for assessing and managing the archaeological resources at Fort Douglas National Historic Landmark in Salt Lake City, Utah, in compliance with Section 106 of the National Historic Preservation Act. Mr. Helton acted as Senior Technical Advisor, including review of subcontractor deliverables, for preparation of this plan that will set forth a process for managing the surface and subsurface archaeological resources that contribute to Fort Douglas' National Landmark status, while at the same time maintaining the Fort's operational mandate as part of the 88th RSC. The management plan will also take into account the potential for discovering subsurface prehistoric and historic archaeological resources and will present a strategy for their evaluation, management, and treatment.

**Project Manager, U.S. Army National Guard Cultural Resources Support Contracts, UT**

Managed cultural resources services from Army National Guard for all 29 facilities within the State of Utah. Primary goal was to assist National Guard with bringing facilities into compliance with Section 106 of NHPA. Managed archaeological survey, testing, and data recovery projects. Assisted with Native American consultation. Authored an Integrated Cultural Resources Management Plan (ICRMP) to assist the Guard in complying with Department of Defense Instructions 4715.3 and Army Regulation 200-4.

**Team Principal, U.S. Navy Southwest Division Naval Facilities Engineering Command (NAVFACENGCOM), On-Call Cultural Resources Support, OR, WA, CA, AZ, NV, NM**

Valued at over \$15.1 million, Mr. Helton authored the winning proposal, and was the overall team leader for this multi-year contract to provide cultural resources services at all U.S. Navy facilities in Oregon, Washington, California, Arizona, Nevada, and New Mexico.

**Program Manager, U.S. Army Dugway Proving Ground, On-Call Cultural and Biological Resources Services, UT**

Program Manager for a 3-year on-call contract to supply cultural and biological resources services to the United States Army's Dugway Proving Ground. Served as primary point of contact for the facility's environmental lead official. Assisted facility staff with cultural resources compliance activities, including cultural resources inventories in harsh and sometimes dangerous conditions within areas known to contain UXO's and other potential hazards. Completed required background checks, safety training, range training, and

other required training and preparation to work on the sensitive facility. Led crews on several large inventories within this expansive training facility in Utah's West Desert. Maintained constant communication with Range Control and base staff to avoid conflict with range training activities, while performing the required inventories.

**Project Manager, Cultural Resources Services, U.S. Army Deseret Chemical Depot, UT**

As Principal Investigator for a large multi-phased cultural resources investigation of the United States Army's Deseret Chemical Depot, led survey design and sampling plan to determine the presence, distribution, type, and significance of cultural resources located at this sensitive chemical weapons facility in Utah's West Desert.

**CRS for Management of Third-Party Environmental Compliance/Mitigation Monitoring Experience Supporting Major Construction Projects (Most >1 Year Duration)**

Alta East Wind Energy  
Russell City Energy Center  
Los Esteros Critical Energy Facility  
Humboldt Bay Generating Station  
Ivanpah Solar Electric Generating Station  
Mariposa Energy Project  
Lodi Energy Center  
Cosumnes Power Plant and Gas Pipeline Project, Sacramento Municipal Utility District  
Level III Fiber Optic Project, Level III  
Talega Housing Development, Talega Associates  
Silver State East Fiber Optic Project, Sierra Pacific Power Company  
I-80 Fiber Optic Project, Williams Communications  
Questar Mainline 104 pipeline loop, Questar Pipeline Company

**Other Professional Skills**

Spanish language fluency; Native level (speak, read, and write)

**Professional Affiliations and Committees**

National Association of Environmental Professionals, Presenter  
Register of Professional Archaeologists  
Society for American Archaeology  
American Anthropological Association, Presenter

**Individual Technical Permits/Authorizations Held:**

<b>Title on Permit</b>	<b>Geographic Area</b>	<b>Year First Permitted</b>	<b>Issuing Agency</b>
Registered Professional Archaeologist	Nationwide	1999	Register of Professional Archaeologists
ARPA Permit--Project Director, Historic/Prehistoric (Statewide), Arizona Bureau of Land Management Cultural Resource Use Permit	Arizona	2008	Arizona State Office of Bureau of Land Management
ARPA Permit—Project Director/Principal Investigator (Statewide), California Bureau of Land Management Cultural Resource Use Permit	California	2004	California State Office of Bureau of Land Management
Project Director (Statewide), Nevada State Antiquities Permit	Nevada	1998	State of Nevada, Nevada State Museum
ARPA Permit--Project Director, Historic/Prehistoric (Statewide), Nevada Bureau of Land Management Cultural Resource Use Permit	Nevada	1998	Nevada State Office of Bureau of Land Management
Principal Investigator, Utah State Antiquities Permit	Utah	1998	State of Utah, Division of State History
ARPA Permit--Project Director (Statewide), Utah Bureau of Land Management Cultural Resource Use Permit	Utah	1998	Utah State Office of Bureau of Land Management
ARPA Permit—Project Director (Statewide), Oregon/Washington Bureau of Land Management Cultural Resource Use Permit	Oregon	2004	Oregon State Office of Bureau of Land Management
ARPA Permit—Project Director (Statewide), Oregon/Washington Bureau of Land Management Cultural Resource Use Permit	Washington	2004	Oregon State Office of Bureau of Land Management
ARPA Permit—Project Director & Principal Investigator, Colorado Bureau of Land Management Cultural Resource Use Permit	Colorado	2012	Colorado State Office of Bureau of Land Management

## GEORGE WEGMANN, PG, CHG

### WATER & GEOLOGICAL RESOURCES

George is a senior consultant with 25+ years of experience in hydrogeologic investigations and water resource management focused on the manufacturing, solid waste and mining sectors. Licensed in California and North Carolina as a professional geologist and a certified hydrogeologist in California. Responsible for conducting and managing multidisciplinary projects, client development, regulatory agencies and stakeholder communication, and staff oversight and mentorship. Experienced in regulatory compliance and water quality concerns at manufacturing, mining, and solid waste sites and the implementation of detection monitoring, evaluation monitoring, and corrective actions. Managed projects include baseline hydrogeologic site characterizations, due diligence environmental site assessments, detection and evaluation monitoring, corrective action investigations and monitoring, water management feasibility studies, site closure evaluations and alternatives analyses, permit application and regulatory compliance support for NPDES and other waste discharge programs, and preparation of reclamation plans and stormwater management evaluations.

### PROJECT EXPERIENCE

**Landfill, Auburn, California:** Project manager for evaluation monitoring program, site conceptual model update, engineering feasibility alternatives analysis, and corrective action program per state Waste Discharge Requirements at a closed landfill and active transfer station. The primary goals included further refining the base elevation of landfill wastes, determining the amount of separation between landfill wastes and groundwater, reviewing the potentiometric influence on shallow groundwater levels and understanding the water collection and management system. Prepared several technical reports for submittal to state agencies.

**Sutter Gold, Sutter Creek, California:** Project manager for a hydrogeologic investigation of an inactive underground gold mine prior to its reopening to establish baseline hydrogeologic conditions and determine dewatering needs in support of Waste Discharge Requirement permitting process and site operations, including disposal options for mine-related waste and development of waste management units. Completed packer testing, geophysical profiling, soil characterization, geochemical characterization, and routine compliance water monitoring. Installed an array of datalogging piezometers to define the piezometric response to dewatering activities in the mine and determine hydraulic properties.

**Cement and Aggregate Manufacturer, Multidisciplinary Projects, Santa Clara County, California:** Project manager for multiple projects for a mining and cement manufacturing facility. The projects included hydrologic, geologic and hydrogeologic investigations. Assisted with permit procurement; provided technical support and prepared reports for reclamation plan amendments and the California Environmental Quality Act; developed stormwater, best management and closure plans; performed National Pollutant Discharge Elimination System compliance



### EDUCATION

- BS, Geology, University of Connecticut

### LICENSES/REGISTRATIONS

- Certified Hydrogeologist: CA #1060
- Professional Geologist (PG): CA; NC #9191

# 16

Years with WSP

# 27

Years of Experience

## George Wegmann, PG, CHG (Continued)

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monitoring and reporting; and provided Title 27 Waste Discharge Requirements compliance detection monitoring and reporting, operations and maintenance plan preparation and implementation, financial assurance review and updates. Prepared overall water management system reports, including a treatment alternatives evaluation, modeling, process flow diagrams and optimization and sustainability studies; provided dewatering feasibility evaluations; and supported creek restoration permitting.

**Aggregate Manufacturer Quarry Evaluation, Santa Margarita, California:** Project manager for a hydrogeologic evaluation of an aggregate quarry in support of reclamation and the California Environmental Quality Act permitting efforts related to expansion. Provided a baseline characterization of the current hydrologic and hydrogeologic conditions and potential changes to the hydrologic systems associated with the proposed development efforts. The activities completed included collecting data, evaluating water balance and assessing potential future changes to the hydrogeologic system and stormwater management.

**Landfill Compliance Monitoring, North Carolina:** Project director and senior technical reviewer of compliance monitoring projects at several MSW and C&D active and closed landfills throughout the southeast. Clients include public entities and large national solid waste firms. Support coordination of the sampling, laboratory analysis, statistical analysis of data, and timely reporting of monitoring results and provide senior technical review.

**Cement and Aggregate Manufacturer, Alternatives Investigation, Calaveras County, California:** Provided hydrogeologic support for developing alternatives to manage groundwater and surface water interactions related to a regulated waste disposal unit. The investigation included developing a conceptual site model, determining a water budget and analyzing subsurface characteristics of the flow regime to complete a feasibility evaluation to determine the best alternative to implement. Provided senior technical review of groundwater compliance monitoring program.

**Department of Toxic Substance Control Voluntary Site Cleanup Program, Facility Groundwater Investigation, San Carlos, California:** Project manager for a facility in the Department of Toxic Substance Control Voluntary Site Cleanup Program where soil and groundwater were impacted by releases of several classes of chemicals from multiple on- and off-site sources. The investigatory techniques were designed and used to distinguish different source areas to aid in determining the multiple responsible parties. The remedial investigation report, which consisted of soil, groundwater and vapor intrusion evaluations, was completed and approved by the state agency. Interim remedial measures were implemented to address a source zone while long-term remedial alternatives were evaluated and implemented as part of the closure strategy.

**Facility Water Supply Evaluation, Monterey County, California:** Completed a water supply evaluation of potential impacts from a proposed increase of groundwater use at a facility undergoing expansion. Reviewed historical and current water elevations, aquifer storage and yield, water rights information and a sustainability plan to evaluate the potential of

## George Wegmann, PG, CHG (Continued)

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water sources to meet the project's growth-driven demand.

### **Landfill and Former Mercury Mine Evaluation, San Jose, California:**

Project manager of the former Guadalupe Mercury Mine located at the Guadalupe Recycling and Disposal Facility. Prepared technical reports based on a site characterization and a hydrology and geomorphology evaluation; developed mitigation measures, including best management practices and erosion control while working with stakeholders; assisted with a geotechnical assessment of slope stability; and assisted with procuring the necessary permits with local and state agencies to implement mitigation measures. The site was a legacy mercury mine.

**Amcor White Cap Site Closure, Hayward, California:** Project manager for a facility where historical on-site releases of petroleum products, including those from underground storage tanks, had impacted soil and groundwater. Evaluated the existing remedial system and implemented recommendations to improve the remedial system efficiency by enhancing the natural attenuation parameters present and closed the site through the low- threat closure policy. Effectively demonstrated that the site was not contributing significant impacts on the groundwater and that potential vapor intrusion was not a concern based on site-specific factors. The facility was under California Water Board jurisdiction.

### **Former Manufacturing Facility Assessment, East Hartford,**

**Connecticut:** Completed a site assessment and soil characterization for the redevelopment of a former manufacturing facility. Developed a remedial action plan that optimized the reuse of impacted soils as part of the redevelopment plan to minimize remedial costs. The constituents of concern consisted of metals, asbestos- containing material and petroleum. The plan included protocols for identifying and segregating impacted material for different end uses, sampling confirmatory soil, profiling waste disposal, monitoring dust and vapor and performing mitigation activities during remediation. Completed post-remediation groundwater compliance monitoring.



## **BETSY MITTON, CPEA**

### **HAZARDS, HAZARDOUS MATERIALS/ WASTE, AND WILDFIRE / SOLID WASTE MANAGEMENT**

Betsy Mitton, Senior Vice President, a Certified Professional Environmental Auditor (CPEA), brings more than 25 years of experience managing and conducting a variety of environmental services projects, including environmental compliance auditing and support, merger and acquisition due diligence, and environmental assessments for the firm's clients. Her compliance and due diligence experience includes projects associated with commercial, industrial, manufacturing, and pharmaceutical facilities, food and beverage, waste management, solar farms, aviation, electronics and electronic equipment manufacturing, chemical manufacturing, printing, electronic waste, household appliances, vacant land development, medical devices, financial, and other sectors.

Betsy regularly assists clients in identifying and addressing regulatory compliance issues associated with air and water permitting, waste management, reporting, the preparation of plans, and the establishment of procedures and management systems.

### **PROJECT EXPERIENCE**

#### **Confidential Client, Battery Recycling with Secondary Lead Smelter, Alloy Research and Development and Laboratory, Various Locations:**

Project Manager and Lead Auditor. Responsible for battery recycling facilities that include secondary lead smelters and associated facilities operating under a Title V air emissions permit, a RCRA Part B permit, and individual National Pollutant Discharge Elimination System permits to identify regulatory deficiencies that could pose a risk to the client during a future regulatory agency inspection. The multi-media audits include a comprehensive review of all applicable Federal, state, and local requirements and cover all three facility work shifts. The firm identified high-risk regulatory issues at the site and compared findings to previous audits and proposed remedies to identify these issues. The client was able to target high-risk items to minimize the potential for future regulatory enforcement.

#### **Confidential Client, Chemical Manufacturing Facilities, CA and**

**KS:** Lead Environmental Auditor. Responsible for third-party regulatory compliance audits at chemical, piping, and roofing manufacturers located in California and Kansas. The facilities specialize in manufacturing polypropylene piping, clay roofing tiles, and ancillary products. The multi-media audits include compliance with all applicable federal, state, and local regulations, including RCRA, hazardous materials management (Tier II and Form R), air (Title V permit), tanks, SPCC, storm water, wastewater, Prop 65.

#### **Confidential Client, Treatment, Storage and Disposal Facility,**

**Bakersfield, CA:** Betsy completed the Violations Scoring Procedure audit for Hazardous Waste Facility Operations found in Chapter 21, Division 4.5 of Title 22 of the California Code of Regulations (22 CCR). The audit



### **EDUCATION**

- BS, Natural Resources and Environment, University of Michigan

### **LICENSES/REGISTRATIONS**

- CPEA, Environmental Compliance
- ASTM 1527-13, Environmental Professional

### **AFFILIATIONS**

- OSHA, 40-Hour HAZWOPER
- USDOT, Hazardous Materials Transportation Materials Handling Certification
- RCRA McCoy Seminar, McCoy
- First Aid and CPR
- ASTM International, E50 Technical Committee: Environmental Assessment, Risk Management and Corrective Action
- Board of Environmental Health and Safety Auditor Certifications (BEAC)

## BETSY MITTON, CPEA (Continued)

was completed under the direction of the California Department of Toxic Substances Control (DTSC) and focused on waste management activities. Betsy is also assisting the client with the submittal of a Part B Hazardous Waste permit renewal, which is under review by DTSC.

### **Confidential Client, Fiberglass Insulation Manufacturing, CA:**

Environmental Auditor of fiberglass insulation manufacturing facilities. The multi-media audits include compliance with all applicable federal, state, and local regulations, including RCRA, hazardous materials management and Form R, air, tanks, SPCC, storm water, wastewater, Prop 65. .

### **Confidential Client, Aviation Parts Manufacturing, CA: Lead**

Environmental Auditor. Responsible for third-party regulatory compliance audit at a global aviation and aerospace parts manufacturer located in Southern California. The facility specializes in ball screw manufacturing and machining. The multi-media audits include compliance with all applicable federal, state, and local regulations, including RCRA, hazardous materials management and Form R, air, tanks, SPCC, storm water, wastewater, Prop 65.

**Confidential Client, Pharmaceutical Manufacturer, CA:** Environmental Auditor. Responsible for third-party regulatory compliance audit at a global pharmaceutical research and development facility located in Northern California. The facilities specialize in R&D with laboratory spaces, testing, vivarium and small manufacturing. The multi-media audits include compliance with all applicable federal, state and local regulations, including RCRA, hazardous materials management storm water, wastewater, Prop 65.

### **Various Clients, Environmental compliance support, Various**

**Locations:** Betsy routinely assists clients in the development of programs and procedures for maintaining compliance with environmental regulations. Clients include pharmaceuticals, transportation hubs, and waste management facilities. Activities include preparation of Emergency Planning and Community Right-to-Know Act Superfund Amendment Reauthorization Act Title III Sections 311, 312, and 313 (and California CERS) reporting forms, including Tier IIs and Forms R for electronic equipment and construction materials manufacturers; storm water National Pollutant Discharge Elimination System permit applications and storm water pollution prevention plans; spill prevention, control, and countermeasures (SPCC) plans; wastewater permit applications; non-Title V air permit applications; RCRA Part B renewal and RCRA annual and biennial hazardous waste reports; and other environmental management system plans and procedural documents. Clients were able to submit complete, technically correct submittals to regulatory agencies in areas where specific experience was lacking within the business

### **Electronics and Electronic Consumer Goods Corporation, Various**

**States:** For over 16 years, Betsy has conducted third-party environmental compliance audits for a Fortune 100 electronics and electronic consumer goods corporation. The program includes annual regulatory compliance audits of 3 to 5 medium- to heavy manufacturing facilities to identify environmental compliance risks within the client's business. The sites are located across the U.S. with a concentration in Texas, California, Missouri, Minnesota, and Ohio. Typical facilities and operations audited include

26  
Years with WSP

27  
Years of Experience

## BETSY MITTON, CPEA (Continued)

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foundries, electroplaters, glass-to-metal seals manufacturers, valve and actuator manufacturers, spray painting, powder coating, machining, and fabrication (including metal stamping). The audit findings are used to identify risk areas within the client's environmental management system and reduce the potential for regulatory violations and/or enforcement.

**Confidential Client, Various Ski Resorts, CA and NV:** Betsy provided environmental compliance assistance to a national ski resort company that included preparation of a comprehensive air emissions inventory to determine the facility's obligations under the local, state and federal air regulations. WSP also prepared several air permit applications submitted to the state air agencies.

**Commercial and Industrial Properties, Los Angeles, CA:** Project Manager and Lead Environmental Professional. Responsible for 22 phase I environmental assessments as part of a U.S. EPA Brownfields grant to the California High-Speed Rail Authority (CHSRA), the Los Angeles County Metropolitan Transportation Authority (Metro), and the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency. The due diligence activities included desktop review of relevant environmental information, review of existing Phase I and Phase II reports, review of publicly available databases, physical inspection of the targeted study area and preparation of ASTM E1527-13 Phase I environmental site assessment reports. The project will progress through the Brownfields program through 2022.

**Custom Building Materials Manufacturing Properties, Multiple States:** Project Manager and Lead Environmental Professional. Responsible for 15 phase I environmental assessments as part of a portfolio acquisition. The due diligence activities included desktop review of relevant environmental information, review of existing Phase I and Phase II reports, review of publicly available databases, physical inspection of the targeted properties and preparation of ASTM E1527-13 Phase I environmental site assessment reports. The portfolio was successfully acquired in 2021.

**Solar Farms, CA:** Conducted ASTM Phase I Environmental Site assessments of solar farms consisting of over 300 and 900 acres of undeveloped land scheduled for construction and installation of solar farms, and also fully developed solar farms. WSP's review included desktop reviews of information provided by the target company, review of publicly available information from federal and state databases, site inspections of pre-and post-solar cell installation, and interviews with company personnel with environmental, health and safety responsibilities. WSP prepared ASTM E1527-13 Phase I environmental site assessment reports and a cost estimate detailing material issues associated with the business unit.

# KYRALAI DUPPEL

## LAND USE, AGRICULTURE, AND FORESTRY/ SOCIOECONOMICS AND EJ

Kyralai is a biologist with an interdisciplinary background covering marine and aquatic ecology, biology, environmental justice, policy, and geospatial technologies. She has experience supporting environmental consulting and compliance services for public utility, power, and oil & gas clients across the Pacific Northwest, including Hydrostor and Kinder Morgan. For Hydrostor, Kyralai wrote Application for Certification chapters discussing the Project's impacts on land use, socioeconomics, and wildfire. She also created GIS figures to show the characteristics of the community and landscape surrounding the Project Site. Kyralai responded to CEC data requests for additional GIS figures as well as information regarding land use, socioeconomics, and wildfire. For Kinder Morgan, she conducted biological surveys for nesting birds, Swainson's hawk, and elderberry longhorn beetle, as well as wetland delineations at 29 sites along the pipeline. Kyralai's areas of practice include coral reef restoration, biological surveying, remote sensing, and environmental justice. Kyralai also supported the Environmental Impact and Monitoring Report for Sperra Inc./CEC.

### PROJECT EXPERIENCE

**Hydrostor Jurisdictional Delineation, CA:** In response to CEC data requests after review of previous submittals of the Jurisdictional Wetland Delineation, Kyralai authored an additional report detailing wetlands in the Project Area as well as their potential to be considered jurisdictional by USACE, RWQCB, and CDFW. After conducting GIS analysis to determine additional potentially jurisdictional drainages, Kyralai organized a field visit to confirm potentially jurisdictional drainages.

**Hydrostor, CA:** A 520MW underground compressed air energy storage center is being constructed in Kern County. Pursuant to the California Environmental Quality Act, Kyralai wrote AFC chapters discussing the Project's impact on land use, socioeconomics, and wildfire. She also created GIS figures to show the characteristics of the community and landscape surrounding the Project Site. Kyralai carried out biological and visual resource field surveys consisting of walking transects and taking photos of the site. Kyralai responded to CEC data requests for additional GIS figures as well as information regarding land use, socioeconomics, and wildfire. Upon receipt of the California Energy Commission's, Preliminary Staff Assessment (PSA), Kyralai reviewed the PSA to suggest edits and ensure consistency with project details.

**Hydrostor Field Surveys, CA:** Kyralai conducted biological surveys for burrowing owls, desert tortoises, and sensitive plants in the Mojave Desert. Vegetation, including Joshua trees, cholla, and phacelia, as well as burrows were mapped using ArcGIS Field Maps. Additionally, Kyralai travelled to key observation points and documented the visual character of the site, with supporting photos.

**Sperra Inc., CA:** Under a CEC grant, Kyralai managed and authored



### EDUCATION

- BS, Society & Environment, University of California
- Minors, GIS and Sustainable Design, University of California

### LICENSES/REGISTRATIONS

- Professional Association of Diving Instructors (PADI) Advanced Diver
- Professional Association of Diving Instructors (PADI) Rescue Diver
- FEMA Badge

# 3

Years with WSP

# 3

Years of Experience

## KYRALAI DUPPEL (Continued)

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the environmental review of the impacts of installation, operation, and decommissioning concrete anchors for offshore wind in the California offshore wind lease areas. Impacts to applicable CEQA resources were analyzed, and anchor design recommendations and mitigation measures were developed. Impacts of Sperra's anchors were compared to other commercially available anchoring systems.

### **Confidential Client, Hop Hill Solar Energy Project ASC Review, WA:**

Pursuant to SEPA, WSP was tasked with reviewing the ASC submitted for the Hop Hill Solar Energy Project whose components consist of a 500-megawatt solar photovoltaic generation facility, a 500-MW battery energy storage system, as well as related interconnection and ancillary infrastructure. Kyralai reviewed additional information provided by new biological resource and habitat studies to determine if gaps in information regarding wildlife remained based on data requests by WSP and the Client. She reviewed the wetland delineation report to determine if any gaps remained in potential wetlands within the Project Area.

### **Confidential Client, Programmatic Environmental Impact Statement, WA:**

The state of WA is planning transmission lines across the state to incorporate renewable energy into the grid. Pursuant to SEPA, WSP is writing a Programmatic Environmental Impact Statement to analyze the environmental impacts of the proposed transmission lines. Kyralai assisted in the land use section by contributing to the land use consistency table detailing relevant land use policies for the transmission line siting. She also contributed to the cumulative effects section by researching planned projects that may contribute to cumulative impacts. Additionally, Kyralai wrote the socio-economic impacts of the project on low income, person of colour, and overburdened communities. Kyralai responded to public comments regarding concerns around public health and safety, environmental justice, earth resources, water resources, and land use.

**Confidential Client, Horse Heaven Wind Farm, WA:** Kyralai assisted in reviewing the final EIS, pursuant to SEPA, for the Horse Heaven Wind Farm, a project covering over 60,000 acres in Benton County with a 1150 MW generating capacity. She put together 5 physical copies of the final EIS.

**Confidential Client, Badger Mountain, WA:** Aurora Solar LLC (Applicant), a wholly owned subsidiary of Avangrid Renewables LLC, proposes to construct and operate the Badger Mountain Solar Energy Project. The Project is a 200MW solar photovoltaic generation facility with an optional 200-MW battery energy storage system in unincorporated Douglas County, WA. Kyralai assisted in reviewing agency comments of the wildlife section of the ASC and subsequently revising the document. She also created a health and safety plan for field surveys.

**Confidential Client, Wallula Gap, WA:** Wallula Gap is a 60MW solar photovoltaic project with an optional battery energy storage system location in Benton County, WA. Kyralai contributed to addressing agency comments and revising the draft ASC in the biological resources and wildlife section pursuant to SEPA.

**Confidential Client, Recommendations, WA:** Following E2SHB 1812, the Client was granted the authority to regulate the siting of green



## KYRALAI DUPPEL (Continued)

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hydrogen and renewable energy product manufacturing facilities. Kyralai created a matrix of renewable energy product types, their environmental impact, current best practices, and existing policies relevant to them. The research and matrix were used to analyze gaps in current policies and create recommendations for the state to fill those gaps in regulating green hydrogen and renewable energy product facilities. The findings were conveyed in a report.

**Avangrid, Potential Site Analysis, Various Locations:** Kyralai gathered extensive data and conducted GIS analysis to evaluate two potential transmission line sites in California, Nevada, and Arizona based on environmental and social factors.

**Kinder Morgan, LS9 and LS16 Investigation, CA:** Kinder Morgan conducted oil and gas pipeline maintenance which involves digging around a petroleum pipeline running from Sacramento to Fremont. Kyralai conducted biological surveys for nesting birds, Swainson's hawk, and elderberry longhorn beetle as well as wetland delineations at 29 sites along the pipeline. She created report figures of surveyed areas using ArcGIS Pro.

**PacifiCorp, Pre-Application Documents, Various Locations:** PacifiCorp is evaluating the feasibility of hydroelectric pumped storage projects to integrate renewable energy better and flexibly respond to customer energy demands. WSP is assisting in analyzing potential pumped storage project sites and resources for further project study and evaluation. Kyralai drafted the fish and aquatic habitat sections of the applications.

**Emery West Station, CA:** Kyralai generated tables based on the lots of soil vapor sampling on-site to monitor VOCs. She utilized and created pivot tables to extract measurements on detected and undetected chemicals which were translated into data boxes in the annual monitoring report.

**TTRS, Orchard Substation, Fresno County, CA:** Kyralai wrote a critical impact analysis by CEQA detailing the local environment and potential impacts on it for the construction of a new substation consisting of a switchyard and satcom systems on approximately 20 acres of land. She created a permit matrix for federal, state, and local permits regarding environmental and biological constraints to constructing the new substation including but not limited to endangered species, roadway blockage, dust control plan, migratory birds, and runoff.

**Repair and Replacement of the Q8 Bulkhead, Norfolk, VA:** The United States Department of the Navy (Navy) proposes to repair and replace the Q8 Bulkhead at Naval Station (NAVSTA) Norfolk. The repairs/replacement of the bulkhead are needed because the existing bulkhead has failed in multiple locations, creating sinkholes and creating unsafe conditions. The repairs/replacements are needed to ensure full functionality of the bulkheads and prevent further erosion to the installation waterfront. Kyralai assisted in developing the Essential Fish Habitat (EFH) Assessment.



## VICTOR YOUNG, MSC

### NOISE AND VIBRATION

Victor is an Acoustic Scientist with WSP Canada Inc. Victor has more than fourteen years of experience working on a variety of mining, power, oil & gas, pipeline, and transportation projects across western and northern Canada. Victor's experience includes conducting field measurements and data analysis, developing predictive computer models, preparing noise impact assessment reports, preparing light assessment reports, and providing expert testimony at regulatory hearings. Prior to starting at WSP, Victor worked for five years as a research scientist at the Department of National Defence. Victor's research focused on underwater acoustics and active sonar.

### PROJECT EXPERIENCE

**Renewable Energy Systems Enterprise, Solar Project, Vulcan, Alberta:**

Glare modelling, noise modelling, and reporting in support of regulatory requirements and applications for the proposed Enterprise Solar Project.

**Renewable Energy Systems, Nova Solar Project, Carseland, Alberta:**

Glare modelling, noise modelling, and reporting in support of regulatory requirements and applications for the proposed Nova Solar Project.

**ATCO, Wicehtowak Solar Project, Bethune, Saskatchewan:**

Glare modelling and reporting in support of regulatory requirements and applications for the proposed Wicehtowak Solar Project.

**EverWind, Windy Ridge Wind Project, Colchester County, Nova**

**Scotia:** Noise modelling, shadow flicker modelling, and reporting in support of regulatory requirements and applications for the proposed Windy Ridge Wind Project.

**Capstone, Buffalo Atlee Wind Project, Jenner, Alberta:**

Noise modelling, shadow flicker modelling, and reporting in support of regulatory requirements and applications for the proposed Buffalo Atlee Wind Power Project.

**Capital Power, Halkirk 2 Wind Project, Halkirk, Alberta:**

Field data analysis, noise modelling, shadow flicker modelling, and reporting in support of regulatory requirements and applications for the proposed Halkirk 2 Wind Power Project.

**Renewable Energy Systems, Forty Mile Wind Power Project, Bow**

**Island, Alberta:** Field data analysis, noise modelling, shadow flicker modelling, and reporting in support of regulatory requirements and applications for the proposed Forty Mile Wind Power Project.

**Capstone, Wild Rose 2 Wind Project, Medicine Hat, Alberta:**

Noise modelling, shadow flicker modelling, and reporting in support of regulatory requirements and applications for the proposed Wild Rose 2 Wind Power Project.

**Enel Green Power, Grizzly Bear Creek Wind Project, Vermillion,**

**Alberta:** Field measurements and data analysis, noise modelling, and reporting in support of regulatory requirements and applications for the

### EDUCATION

- MS, Physics, Dalhousie University
- BS, Honours Physics, University of Guelph

# 14

Years with WSP

# 23

Years of Experience

## VICTOR YOUNG (Continued)

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proposed Grizzly Bear Creek Wind Power Project.

**RES, Rattlesnake Ridge Wind Project, Bow Island, Alberta:** Field data analysis, noise modelling, shadow flicker modelling, and reporting in support of regulatory requirements and applications for the proposed Rattlesnake Ridge Wind Power Project.

**Capstone, Riverhurst Wind Project, Riverhurst, Saskatchewan:** Noise modelling and reporting in support of regulatory applications for the proposed Riverhurst Wind Power Project.

**Dokie Ridge Wind Power Project, Chetwynd, British Columbia :** Post-construction noise monitoring, turbine noise emissions measurements, and reporting in support for regulatory requirements for the existing Dokie Ridge Wind Power Project.

**TransAlta, Sundance Power Plant, Stony Plain, Alberta:** Field measurements, data analysis, modelling, reporting, and hearing testimony in support of regulatory requirements and applications for the Sundance Power Plant.

**TransAlta, Keephills Power Plant, Stony Plain, Alberta:** Field measurements, data analysis, modelling, and reporting in support of regulatory requirements and applications for the Keephills Power Plant.

**TransAlta Pinnacle Power Plant, Stony Plain, Alberta:** Noise modelling and reporting in support of regulatory requirements and applications for the proposed Pinnacle Power Plant.

**Capital Power, Genesee Power Plant, Genesee, Alberta:** Field measurements, data analysis, modelling, and reporting in support of regulatory requirements and applications for the Genesee Power Plant.

**Cenovus, Christina Lake Thermal Project, Conklin, Alberta:** Collected field measurements, developed predictive computer models, and prepared noise impact assessment reports to support regulatory applications and filings.

**Suncor, Firebag In-Situ Project, Fort McKay, Alberta:** Developed predictive computer models and prepared noise impact assessment reports to support regulatory applications and filings.

**Canadian Natural Resources Ltd., Horizon Oil Sands Mine, Fort McKay, Alberta:** Analyzed field measurements, developed predictive computer models, and prepared noise impact assessment reports to support regulatory applications and filings.

**Suncor, Base Plant and Millennium Mine, Fort McMurray, Alberta:** Collected field measurements, developed predictive computer models, and prepared noise impact assessment reports to support regulatory applications and filings.

## MATT SAUTER

### LEAD CONSULTANT – ENVIRONMENTAL PLANNING & PALEONTOLOGY

As a senior environmental planner, Matt has NEPA and California Environmental Quality Act environmental impact, siting, and environmental justice analyses across a range of topics including paleontological resources, photovoltaic solar, thermal salt energy storage, large-scale linear projects (e.g., electrical transmission), marine mammals and underwater noise, social equity, waterfront development, and disaster response doctrine. Regarding permitting and planning, he has conducted siting studies and critical issues/fatal flaw analyses for novel green energy projects (e.g., thermal salt and sub-surface air pressure energy storage solutions) in California with an eye to future ease of permitting and environmental assessment under NEPA and CEQA. As part of his environmental planning experience, Matt has led or prepared NEPA- and CEQA-compliant, resource-specific impact assessment and mitigation planning for topics ranging from water resources to environmental justice across projects ranging from future disaster mitigation efforts, waterfront development by the US Coast Guard and Navy, and large-scale water management projects in the Desert Southwest. Previous to WSP, Matt served as local agency planner with the County of Ventura, California and prepared NEPA-compliant impact assessment and mitigation planning documentation for multi-state, multi-jurisdiction electrical transmission line project as staff paleontologist/earth resource subject matter expert with the Environmental Planning Group (EPG) in Phoenix, Arizona.

### PROJECT EXPERIENCE

**NV Energy, Comstock Meadows to West Tracy 345 kV Line Project – UEPA Environmental Statement. Washoe County, NV:** Matt provided the paleontological resource impact assessment and mitigation planning analysis to support development of a 10.4-mile electrical transmission line between Comstock Meadows and East Tracy in the Reno area as detailed in the Utility Environmental Protection Act Environmental Statement provided to the Nevada Public Utilities Commission.

**Century Lithium, Angel Island Mine Project, Esmeralda County, NV:** Project Paleontologist. Responsible to draft a paleontological resource study to support Century Lithium in responding the Bureau of Land Management Battle Mountain District Office's request for an assessment of the paleontological resources likely to be present, and/or impacted, by the client's proposed mine expansion project at Angel Island. The study summarized relevant laws, regulations, and standards applicable to paleontological resources management by the Bureau of Land Management and described the potential for fossils to be present and impacted by expansion of an open-pit mine.

**Los Angeles County Metropolitan Transportation Authority, Metro K Line Northern Extension. Los Angeles County, CA:** Matt provided third party per review of the paleontological resources technical report developed by another contractor to Metro in support of Metro's K Line Northern Extension Project. Matt provided advice related to improving the



### EDUCATION

- MS, Paleontology, South Dakota School of Mines & Technology
- BA, Geology, University of Minnesota

# 8

Years with WSP

# 16

Years of Experience

## **MATT SAUTER** (Continued)

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paleontological resources assessment including sensitivity determinations for geologic units expected to be encountered as well as identifying additional measures to be implemented during construction to avoid, minimize, and mitigate potential impacts to paleontological resources.

**Confidential Client, Novel Green Energy Storage and Transmission Project Siting and Application, Rosamond, CA:** Matt assisted a private client in conducting a critical issues analysis and siting study following by paleontology-specific portions of an application to the California Energy Commission. This work focused on complying with the CEC's unique requirements for paleontological studies necessary to complete the CEQA process unique to that State agency.

**U.S. Coast Guard (USCG), Moorings Seward and Sitka Modernization and Fast Response Cutter Homeporting EAs and Marine Mammal Permitting, Seward and Sitka, AK:** Senior Environmental Planner and Scientist. Responsible for drafting NEPA-compliant Environmental Assessments (EAs) and preparing Incidental Harassment Authorizations applications to the National Marine Fisheries Service (NMFS). These paired projects include construction of new floating docks and other in-water and shoreside facilities to support USCG's addition of new FRC's to Southeast Alaska. In addition to marine mammal take analysis and authorization, Mr. Sauter is supporting the preparation of two Biological Assessments and Essential Fish Habitat Assessments for these projects.

**USCG, CEU Juneau In-Water Maintenance Activities EA and Marine Mammal Permitting, Various USCG Facilities, AK:** Lead Technical Analyst. Responsible for preparing the NEPA-compliant EA for the USCG comprehensive in-water maintenance program at eight USCG facilities across Alaska. He was the lead preparer of a Letter of Authorization application for the incidental harassment and take of marine mammals prepared for the National Marine Fisheries Service and US Fish and Wildlife Service. This work included the analysis of potential airborne and underwater noise impacts on numerous populations of sixteen species of marine mammals and accounted for maintenance activities including pile removal, pile driving, drilling, power-washing, and others. The Letter of Authorization allows the Coast Guard to conduct routine maintenance activities at eight separate facilities for the next five years without requiring additional complex permitting on a project-by-project basis.

**Coachella Valley Water District and City of Palm Springs-Bureau of Land Management, Whitewater River Groundwater Replenishment Facility Renewal Project, Palm Springs, CA:** Deputy Project Manager. Responsible for the WSP team developing CEQA-compliant documentation for the right-of-way renewal for the Coachella Valley Water District's Whitewater River Groundwater Replenishment Facility in the northwestern portion of the City of Palm Springs. The Facility allows the Water District to use natural flows of the Whitewater River along with Colorado River Water delivered by the Municipal Water District to recharge groundwater aquifers within the Coachella Valley. Project included efforts to develop the CEQA-compliant documentation, and Environmental Impact Report, include direction of impact assessment and mitigation planning efforts and presentations at public meetings.

**WellQuest Inc., WellQuest Assisted Living Facility, Menifee, CA:**

## MATT SAUTER (Continued)

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Qualified Paleontologist. Responsible for the construction of a new senior living and memory care facility in the City of Menifee. He developed the Paleontological Resources Impact Mitigation Plan for the project that governed the location and assignment of paleontological monitors during construction activities as well as provided a detailed response plan in the event significant paleontological resources were discovered during project construction. He provided oversight of paleontological monitors in the field during construction activities.

### **SunZia, Multi-State High-Voltage Electrical Transmission Line**

**EIS, New Mexico and Arizona:** Environmental Planning Group's Staff Paleontologist and Earth Resources Specialist. Responsible for supporting the development of the Bureau of Land Management's Environmental Impact Statement analyzing environmental impacts of construction of the SunZia Transmission Line between New Mexico and Arizona. Matt worked with GIS team members to compile appropriate geological maps for all of the alternative routes and assigned each unit to the BLM's Potential Fossil Yield Classification system based on museum record and literature reviews to create impact models for each alternative route that factored into the route selection process. Matt also developed mitigation measures and plans for use during eventual construction of the transmission line.

### **Energy Gateway, South Multi-State High-Voltage Electrical**

**Transmission Line EIS:** Environmental Planning Group's Staff Paleontologist and Earth Resources Specialist. Responsible for supporting the development of the joint Bureau of Land Management/US Forest Service Environmental Impact Statement analyzing environmental impacts of construction of the Energy Gateway South Transmission Line with alternatives passing through Wyoming, Colorado, and Utah. Matt worked with federal agency field and regional office personnel and Environmental Planning Group GIS team members to compile appropriate geological maps for all of the alternative routes and assigned each unit to the BLM's Potential Fossil Yield Classification system based on museum record and literature reviews to create impact models for each alternative route that factored into the route selection process. Matt also developed mitigation measures and plans for use during eventual construction of the line.

## VAMSHI AKKINEPALLY, TE

### ASSISTANT VICE PRESIDENT, TRAFFIC ENGINEERING

Vamshi Akkinapally brings more than 22 years of transportation engineering and planning experience including transportation systems analysis, traffic operations analysis, traffic safety, traffic engineering, and travel demand modeling. He has served as a project engineer and task lead for a variety of projects. His primary responsibilities include conducting traffic impact studies for California Environmental Quality Act/ National Environmental Policy Act projects and preparing transportation planning studies for freeway corridor and interchange improvement projects.

### PROJECT EXPERIENCE

#### **Hydrostor Inc., Willow Rock Energy Storage Center, Kern County, CA:**

Lead Transportation Engineer. Vamshi prepared the transportation section of the Supplemental Application for Certification (AFC) for the California Energy Commission's (CEC) review and approval. Vamshi developed trip generation estimates for both construction and operations of the proposed development and conducted the Vehicle Miles Traveled analysis for CEQA purposes. Vamshi also evaluated the effect of construction traffic on the roadway network near the site and provided measures to improve traffic operations.

#### **Confidential Client, Several Solar and Wind Projects, WA:**

Transportation Engineer. Responsible for providing a technical review of the Application for Site Certification (ASC) prepared by the applicants. Vamshi has coordinated with The Client and WA Department of Transportation (WSDOT) in reviewing the ASC for Horse Heaven Wind Farm, Carriger Solar, and Badger Mountain Solar projects.

#### **International-Matex Tank Terminals LLC (IMTT), Richmond Renewable Fuels Project, Richmond, CA:**

Lead Traffic Engineer. Vamshi has prepared a traffic study to evaluate the potential transportation impacts of adding new renewable fuel storage tanks at an existing IMTT terminal in Richmond, CA. Vamshi has evaluated intersection traffic operations and conducted a VMT screening analysis in support of CEQA.

#### **LA Metro, K Line (Crenshaw) Northern Extension Environmental**

**Impact Report (EIR), Los Angeles County, CA:** Lead Transportation Engineer. Responsible for evaluating transportation impacts and preparing the transportation technical report in support of the draft Environmental Impact Report (EIR) associated with the K Line (Crenshaw) Northern Extension project. He has identified potential transportation impacts resulting from the proposed project using CEQA Guidelines, including conducting a VMT analysis.

#### **LA Metro, Interstate 405 Sepulveda Pass ExpressLanes Concept of Operations and Project Approval/Environmental Document, Los Angeles, CA:**

Lead Traffic Engineer. Responsible for the preparation of a Traffic Operations Analysis Report (TOAR) for the Project Approval/ Environmental Document (PA/ED). WSP is delivering the PA/ED and



### EDUCATION

- MS, Civil Engineering, The University of Alabama
- BTech, Civil Engineering, Kakatiya University

### LICENSES/REGISTRATIONS

- Professional Engineer (PE): CA #TR2753

### AFFILIATIONS

- Institute of Transportation Engineers

# 4

Years with WSP

# 22

Years of Experience



## VAMSHI AKKINEPALLY (Continued)

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concept of operations phase for the potential implementation of a high-occupancy toll (ExpressLanes) facility on Interstate 405 between Interstate 10 and U.S. Route 101.

**Tri-Valley San Joaquin Valley Regional Rail Authority, Valley Link Rail Project, Alameda County and San Joaquin County, CA:** Lead Traffic Engineer. Responsible for preparing a TOAR for the proposed new passenger rail service running on I-580 between the existing Dublin/Pleasanton BART Station in Alameda County and the proposed Mountain House Community Station in San Joaquin County. Vamshi has prepared a traffic study in support of the NEPA document. He has prepared a TOAR for approval by Caltrans District 4 and District 10.

**Caltrans District 12, Interstate 5 Managed Lanes Project Approval/Environmental Document, Orange County, CA:** Traffic Engineer. WSP is responsible for obtaining Project Approval for the 16-mile conversion and expansion of median Express Lanes facilities on I-5 between SR 55 and the LA County Line. Vamshi has coordinated with the traffic team in delivering the TOAR for the project. He has prepared the funding application for the Carbon Reduction Program and helped prepare a draft Toll Facility Application for consideration by the California Transportation Commission (CTC).

**SCAG and City of Burbank, Media District Specific Plan Update, Burbank, CA:** Lead Traffic Engineer. The Specific Plan update focuses on developing and implementing policies and programs to remove barriers to housing production, streamline the permitting process, and introduce practical design standards for new development. Vamshi has evaluated the intersection operations within the Media District Specific Plan study area for the No Project and With Project scenarios and recommended circulation improvements. He has conducted the VMT analysis using the City's travel demand model per the City's guidelines.

**City of National City, Focused General Plan Update, National City, CA:** Transportation Engineer. Vamshi has prepared a Transportation Impact Analysis to document the potential impacts related to the City's Focused General Plan Update. He has calculated the change in VMT due to the proposed updates to the City's land use, transportation network, and mobility circulation.

**Nevada Department of Transportation (NDOT), Rancho Drive Complete Streets NEPA, Las Vegas, NV:** Lead Traffic Engineer. Vamshi has prepared the technical traffic study to support the NEPA process for the improvement of a 6.6-mile segment of Rancho Drive from Mesquite Avenue to Rainbow Boulevard in Las Vegas as a complete street. He has finalized the transportation analysis methodology memorandum in coordination with NDOT and has conducted analysis of existing and future traffic operations at study intersections.

# DARYL HARRISON

## PROJECT ROLE

Daryl Harrison is a senior specialist in WSP Canada Inc.'s Victoria office. He has over 20 years' experience with resource development, land use planning and environmental assessments for the mining, energy / renewable energy, oil and gas, infrastructure, and forestry sectors. He has led a range of socio-economic components for environmental assessments in accordance with various Canadian and international regulatory requirements. Daryl has expert knowledge and extensive experience in the provision of visual landscape assessments and scenic values management services. Daryl has also contributed strategic support to Indigenous knowledge integration processes and the assessment of effects to Indigenous rights and interests.

Daryl is committed to providing creative solutions that support decision making and effective collaboration. He is skilled at both desktop and field data collection methods, and with a variety of relevant socio-economic and spatial analysis techniques. Daryl has been involved in various technical working groups and public engagement processes and has also provided expert support as a part of third-party technical reviews and as a witness in both Canadian federal and provincial review panels. Recent experience has focussed on the development of visual quality management strategies for mine reclamation and the development of land and marine use management and monitoring plans.

## PROJECT EXPERIENCE

### **Hydrostor Inc., Compressed Air Energy Storage Visual Assessment:**

Technical Lead. Led and supported the visual assessment of proposed Compressed Air Energy Storage facilities located in California, U.S. and southwestern Ontario, Canada. Coordinated baseline visual inventory and landscape modelling, conducted data analysis and visual effects assessment for the California State Application for Certification process and Ontario provincial permitting approval process. Includes ongoing support for California Energy Commission Evidentiary Hearing process related to the Willow Rock Energy Storage Center.

### **Elk Valley Resources (formerly Teck Coal Ltd.), Line Creek Operations Landscape Design Services:**

Visual Management Lead. Support for engagement with local stakeholders, and the development and application of visual design guidelines and landscape design services for the expansion of coarse coal rejects stockpiles and related infrastructure in southeastern British Columbia.

### **Elk Valley Resources (formerly Teck Coal Ltd.) Elkview Operations**

**Visual Quality Management Plan and Toolkit:** Visual Management Lead. Led the development of a Visual Quality Management Plan and Toolkit for a coal mine in southeastern British Columbia, Canada. Involved identifying strategic objectives and guidelines for achievement of natural landscape reclamation, community and Indigenous group engagement, the development of best practices for landscape design, and procedures for visual monitoring and auditing. Development of the Toolkit involved further defining procedures for implementing landscape design and monitoring



## EDUCATION

- BA, Geography, University of British Columbia
- Advanced Diploma Geographic Information Systems (GIS), British Columbia Institute of Technology

## TRAINING

- Indigenous Awareness, Indigenous Corporate Training Inc.
- Visual Resource Stewardship Conference hosted by the Argonne National Laboratory
- Introduction to Gender-based Analysis Plus, Status of Women Canada
- Visual Resource Management Training, British Columbia Ministry of Forests, Lands and Natural Resource Operations

## AFFILIATIONS

- International Association for Impact Assessment, since 2014

## DARYL HARRISON (Continued)

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to re-establish natural landscape character. Recent work included the implementation of visual quality monitoring and auditing procedures and reporting.

**Elk Valley Resources (formerly Teck Coal Ltd.) Elkview Operations Visual Air Quality Monitoring Plan:** Visual Management Lead. Led the development of recommendations to address the visual effects of dust from mining activity for a coal mine in southeastern British Columbia. Involved the design of visual air quality management recommendations and monitoring planning.

**British Columbia Ministry of Transportation and Infrastructure, Pattullo Bridge Replacement Project - Marine and Fisheries Access Management Plan:** Technical Lead. Supported the development of a marine fisheries access management plan for the Fraser River, British Columbia. A draft plan was developed to meet commitments outlined in the Pattullo Bridge Replacement Project Environmental Assessment Certificate (EAC) Application. Involved engaging with communities and technical working groups to support the identification of mitigation measures and drafting procedures and protocols to address project effects on Indigenous and commercial fisheries.

**Elk Valley Resources (formerly Teck Coal Ltd.), Elk Valley Mines Social Information Baseline Assessment:** Technical Lead. Contributed to the compilation of socio-economic related data in a regional snapshot of current social conditions to support the assessment of social impacts associated with Teck's operations in the Elk Valley. Managed land and resource use information and presentation of data results.

**BURNCO Rock Products Ltd., McNab Creek Aggregate Mine Project - Marine Transport and Access Management Plan:** Technical Lead. Supported the development of a draft management plan to meet commitments outlined in the McNab Creek Aggregate Mine Project EAC Application pertaining to marine transportation and access. Involved drafting specific measures, procedures and protocols to address project effects from marine transportation within Howe Sound, British Columbia and to support Squamish Nation engagement and marine access.

**White Pass & Yukon Route, White Pass Loop Management Plan:** Technical Lead. Visual Resources Lead for management plan as part of a tenure application process in southwest Yukon Territory. Included desktop inventory of visual resources and viewpoint locations and related scenic resource management objectives.

**Northback Holdings, Grassy Mountain Coal Mine Project:** Technical Lead. Technical visual and light component lead for the assessment of a proposed metallurgical coal mine project in southwestern Alberta. Coordinating baseline field inventory and data collection, landscape modelling, as well as conducting visual assessment and reporting as part of a coordinated provincial and federal environmental assessment process.

**Li-FT Power Ltd., Yellowknife Lithium Project:** Technical Lead. Technical visual component lead for the assessment of a proposed lithium mine project 60 km of Yellowknife, NWT. Coordinating baseline field inventory and data collection and reporting.

1

Years with WSP

22

Years of Experience

## **DARYL HARRISON** (Continued)

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**Pine Point Mining Ltd., Pine Point Mine Project:** Technical Lead. Visual Resources component lead for the assessment of a proposed zinc-lead mine project south of Great Slave Lake, NWT. Coordinating baseline field inventory and data collection, landscape modelling, as well as conducting visual analysis and reporting and reporting for a Developers Assessment Report (DAR) in response to the Mackenzie Valley Environmental Review Board (MVEIRB) environmental assessment process.

**Transportation Investment Corporation, Fraser River Tunnel Replacement Project:** Technical Lead. Technical socio-economic component lead for the assessment of a proposed transportation infrastructure project in southeast British Columbia. Conducted baseline field inventory and site visits, and coordinated data collection and reporting for visual quality, land use, and marine use components as part of a provincial Environmental Impact Assessment Application process. Supporting ongoing visual effects assessment through the EAC process.

**Elk Valley Resources (formerly Teck Coal Ltd.), Fording River Extension Project:** Technical Lead. Visual Quality and Land and Resource Use Lead for a proposed mine expansion project in southeast British Columbia. Coordinating and supporting baseline inventory and interviews, landscape modelling and reporting as part of a coordinated provincial and federal environmental assessment process.

**Osisko Development Corp, Cariboo Gold Project:** Technical Lead. Visual Resource Lead of a proposed underground mine and related infrastructure near Wells, British Columbia. Coordinated photographic surveys and inventory as well as baseline and effects analysis and reporting to support a provincial EAC Application. Supporting ongoing amendments to the approved EAC.

**British Columbia Hydro, Environmental and Socio-Economic Effects Reports:** Technical Lead. Visual Landscapes and Land Use Lead for a number of Environmental and Socio-Economic Effects Reports (ESERs) in British Columbia. Projects included Metro North Transmission Line, West Kelowna Transmission Project, the Ladore Spillway Seismic Upgrade Project, and the Lower Mainland Capacity and Reactive Power Reinforcement Project.

**Transportation Investment Corp, Fraser River Tunnel Replacement Project:** Senior Technical Advisor. Technical support for the assessment of effects to Indigenous rights and interests with Two Worlds Consulting. Support provided as part of a provincial EAC Application process.

**Confidential Client, Technical Review:** Technical Lead. Supported the review and response to Applications Site Certification for proposed renewable energy projects in WA State. Led auditing and analysis of visual effects assessment to meet State Environmental Policy Act (SEPA) requirements. Projects included Desert Claim Wind Power Project, Horse Heaven Wind Project, Goose Prairie Solar Energy Project, Badger Mountain Solar Energy Project, and High Top and Ostrea Solar Energy, and Carriger TCP Projects.

**St'át'imc Government Services, Bridge River Transmission Project:** Technical Lead. Provided visual impact assessment of a proposed improvements to the existing British Columbia Hydro 2L90 transmission

## **DARYL HARRISON** (Continued)

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line near Lillooet, British Columbia for an ESER process with Two Worlds Consulting. Engagement with members of local Indigenous communities focussed on the identification of viewpoints to represent cultural use areas and to discuss proposed mitigations to address concerns raised about aesthetic changes to the landscape.

**Fortis British Columbia , Tilbury LNG Phase 2 Project:** Technical Support. Technical support for the assessment of a proposed expansion of an existing LNG facility in southeast British Columbia. Provided analysis and reporting of socioeconomic components with Two Worlds Consulting as part of a provincial EAC Application process. Also coordinated with Indigenous Interests sections and the integration of traditional knowledge.

**Metis Nation Saskatchewan, Denison Mines Corp's Technical Review:** Technical Lead. Coordinated with Metis Nation Saskatchewan to provide third-party technical review of Environmental Impact Statements for a number of Denison Mines Corp's projects in northern Saskatchewan including Wheeler River Project, McArthur River/Key Lake Project, Rabbit Lake Operation, and Cluff Lake Project. Authored reporting to inform the project related assessments with Two Worlds Consulting.

**Chance Oil and Gas Ltd., Eagle Plains Exploration Project:** Socio-Economic Lead. Led the socio-economic assessment with Two Worlds Consulting for a proposed oil and gas exploration Project Proposal for the Yukon Environmental Socio-economic Assessment Board's (YESAB) Executive Committee. Responsible for assessing potential effects to a range of social components and incorporating information from Gwich'in Tribal Council, First Nation Na-Cho Nyäk Dun, Tr'ondëk Hwëch'in, and Vuntut Gwitchin First Nation with Two Worlds Consulting.

**Confidential Wind Farm Project:** Technical Lead. Provided service focused on the Early Engagement phase of the provincial EAC process for a renewable energy project near Prince George, British Columbia. Services included the development of the Initial Project Description and Engagement with Two Worlds Consulting. The proposed project did not formally enter the EAC process.

**JX LNG Canada Ltd., Summit Lake PG LNG Project:** Technical Lead. Provided socio-economic and engagement strategy to support the Early Engagement and Process Planning phases of the provincial EAC process for a proposed LNG facility project near Prince George, British Columbia. Services focussed on the development of the socio-economic and Indigenous Interest components of the Detailed Project Description and draft Application Information Requirements with Two Worlds Consulting.

**Elk Valley Resources (formerly Teck Coal Ltd., British Columbia Mine Permitting:** Technical Lead. Visual Aesthetics and Land Use and Tenure Lead for a number of application amendments for proposed mining operation projects at Teck Coal Ltd. (currently Elk Valley Resources) Greenhills Operations, Line Creek Operations, and Elkview Operations in southeast British Columbia. Included assessments for Greenhills Operation Phase 1 & 2, Phase 7-1 / North Spoil, and Mickelson Creek Projects, East Coal Rejects Dump Extension Phase 2, Cedar North In-Pit Spoil Extension, Active Water Treatment Early Work and Construction phases, Line Creek Dry Creek Conveyance, and Elkview Harmer Facilities Relocation.

## **DARYL HARRISON** (Continued)

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**Hydro One, Environmental Assessments:** Senior Technical Advisor. Provided technical guidance and review of visual impact assessment analysis and reporting as part of Ontario provincial environmental screening and assessment processes. Projects included Waasigan Transmission Line Project, Nation Rise Windfarm Project, and Romney Wind Energy Centre Project.

**Suncor Energy Inc., Base Mine Extension Project:** Technical Lead. Visual Resources Lead for a proposed oil sands mining expansion project in northern Alberta, Canada. Coordinating landscape inventory and modelling, visual analysis, and reporting results for a federal Environmental Impact Assessment process.

**Chevron Canada Ltd., Kitimat LNG Project:** Technical Lead. Technical Lead for Visual Resources and Land and Marine Use components of a proposed LNG facility in northwest British Columbia. Coordinating baseline inventory and interviews, landscape modelling, effects assessment, and reporting results for a provincial Environmental Assessment Application Amendment process. Also participated in technical working groups. The proponents elected to withdraw from the Project prior to application. Client:

**Climate and Renewables Canada, Grizzly Bear Creek Wind Power Project Visualization Update:** Technical Assistant. Coordinated and supported an update of visual simulations for a windfarm project in the counties of Minburn and Vermilion River, Alberta. The project included up to 34 4.2 and 4.5 megawatt wind turbines.

**CBM Aggregates Ltd., Dance Pit Extension:** Senior Technical Advisor. Responsible for providing technical support for a visual assessment of a proposed extension of an existing aggregate pit in the Township of North Dumfries, Ontario. Provided technical guidance and review of visual impact assessment as part of a provincial aggregate license application.

**Vancouver Fraser Port Authority, Roberts Bank Terminal 2, Vancouver WA:** Technical Lead and Visual Resources Lead. Responsible for a federal Environmental Impact Statement of a proposed marine terminal expansion project in Metro Vancouver. Provided technical review and reporting on baseline inventory and visual effects assessment of daytime and nighttime viewing conditions. Supported the project through a federal Joint Review Panel including numerous information requests, additional studies, and Panel hearings as an expert witness. Also participated in Indigenous Advisory Forums and developed nighttime simulations of lighting effect.

**British Columbia Ministry of Transportation and Infrastructure and Translink, Pattullo Bridge Replacement Project:** Technical Lead. Responsible for a provincial EAC Application of a proposed bridge replacement project in Metro Vancouver. Conducted project effects assessment on Visual Quality, Lighting, Shade, and Marine Resource Use components including baseline data collection and field programs, analysis, and effects assessment reporting. Participated in post EAC Application phase technical working groups, information requests and management planning pertaining to visual quality and marine use assessment components.

**Lehigh Hanson Materials Ltd., Shaftesbury Pit #2:** Visual Management Lead. Responsible for a proposed aggregate mining project in



## **DARYL HARRISON** (Continued)

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northwestern Alberta. Coordinated baseline photographic inventory and landscape modelling. Conducted visual impact assessment modelling and analysis, for municipal permitting process. Involved the support of a reclamation Landscape Concept Plan.

### **Wataynikaneyap Power, Transmission Project Phase 1 & Phase 2:**

Technical Lead and Visual Aesthetics Lead. Responsible for Land and Resource Use assessment support for a proposed total of 1,800 km power transmission lines in northwestern Ontario connecting 17 remote First Nations communities. Coordinated baseline photographic inventory and landscape modelling, conducted assessment of visual effects and mitigation planning, and reported results for an Ontario provincial and federal Environmental Assessment process. Also conducted secondary and primary data collection, effects assessment, and reporting for land and resource use.

**Capital Power, Halkirk 2 Wind Project:** Technical Lead and Visual Resources Specialist. Responsible for a proposed wind power project in southern Alberta. Provided support for a review panel hearing with the Alberta Utilities Commission.

### **Wolverine Terminals ULC, Prince Rupert Marine Fuel Terminal Project:**

Technical Lead. Visual Amenities and Land and Marine Use Lead for a proposed marine fuelling facility in the northwest coast of British Columbia. Coordinated baseline photographic survey and landscape modelling, conducted visual impact analysis, and reporting results for a federal Environmental Effects Evaluation process. Also provided lead technical assessment of Land and Marine Use effects and reporting.

### **NextBridge Infrastructure, East-West Tie Transmission Project:**

Technical Lead. Visual Environment Lead for a proposed 400 km power transmission project in northwestern Ontario. Coordinated baseline photographic inventory and landscape modelling, conducted assessment of visual effects and mitigation planning, and reported results for an Ontario provincial Environmental Assessment process.

### **British Columbia Hydro, Revelstoke Unit 6 Generating Station Project:**

Technical Lead. Visual Quality Lead and Land and Resource Use Lead for a proposed hydro-electric development expansion project in south-central British Columbia. Coordinated baseline inventory and data collection, landscape modelling, assessment of effects, mitigation planning, and reported results for a provincial EAC Application.

### **Imperial Oil Resources Ltd. / EXXON Mobil, West Coast Canada**

**LNG Project:** Technical Lead. Visual Resources Lead for baseline data collection program for a proposed LNG facility in northwest British Columbia. Conducted photographic survey and inventory, analysis, and reporting for provincial EAC Application process. The proponent elected to withdraw from the assessment process prior to application.

### **Elk Valley Resources (formerly Teck Coal Ltd.) Baldy Ridge**

**Expansion Project:** Technical Lead. Visual Resources Lead for a proposed mining operation expansion project in southeast British Columbia. Involved coordinating landscape modelling, conducting baseline photographic surveys and visual inventory, visual effects analysis and assessment reporting for a provincial Environmental Assessment process.

## DARYL HARRISON (Continued)

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Also included the assessment of effects of particulate matter to visible air quality.

**British Columbia Hydro, Site C Clean Energy Project:** Technical Lead. Visual Resources Lead for a proposed hydroelectric project in northeast British Columbia. Involved coordinating landscape modelling, conducting baseline photographic surveys and visual inventory, visual effects analysis and assessment reporting for a federal Environmental Impact Statement process. Participated as expert witness during a federal Joint Review Panel process.

**Shell Canada Ltd., Pierre River Mine Cultural SIR 69a:** Technical Lead. Assessment and response to information request of cultural land use and visual disturbance. Involved analysis of potential for 'wilderness' experiences based on a review of the existing visual assessment reporting and the Wood Buffalo Region Landscape Visual Landscape Inventory information.

**NPE Holdings, NY Biofuels Facility:** Technical Lead. Visual Resources Lead involved in pre-screening analysis and assessment of a proposed biofuels facility in New York State, USA. Included an inventory of scenic and aesthetic resources, pre-screening analysis for viewpoint selection, and coordinating baseline photo survey and inventory for and New York State Department of Environmental Conservation approval process.

**Woodfiber LNG, Woodfiber LNG Project:** Technical Lead. Visual assessment and land marine use assessment of a proposed LNG facility in southwest British Columbia. Conducted photographic surveys and inventory, landscape modelling, technical analysis and assessment, and reported results as part of a provincial EAC Application process. Supported Land and Marine Use component assessment. Conducted modelling and visualization of project site for preliminary site planning and design as part of environmental and social management services. Client:

**Imperial Oil Resources Ltd. Beaufort Sea Exploration Joint Venture Drilling Program:** Technical Lead. Visual Resources Lead for proposed offshore exploration program in Canadian arctic. Developed visual aesthetics baseline report characterizing scenic potential of Beaufort Sea shoreline based on desktop analysis.

**TransAlta Corp., Sundance 7 Power Plant Project:** Technical Lead. Visual Resources Lead for a proposed natural gas-fired power plant in northern Alberta. Conducted baseline photographic survey, landscape modelling, and preparation of a visual impact assessment in support of a review panel hearing with the Alberta Utilities Commission.

**Gerdau Açominas S.A., Mina Várzea do Lopez Project:** Technical Lead. Provided visual assessment of a proposed iron mine project in the Itabirito municipality of Minas Gerais, Brazil. Coordinated baseline photographic survey and inventory, landscape modelling, visual impact assessment, and reporting results to international standard for an Environmental and Social Impact Assessment (ESIA) process. Also coordinated viewshed analysis and landscape modelling for alternate mine scenarios.

**Taquaril Mineração S.A., Complexo Minerário Serra Do Taquaril Project:** Technical Lead. Visual Impact Assessment Lead for a proposed

## DARYL HARRISON (Continued)

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mining project in the Minas Gerais region of Brasil. Coordinated baseline photographic surveys and landscape modelling, conducted visual assessment, and reported results for ESIA process.

**Torex Gold Resources. Morelos Mine Project:** Technical Lead. Visual Resources Component Lead for the proposed mining project in central Mexico. Conducted baseline photo inventory and landscape modelling, visual impact assessment, and reported results to the international standard for Environmental and Social Impact Assessment process.

**Curtain Bros. Ltd & IPBritish Columbia , Motukea Terminal Project:** Technical Lead (2013): Provided visual impact assessment of a proposed terminal facility in Port Moresby, Papua New Guinea. Coordinated photographic survey and landscape modelling, conducted visual analysis, and reported results for an Environmental Impact Assessment process. .

**Bonneville Power Administration, I-5 Corridor Reinforcement Project:** Technical Lead. Visual Resources Lead for a proposed transmission line project in WA State, USA. Coordinated landscape modelling and conducted the baseline photographic survey, visual assessment of route options, and reporting for an Environmental Impact Statement meeting National Environmental Policy Act (NEPA) standards.

**Zero Emission Energy Developments, Septimus Creek Wind Power Project:** Technical Lead. Visual Resources Technician for a proposed wind power project in northeast British Columbia. Conducted spatial analysis and modelling of wind turbine layout to support environmental constraints analysis. Also supported past and current land and resource use with respect to First Nations traditional land use. Client:

**Graymont, Confidential Project:** Technical Assistant. Coordination of landscape modelling and developing composite imagery of quarry closure plans to support project design options.

**Confidential Mine Reclamation Project:** Technical Assistant. Supported visual simulation demonstrating the development of a tailings dam and related infrastructure project design options. Landscape modeled was developed into an animated tour of different project components.

**British Columbia Hydro, Interior Lower Mainland Project:** Technical Assistant. Developed visualization of transmission structures and overhead conductors near a confidential Indigenous cultural use site within the Fraser Valley, British Columbia. Included photographic survey, landscape modelling, and photo compositing to create photo-realistic images to address Indigenous concerns about aesthetic impacts to cultural use.

**SaskPower, Tazi Twé Hydroelectric Power Project:** Technical Assistant. Coordination and support of visualization for a proposed hydroelectric development project in northern Saskatchewan. Involved the development of landscape visualizations of predicted project effects to seasonal water levels in support of local Indigenous and stakeholder participation for a federal Environmental Impact Statement process.

**Avro Wind Energy Inc., Sundance Wind Energy:** Technical Assistant. Developed visualization of a proposed wind power project in northeast British Columbia. Conducted modelling of wind turbine layout, and developed graphics to support environmental constraints analysis.

## **DARYL HARRISON** (Continued)

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### **Kitselas First Nation, Community Mapping and Land Use Planning:**

Technical Assistant. Managed and supported charettes and environmental assessment inventory.

### **Lower Similkameen Indian Band Land Use Plan:**

Technical Assistant. Managed spatial data and supported development of workshops, analyzing community mapping results, and reporting mapping. Client: Lower Similkameen Indian Band

### **MK Delta Lands Group, OCP and Zoning Approval:**

Technical Assistant. Developed landscape and build-out model of proposed community development plan. Work included 3D modelling and design for public engagement workshops and visual impact assessment reporting as part of a municipal zoning approval process.

### **Penticton Indian Band Land Use Gap Analysis:**

Technical Assistant. Land use gap analysis and mapping for Penticton Indian Band reserves 1 to 3. Developed data sharing agreements, management and assessment of land use and community mapping data. Client: Penticton Indian Band

### **Regional District Official Community and Parks Plan:**

Technical Assistant. Supported public engagement coordination, conducted community mapping workshops and analysis, developed web-mapping applications for public input, developed maps for official community planning and reporting. Client: Columbia Shuswap Regional District, Powell River Regional District, Regional District of Central Okanagan, Capital Regional District, District of Sparwood.

## JESSE STEEL

### ASSISTANT VICE PRESIDENT, ENVIRONMENTAL HEALTH AND SAFETY

Jesse is an experienced Environmental, Health and Safety leader with over 21 years experience in environmental studies, project management, mining and manufacturing.

Jesse has a strong Environment Health and Safety (EHS) background and has supported a variety of projects and operating sites across Australia and North and South America. Jesse has extensive experience in EHS compliance, integrated management systems, auditing, certification and assurance (ISO14001, ISO45001, Cyanide Code), Enterprise Risk Management, continuous improvement, fatality and serious injury prevention and employee-driven safety programs. He has supported a variety of strategic environmental projects and sustainability planning and assisted clients meet a wide range of federal, state and local regulatory requirements.

### PROJECT EXPERIENCE

**Washington Metropolitan Area Transit Authority (WMATA):** Project lead and subject matter expert for development of WMATA's occupational, health and safety program and supporting training resources.

**Grosvenor Property Americas, San Francisco:** Development of Grosvenor's emergency management system including, support of the business continuity and crisis management plan, development of a workplace violence prevention plan and associated training and delivery of a company-wide, emergency response scenario.

**SAP, San Jose:** Development of a California Illness and Injury Prevention Plan (IIPP). Key components include, risk management, workplace hazard assessment, incident and action management, communications, inspection and audits.

**Peabody Energy, EHS Auditing, Multiple Sites:** Lead Auditor and Subject Matter Expert. Responsible for the Peabody Energy / WSP team. Audit of internal management systems and technical EHS standards.

**Graymont Lime Environmental Compliance Audit, Genoa, OH:** Environmental compliance audit at the Genoa Lime facility. Audit reviewed compliance with state and federal regulations; local county and city government requirements were also reviewed.

**Rio Tinto Resolution Copper Mine Ergonomic and Industrial Hygiene Support, Superior, Arizona:** Development and implementation of an industrial hygiene sampling plan for site Underground and Surface operations. Ergonomic assessment of core handling facility.

**SSR Mining, EHS Program Development, British Columbia, Canada:** Project Lead and Subject Matter Expert. Responsible for the SSR Mining / WSP team responsible for the development of SSR Mining's integrated HSEC management system. Performed industry benchmarking of existing management system against peer management systems and industry best



### EDUCATION

- MS, Physical Geography, University of Western Australia
- BS, Geography, University of Western Australia

### TRAINING

- MSHA Surface Miner (2023)
- OSHA 30 Hr (2017)
- CAL RCRA (2018)
- CORESafety Approved Auditor
- Project Management Advancement Program (PMAP) – Tier I Certified
- ISO14001 Lead Auditor Training

**6**  
Years with WSP

**22**  
Years of Experience

## JESSE STEEL (Continued)

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practice. Designed the framework and developed the management system standards and technical standards.

**SeaGen, EHS Program Support, Seattle, WA:** Support of development of global Health and Safety Standards. Development of an audit and inspection program to support business integration and compliance.

**AltaGas Ltd, EHS Program Development, Calgary, Alberta, Canada:** Development of an incident management governance structure for implementation across US and Canadian Business Units. Project developed key process elements and standards for incident management including reporting and notification, risk assessment, incident investigation, causal analysis, corrective action management and business learning.

**Glencore Grey Eagle Closure Site, EHS Program Development, Happy Camp, CA:** Development of site Illness and Injury Prevention Plan (IIPP). Key components include, risk management, workplace hazard assessment, incident and action management, communications, inspection and audits.

**Nevada Copper Industrial Hygiene Support, Yerington, NV:** Development and implementation of an asbestos and diesel particulate sampling plan for site Underground and Surface operations.

**Chevron Water Treatment Plant, Site EHS Support, Questa, New Mexico:** Site safety support for refurbishment of water treatment tanks. Tasks included; confined space entry, working at heights, energy isolation, sandblasting and recoating, welding and hot-work.

**Element Resources Battery Recycling and Lead Smelter, EHS Auditing, Muncie, IN:** Health and Safety compliance audit at Indiana facility. Audit reviewed compliance with federal regulations; local county and city government requirements were also reviewed.

**Stryten Manufacturing Battery Manufacturer, EHS Auditing, IW and AK:** Health and Safety compliance audits at multiple facilities. Audit reviewed compliance with federal regulations; local county and city government requirements were also reviewed.

**Saxco International, EHS Auditing, CA and OR:** Health and Safety compliance audits at multiple facilities. Audit reviewed compliance with state and federal regulations; local county and city government requirements were also reviewed.

**MOTUS Integrated Technologies, EHS Auditing, Holland, MI:** EHS compliance audit at the Michigan facility. Audit reviewed compliance with Michigan and federal regulations; local county and city government requirements were also reviewed.

**Nevada Gold Mine, (Turquoise Ridge), EHS Auditing, Winnemucca, NV:** Technical Expert Auditor. Responsible for recertification audit under the International Cyanide Management Code (Code). Involved in facility inspections, record review, staff interviews, presentations, and preparation of detailed audit reports.

**Newmont Mining (CCV), EHS Auditing, Victor, CO:** Technical Expert Auditor. Responsible for recertification audit under the International Cyanide Management Code (Code). Involved in facility inspections, record review, staff interviews, presentations, and preparation of detailed audit



## JESSE STEEL (Continued)

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reports.

**KMG Chemicals, EHS Auditing, Hollister, CA:** EHS compliance audit at the KMG facility. Audit reviewed compliance with California and federal regulations; local county and city government requirements were also reviewed.

**Newmont Mining, EHS Program Development, Denver, CO:** Integrated Management System (IMS) support as part of the Newmont-GoldCorp merger. Selection of IMS software to support system including; assistance with RFP process, technical support around software capabilities, selection of software, internal execution plan development.

## JIMENA CADILLO-ALDAMA, PMP

### SOCIOECONOMICS/ EJ

Jimena is a project manager and environmental consultant with more than ten years of experience in environmental permitting and compliance projects across sectors, including energy, government, and mining. During her career, she has supported projects in achieving environmental and social related objectives, by planning, executing, monitoring, and controlling project progress and impacts throughout the project's lifecycle. Jimena's experience includes environmental permits, environmental impact statements and management plans, stakeholder engagement and consultation with local communities. Also, she has experience in business development and supporting strategic client development initiatives.

### PROJECT EXPERIENCE

#### **Hydrostor Inc., Environmental Monitoring of Drilling Program for Pecho Energy Storage Center, San Luis Obispo County, California:**

Deputy Project Manager. Pecho would be an advanced compressed air energy storage (A-CAES) facility. Responsible for coordinating and reporting on biological and cultural monitoring of construction activities at the site, in compliance with conditions listed in Hydrostor's Conditional Use Permit (CUP) and Best Management Practices.

#### **Hydrostor A-CAES Willow Rock Energy Storage Center Project, Kern County, CA:**

Environmental Consultant. Support the preparation of an economic impact analysis (EIA) of Hydrostor's advanced compressed air energy storage (A-CAES) facility, in compliance with California Environmental Quality Act (CEQA). An EIA is an analysis of the effect of a change in the demand for goods and services, measured by changes in employment, income, and tax revenue. Additionally, it involves the estimation of three types of economic effects: direct, indirect, and induced.

**TVA, engineering services dam safety & environmental, TN:** Facilitated and contributed to the development of the suBritish Columbia ontractor management plan to comply with federal procurement requirements.

#### **Collier County, Engineering Design Services for Above Ground Leachate Storage Tanks and Deep Injection Well Pumping Station, FL:**

Responsible for document control and tracking of technical deliverables of the project. Participated in monthly meetings with client, as well as follow up on action items with the project team. Prepared budget and schedule of the project.

#### **LA Metro, Detailed Design Resiliency Chargers, Los Angeles, CA:**

Permitting specialist. Review of CEQA clearance, local land use permitting, and south coast air quality management district air permitting.

#### **Confidential Client, Green Hydrogen and Clean Energy Manufacturing Facilities - A Review of Clients' Readiness for Siting the Transition to Clean Energy, WA:**

Environmental Consultant. Conduct a gap analysis comparing the applicability of the Client's guiding regulations and documents (i.e., WAC 463, and SEPA Checklist) with the characteristics of green hydrogen production and clean energy manufacturing facilities. A list was prepared to identify potential clean energy manufacturing projects that



### EDUCATION

- MS, Environmental Engineering, University of Florida, Gainesville
- BS, Industrial Engineering, Universidad de Lima

### LICENSES/REGISTRATIONS

- Project Management Professional (PMP)
- Professional Engineer Licensure - Peruvian
- Engineers Association #150597

# 07

Years with WSP

# 13

Years of Experience

## **JIMENA CADILLO-ALDAMA** (Continued)

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could be developed in WA State under RCW 80.50.020 and determine the applicability in preparing and processing an ASC. A report was submitted to provide a summary of the findings and recommendations.

**Confidential Client, Draft and Final EIS for Horse Heaven Wind Project, WA:** Deputy Project Manager. This 70,000+ acres wind farm consists of wind turbines, solar arrays, substations, and battery energy storage systems. Supported the management of the project and was responsible for reviewing and contributing to deliverables before their submittal to the client.

**Confidential Client, Draft and Final EIS for Badger Mountain Solar Project, WA:** Deputy Project Manager and Environmental Consultant. Badger Mountain Solar consists of solar arrays, substations, and battery energy storage systems. Currently managing the project and responsible for reviewing and contributing to deliverables before their submittal to the client.

**Confidential Client, Green Hydrogen and Clean Energy Manufacturing Facilities A Review of The Client's Readiness for Siting the Transition to Clean Energy, WA:** Environmental Consultant. Conduct a gap analysis comparing the applicability of The Client's guiding regulations and documents (i.e., WAC 463, the WA State Environmental Policy Act, and SEPA Checklist) with the characteristics of green hydrogen production and clean energy manufacturing facilities. A list was prepared to identify all potential clean energy manufacturing projects that could be developed in WA State under RCW 80.50.020 and determine the applicability in preparing and processing an ASC. A report was submitted to provide a summary of the findings and recommendations.

**Confidential Client, ASC Review Carriger Solar Project, WA:** Environmental Consultant. Responsible of reviewing the Air Quality section of the ASC to verify compliance with the State Environmental Policy Act (SEPA). A tech memo was submitted to provide a summary of the findings and recommendations for potential additional information or mitigation requirements.

**Confidential Client, ASC Review Hop Hill Solar Project, WA:** Environmental Consultant. Responsible of reviewing the Air Quality section of the ASC to verify compliance with the State Environmental Policy Act (SEPA). A tech memo was submitted to provide a summary of the findings and recommendations for potential additional information or mitigation requirements.

# BAKAI RUSLANBEK UULU

## SOCIOECONOMICS/ EJ

Bakai is a Lead Consultant at WSP's Economics, Finance, and Grants team. He has over 8 years of experience performing a variety of economic and data analyses. He has conducted economic forecasts, benefit-cost, and economic impact analyses. Bakai has led numerous benefit-cost analyses for Federal grant applications (BUILD/RAISE, INFRA, Mega, Rural, CRISI, BIP) for different transportation agencies and helped secure over \$2.6 billion in discretionary grant funding.

Bakai specializes in evaluating the externalities and economic impacts of transportation projects (bridge replacement, rail improvements, active transportation, highways), energy (offshore wind, energy storage), and community development. For Amtrak's Gateway Program, he served as a project manager and lead economist, quantifying the significant economic impacts of expanding rail capacity between New Jersey and New York City. In another key project for Pierce County, WA, he created a customized Excel-based model using Impact Analysis for Planning multipliers to assess how freight transportation enhancements would generate productivity gains for local supply chains. Bakai is highly proficient in a suite of industry-standard economic impact modeling tools and software, including BEA RIMS II, IMPLAN, TREDIS, REMI, and JEDI.

Bakai is also an advanced Excel modeler with experience in building tools for several agencies. Bakai led the updates to Caltrans's California Life-Cycle Benefit-Cost Analysis Model (Cal-B/C) set of tools to estimate benefits and costs of transportation projects. These updates improved the model's calculations, added new benefit categories, enhanced Cal-B/C functionality with VBA coding, and ensured all Cal-B/C tools comply with ADA standards. Bakai also led the development of Cal-B/C training materials, user guides, and recorded webinars on the use of the tools for Caltrans staff and Cal-B/C users.

## PROJECT EXPERIENCE

**Hydrostor Energy, Storage Center, Kern County, CA:** Economist. Bakai Estimated direct, indirect, and induced jobs and labor income generated from developing an energy storage center. Willow Rock Energy Storage Center (WRESC, or Willow Rock) will be located on approximately 88.6 acres of private land immediately north of Dawn Road and between State Route (SR) 14 and Sierra Highway within unincorporated, southeastern Kern County, California. The WRESC will be a nominal 520-megawatt (MW) gross (500 MW net) and 4,160 megawatt-hour (MWh) gross (4,000 MWh net) facility using Hydrostor, Inc.'s (Hydrostor's) proprietary, advanced compressed air energy storage (A-CAES) technology.

**Confidential Client, Transmission Line Installation Economic Impact Analysis:** Economics Lead. Bakai led the economic impact analysis (EIA) for a confidential transmission line installation project for a confidential client. The WSP team estimated direct (construction and operations), indirect (supply chain), and induced economic benefits, including job creation, labor income, statewide GDP, and output using National Renewable Energy Laboratory's (NREL) Jobs and Economic Development



## EDUCATION

- MA, International Economics and Finance, Johns Hopkins University, 2018
- BS, Economics, American University, 2015

# 3

Years with WSP

# 8

Years of Experience

## BAKAI RUSLANBEK UULU (Continued)

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Impact (JEDI) Model for transmission lines. Our analysis further provided a detailed workforce assessment, outlining job creation by industry and occupation, training needs, wage levels, and labor availability. The analysis also included the estimation of fiscal impacts from materials purchase and income tax revenue.

**Amtrak, Gateway Economic Benefits Study, NY:** Project Manager and Economic Lead. Bakai managed and led the economic study of the Gateway Program, a series of rail infrastructure projects that improve the most congested 10 miles of the Northeast Corridor. The economic study estimates direct, indirect, and induced economic impacts of the Gateway Program on the New York – New Jersey – Connecticut metropolitan area due to capacity increases of Amtrak and New Jersey Transit service.

**Canyon Road Regional Connection Project, Pierce County, WA:** Economic Impact Analysis Lead. WSP conducted a benefit-cost analysis (British Columbia A), economic impact analysis (EIA), and equity analysis for the Canyon Road Regional Connection Project that aims to improve the economic corridor by connecting the Frederickson Manufacturing Industrial Center (MIC) to Fife's Industrial center and Port of Tacoma MIC. Bakai led the effort on estimating the economic impacts using IMPLAN's input-output model. Bakai conducted interviews with Pierce County's Economic Development office to understand what economic impact metrics would be most useful to the agency for planning purposes.

**WMATA, Regional Socioeconomic Impact Analysis, WA:** Economist. WSP analyzed how extreme weather events can impact WA Metropolitan Area Transit Authority's operations. Bakai led the estimation of socio-economic impacts of transit disruptions on local communities in the DC metropolitan area. The analysis isolated impacts between white collar, blue collar, and service workers, and identified impacts to disadvantaged communities based on multiple criteria, such as transit dependency, access to healthcare, grocery stores, and type of employment.

**CapMetro, Automated Bus Yard Benefit-Cost Analysis Tool, Austin, TX:** British Columbia A Modeling QA/QC Reviewer. WSP was selected to lead an industry-first deployment with Clever Devices, Perrone Robotics, and the Texas A&M Transportation Institute (TTI) for CapMetro in Austin, TX to test and deploy a Level 4 automated battery electric bus (BEB) in an active bus yard. As part of the project, WSP is developing an automated benefit-cost analysis (British Columbia A) tool for CapMetro and the industry to help evaluate the return on investment in retrofitting battery electric buses with automation kits. The British Columbia A tool is still under development. Bakai Ruslanbek Uulu oversees the British Columbia A tool testing and QA/QC review, ensuring methodological accuracy across model iterations. He provides feedback that drives improvements in the tool's calculations.

## REDA HANI, CEP

### NOISE AND VIBRATION

Reda is a Mining Engineer in Training with a degree from Polytechnique Montreal and practical experience in drill and blast planning, mine operations, mine waste management, and ventilation. He has worked with leading companies such as WSP, Newmont, and Vale, contributing to key projects by designing blast plans to control vibrations and projections, analyzing ventilation systems to optimize fan selection and equipment requirements, and ensuring safety and compliance during dam raising activities by validating material quality through laboratory testing. Proficient in tools like Deswik, AutoCAD, Iblast, GeoStudio, and Ventsim, Reda combines strong technical expertise with problem-solving skills and adaptability to site conditions. He is recognized for his teamwork, clear communication, and practical approach to achieving results. .

### PROJECT EXPERIENCE

**Hydrostor, Willow Rock Energy Storage Center:** Estimate the potential vibrations based on the blast location. Present the results using an isometric graph illustrating the propagation of vibrations around the site as well as their intensity. Assist the engineer in drafting the report on drilling and blasting parameters, ensuring all calculations are thoroughly reviewed. Provide blast mitigation measures while complying with the legal requirements.

**DJL – Mont Saint Bruno quarry:** Prepare detailed drill and blast plans, including vibrations and flyrock simulations. Analyze face holes burden and determine appropriate loading. Predict potential vibration levels based on peak particle velocity data from previous blasts. Conduct loading follow-ups in the field and adjust plans according to site conditions.

**Dundee Precious Metals – Coka Rakita Mine, PEA:** Design longhole according to client's request, calculate powder factors, determine appropriate spacing and burden according to stope sizes. Adjust charge columns to prevent misfires. Design drift sizes. Determine spacing and burden, number of holes, explosives type and minimize powder factors. Present different scenario to suit best interest of client.

**Saint Michel Quarry:** Conduct follow up to ensure drill and blast plans of pre-splitting are followed. See real life result between two methods implemented to make a long-term decision.

**Quarry Salaberry de Valleyfield:** Follow up on drill and blast plans to ensure vibrations limit are respected. Prevent any flyrock touching high voltage electric lines 15m above location. Adjust last minute details depending on site conditions. Support the principal engineer in the decision making.

**Darlington nuclear power plant:** Assist the engineer in updating plans and calculations based on changes planned by the client. Review calculations for vibrations, explosive quantities, and excavation limits for shafts and tunnels.

### EDUCATION

- Bachelor's degree in mining engineering, Polytechnique Montreal, 2024

### MEMBERSHIPS

- Ordre des Ingénieurs du Québec

1

Years with WSP

3

Years of Experience



## REDA HANI, CEP (Continued)

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**Lac Bloom mine – Geotechnical Monitoring:** As part of the construction work for the road and dam surrounding the future waste rock pile, I oversee and supervise the operations to ensure that all activities are carried out as planned. This includes verifying that the required materials are used and that all work complies with the geotechnical specifications and standards.

**Dundee Precious Metals – Coka Rakita Mine PFS:** Develop the complete drill and blast design criteria for the future Coka Rakita mine, from initial planning to final specifications. This included designing blast patterns for both development and production phases, selecting appropriate types of explosives and detonators, determining the optimal powder factor based on rock competency, and proposing detonation methods aimed at minimizing overbreak.

**Upper Beaver Gold Project:** Support the team in a comprehensive vibration analysis for the mine blasting operations to minimize potential impacts on nearby residential structures and off-site structures. This included evaluating underwater shockwaves, assessing the propagation of ground vibrations, and developing mitigation measures and optimized blasting techniques to ensure compliance with safety and environmental standards.

**Lac bloom tailing dam:** Performs test with a nucleo-densimeter to ensure proper soil compaction. Conduct laboratory test on various samples to verify materials conformity. Produce detailed daily report on the projects progress. Monitor elevation work of tailings dam to ensure compliance with plans.

### PREVIOUS EXPERIENCE

**Newmont Corporation, Drill & Blast Intern — Éléonore mine:** Design loading plans with particular attention to maximize blast efficiency. Evaluate work sites during blasting, analyzing dilution to ensure mining operations comply with standards. Develop remote plans providing precise instructions for mucking operations. Analyse cavity monitoring scan result and adapt drilling parameters to optimize future operations. Collaborate with rock mechanics engineers on post-blast operations for sites requiring rehabilitation. Support the engineering team in the implementation of a new-hole loading method using a gassing solution.

**Creighton mine:** Participate in short-term mine production planning in line with weekly objectives. Conduct surveys using precise equipments for breakthrough holes. Provide production analysis to identify stope recovery trends. Operate ventilation instruments to examine airflow through different levels of the mine.

# **CURTIS A. HILDEBRAND**

DANVILLE, CALIFORNIA  
CURT.HILDEBRAND@HYDROSTOR.CA

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## **QUALIFICATIONS SUMMARY**

*Proven professional history in Project & Business Development, Sales & Marketing, Government, Regulatory & Public Affairs and Senior Management in the energy industry. Managed multi-disciplinary teams to successfully develop, permit and finance \$3 billion of profitable new energy investments in the U.S. Directed the execution of power purchase contracts with total revenues of over \$4 billion.*

## **EXPERTISE INCLUDES:**

- Project Development & Management
- Power Sales & Marketing
- Complex Commercial Negotiations
- Public, Media & Investor Relations
- Senior Management Responsibilities
- Government & Regulatory Affairs
- Financial Project & Operations Analysis
- Mergers & Acquisitions

## **PROFESSIONAL EXPERIENCE**

### **HYDROSTOR Danville CA, Toronto (October 2020 – Current)**

#### **SENIOR VICE PRESIDENT \_ COMMERCIAL AFFAIRS**

Managing multi-faceted development activities for Hydrostor's Advanced Compressed Air Energy Storage (A-CAES) projects in California and the western U.S. The Willow Rock Energy Storage Center located near Rosamond, CA is a 500 MW project with 8 hours of storage capacity.

### **WESTERN ENERGY PARTNERS, LLC, Danville CA (April 2012 – October 2020)**

#### **PRESIDENT**

Actively developing, partnering in and consulting for Energy Storage, Solar PV and Hydrogen Fuel projects in the western U.S. Responsible for managing development and commercial activities for the 755 MW Clean Path Energy Center located in Waterflow, NM.

### **AGILE ENERGY INC., San Bruno, CA (July 2011 – January 2012)**

#### **VICE PRESIDENT - DEVELOPMENT**

Managed project and commercial development team for Agile's 600 MW U.S. project portfolio. Served as development lead for the 49.9 MW Turning Point Solar project in Noble County, OH.

### **TSMC SOLAR NORTH AMERICA, INC., San Jose, CA (May 2010 – June 2011)**

#### **DIRECTOR – UTILITY BUSINESS DEVELOPMENT**

Established new product and overall business plans for startup TSMC Solar NA. Created new business sales channels with utilities and IPP's active in the solar marketplace.

**GREENWING ENERGY MANAGEMENT LTD, Danville, CA (September 2006 – April 2010)**

**VICE PRESIDENT – COMMERCIAL DEVELOPMENT**

Managed project and commercial development and acquisition activities for solar, wind and natural gas power generation projects in the western U.S. and Canada. Representative activities include the successful development and sale of the 200 MW High Plains Wind Energy Project in McFadden, WY. The project's initial 132 MW Phase I achieved commercial operation October 2009.

Developed additional power projects as part of a Joint Venture between GreenWing and AltaGas. Managed the divestiture of GreenWing interests in the Joint Venture in 2008 with a total portfolio valuation in excess of \$25 million.

**CALPINE CORPORATION, San Jose, Dublin, CA (February 1995 – March 2006)**

**SENIOR VICE PRESIDENT – MARKETING & SALES (August 2003 – March 2006)**

Managed business relations and accounts with over 50 customers in the western U.S. and Canada and was responsible for energy sales and other commercial transactions from an \$8 billion portfolio of Calpine power generation and natural gas assets. Under my supervision, Calpine West Sales revenues exceeded \$600 million in 2005 and yielded gross profits in excess of \$80 million.

**VICE PRESIDENT – BUSINESS DEVELOPMENT (March 2000 – August 2003)**

Responsible for all facets of the development of the 600 MW Metcalf Energy Center in San Jose, California including public, government and media relations, as well as overall project permitting.

Served as the General Manager of the Calpine/Bechtel Joint Venture and directed the successful permitting, development and construction of over \$2.0 billion of new energy investments in the San Francisco Bay Area. The Joint Venture also permitted over 2,600 MW of new generation capacity in the greater San Francisco Bay Area under my management.

Presented expert testimony to committees of the U.S. Senate, U.S. House of Representatives, California Energy Commission and numerous other Federal, State and local agencies.

**DIRECTOR – BUSINESS DEVELOPMENT (February 1995 – March 2000)**

Responsible for all aspects of the permitting and development of the 545 MW Sutter Energy Center in Sutter County, CA. Sutter was the first major power plant licensed by the CEC in over 13 years.

**MAGMA POWER CORPORATION, San Diego, CA (October 1993 – February 1995)**

**MANAGER – PROJECT ANALYSIS**

Responsible for economic and engineering assessments for Senior Management and multi-national lending institutions resulting in over \$600 million of successful new capital investment in the U.S. and Asia. Served as a principle finance manager during the \$1.1 billion sale of the company.

**UNOCAL CORPORATION, Los Angeles, Santa Rosa, CA (July 1985 – October 1993)**

**MANAGER – PLANNING & VALUATION, ENGINEERING ROLES (July 1985 – Oct. 1993)**

Assembled long-range corporate financial plans and detailed economic analyses for geothermal, oil and gas projects in the U.S and internationally.

## **EDUCATION AND OTHER QUALIFICATIONS**

### **CALIFORNIA POLYTECHNIC STATE UNIVERSITY SAN LUIS OBISPO**

Bachelor of Science, Mechanical Engineering - 1985

**CALIFORNIA PROFESSIONAL ENGINEER:** (Mechanical Engineering) - Certificate # 27324

**BOARD MEMBER: CALIFORNIA ENERGY STORAGE ALLIANCE (CESA, 2021 - Present)**

**PROFESSIONAL REFERENCES AND OTHER AFFILIATIONS:** Gladly furnished upon request

## SUMMARY OF QUALIFICATIONS

- Experienced engineering executive overseeing in-house, external consultant and EPC project delivery teams, reporting to Hydrostor's COO.
- Experience across four continents, successfully managing and completing multi-million dollar facility design and construction in the renewable energy and marine infrastructure fields.
- Successfully oversaw and managed the development of Hydrostor's adiabatic compressed air energy storage technology platform, including building multiple "World's first" projects in the space and is listed as inventor on multiple patents.

## WORK EXPERIENCE

Dec 2017 – Present

### Hydrostor Inc. – SVP Engineering Toronto, Ontario, Canada

- Mr. McGillis manages and leads a dynamic team of engineers and EPC partners designing and building multiple projects in Canada, USA and Australia within the Compressed Air Energy Storage (CAES) industry.
- Mr. McGillis develops the technical strategies for execution of projects and technical advancement of the technology.
- Mr. McGillis is one of the lead inventors continuing to advance the technology around compressed air energy storage, enhancing the bankability of projects and insulating the business from competition.

March 2014 – Dec 2017

### Hydrostor Inc. – VP Engineering & Projects Toronto, Ontario, Canada

- Mr. McGillis worked on pioneering the design and deployment operations for the World's first Underwater Compressed Air Energy Storage system since 2012; first as lead marine consultant for Baird & Associates (subcontractor on the project) and then as head of the engineering group within Hydrostor.
- Mr. McGillis managed the development of Hydrostor's next generation underground air cavity.
- Mr. McGillis manages the technical team working on the development of Hydrostor's landside plant, efficiency model, and construction coordination.

Sept 2000 – March 2014

### W.F. Baird & Associates Coastal Engineers Ltd. – Coastal Engineer & Corporate Associate Oakville, Ontario, Canada

- Mr. McGillis was a Coastal Engineer with Baird & Associates. He was involved with many multidisciplinary projects throughout Canada, and internationally in the USA, Caribbean, Europe, Africa, and Asia.
- Primary leadership roles:
  - Renewable energy business lead – Instigated and developed Baird's offshore renewable unit, securing new business in Canada and the USA.
  - Co-manager of the Design Resource Group – managed group that addresses engineering design issues, procedures, and best practices

Dec 2005 – Aug 2006

### Carl Bro A/S – Industrial Masters – Offshore Wind Turbine Foundations at Kriegers Flak Sweden

- In conjunction with his Master's Thesis, Mr. McGillis worked with Carl Bro A/S on the development of a new offshore wind farm at Kriegers Flak (Swedish waters in the Baltic Sea)

## EDUCATION

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- 2006 **Technical University of Denmark**  
M.Sc. Coastal and Maritime Engineering
- Thesis: Offshore Wind Turbine Foundations at Kriegers Flak

- 1998-2002 **Queen's University**  
B.Sc. Civil Engineering
- Focus on structural engineering and fluid dynamics

## PROFESSIONAL DESIGNATION

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- Professional Engineers Ontario – Licensed Professional Engineer since 2007
- License Number: 100064925

## INTERNATIONAL EXPERIENCE

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Mr. McGillis has professional project experience working on projects throughout all continents except Antarctica, with in-country experience in Canada, United States, Denmark, Sweden, United Kingdom, Saudi Arabia, Bahamas, St. Lucia and Barbados.

## RESEARCH & DEVELOPMENT

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- Mr. McGillis is a global leader in research within the Compressed Air Energy Storage Space and is listed as an inventor on multiple patents within the industry.
- Mr. McGillis leads industrial research initiatives and grants at Hydrostor, including the decade-long research partnership with the Turbulence & Energy Lab at University of Windsor, where Mr. McGillis is an external lecturer.
- Mr. McGillis is an author on more than a dozen published academic papers.
- Prior to Hydrostor, Mr. McGillis led several research initiatives into the impacts of offshore renewable energy installations on physical marine process, including seminal research on Great Lakes impacts. He also led research into life cycle costing of marine infrastructure using advanced statistical methods.



**LAUREL G. LEES**  
CARPINTERIA, CALIFORNIA  
LAUREL.LEES@HYDROSTOR.CA

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**QUALIFICATIONS SUMMARY**

*Proven professional history in Land Use & Environmental Planning and Permitting, CEQA/NEPA Public Review, Regulatory Affairs and Senior Management in the power and minerals industry. Managed multi-disciplinary teams to successfully plan, permit, and construct privately and publicly initiated capital improvements projects in North America. Served on the Board of Directors of California Association of Environmental Professionals for over five years.*

**EXPERTISE INCLUDES:**

- Project Development & Management
- Integrated Natural Resources Planning
- Public Engagement & Outreach
- Climate and Energy Planning
- Strategic Business Planning
- Government & Regulatory Affairs
- CEQA/NEPA Review
- Land Use & Environmental Permitting

**RELEVANT PROFESSIONAL EXPERIENCE**

**HYDROSTOR Denver, CO (July 2022 – Current)**

**SENIOR DIRECTOR, DEVELOPMENT PERMITTING – NORTH AMERICA**

Managing multi-faceted development activities for Hydrostor's Advanced Compressed Air Energy Storage (A-CAES) projects in California and the U.S.

**PANORAMA ENVIRONMENTAL, INC., San Francisco, CA (May 2022 – January 2024)**

**SENIOR MANAGER**

Provided environmental professional services for public agencies and private developers in the renewable energy and water infrastructure sectors.

**CONTROLLED THERMAL RESOURCES, Imperial, CA (March 2020 – February 2022)**

**ENVIRONMENTAL PERMITTING & REGULATORY AFFAIRS**

Led local, state, and federal development permitting for the Hell's Kitchen Geothermal & Lithium Projects at the Salton Sea.

**GREAT ECOLOGY, San Diego, CA (September 2017 – August 2019)**

**WESTERN REGIONAL DIRECTOR**

Led interdisciplinary teams providing environmental planning and permitting services including ecological restoration, natural resources damage assessments, and biological resources mitigation bank planning for public agencies and developers across the U.S.

**COUNTY OF SAN DIEGO, San Diego, CA (February 2016 – July 2017)**

**LAND USE/ENVIRONMENTAL PLANNING MANAGER – DEVELOPMENT**

Led interdisciplinary teams to deliver the County's Climate Action Plan and Environmental Impact Report, Local Government Partnership with San Diego Gas & Electric, Purchase of Agricultural Easements Program, and Comprehensive Renewable Energy Plan, among other advanced planning projects and programs. The County team was awarded the California Association of Environmental Professionals – San Diego Chapter's Outstanding Public Involvement Award for developing and implementing the Public Outreach and Engagement Plan for the County's Climate Action Plan.

**URS CORPORATION (now AECOM), San Diego, CA (September 2014 – January 2016)**

**SENIOR ENVIRONMENTAL PLANNER, PROJECT MANAGER**

Responsible for preparing technical reports, environmental compliance plans, and CEQA/NEPA documents for discretionary development projects. Some project examples include the Oak Creek Development EIR, City of San Diego Plastic Bag Ordinance EIR, City of San Diego Miramar Landfill Height Increase Project, SDG&E Synchronous Condenser Project, County of San Diego Cyber Disruption Response Plan, and the San Onofre Nuclear Generating Station Decommissioning Project. Provided in-office environmental planning and permitting services for County of San Diego Parks & Recreation Resource Management Division including resource management plans, comprehensive biological resources monitoring plan, public access plans and various grant-funded trails and parks projects. Became URS Project Management certified.

**AMEC (now WSP), San Diego, CA (October 2008 – August 2014)**

**MARINE SCIENTIST, ENVIRONMENTAL PLANNER, PROJECT MANAGER**

Responsible for water and sediment quality sampling and analysis and assisting project managers with various technical tasks for public and private sector clients including the Port of San Diego, Port of Long Beach, Port of Los Angeles, Port of Guam, SDG&E, Caltrans, U.S. DoD, and County of San Diego, among others. Provided in-office environmental planning and permitting services for County of San Diego Public Works including preparation of CEQA/NEPA documents and public review materials, water quality and species permitting and compliance tracking, grant applications, and project presentations for resource agency coordination meetings. Worked directly from the County of San Diego Watershed Protection Division, logging data gathered from the site inspections of the water quality Treatment Control Best Management Practices performed as a Qualified Stormwater Pollution Prevention Plan Practitioner and Certified Inspector of Sediment and Erosion Control. Worked directly from the Port of Los Angeles Environmental Management Division to assist with annual tenant outreach associated with the Port's Water Resources Action Plan including site inspections of marine cargo terminals, oil terminals, fishing operations, and other tenants of the Port. Became AMEC Project Management certified and developed skills in jurisdictional delineations, marine surveys, public outreach, habitat restoration, construction monitoring, storm water monitoring, water/sediment sampling and analysis plans, and sediment characterization reports.

**EDUCATION AND OTHER RELEVANT QUALIFICATIONS**

**UNIVERSITY OF SAN DIEGO**

Bachelor of Arts, Environmental Studies & Economics - 2008

**CALIFORNIA ASSOCIATION OF ENVIRONMENTAL PROFESSIONALS**

San Diego Chapter and State Board Member 2011 - 2021

**CALIFORNIA STORMWATER QUALITY ASSOCIATION**

Qualified Stormwater Pollution Prevention Plan Practitioner, Issued March 2013 ID#24062

**CISEC**

Certified Inspector of Sediment and Erosion Control, Issued January 2013 ID# 1256

**Wetland Delineator**

Wetland Training Institute, Issued 2011

## **Victor Grille**

Project Director

### **Major project experience**

Willow Rock Energy Storage Center, Hydrostor.

A-CAES Energy storage plant for 500 MW- 8 hours storage. Kern County, CA.

Project Director

Fulcrum Biofuels Biorefinery, Abengoa.

First-of-its-kind MSW to Syncrude gasification and Fischer Tropsch biorefinery, 12 MGal/year  
Reno, NV

Project Director

Centro Morelos Power Plant, Abengoa

640 MW Combined Cycle for CFE, Morelos, Mexico

Project Director

Hugoton Ethanol Plant, Abengoa

First-of-its-kind Cellulosic Ethanol plant and Biomass cogeneration plant, 18 Mgal/year / 22  
MWel / 55MWth in Hugoton, KS

Project Director

Harper Lake Power Plant, Abengoa

250 MW Thermal Solar Power plant in San Bernardino County, CA.

Project Director

### **Work History**

Hydrostor Inc.

Project Director, Feb 2022 to Present

Copenhagen Biomass Merchant

Senior Project Manager, July /2021 to Feb /2022

VGG LLC/St Louis, MO

Senior Project Manager, May/2019 to June/2021

Abengoa North America

Project Director, May/2010 to April /2019

Weyerhaeuser Engineering Services (WES)

Engineering Manager, Oct 2006 – May 2010

## Berkes Engineering

VP of Operations, 2003-2006

Project Manager, 2000-2003

Proj Engineer, 1998 -2000

## **Education History**

University of the Republic, Montevideo, Uruguay.

BSc. Bachelor of Science, Mechanical and Industrial Engineering, Oct 1998.

Georgetown University, Washington, DC

DPA – Project Manager Program, Dec 2011

## **Licensures**

Professional Engineer, Mechanical (Nevada License 026827)

Professional Engineer, Mechanical (Missouri License 2020011423)

## **Professional Certifications**

Project Management Professional , PMP -PMI

Functional Safety Engineer, TUV Rheinland

## **Cody Niehus Resume**

Denver, Colorado

### **Professional Experience**

#### **Hydrostor – Manager, Development**

**2024-Present**

**Denver, Colorado**

Land management: purchases, leases, title, entitlements, and easement acquisitions for projects in development. Development related activities with other utility owners, encroachments, permits, transmission, and pre-construction activities.

#### **Ascent Geomatic Solutions - Senior Project Manager**

**2023 – 2024**

**Broomfield, Colorado**

Land acquisition and permitting projects for various infrastructure projects. Managing surveying, engineering, and regulatory departments. Support clients through due diligence and entitlement processes, submit permits on client's behalf and manage through approvals and construction.

#### **SAM Companies - Senior Project Manager**

**2022 – 2023**

**Denver, Colorado**

Lead for utility engineering and construction management projects. Providing land acquisition, permitting, zoning, leasing, engineering, and lease management services to clients. Main interface with jurisdictional and utility entities.

#### **Verizon (MCI) - OSP Engineer III**

**2020 – 2022**

**Denver, Colorado**

Real estate acquisition, permitting, zoning, and leasing for infrastructure locations. Oversight of outside plant development throughout the Denver Metro market. Manage network improvements for greenfield sites, brownfield sites, and special projects. Management of engineering and construction, lead negotiations between Verizon and corresponding jurisdictions/stakeholders. Utility coordination efforts with capital improvement projects and jurisdictional maintenance.

#### **Black & Veatch - Senior Right Of Way Agent**

**2018 – 2020**

**Denver, Colorado**

Right of way and land acquisition projects for utilities including telecom, oil and gas, and renewables. Negotiate acquisition of property interests, permits, franchise agreements, as necessary to accommodate the construction and operation of facilities.

#### **Land Services Inc - Right of Way Manager**

**2017 – 2018**

**Lakewood, Colorado**

Easement acquisition, lease acquisition, federal / state / local municipality permitting. Leading damage/loss claims at project completion. Projects in transmission, renewable, telecommunications, oil and gas, transportation, and water utility industries. Management of environmental vendors, permitting, zoning, and land acquisition for multiple projects.

#### **Richardson Operating Company - Operations Manager**

**2014 – 2016**

**Denver, Colorado**



Regulatory compliance management as well as daily field operations coordination for upstream oil and gas production. Overall management of surface land agreements, permitting and compliance with state, federal, and private entities located in Colorado, Wyoming, Utah, and New Mexico.

**Bureau of Land Management - Land Technician**  
**2013**  
**Meeker, Colorado**

Evaluating public energy lease inventory in accordance with Federal Land Policy and Management Act in Northwestern Colorado.

**Education & Certifications**

- Master of Science, Resource Management – Class of 2014  
Colorado State University - Fort Collins, CO
- Bachelor of Science, Criminal Justice – Class of 2012  
Metropolitan State University of Denver - Denver, CO

**Certifications:** OSHA 10, Colorado Notary Public - Expires 9-2027

# Lucas Thexton

Engineering Manager

## Work Experience

### **Hydrostor Inc. – Toronto, Canada**

During the past 8 years at Hydrostor Mr. Thexton has supported the development of the full scale A-CAES technology with a focus on support of the underground storage cavern and it's integration with the topside A-CAES facility in the past 5 years. Mr. Thexton manages the development and ongoing maintenance of Hydrostor's patent portfolio. Mr. Thexton currently manages a team of engineers and EIT's in support of the A-CAES technology advancement and the adoption of the technology in Hydrostor's projects.

- *Engineering Manager (2023-Present)*
- *Senior Engineering Associate (2019 – 2022)*
- *Engineering Associate (2017 – 2019)*

## Education

### **BS – Environmental Engineering**

*University of California- San Diego, June 2017*

## Skills & Qualifications

- Engineering fundamentals in fluid mechanics, heat transfer, thermodynamics, statics, circuits, solar-energy, and computer aided analysis & design
- Strong math fundamentals in vector calculus, linear algebra, statistics, partial & ordinary differential equations.

Electrical Engineer with over 20 years of experience working in the power generation, petrochemical, oil, and gas industries. Experience in both greenfield design and brownfield sustaining projects. Extremely efficient, excelling in leading low cost high performance teams. Have performed and led teams in the design of systems and creation of construction work packages (CWPs) at voltages up to 38 kV, including power distribution, electrical equipment layouts, area classification, schematics and wiring, and electric heat tracing. Proficient in power system studies including load flow, short circuit, relay coordination, arc flash hazard and ground grid analysis. Well versed in the procurement cycle including creation of material requisitions (MRs) and specifications, technical bid analysis, vendor drawing review and witness testing. Project Engineering experience leading small multi-discipline teams to complete projects from conceptual through to detail design stages.

## **EDUCATION**

- Bachelor of Science in Electrical Engineering (Power Specialty), University of Alberta, Edmonton, Alberta, Canada – 2003

## **PROFESSIONAL AFFILIATIONS**

- Professional Engineer (P.Eng.) with the Association of Professional Engineers and Geoscientists of Alberta (APEGA)

## **EMPLOYMENT HISTORY**

2024 to Present

**Hydrostor Inc, Toronto, Ontario, Canada**  
**Senior Electrical Engineer**

Subject matter expert for Hydrostor in Electrical Engineering. Scope of responsibilities range from high voltage transmission and substation design, to low voltage system design.

Responsibilities include supporting development of core A-CAES technology, creation of internal technical specifications, technical review of internal and external documents, managing consultants and contractors, managing technical aspects of high voltage interconnection agreements, vendor technical bid evaluation and technical document review.

2012 to 2023

**Rally Engineering Inc., Edmonton, Alberta, Canada**  
**Senior Electrical Engineer**

Lead Electrical Engineer at Rally Engineering, on a variety of pipeline, tank farm, refinery, fertilizer, and other heavy industrial facility projects. Provided cold eye technical review support to other projects. Responsible Engineer and lead designer for Single Line Diagrams, Detailed Wiring Schematics, Hazardous Area Locations, Fire Alarm Systems, Electric Heat Tracing Isos and Controller Settings, Power System Studies (Load Flow, Short Circuit, Arc Flash, Relay Coordination), Material Requisitions/Bid Evaluations/Vendor Drawing Review, Layouts, Cable Schedules, Panel Schedules, Grounding Drawings, Detail Installation Drawings and Construction Work Package Creation. Design and Stamp for Low and Medium voltage Heavy Industrial projects including:

**Enbridge : Langbank L13 VCB Replacement - \$2M.**

Electrical Discipline Lead for the FEED and detail engineering phase to migrate an existing medium voltage MCC lineup to a different substation bus. Scope included existing relay and power quality meter replacement with new SEL relays, new 5kV shielded cables and cable tray, and revision of existing controls to migrate control of the existing 5kV breaker to the migrated E-House.

**Co-Op Refinery Complex (CRC): Tank 803 Replacement, Regina, Saskatchewan, Canada - \$10M**

Electrical Discipline Lead for the FEED and detail engineering phases of the installation of a new 80,000 bbl tank at the CRC refinery. Scope included routing power to new lighting and receptacles, instrumentation cables for new tank instrumentation, MOVs, new electric heat tracing, cathodic protection and tank grounding.

**Nutrien: Main Compressor Replacement, Joffre Alberta - <\$1M**

Electrical Discipline Lead for a feasibility study and detail design to replace the facilities main 7500hp compressor motor with a larger unit. Produced installation package, power system study with necessary transformer tap setting changes, new relay settings, and procurement support.

**Rio Tinto Strathcona Works: Coke Storage Pad Lighting Upgrade, Edmonton, Alberta - <\$1M**

Electrical Discipline lead for a conceptual study on upgrading the lighting at the facility to allow for 24h loading operations, as well as detail engineering, material specification and lighting study to install two new 100ft high mast lighting and supplementary area lighting.

**Co-Op Refinery Complex (CRC): Turn Around Support Projects, Regina, Saskatchewan, Canada – <\$1M per year**

Electrical Discipline Lead for the scoping and detail engineering phases of various small turnaround support projects, including new instrumentation, filters, coalescers, vessels etc.

**Co-Op Refinery Complex (CRC): Tank 201 Replacement, Regina, Saskatchewan, Canada - \$13M**

Electrical Discipline Lead for the FEED and detail engineering phases of the installation of a new 50,000 bbl tank at the CRC refinery. Scope included routing power to new lighting and receptacles, instrumentation cables for new tank instrumentation, MOVs, new electric heat tracing, cathodic protection and tank grounding.

**Nutrien: Mono Ammonium Phosphate to Ammonium Sulphate Conversion, Redwater, Alberta-\$30M**

Lead electrical team from fast track scoping study thru detailed engineering and construction/commissioning support. Worked closely with plant personnel to develop scope, order materials (LV MCC, Electrical Building, VFDs), develop fit for purpose construction deliverables for an old plant with poor records based on photographs, 3D model shots and laser scan.

**Wolf Midstream: Power System Studies, Various Sites Throughout Alberta-\$<1M per year**

- **Arc Flash Study Program**

Scope included reviewing existing ETAP models / single lines, directing field personnel to collect data, updating ETAP model, writing Arc Flash study, printing arc flash hazard labels, updating client Arc Flash standard.

- **Relay Standardization Program**

Scope included reviewing existing Multilin 750 relay settings throughout client facilities, providing recommendations for standardizing settings as well as identifying where existing hardware or system topology required unique settings. Provided guidance for revising client standards for both procurement of equipment (e.g., to ensure proper CTs and hardware are ordered) as well as power system design criteria.

- **Relay Replacement Program**

Scope included replacing existing GE Multilin relays (350, 369, 469, 750) with equivalent SEL product, at various client facilities. Specification of relays, demolition, and construction drawings to replace the existing relays, and creation of SEL relay setting files.

**Sherritt International: Various Small Projects, Fort Saskatchewan, Alberta, Canada, Canada-\$<1M**

Electrical Discipline Lead for various small projects. Projects included:

- **Phosphate Granulation Building Grounding Upgrade**  
Determine appropriate metallurgy for grounding connections to resist the corrosive atmosphere. Replace the existing ground grid.
- **Urea North Tower Demolition**  
Determine electrical demolition / isolation requirements for a building with little to no documentation. Field visit intensive to follow conduits and determine anything that needed to be rerouted to remove the tower.
- **General Structural Repairs Electrical Support**  
Support structural repair program by confirming temporary and permanent electrical support / reroute requirements.

**Sherritt International: Track 5 Loadout Project Fort Saskatchewan, Alberta, Canada -\$5M**

Electrical Discipline Lead on this project from FEED through detailed engineering. Scope was to demolish a poorly documented control panel and all associated wiring and reroute existing control cables to facilitate demolition of the existing control room structure. Supported the project as the Project Engineer / Coordinator.

**Co-Op Refinery Complex (CRC): Gasoline Blending System Replacement, Regina, Saskatchewan, Canada - \$24M**

Electrical Discipline Lead for the FEED and detail engineering phases of the installation of a new medium voltage gasoline transfer pumps, new arc resistant medium voltage MCC, new tank isolation MOVs, and a new UPS system.

**Co-Op Refinery Complex (CRC): Replace LCO Tank 207, Regina, Saskatchewan, Canada - \$12M**

Electrical Discipline Lead for the FEED and detail engineering phases of the installation of a new 50,000 bbl. tank at the CRC refinery. Scope included routing power to new lighting and receptacles, instrumentation cables for new tank instrumentation, and tank grounding.

**Suncor Energy: Edmonton Refinery, Various Small Projects, Edmonton, Alberta, Canada – \$<1M**

Electrical Discipline Lead for various Suncor Edmonton refinery projects. Responsible for all areas of the electrical discipline in the EDS, detail engineering and construction support phases, including creating electrical portions of bid documentation, conceptual design and design refinement / value engineering with client proposals. Responsible for all facets of electrical detail design and professional engineer stamping. Projects included:

- **Main Control Room Fire Suppression System**  
Installation of a new Vortex fire suppression system. Working with Vipond to install the necessary electrical infrastructure for a new fire suppression system, motorized overhead door in the mechanical room, and tying in the existing fire system to the new Vortex controller.
- **7F-1 Demolition**



Identification and removal of all obsolete electrical infrastructure on the furnace, including finding control wiring routed through the furnace and rerouting to maintain control on other equipment.

- **52F-4 and 5F-4 Furnace Replacement**

Identification and removal of electrical connections on existing furnace convection boxes to facilitate the removal and replacement of the mechanical equipment. Replaced and rerouted electrical connections after convection box replacement.

- **11G-1A/B Increased Safety EDS**

Installation of a new dual seal system on existing pump. Scope includes new EHT, instrumentation, and modifications to existing pump control.

- **21G-4 Replacement**

Installation of a new sealed canned pump. Scope included new motor feeder, redesigned motor control, EHT, instrumentation upgrades and control wiring replacement.

- **Site Facilities Demolition**

Isolation and removal of abandoned structures on site and the installation of a new temporary trailer power distribution center with new LED area lighting.

- **New Instruments – Various Projects**

Support installation of new instruments including routing instrument cabling and providing power to heated enclosures.

**Suncor Energy: Firebag In-Situ East Tank Farm Expansion, Temporary Chilling Permanent Power , Fort McMurray, Alberta, Canada – \$4M**

Electrical Discipline Lead on this project from Scoping Study through Detailed Engineering.

The project replaced 5 existing 1.5MVA 480V generators with permanent power from an overhead 25kV power line. Engineering scope of work included conceptual design, review of options with stakeholders, material take offs to support capital cost estimates, creation of detailed engineering drawings, power system study including intensive review of grounding system, discussions with client Subject Matter Experts (SMEs), construction support and as-building.

**Suncor Energy: Firebag In-Situ East Tank Farm Expansion Scoping Study and Front-End Engineering Design (FEED), Fort McMurray, Alberta, Canada**

Lead Electrical Engineer for the East Tank Farm (ETF) Expansion Project which was required to accommodate an increase in blending of up to 160 kbpsd of bitumen from Firebag with diluent supplied from the Athabasca Tank Terminal (ATT) into synbit / dilbit, and cooling of the blended product to the specified temperature for transfer, receipt, and storage at the tank terminal(s). The scoping study included the necessary deliverables to support the evaluation of project economics and business case. The design basis memorandum (DBM) refined the selected design, updated the capital cost estimates, included long lead equipment procurement, and development of early works construction activities in conjunction with the Construction Management Team.

**Co-Op Refinery Complex (CRC): Motor Control Center (MCC) Replacement, Regina, Saskatchewan, Canada – \$2M**

Lead Electrical Engineer on the MCC Replacement Project which consisted of the replacement of an obsolete outdoor MCC unit with one inside a retrofitted existing storage building. Existing underground conduits were capped and replaced with a new above ground cable tray system. Four (4) cooling tower two (2) speed motors were replaced with new motors controlled by a variable frequency drive (VFD). Primary responsibilities included field walk down and as-building of existing layout drawings. Created material requisitions (MRs), performed technical bid evaluation and reviewed vendor drawings for the MCC, VFDs, and new cooling tower motors. Checked and stamped detailed engineering deliverables such as single line diagrams, schematics, layouts and cable schedules.

**Co-Op Refinery Complex (CRC): Vacuum Tower Replacement, Regina, Saskatchewan, Canada - \$16M**

Lead Electrical Engineer on the Vacuum Tower Replacement Project, which consisted of the replacement of an aging vacuum unit and connection of new instrumentation, lighting, power and grounding. Responsibilities included performing a field walk down to catalog existing assets (spare homerun conductors, available spare power circuits, cable tray and conduit routing). Oversaw the as-building and creation of new drawings. Design of cable trays for the tower and associated instrument platforms. Oversaw the development of the electrical portion of a 3D model of the tower and participate in vendor, constructability and owner reviews. Managed, checked and stamped detailed engineering deliverables.

**Suncor Energy: Voyageur Upgrader East Tank Farm ISBL and Tanks Completion, Fort McMurray, Alberta, Canada – \$350M**

Electrical Engineer on the Suncor Project Implementation Model (SPIM) Gate 3, Engineering Design Specification (EDS) Phase. A project consisting of completing engineering and procurement services on the remaining scope of the original Voyageur Upgrader East Tank Farm (ETF) which was put in Safe Mode in 2008. The ETF Inside Battery Limits (ISBL) and Tank Completion Project included the completion and integration of all the ETF facilities, infrastructure, equipment and eight (8) storage tanks. Completed deliverables for EDS including single line drawings, layouts, cable schedules, load list and equipment list.

**Statoil Canada Limited: Cheecham Dilbit Booster Pump Upgrade, Fort McMurray, Alberta, Canada – \$13.0M**

Lead Electrical Engineer for the Dilbit Booster Pumps Upgrade at Statoil's Cheecham terminal. The project required the procurement of new 1750 hp 5 kV pumps and associated medium voltage motor controls to replace the existing 1000 hp units and increase flow rate. Primary responsibilities included:

- Managed electrical team and was stamping engineer for the project.
- Created material requisitions (MRs), performed technical bid evaluation and reviewed vendor drawings for 5 kV motors, 5kV switchgear, and medium voltage motor control centers (MCC).
- Led conceptual electrical design and power system study.
- Responsible for creation and checking of all electrical technical deliverables.

**Statoil Canada Limited: Cheecham Keyera Condensate Connection Study, Fort McMurray, Alberta, Canada – \$11.0M**

The Statoil Cheecham Terminal will be the termination and delivery point for a newly constructed condensate diluent pipeline by Keyera. The study consists of custody transfer metering, a quality

assurance (QA) building, piping and tie-ins to enable delivery of Keyera condensate diluent to the existing diluent tank at Cheecham. Lead Electrical Engineer with primary responsibilities including:

- Managed electrical team and was stamping engineer for the project.
- Created material requisitions (MRs), performed technical bid evaluation and reviewed vendor drawings for low voltage motor control centers (MCC), electrical building and 4.16kV-600V station service transformer.
- Responsible for creation and checking of all electrical technical deliverables.

**Suncor Energy: Various Small Projects, Fort McMurray, Alberta, Canada – <\$1.0M**

Electrical Discipline Lead for various Suncor projects. Responsible for all areas of the electrical discipline including creating electrical portions of bid documentation, conceptual design and design refinement / value engineering with client proposals. Responsible for all facets of electrical detail design and professional engineer stamping. Projects included:

- **Main Admin Power Upgrade**  
Installation of a new 13.8 kV to 480 V – 2 MVA transformers to supply power to local motor control centers (MCC) and switchgear.
- **Top Shop Tool Room**  
Installation of a new tool repair room in Plant 65.
- **EBI Room HVAC Upgrade**  
Installation of new HVAC units for two computer rooms at the Main Admin Building.
- **Main Gate Server Room**  
Installation of new HVAC units for the Main Gate Server Room.
- **Pond 1 Radio Tower**  
Installation of a new HVAC unit for the radio tower equipment building
- **MCB Locker Complex**  
Installation of a new locker complex, installing power to building and commissioning/witnessing/signoff of the fire alarm system and completing the ABC schedules for the building as the registered professional of record.

2011 to 2012

**WorleyParsons Canada (formerly Colt Engineering Corporation), Edmonton, Alberta, Canada**  
**Lead Electrical Engineer**

**Suncor Energy: Sustaining Projects, Fort McMurray, Alberta, Canada – \$2.0M to \$5.0M**

Electrical Discipline Lead for Suncor Sustaining Projects. Responsible for all areas of the electrical discipline including recruitment and management of electrical personnel within the project group, creating electrical portions of bid documentation, conceptual design and design basis memorandum (DBM) / engineering design specification (EDS) creation, detail design and stamping. Projects included:

- **HT4 Booster Pump House**  
Installation of a new 5 kV 2750 hp booster pump complete with electrical building.
- **U2 Make Up Diluent (MUD)**  
Incorporation of safety instrument system (SIS) emergency shutdown signals into existing motor control circuits and electric heat tracing of new and existing lines.
- **U1 Make Up Diluent (MUD)**  
New electric heat trace (EHT) controller, associated distribution transformer and electric heat tracing of new and existing lines.

**Kinder Morgan: Edmonton Terminal Expansion, Edmonton, Alberta, Canada – \$200.0M**

Electrical Lead for preparation of an Association for the Advancement of Cost Engineering International (AACE) Class III estimate for the Edmonton Terminal Expansion Project. This project involved the construction of 10 additional 200,000 to 300,000 bbl. tanks at the existing Edmonton Terminal, as well as the piping and electrical infrastructure to transfer product to the Transmountain pipeline system. The fire protection system was upgraded, along with new satellite electrical buildings to service the mixers and pumps in the tank farm. Responsible for producing preliminary design, electrical material take-off (MTO) for estimate and preliminary power study. Other duties included inter-discipline coordination and preparation of the preliminary construction strategy.

2010 to 2011

**CoSyn Technology (A Division of WorleyParsons), Edmonton, Alberta, Canada**  
**Lead Electrical Engineer / Electrical Engineer**

**Syncrude Canada Limited: Various Projects, Fort McKay, Alberta, Canada – \$20.0K to \$2.0M**

Lead Electrical Engineer / Electrical Engineer on a site secondment to the Syncrude facility north of Fort McMurray, Alberta. Responsibilities included design, drafting and stamping for small projects for facilities, rapid development, utilities, upgrading and process control teams. Assisted other team members on scope development and control, material selection, utilization of design practices, preparing engineering cost estimates, design checking, preparing construction cost estimates, inter-discipline coordination and complex heat tracing design utilizing Institute of Electrical and Electronics Engineers (IEEE) 515 (Fin equations). Role also included leadership of the site design team via mentoring. Projects included:

- **FT-4 Furnace Replacement**  
Replacement of natural gas fired heater skid for heating process stream.
- **EHT Maintenance**  
Investigation and design of new Electrical Heat Tracing (EHT) circuits from maintenance requests throughout the plant.
- **Security Camera Upgrade**  
Design and integrate new H.264 compliant security camera system.
- **Water Filtration Skid Installation**  
Installation of temporary water filtration skids to facilitate the shutdown of the main water filtration system for maintenance.

- **Carbon Monoxide and Nitrous Oxide Monitoring**

Coordination and implementation of site wide standard for temporary facilities (vehicle repair, garages) gas detection system to comply with Occupational Health and Safety (OH&S).

2001 to 2009

**WorleyParsons Canada (formerly Colt Engineering Corporation), Edmonton, Alberta, Canada**  
**Electrical Engineer**

**Imperial Oil Limited (IOL): Various Small Projects, Various Locations – \$100.0K to 3.0M**

Lead Electrical Engineer and Project Engineer for a variety of small projects with Imperial Oil from conceptual engineering (Gate 2) through detail engineering and construction support. Responsibilities included initial Client consultation regarding scope of work, preparing technical and man-hour sections of proposal, field visit, creating an Early Project Design Basis (EPDB) (equivalent to a design basis memorandum), estimating material take-off (MTO) and attending estimate review with management team and Client for estimates from Association for the Advancement of Cost Engineering International (AACE) Class V to Class III. Other duties included the creation of material requisitions (MRs), creation of drawing packages, performing power studies, stamping and construction support. Projects included:

- **Pump Station Upgrade, Red Deer, Alberta, Canada**

Replacement of electrical infrastructure with modern equipment and re-cabling of all equipment on site.

- **Sump Tank Replacement, Edmonton, Alberta, Canada**

Replacement of existing concrete sump tank with new fiberglass tank including sump pump.

- **Sump Tank Freeze Protection, Viking, Alberta, Canada**

Installation of insulation above existing fiberglass sump tank to raise effective frost line above the top of the tank.

**Enbridge Pipelines: Christina Lake Lateral, Christina Lake, Alberta, Canada – \$180.0M**

Lead Electrical Engineer for detail engineering of the new pump station and associated upgrades to existing pipeline facilities to support the increase in production at the Foster Creek and Christina Lake's (FCCLs) Christina Lake Steam Assisted Gravity Drainage (SAGD) facility. Responsibilities included all aspects of detail engineering including preparing drawings and material requisitions (MRs), providing schedule updates, scope management through key document change notices (KDCNs) and project change registers (PCRs) and providing technical deviations and man-hour reporting / control for a team of five (5) Engineers and Designers.

**Enbridge Pipelines: Christina Lake Growth Phase 1C, Christina Lake, Alberta, Canada – \$180.0M**

Lead Electrical Engineer responsible for the creation of the Front End Loading 2 (FEL2) and FEL3 reports for the new pump station and associated upgrades to existing pipeline facilities to support the increase in production at Foster Creek and Christina Lake's (FCCL's) Christina Lake Steam Assisted Gravity Drainage (SAGD) facility. Responsibilities included all aspects of conceptual engineering including preparing preliminary single lines, power systems model, load list, material requisitions (MRs) for major equipment, Class 5 and Class 3 estimate material take-offs (MTOs) and detailed engineering man-hour estimate. Other duties included participating in HAZOP and reviewing estimates.

**Enbridge Pipelines: Line 13 Reversal, Various Locations, Canada – \$75.0M**

Lead Electrical Engineer on the project to reverse Enbridge's Line 13 which included modifications to 20 existing stations to allow product flow to be changed from west to east. Modifications to the facilities included new power services and electrical service buildings (ESBs) new drag reducing agent (DRA), quality assurance (Q/A) and metering skids, additional valve manifolds, rewiring / retagging of equipment. Responsibilities included review of design of ESBs, Q/A buildings, DRA and metering skids, managing large numbers of scope changes, material requisitions (MRs) for all major equipment, participating in what-if analysis, detail design calculations and drawings for construction work packages. Other duties included scheduling and resource management.

**Enbridge Pipelines: Waupisoo Pipeline Edmonton Terminal Tie-In, Edmonton, Alberta, Canada – \$5.0M**

Lead Electrical Engineer responsible for the design for the electrical infrastructure for the scraper trap and tie-in piping / valves associated with tying in the Waupisoo Pipeline to the Edmonton Terminal. The project included a new electrical service building (ESB), new quality assurance (Q/A) building, new metering skid, and new valve manifold. Responsibilities included preparing proposals for power system topology, unclassified estimates and material requisitions (MRs) for all major equipment, reviewing and signing off for vendor documents, performing detail design calculations, preparing drawings for construction and modular work packages and creating the commissioning manual.

**Enbridge Pipelines: Access Pipeline Receipt Metering Manifold, Edmonton, Alberta, Canada – \$8.0M**

Lead Electrical Engineer responsible for the design of a metering manifold for the Access Pipeline's tie-in to the Edmonton terminal. The project included a new electrical service building (ESB), new quality assurance (Q/A) building, new metering skid, and new valve manifold. Responsibilities included preparing Material Requisitions (MRs) for all major equipment, reviewing and signing off vendor documents, performing detail design calculations, preparing drawings for construction and modular work packages and creating the commissioning manual.

**Imperial Oil Limited (IOL): Wetaskiwin Pump Station Electrical Upgrade, Wetaskiwin, Alberta, Canada – \$1.5M**

Lead Electrical Engineer responsible for upgrading the electrical infrastructure of the site, which included the replacement of obsolete low voltage motor control center (MCC) and medium voltage switchgear and MCC, replacement of the underground conduit system with an above ground tray system, and tying the new and existing equipment into an existing programmable logic controller (PLC). Responsible for preparing designs, performing power systems studies, optimizing relay settings, creating MRs, reviewing vendor documents, performing Arc Flash hazard analysis and completing construction work packages for the project.

**Rainbow Pipelines: Various Engineering Design Studies, Rainbow Lake and Utikuma, Alberta, Canada – \$5.0M**

Lead Electrical Engineer responsible for creating electrical Engineering Design Specifications (EDS) for upgrades to various sites on the Rainbow Pipeline. Responsibilities included scope clarification, site visits, creation of preliminary design and material take-off (MTO) as well as overseeing projects into detail design. EDS included:

- Replacement of existing underground power conduits for pumps with a new above ground tray system.



- Replacement of existing aging medium voltage motor control center (MCC) and switchgear with new modern equipment, and conducting an arc flash hazard analysis to ensure compliance with Client's specification.

**Enbridge Pipelines: Line 5 Expansion, Wisconsin / Michigan, United States of America – \$15.0 M**

Lead Electrical Engineer responsible for creating a Class 3 estimate to increase the capacity of Line 5 by approximately 10% by use of drag reducing agent (DRA) and either increasing mainline pump motor load factor or replacement of mainline pump motors. Responsibilities included creating the preliminary design and material take-off (MTO) for the new DRA skid design, retrofit of existing DRA skids and new metering facilities as well as preparing a cost of services estimate for detail design.

**Enbridge Pipelines: Gateway, Alberta / British Columbia, Canada – >\$1.0B**

Electrical Engineer-in-Training assisting the Senior Electrical Engineer in creating a Class 3 estimate for the Gateway Pipeline, a new pipeline to ship approximately 600,000 barrels of crude oil from the existing terminal in Edmonton, Alberta to a new terminal in Kitimat, British Columbia via seven (7) new mainline pump stations. Responsible for gathering historical quotes for equipment, checking preliminary design and material take-offs (MTOs) for stations as well as doing quality assurance on estimate deliverables (estimate and preliminary drawings).

**Enbridge Pipelines: Cheecham Station, Cheecham, Alberta, Canada – >\$50.0M**

Electrical Engineer-in-Training on this project involving the detailed design of the Cheecham pump station. The new Cheecham Station was a new product hub for Enbridge and included oil storage tanks, transfer and mainline pumps, quality assurance (Q/A) and metering skids, valve manifolds, pig traps and new electrical service. Assisted in the basic design / checking role for schematic drawing, electrical heat tracing, layouts and programmable logic controller (PLC) interconnection diagrams.

**Imperial Oil (IOL): Miscellaneous Projects, Edmonton, Alberta, Canada – >\$1.0M**

Electrical Design Lead responsible for all aspects of the design of a complete construction work package (CWP) including interfacing with other disciplines and the Client, shop testing and quality assurance of vendor's items, site visits and drawing creation. Projects included:

- **Truck Loading Facility Upgrades, Bonnyville, Whitecourt, Manning, Alberta, Canada**  
Installation of new facility lighting. Upgrading of loadout controllers.
- **Edmonton Sump Replacement, Edmonton, Alberta, Canada**  
Replacement of existing vertical concrete sump tank with a new fiberglass double walled tank, new sump pump and connection to existing reinjection line.
- **Regina OWS Upgrade, Regina, Saskatchewan, Canada**  
Upgrade of the existing oily water system at Regina to comply with municipal regulations. Weir and pump upgrades, as well as new leak detection instrumentation.

**Albian Sands Energy: Debottlenecking Basis of Design (BOD) Phase 1 Estimate – Froth, Fort McMurray, Alberta, Canada – >\$250.0M**

The project scope was to increase the production capacity of the froth portion of the Albian Sands Fort McMurray, Alberta plant. The scope included new piping, instrumentation, pumps and new electrical services. Electrical Engineer-in-Training working on the froth portion of the Basis of Design (BOD) estimate. Created a portion of the BOD design including preliminary drawings (single lines and

preliminary plot plans), scope of work, material take-offs (MTOs), long lead item identification, and vendor quote acquisition.

**Albian Sands Energy: Debottlenecking Basis of Design (BOD) Phase 1 Estimate – Third Extraction Train (TEXT), Fort McMurray, Alberta, Canada – >\$250.0M**

This project was to increase the production capacity of the TEXT of the Albian Sands Fort McMurray, Alberta plant. Scope included new piping, instrumentation, pumps and new electrical services. Electrical Lead for the TEXT portion of the BOD estimate. Responsible for the creation of the BOD design including preliminary drawings (single lines and preliminary plot plans), scope of work, material take-offs (MTOs), long lead item identification, vendor quote acquisition and estimate review.

**Albian Sands Energy: Debottlenecking Project, Fort McMurray, Alberta, Canada – \$100.0M**

This project was to increase the production capacity of the Albian Sands Fort McMurray, Alberta plant. Scope included new piping, instrumentation, pumps and new electrical services. Electrical Design Lead responsible for discipline coordination for multiple sub-projects, assisting the Overall Electrical Lead in manpower scheduling for the Debottlenecking Project. Developed cost estimates for sub-projects. Oversaw projects through multi-gate stages, ensuring timely completion of required deliverables. Designed complete construction work packages (CWPs). Participated in client reviews and inter-discipline final document reviews.

**Albian Sands Energy: Muskeg River Electric Heat Trace (EHT) - Phase 3, Fort McMurray, Alberta, Canada**

Electrical Engineer-in-Training responsible for providing field engineering support for the completion of the EHT system for the Muskeg River Mine. Duties included EHT zone design, quality assurance on new construction, signoff / acceptance of turnover and commissioning documentation, construction coordination, redlining and as building, final walk downs and answering requests for information (RFI).

**Shell Canada: Scotford Modifications (ScotMods), Fort Saskatchewan, Alberta, Canada**

ScotMods was a suite of projects servicing the Shell Scotford Refinery with small projects including new heat tracing, new pumps, motorization of valves and new instrumentation. Electrical Engineer-in-Training responsible for detailed design of drawings from receipt of Notice of Flow Diagram Change to design of schematic, wiring, conduit layouts, etc., detailing scale of work and material billing. Duties included producing construction work packages (CWPs) under the guidance of a Senior Designer including power and cable tray layouts, instrumentation plans, cable and conduit schedules, electrical schematics and wiring diagrams, cabinet arrangements, instrumentation loop diagrams and grounding drawings and creating and revising the scope of work and bill of materials for several CWPs. Utilized Shell's standards and procedures in documentation, drawing transfer and drawing control.

**Shell Chemicals: Styrene Plant Power Study, Fort Saskatchewan, Alberta, Canada**

Electrical Engineering Student responsible for field data checking and short circuit per unit analysis to support a new power system study at Shell's styrene plant. Duties included collecting and checking field data for motor ratings, circuit breaker models, bus bracing information, relay and timer information and calculations per unit analysis of fault conditions and time delay under voltage (TDUV) restart voltage drop to verify Powertool results.

**EPCOR: Genesee Phase 3, Wabamun, Alberta, Canada**

This project was a new coal fired power plant at Wabamun. Electrical Engineering Student responsible for voltage drop, cable sizing, grounding details for projects and design layouts. Duties included

telephone, lighting and power receptacle layout design, including voltage drop, conduit / cable sizing, bill of material, ordering, drawing numbers and equipment tags from EPCOR Electrical department and checking and design of grounding grid for the powerhouse and substation to ensure concrete was poured in a timely manner.

# TRI L. LUU, CFA

7 Carlton Street, Suite 1811 Toronto, ON M5B 2M3 416-939-3061 tri.l.luu@outlook.com

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## Work Experience

**Hydrostor** Senior Director, Business Development January 2022 – Present  
Director, Business Development January 2021 – January 2022  
Senior Manager, Business Development January 2019 – December 2020  
Senior Commercial Advisor November 2017 – December 2018

- Oversee and manage business development activities in key target markets with a focus on California including developing commercial/contracting pathways, regulatory affairs and early-stage project development (site control, interconnection, permitting, financing)
- Core areas of focus:
  - Interconnection activities including submissions and negotiating two CAISO interconnection agreements
  - Offtake contracting including the execution of an energy storage agreement valued at ~US\$1 billion
  - Regulatory submissions including to the California Public Utilities Commission in the IRP and RA proceedings
  - Financing efforts including a US\$1.8 billion conditional loan guarantee from the U.S. Department of Energy

**Luu & Co.** Principal and Founder August 2008 – November 2017

- Established a boutique strategic advisory and consulting firm specializing in the power, infrastructure and resource sectors to provide focused and value-added advice to corporations, governments and First Nations
- Select transactions:
  - Advisor to a gold mining company in their negotiations with a First Nation on a MOU on exploration activities
  - Sub-advisor in a strategic review of a nuclear power generation holdings of a major Canadian corporation
  - Advised on the acquisition, re-contracting and day-to-day operations of two hydroelectric dams

**Desjardins Securities** Investment Banking Associate December 2006 – August 2008

- Lead energy and infrastructure investment banker responsible for completing all analysis including financial modeling and sensitivity analysis with a focus on merger and acquisition opportunities; researching industries and comparable companies/precedent transactions in support of proposed transactions; and drafting presentations for both existing and prospective clients outlining financing and value creation opportunities
- Acted as a point of contact for current and prospective clients including making presentations to senior management and Board of Directors
- Select transactions:
  - Advisor to a major local distribution company client with respect to a potential C\$1 billion+ merger
  - Sole financial advisor to a First Nation in negotiations with a utility on a first of its kind partnership
  - Secured financing for a junior potash exploration and development company

**Ontario Ministry of Energy** Research Analyst October 2004 – December 2006

### Office of the Deputy Minister

- Conducted research in support of Government decision-making including industry/company analysis, historical background research and investigation into technical/regulatory issues
- Developed financial models to test the sensitivities and assumptions for proposed generation projects
- Prepared presentations, including Cabinet submissions, given input from senior Ministry officials
- Central to the government negotiating team during the Bruce A refurbishment contract negotiations which resulted in the largest infrastructure project in Canada at the time
- Core areas of focus:
  - Nuclear energy (refurbishments & new build)
  - New generation projects
  - Mitigation of the environmental impact of coal

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## Education

**Bachelor of Commerce** - University of Toronto Graduated with High Distinction: June 2003

- Specialist in Commerce and Finance, Major in Peace and Conflict Studies

**CFA Charterholder** - CFA Institute Charterholder since September 2006

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## Activities

Electrons Softball Team (Manager, 2004 – Present); Ontario Provincial Civil Servants Softball League (Commissioner, 2016 – Present); International Reptile Conservation Foundation (Information Analyst, 2016 – Present)

**APPENDIX B**

**Declarations**

**DECLARATION OF Jeremy Matthew Paris**

I, Jeremy Matthew Paris declare as follows:

1. I am presently employed by WSP USA, Inc as a Vice President, Earth and Environment.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Land Use, Agriculture, and Forestry and Socioeconomics for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.



Dated: 28 July 2025

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**Jeremy M. Paris**

**Vice President**

**WSP USA, Inc.**



**DECLARATION OF David A. Stein, PE**

I, David A. Stein, PE declare as follows:

1. I am presently employed by WSP USA, Inc as a Senior Vice President, Earth and Environment.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Alternatives, Project Description, Facility Design, Facility Reliability, Efficiency and Energy Resources, Transmission Line Safety and Nuisance, Transmission System Engineering, Air Quality and Climate Change and Greenhouse Gas Emissions for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 25 July 2025



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**David A. Stein, PE**

**Senior Vice President**

**WSP USA, Inc.**

**DECLARATION OF Gregory Darwin**

I, Gregory Darwin, declare as follows:

1. I am presently employed by Atmospheric Dynamics, Inc. as a Meteorologist.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Air Quality, Climate Change and Greenhouse Gas Emissions and Public Health for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 24 July 2025



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**Gregory Darwin**

**Meteorologist**

**Atmospheric Dynamics, Inc.**

### **DECLARATION OF KATE MOSS**

I, **Kate Moss**, declare as follows:

1. I am presently employed by WSP Canada Inc as Principal Biologist.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Biological Resources for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.



Dated: July 29, 2025

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**Kate Moss, BSc., RPBio**

**Principal Biologist**

**WSP Canada Inc**

**DECLARATION OF Scott Crawford**

I, **Scott Crawford**, declare as follows:

1. I am presently employed by WSP USA, Inc. as a Biological Group Manager
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Biological Resources for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 29, 2025



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**Scott Crawford, MA**

**Biology Group Manager**

**WSP USA Inc.**

### **DECLARATION OF Clint Helton**

I, **Clint Helton**, declare as follows:

1. I am presently employed by CH Advisory as President.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Cultural Resources and Tribal Cultural Resources for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 28, 2025



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**Clint Helton**

**President**

**CH Advisory**

**DECLARATION OF George Wegmann**

I, **George Wegmann**, declare as follows:

1. I am presently employed by WSP USA Inc. as a Vice President, Geology and a Professional Geologist and Certified Hydrogeologist.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Water Resources and Geology and Minerals for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 28 JULY 2025



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**George Wegmann, PG, CHG**

**Vice President**

**WSP USA Inc.**



**DECLARATION OF Betsy Mitton**

I, Betsy Mitton, declare as follows:

1. I am presently employed by WSP USA Inc. as a Senior Vice President,  
Environmental Science and a Certified Professional Environmental Assessor.
2. A copy of my professional qualifications and experience are attached hereto and  
incorporated herein by reference.
3. The testimony on Solid Waste Management and Hazards, Hazardous Materials/  
Waste and Wildfire for the Willow Rock Energy Storage Center (21-AFC-02) was prepared  
either by me or under my supervision, and is based on my independent analysis, data from  
reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate  
with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony  
and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the  
foregoing is true and correct to the best of my knowledge and belief.

Dated: 23 July 2025



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**Betsy Mitton, CPEA**

**Senior Vice President**

**WSP USA Inc.**

## **DECLARATION OF KYRALAI DUPPEL**

I, Kyralai Duppel, declare as follows:

1. I am presently employed by WSP USA Inc. as a Coastal Environmental Scientist.
2. A copy of my professional qualifications and experience are attached here to and incorporated herein by reference.
3. The testimony on Land Use, Agriculture, and Forestry, Socioeconomics and Environmental Justice for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 23 July 2025



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**Kyralai Duppel**

**Coastal Environmental Scientist**

**WSP USA Inc.**

**DECLARATION OF Victor Young**

I, Victor Young, declare as follows:

1. I am presently employed by WSP Canada Inc. as an Acoustic Scientist.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Noise and Vibration for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 23 July 2025

A handwritten signature in blue ink, appearing to read 'Victor Young', is written over a horizontal line.

Victor Young, MSc

Acoustic Scientist

WSP Canada Inc.

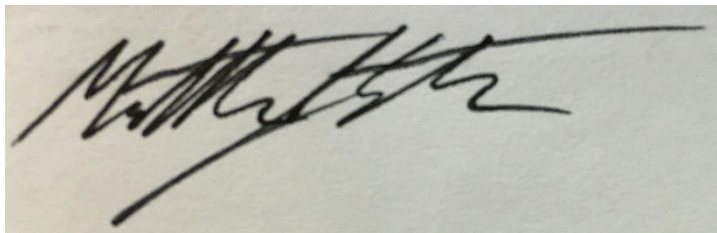
## **DECLARATION OF MATT SAUTER**

I, **MATT SAUTER**, declare as follows:

1. I am presently employed by WSP as PALEONTOLOGIST/SENIOR ENVIRONMENTAL PLANNER.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Paleontology for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 28 JULY 2025

A handwritten signature in black ink, appearing to read 'Matt Sauter', is written over a horizontal line.

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**MATT SAUTER**

**PALEONTOLOGIST/SENIOR  
ENVIRONMENTAL PLANNER**

**WSP**

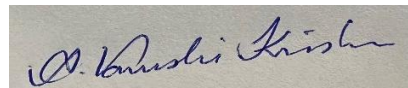
**DECLARATION OF Vamshi Akkinpally**

**A. I, Vamshi Akkinpally**, declare as follows:

6. I am presently employed by WSP as Assistant Vice President, Traffic Engineering.
7. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
8. The testimony on Transportation for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
9. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
10. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: [7/29/2025]



---

**Vamshi Akkinpally**

Vice President, Traffic Engineering

WSP

**DECLARATION OF Daryl Harrison**

I, Daryl Harrison, declare as follows:

1. I am presently employed by WSP Canada Inc. as a Principal Human Environment Specialist.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Visual Resources for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or a colleague within my organization, and is based on independent analysis, data from reliable sources, and professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 24 July 2025



---

**Daryl Harrison BA, ADP GIS**

**Principal Human Environment Specialist**

**WSP Canada Inc.**

## **DECLARATION OF JESSE STEELE**

I, Jesse Steele, declare as follows:

1. I am presently employed by WSP USA Inc. as Assistant Vice President Environmental Health and Safety.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Worker Safety and Fire Protection for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 23 July 2025

A handwritten signature in black ink, appearing to read 'J. Steele', is written over a light gray grid background.

---

**Jesse Steele, MSc**

**Assistant Vice President, Environmental  
Health and Safety**

**WSP USA Inc.**



**DECLARATION OF JIMENA CADILLO-ALDAMA**

I, **JIMENA CADILLO-ALDAMA**, declare as follows:

1. I am presently employed by WSP USA INC. as SENIOR ENVIRONMENTAL SPECIALIST.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Socioeconomics for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 28, 2025



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**JIMENA CADILLO-ALDAMA**

**SENIOR ENVIRONMENTAL  
SPECIALIST**

**WSP USA INC.**

**B. DECLARATION OF Bakai Ruslanbek Uulu**

I, Bakai Ruslanbek Uulu, declare as follows:

6. I am presently employed by WSP USA, Inc as a Lead Consultant in WSP's Management Consultancy.
7. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
8. The testimony on Socioeconomics for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
9. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
10. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 28 July 2025



---

**Bakai Ruslanbek Uulu**

**Lead Consultant**

**WSP USA, Inc.**

## **DECLARATION OF REDA HANI**

I, **Reda Hani**, declare as follows:

1. I am presently employed by **WSP** as a **Graduate Mining Engineer**.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on **Blasting Vibration** for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 2025-07-29

*HaniReda*

---

**Reda Hani**

**Graduate Mining Engineer**

**WSP**

**DECLARATION OF CURT HILDEBRAND**

I, Curt Hildebrand, declare as follows:

1. I am presently employed by Hydrostor as Senior Vice President – Commercial Affairs.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on: Project Description; Alternatives; Water Resources; Worker Safety and Fire Protection; Land Use, Agriculture, and Forestry; Noise and Vibration; Geology, Paleontology, and Minerals; Hazards, Hazardous Materials/Waste, and Wildfire; Solid Waste Management; Public Health; Air Quality, Climate Change, and Greenhouse Gas Emissions; Socioeconomics and Environmental Justice; Transportation; Facility Design; Facility Reliability; Transmission System Engineering; Efficiency and Energy Resources; and Transmission Line Safety and Nuisance for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 29, 2025



**Curt Hildebrand**

**Senior Vice President – Commercial  
Affairs**

**Hydrostor**

**DECLARATION OF ANDREW MCGILLIS**

I, Andrew McGillis, declare as follows:

1. I am presently employed by **Hydrostor** as **Senior Vice President, Engineering**.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on: Project Description; Alternatives; Water Resources; Worker Safety and Fire Protection; Noise and Vibration; Geology, Paleontology, and Minerals; Hazards, Hazardous Materials/Waste, and Wildfire; Waste Management; Public Health; Air Quality, Climate Change, and Greenhouse Gas; Socioeconomics and Environmental Justice; Facility Design; Facility Reliability; Efficiency and Energy Resources; and Transmission Line Safety and Nuisance for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: [July 28, 2025]



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**Andrew McGillis**

**[Senior Vice President, Engineering]**

**[Hydrostor Inc.]**

## **DECLARATION OF LAUREL LEES**

I, Laurel Lees, declare as follows:

1. I am presently employed by Hydrostor as Senior Director, Development Permitting – North America.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on: Project Description; Biological Resources; Cultural Resources; Visual Resources; Water Resources; Worker Safety and Fire Protection; Noise and Vibration; Hazards, Hazardous Materials/Waste, and Wildfire; Transportation; Transmission System Engineering; and Transmission Line Safety and Nuisance for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 29, 2025



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**Laurel Lees**

**Senior Director, Development Permitting –  
North America  
Hydrostor**

## **DECLARATION OF VICTOR GRILLE**

I, Victor Grille, declare as follows:

1. I am presently employed by Hydrostor as Project Director .
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on: Project Description; Alternatives; Water Resources; Worker Safety and Fire Protection; Land Use, Agriculture, and Forestry; Noise and Vibration; Geology, Paleontology, and Minerals; Hazards, Hazardous Materials/Waste, and Wildfire; Solid Waste Management; Public Health; Air Quality, Climate Change, and Greenhouse Gas Emissions; Socioeconomics and Environmental Justice; Transportation; Facility Design; Facility Reliability; Transmission System Engineering; Efficiency and Energy Resources; and Transmission Line Safety and Nuisance for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 29, 2025]



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**Victor Grille**

**Project Director**

**Hydrostor**



## **DECLARATION OF CAVAN LEE**

I, Cavan Lee, declare as follows:

1. I am presently employed by Hydrostor as a Senior Electrical Engineer.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on: Transmission System Engineering; Efficiency and Energy Resources; and Transmission Line Safety and Nuisance for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 28-July-2025

**Cavan Lee**

Digitally signed by Cavan Lee  
DN: C=CA,  
E=cavan.lee@hydrostor.ca,  
O=Hydrostor, CN=Cavan Lee  
Date: 2025.07.28 15:31:03-06'00'

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**Cavan Lee**

**Senior Electrical Engineer**

**Hydrostor**

**DECLARATION OF LUCAS THEXTON**

I, Lucas Thexton, declare as follows:

1. I am presently employed by [**Hydrostor**] as [**Engineering Manager**].
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Facility Design and Geology, Paleontology, and Minerals for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: [July 30, 2025]

  
\_\_\_\_\_  
**Lucas Thexton**  
**[Engineering Manager]**  
**[Hydrostor]**

## **DECLARATION OF CODY NIEHUS**

I, Cody Niehus, declare as follows:

1. I am presently employed by Hydrostor as Manager, Development.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Land Use, Agriculture, and Forestry and Transmission System Engineering for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 29, 2025

**Cody Niehus**

Digitally signed by Cody Niehus  
DN: C=US, E=cody.niehus@hydrostor.ca,  
O=Hydrostor USA, OU=Development, CN=Cody  
Niehus  
Reason: I attest to the accuracy and integrity of this  
document  
Date: 2025.07.29 17:00:30-06'00'

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**Cody Niehus**

**Manager, Development**

**Hydrostor**

## **DECLARATION OF TRI LUU**

I, Tri Luu, declare as follows:

1. I am presently employed by Hydrostor Inc. as Senior Director, Business Development.
2. A copy of my professional qualifications and experience are attached hereto and incorporated herein by reference.
3. The testimony on Transmission System Engineering for the Willow Rock Energy Storage Center (21-AFC-02) was prepared either by me or under my supervision, and is based on my independent analysis, data from reliable sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.
5. I am personally familiar with the facts and conclusions presented in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 29, 2025



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**Tri Luu**

**Senior Director, Business Development  
Hydrostor Inc.**

