Rancho Viejo Solar + Storage Project

Accelerating Santa Fe's clean energy transition with locally-sourced, dispatchable solar power!

Planning Commission Meeting

February 3, 2025, presented by AES

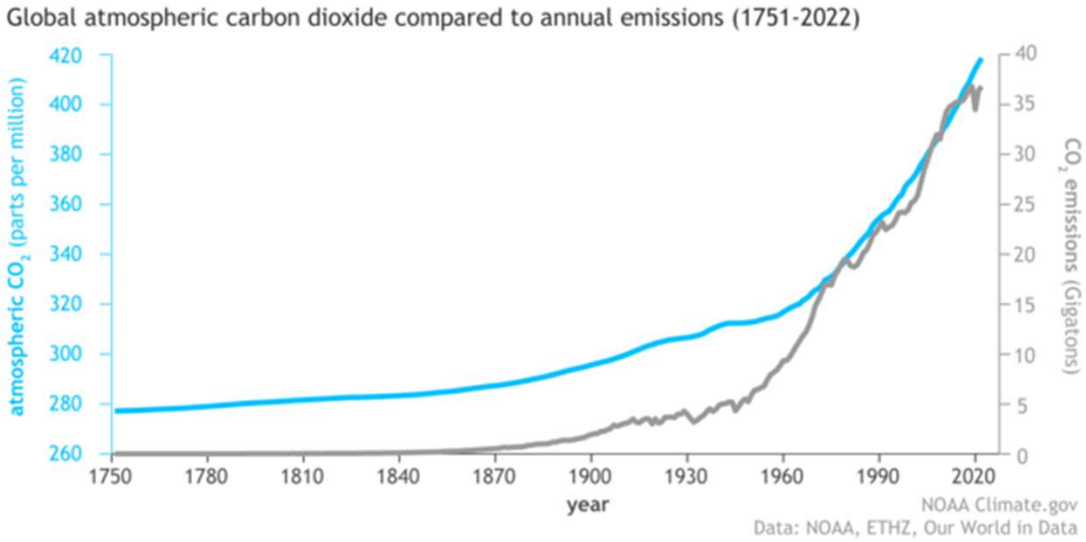
115 MWdc / 96 MWac / 192 MWh
Solar + Battery Energy Storage System (BESS)

2 miles east of Hwy 14. Santa Fe County, New Mexico

Presentation Agenda

- Why we are here today
- The AES Corporation / AES Clean Energy
- Project Location
- Project Overview
  - Updates for Revised CUP Application
  - Solar Photovoltaic Modules
  - Battery Storage Design and Safety + UL 9540A Video
- Project Diligence
  - Visual Simulations, Noise Study, Water, Environmental Studies
- Estimated Project Timeline
- Economic & Environmental Benefits
- Conditional Use Permit Approval Criteria & Response to Hearing Officer Recommendation

Why we are here today



Photograph: Eliud Gil Samaniego

Why we are here today

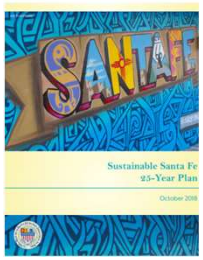
- UN Paris Agreement 2015
- NM Energy Transition Act of 2019 (SB489)
  - 50% renewables by 2030
  - 100% carbon-free by 2045
- Santa Fe City & County Climate Goals
  - Sustainable Santa Fe 25 Year Plan
  - County Resolution No 2023-074
- PNM Request for Proposals
  - 2029-2032 Resources

PUBLIC SERVICE COMPANY OF NEW MEXICO

2029-2032 GENERATION RESOURCES RFP

Gov. Michelle Lujan Grisham signs the Energy Transition Act into law Friday at the State Capitol. The act will require electric utilities to produce a larger share of electricity from renewable sources, eventually getting to 100 percent renewable energy by 2045. Luis Sánchez Saturno/The New Mexican

Santa Fe New Mexican



THE BOARD OF COUNTY COMMISSIONERS OF SANTA FE COUNTY

RESOLUTION NO. 2023 - 074

A RESOLUTION ADOPTING THE COUNTYWIDE CLIMATE ACTION PLAN PHASE I AND SUPPORTING ITS IMPLEMENTATION

WHEREAS, the County seeks to increase its funding capacity, participation and support in collaborative opportunities that conserve resources, promote renewable energy, stimulate social equity and engagement, and increase sustainable practices in New Mexico.

The Daily Times

aes

Why we are here today

NEWS

New Mexico targets 7GWh of new energy storage by 2034

By Cameron Murray

March 15, 2023

US & Canada, Americas | Grid Scale | Policy

LinkedIn | Twitter | Reddit | Facebook | Email

The State Capitol of New Mexico in Santa Fe. Image: Jena G / Wikicommons

The Senate of New Mexico has passed a bill, which will require investor-owned utilities to have 2GW/7GWh of energy storage online by 2034, the second such move by a US state this week.

IN FOCUS Israel-Ha

BUSINESS

New er … high

deman…

Klaus Deuse

02/18/2021

Wind and solar fa… ll weather conditions.

Germany's energ… s — and batteries come to

the rescue.

Storage appears to be the most rea…

by Kari Lydersen

August 22, 2024

…tteries are Keeping the Lights On

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SUPPORT

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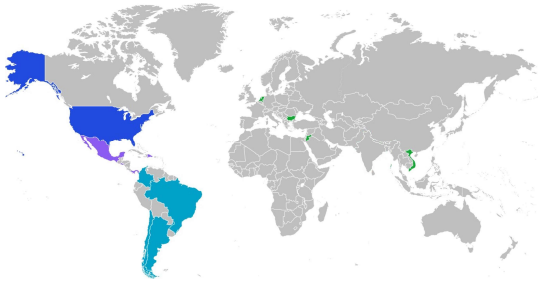
The AES Corporation



34,908 MW

Gross MW in operation*

*24,047 proportional MW (gross MW multiplied by AES' equity ownership percentage).

$12.7 billion

Total 2023 revenues

5,484 MW

Generation capacity under construction

$45 billion

Total assets owned & managed

4 Continents

13 Countries

6 Utility companies

22 million

Number of people served by energy we generate annually in countries where we operate

9,600 people

Our global workforce

Recognition for our commitment to sustainability

Great Place To Work.

2024 WORLD'S MOST ETHICAL COMPANIES® ETHISPHERE 11 Time Honoree

FTSE4Good

FORTUNE

AES' US Renewables business overview

1,500+ People

580+ Projects

28 States

8.6 GW
Operating clean energy resources

51 GW
Clean energy projects in development

FLUENCE
A Siemens and AES Company

Fluence Energy, our joint venture with Siemens, was recognized in 2023 as the #1 Global Provider of Battery-Based Storage Systems by S&P Global Commodity Insights, reflecting AES' global leadership in energy storage.

Recognized for our commitment to sustainability

Great Place To Work.

2024 WORLD'S MOST ETHICAL COMPANIES® ETHISPHERE 11 Time Honoree

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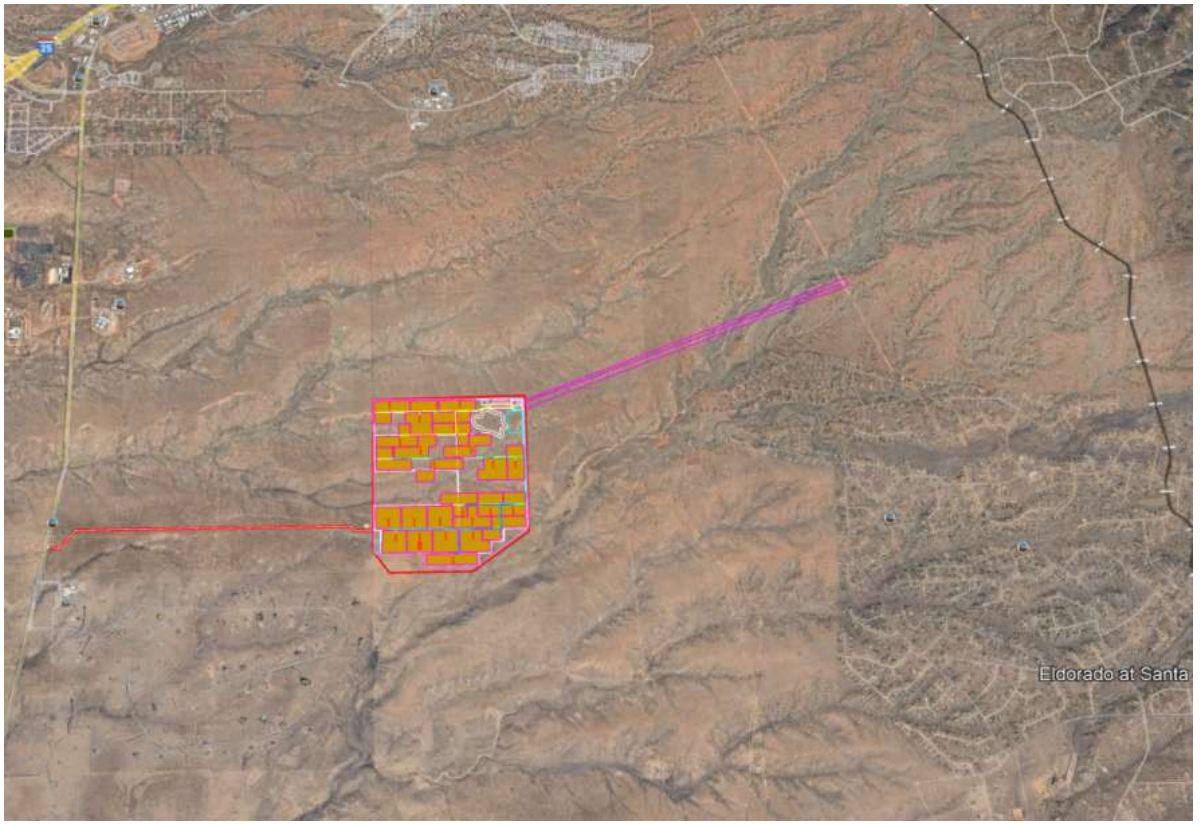
FAST COMPANY

Bloomberg
NEW ENERGY FINANCE

We are proud to be recognized by BloombergNEF for the past three years as one of the top two Sellers of Clean Energy to Corporations Through PPAs, reflecting our leadership in co-creating innovative energy solutions with our partners.

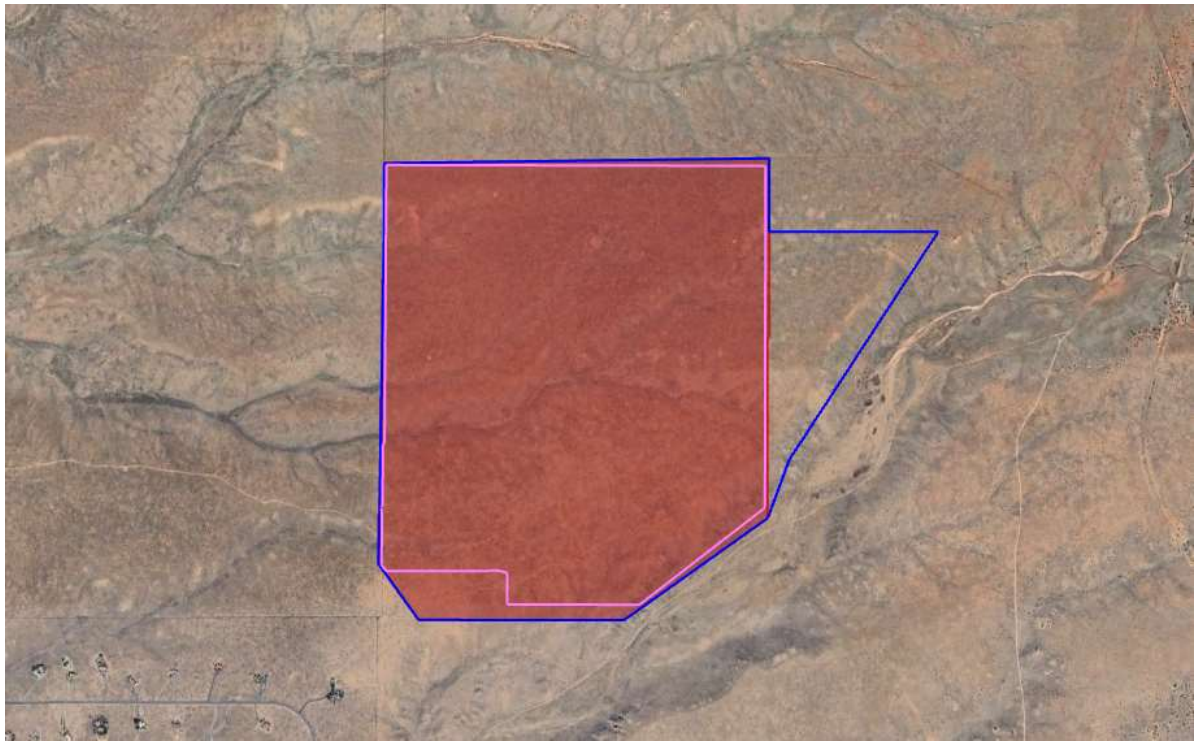
Project Location - Summary

- 3 miles south from Santa Fe
- 2 miles east of Hwy 14
- 1.3-1.5 miles west of Eldorado neighborhood
- 1/3 mile from nearest residence in San Marcos
- BESS sited 1.5 miles from both San Marcos and Eldorado neighborhoods
- 680 fenced acres for project
- Located on private property, within a larger 8,225-acre tract



Property in Relation to Project Boundary

- 828-acre property (blue boundary), as specified in the approved survey plat included with the CUP application
- 731-acre project boundary (red polygon)
- 680-acre fenced project area (pink boundary)
- 340 acres will remain natural opens space in conformance with SLDC open space requirements



Perpetual Conservation of Buffer Lands

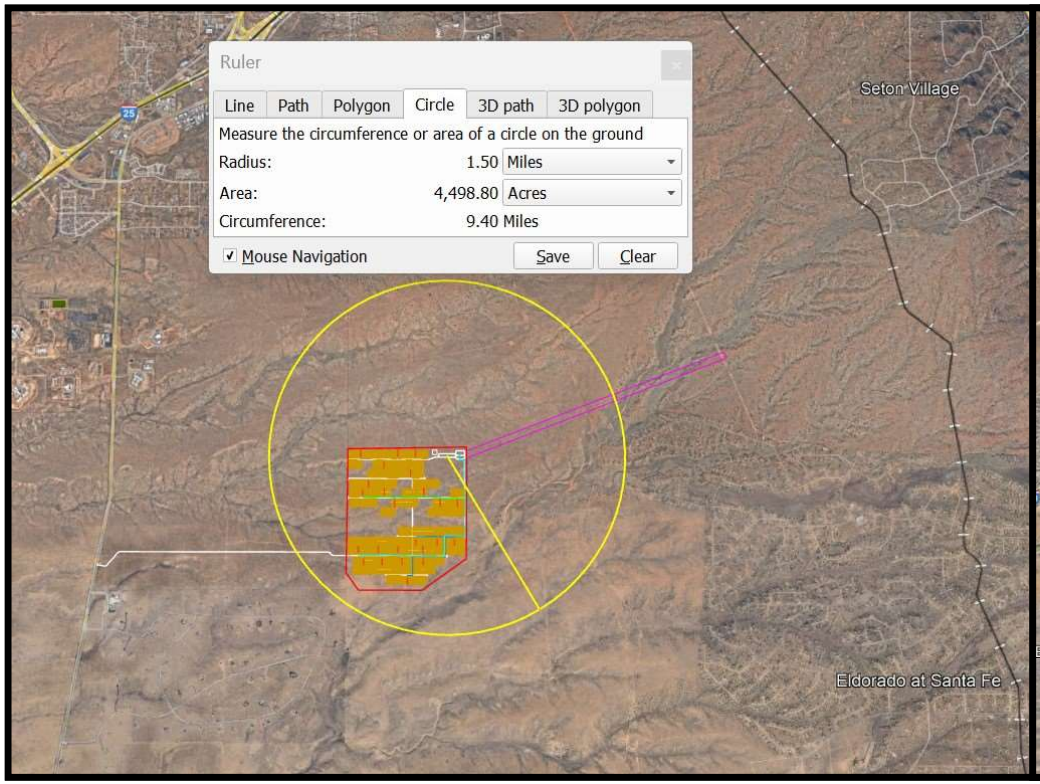
Landowner working with County on a Transfer of Development Rights on surrounding parcels

- 828-acre project property (blue boundary)
- Proposed **5,706-acre** TDR Sending area (yellow)

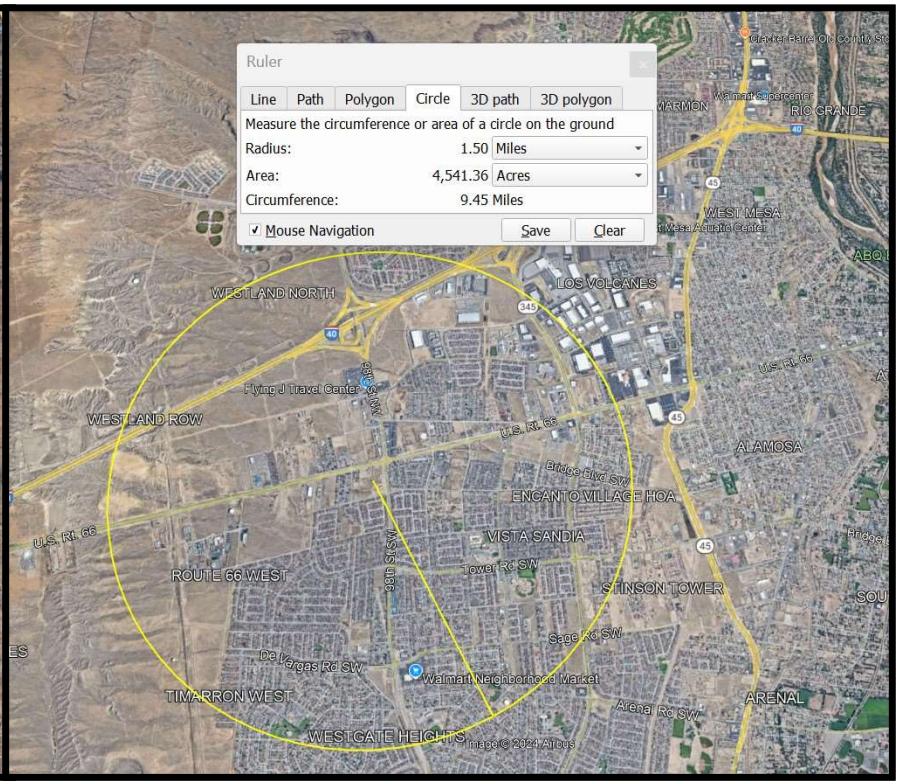
Project Location - Perspective

View from SW corner of nearest planned solar array 1/3 mile to the nearest residence in San Marcos

Project Location – 1.5 mile BESS Setback



1.5 mile radius of Rancho Viejo 48 MW / 192 MWh BESS facility



1.5 mile radius from approved Sun Lasso 150 MW / 600MWh BESS project in ABQ

Project Location – Safe Distance in Worst Case

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Local officials scrambled over the last few days to assure the public that a fire at San Diego Gas and Electric's energy storage facility in Escondido was not harmful despite the city's evacuation orders and a torrent of panic on social media.

Escondido Battalion Chief Tyler Batson told me air monitors brought to the scene never picked up any dangerous levels of harmful pollutants one might worry about during a chemical fire of this kind.

"Honestly a car fire is more toxic," said Rob Rezende, the region's alternative energy emergency response expert. "There are additional chemicals in batteries that add to its toxicity, but they don't travel that far."

Even during the multi-day burn of a fire at an Otay Mesa battery facility, air monitoring instruments never reported any elevated air toxicity more than 15 feet away from the burn, Rezende said. That's because the chemicals that burn from lithium-ion fires become lighter than air and float vertically into the atmosphere before dissipating, he confirmed.

About the evacuations: The Escondido Fire Department initially issued a mandatory evacuation order on a 300-foot radius from the battery site. The batteries are built on a parking lot next to landscaping, towing and automotive companies in an industrial part of town. The department later said anyone in a three to four block radius east of the battery site (due to the wind direction) should shelter in place, including around 500 businesses and 1,500 customers and employees.

pv magazine Subscriptions

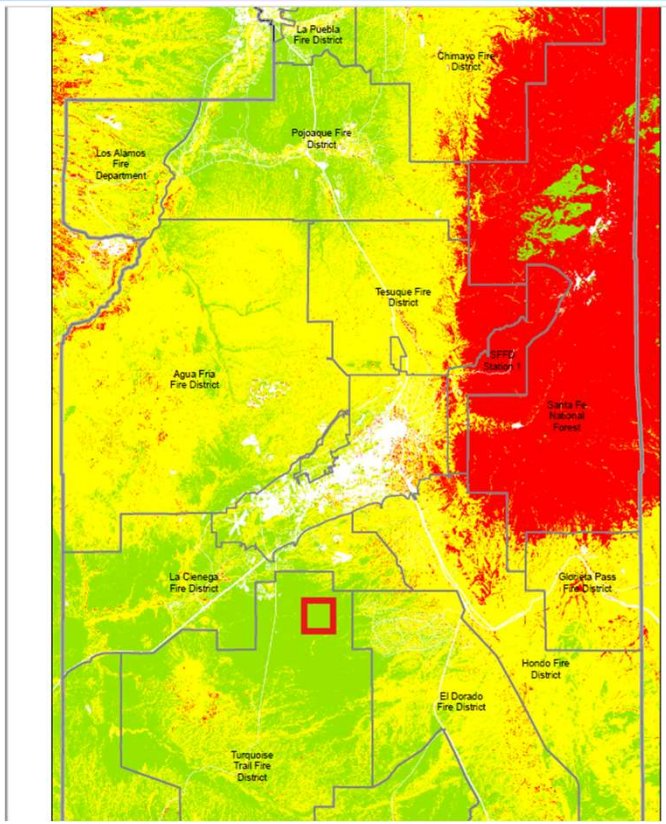
Incidents similar to Moss Landing battery fire are unlikely but stricter regulations proposed

Battery safety has come a long way since the construction of the 300 MW first phase of Vistra Energy's Moss Landing Energy Storage Facility in California, which caught fire on January 16. The vast majority of today's large-scale battery energy storage systems does not have much in common with the affected project deployed in a former turbine hall.

JANUARY 28, 2025 MARIJA MAISCH

No one was reported injured or killed and the air monitoring for hydrogen fluoride and particulate matter carried out by Environmental Protection Agency (EPA) showed no risk to public health throughout the incident. Expanded sampling of soil, water, debris and dust by state and county inspectors is underway. The first samples are being tested with the first results expected next week.

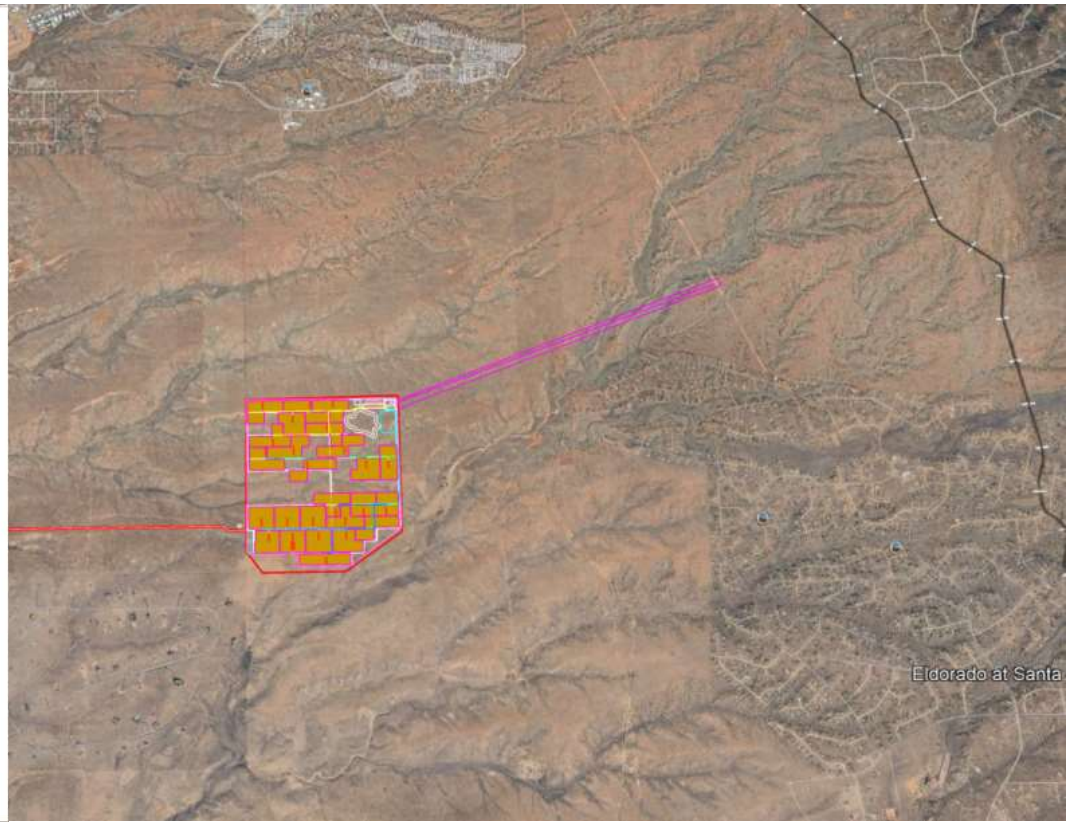
Project Location – Lowest County Wildfire Risk



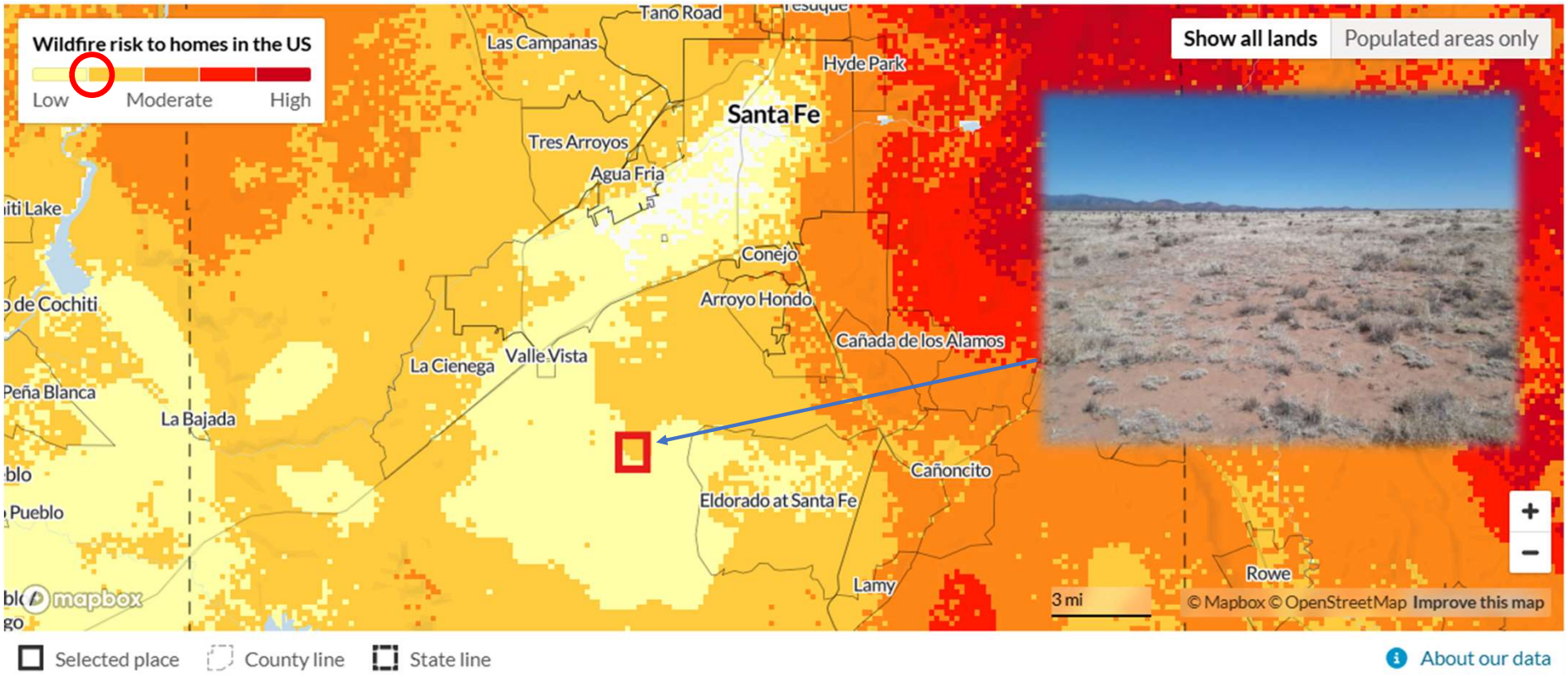
Santa Fe County Wildand Urban Interface Areas

- Extreme
- High
- Moderate
- Not Classified
- County Boundary
- Fire Districts

The source data consists of the vegetation classification from the U.S. Forest Service 2014 Landfire Mapping. The classifications have been aggregated and grouped into categories appropriate for the Santa Fe County region. Fire hazard severity levels were then determined based upon these categories.



Project Location – Low-Moderate Wildfire Risk



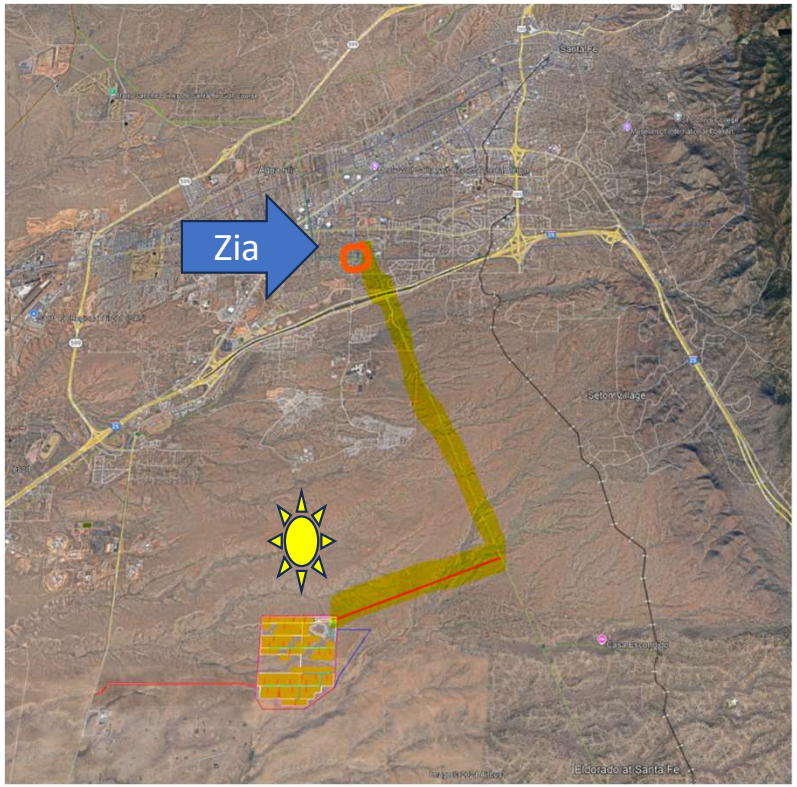
https://wildfirerisk.org/

Wildfire Risk Reduced with Defensible Space

Representative BESS yard for illustrative purposes of defensible space. Not Rancho Viejo visualization

Concrete pads, and graveled BESS yard and perimeter road distance from vegetative fuel

Project Location - Where does the power go?



The following types of resources are of specific interest to PNM under this RFP:

- Stand-alone short-duration and long-duration energy storage and hybrid renewable-storage projects that maximize benefits to PNM ratepayers by capitalizing upon the
- Resources located near PNM's load center or load-side resources that avoid transmission curtailment risks and/or the need for significant transmission upgrades;

18) Transmission Deliverability: To the extent applicable to the Proposal offered, provide proof that the quoted capacity can be delivered via the electric transmission system to PNM's load (including documentation demonstrating that either (i) firm transmission service is available or (ii) a viable plan for firm transmission service to enable the delivery of energy to PNM's load is in place) with a copy of any associated agreements included in the Proposal. Proposals must account for delivery to PNM's system at one of the following locations:

- Albuquerque and Rio Rancho Load Center;
- South of the Albuquerque Load Center (Los Lunas/Belen);
- San Juan;
- Four Corners;
- West Mesa;
- Clines Corners;
- Zia; or
- Norton.

Excerpt: DRAFT PNM 2029-2032 Resource RFP

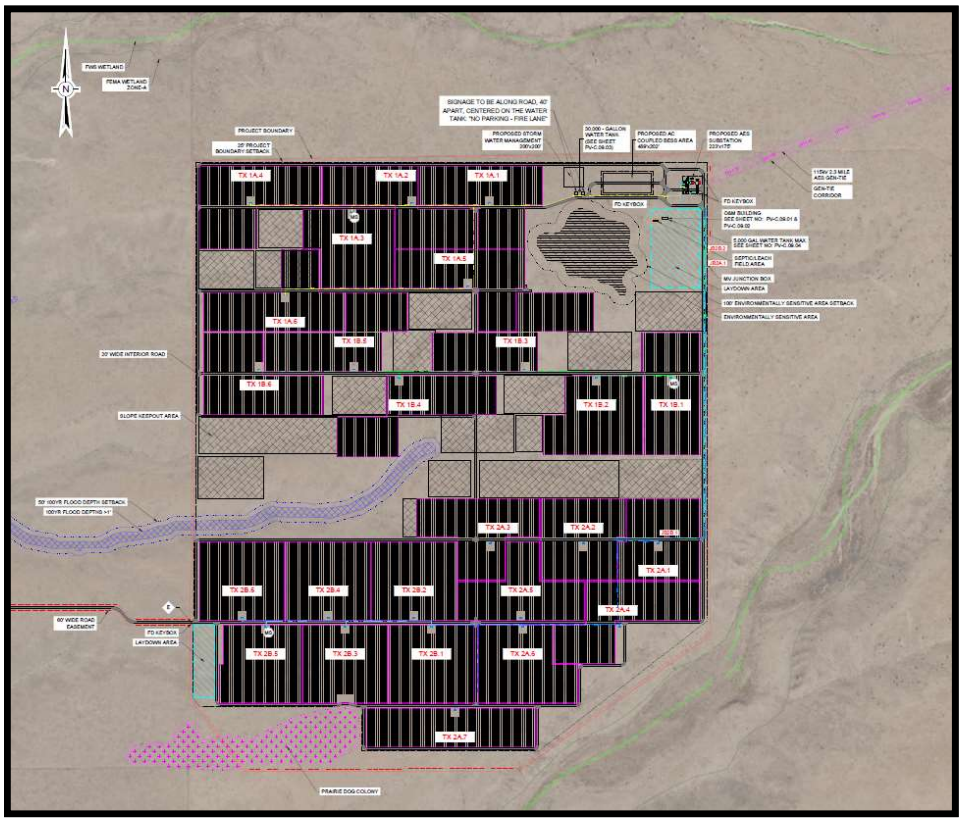
SEARCHLIGHT NEW MEXICO
INDEPENDENT INVESTIGATIVE JOURNALISM

HOME TOPICS SERIES SUBMIT TIPS ABOUT NEWSLETTER

"When we have a contract, it's completely exclusive and the vendor cannot sell energy to anyone else," said Raymond Sandoval, a spokesman for PNM, the state's largest electricity provider. "PNM charges and discharges the battery at its sole discretion, and operates the facility to the sole benefit of PNM customers." While acknowledging that "there really isn't a way to know where the power is going to go," Sandoval said PNM wants to "use it first here in New Mexico." If there's excess energy in the system, that could be sold out of state and the profits used to reduce rates for PNM customers, he added. If PNM and AES reach an agreement on the project, he assumes the generated energy mostly would be sent to Santa Fe and Albuquerque.

https://searchlightnm.org/burning-question-whats-the-right-place-for-a-solar-farm/

Project Overview



Technical Specifications

- 115 MW DC solar photovoltaic source
- 96 MW AC output
- 48 MW / 192 MWh battery storage (4 hours)

Utility-Scale Project

- Feed into PNM transmission grid
- ~268 GWh of clean energy, equivalent of entire annual residential load of Santa Fe
- Fully power Santa Fe at times of max output
- 100% renewable energy goal by 2045

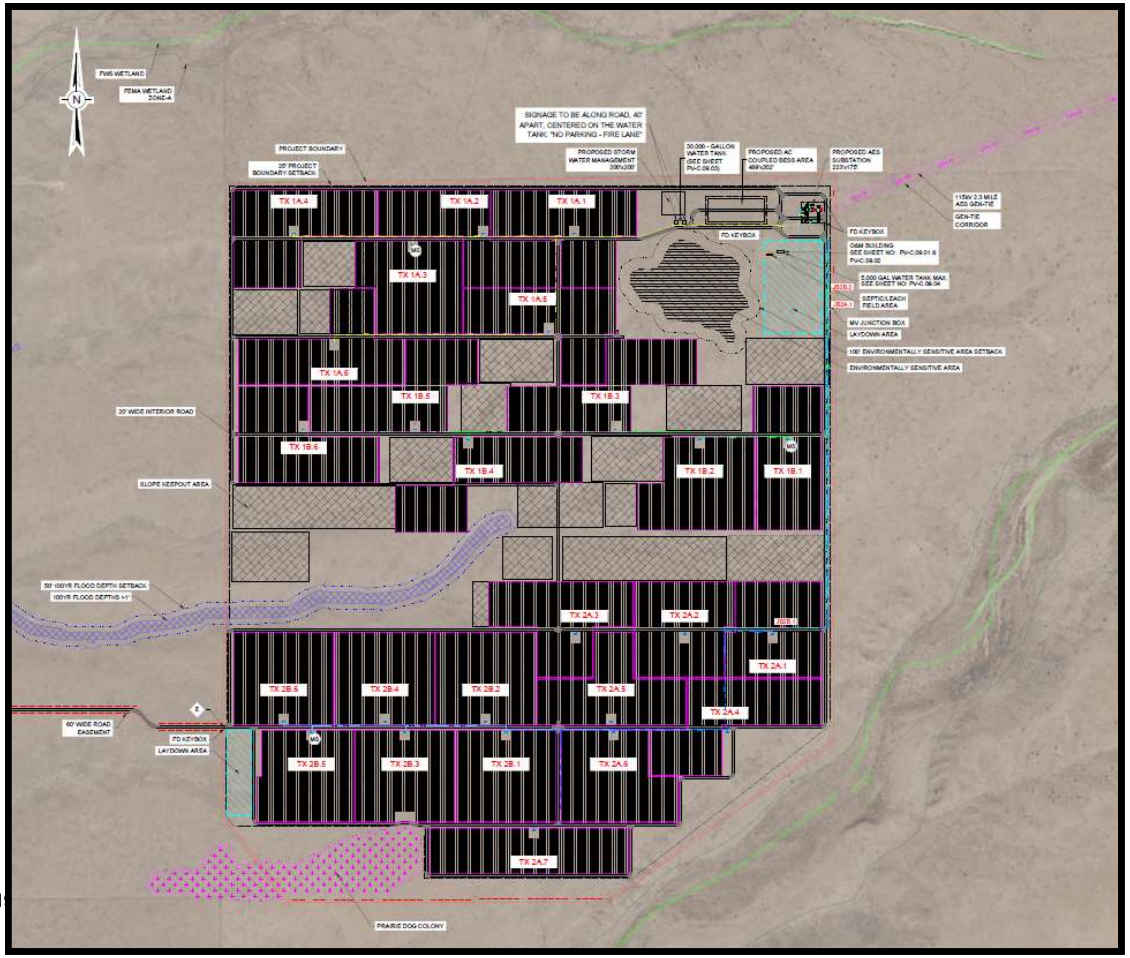
Temporary Use

- 35-year asset life
- Decommissioning and Restoration

Construction and Operation

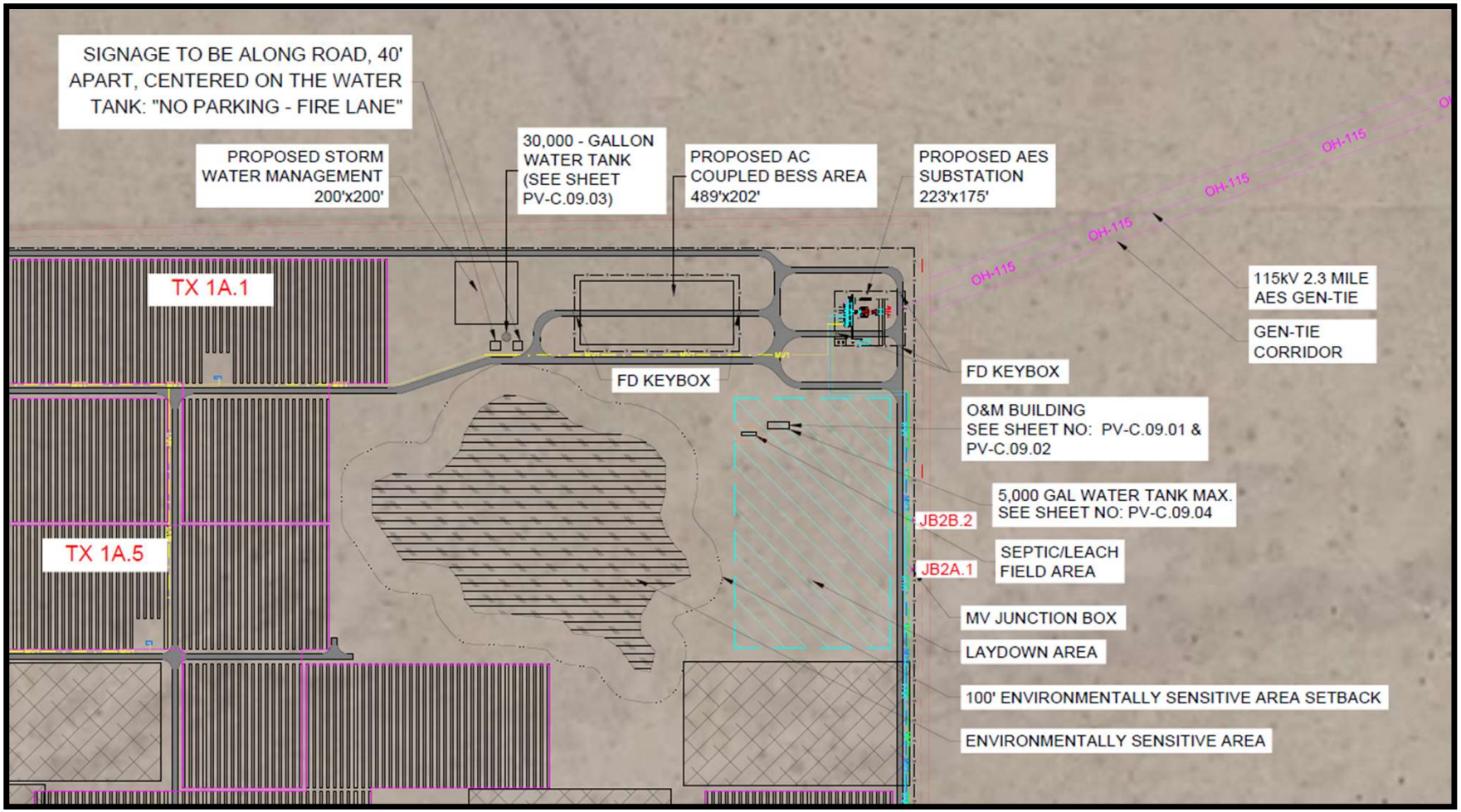
- Year-long construction process
- Remote & on-site operation with limited site traffic
- Low impact - minimal noise, water, lighting

Project Overview – Site Plan Updates



- **Removed array north of San Marcos**
- **Max panel height reduced to 8’**
  - Previously specified 12’
- **Perimeter access road**
  - Consultation with SFCFD
- **Water storage tank** – 30,000 gallon
  - 2021 IFC Chapter 5, Fire Service Features, Section 507, Water Supply
- **O&M building** – 1400 sq ft
  - IFC Chapter 12, Energy Systems, Section 1207.1.6.1, Fire mitigation personnel.
- **Monopole vs. H-frame gen-tie**

Project Overview – Site Plan Updates



Project Overview - Solar Photovoltaic Modules

Structure Dimensions

- ~8’ max height at full 52° tilt in early morning/late evening
- 5’ 4” clearance at central rack and at flat tilt, or stow mode.
- 14’ 6” aisles between modules / 22’ post to post
- Currently specified with New Mexico-built racking & trackers

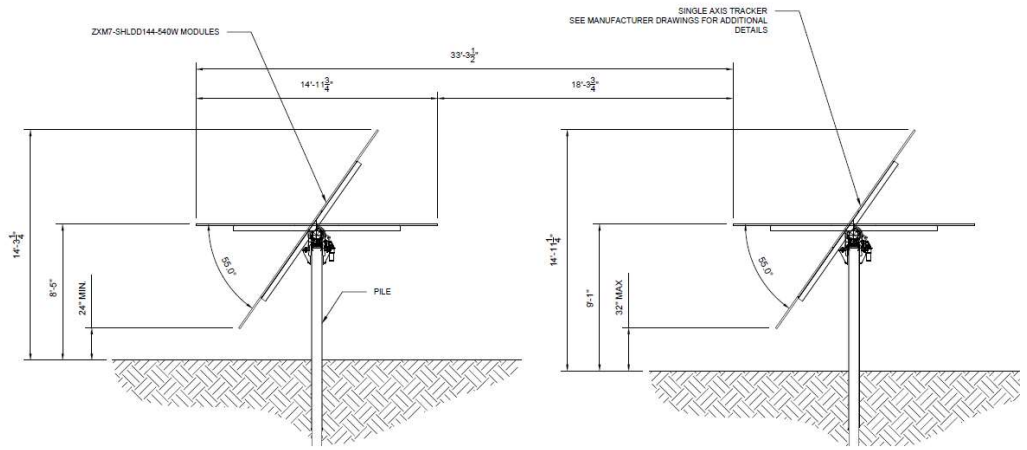


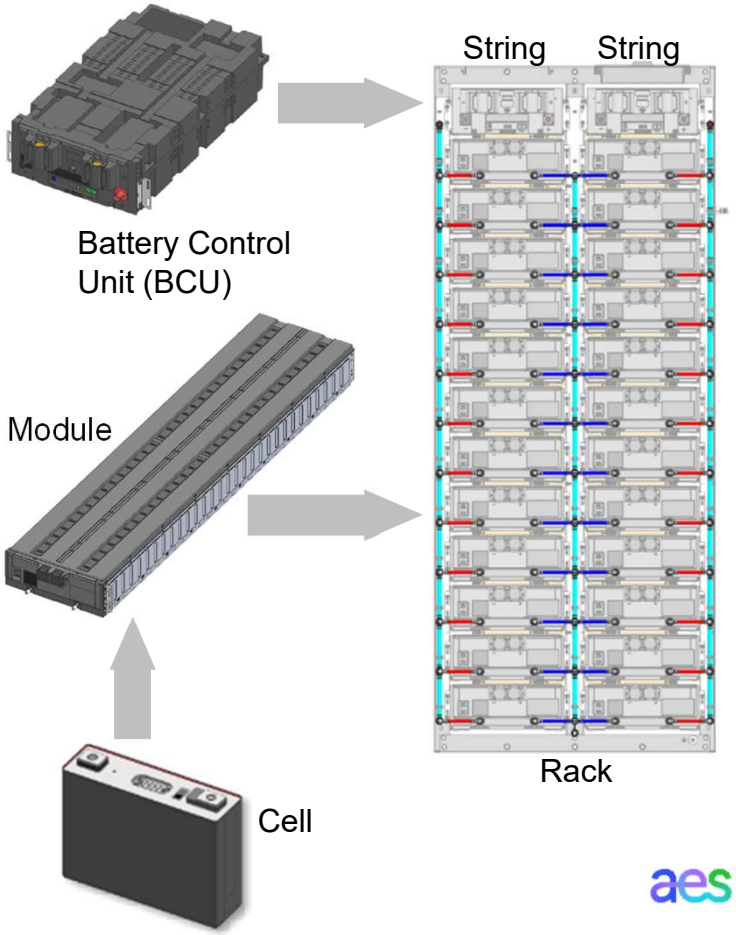
Image representative of tilt and function, clearances are not related to Rancho Viejo specifications

Project Overview - Battery Storage System

Table 4: E5S BESS System Specification Summary	
ESS System Manufacturer:	AES
ESS Model #:	AES Spec CEN-E5S
ESS Electrical Ratings:	8,068 kWh
ESS Max Voltage:	1494 Vdc
ESS Enclosure Dimensions:	40'-0" (L) x 8'-0" (W) x 9'-6" (H)
ESS Layout / Construction:	Non-Occupiable, Non-Walk-in, Non-Combustible 252 Modules per enclosure

Bank / System / "Installation Level"

Representative image from earlier containerized BESS solution



BESS Technology Evolution

	Early BESS Technology	Advanced AES Spec BESS
Enclosure Type	Walk-in Warehouse Style	Non-walk-in, Containerized
BMS Protection	Yes	Yes
Internal Energy Sources	Batteries + Power Electronics	Batteries Only
Thermal Management	Air Cooling	Liquid Cooling
Gas Detection & Explosion Prevention	No	Yes
Smoke & Heat Detection	Yes	Yes
Fire Suppression	Disperse Clean Agent / Sprinkler	Targeted Clean Agent
NFPA 855 Compliant	No	Yes
UL 9540 Certified	No	Yes

No battery fires in over 6 years of AES Spec BESS operations.

aes

Project Overview - Battery Storage System

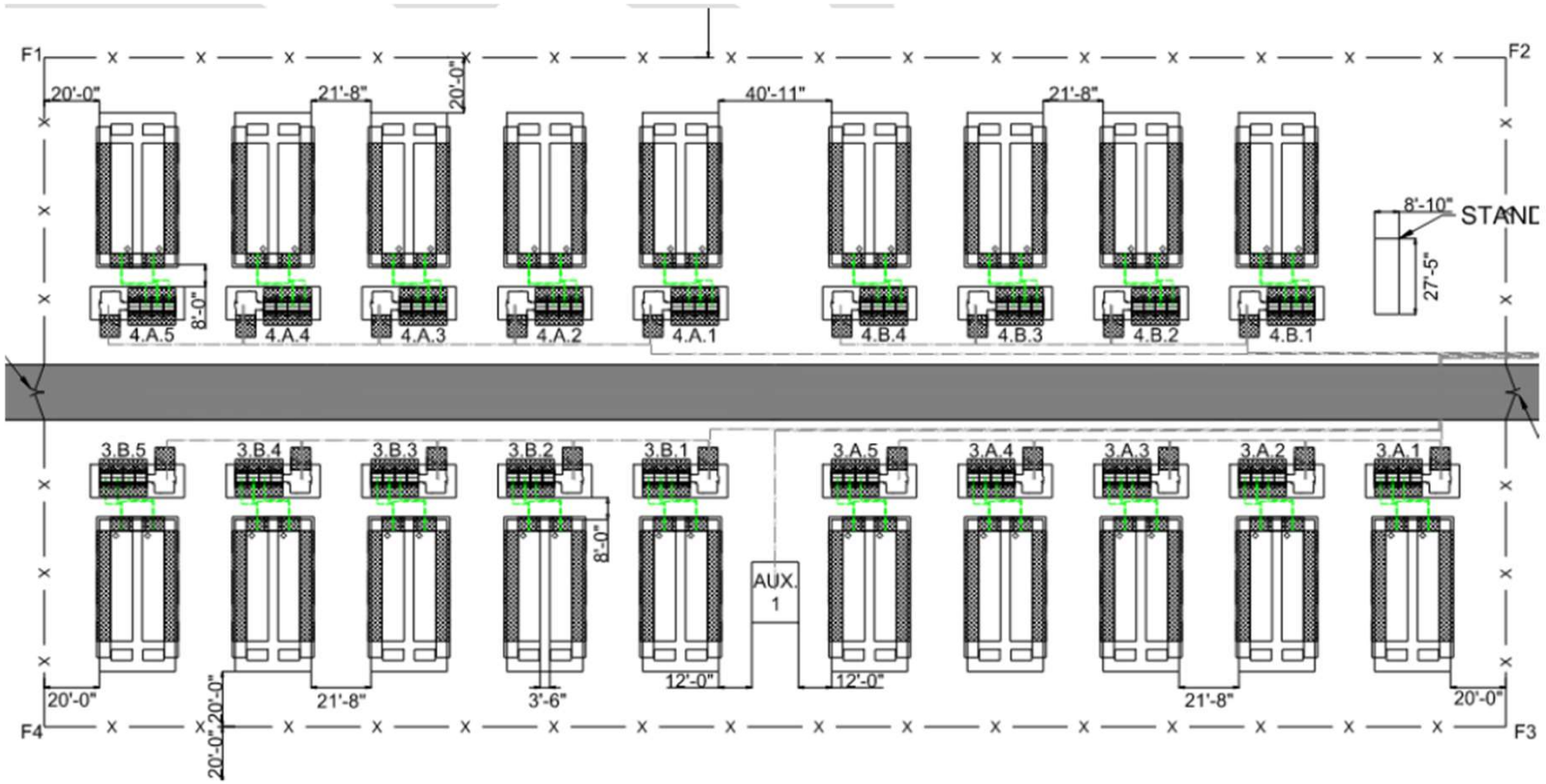
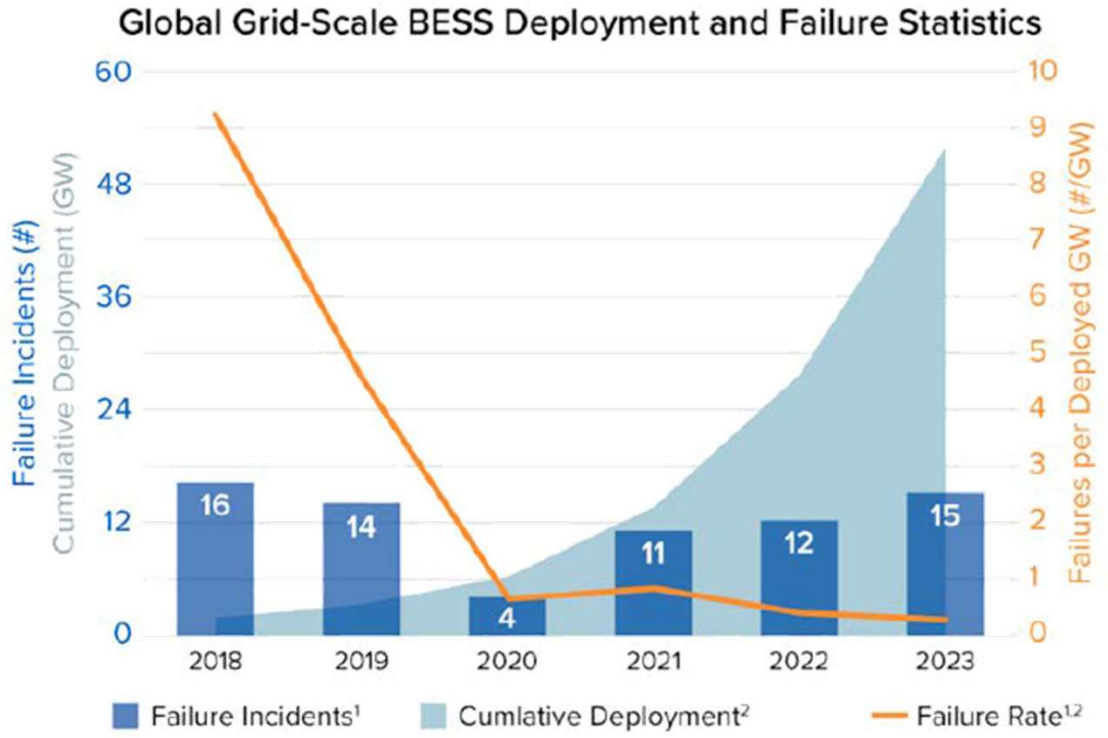


Figure 1 - Rancho Viejo BESS Site Plan

Energy Storage Hazards

BESS Failure Rate Decreasing



Sources: (1) EPRI Failure Incident Database, (2) Wood Mackenzie. Data as of 12/31/23.

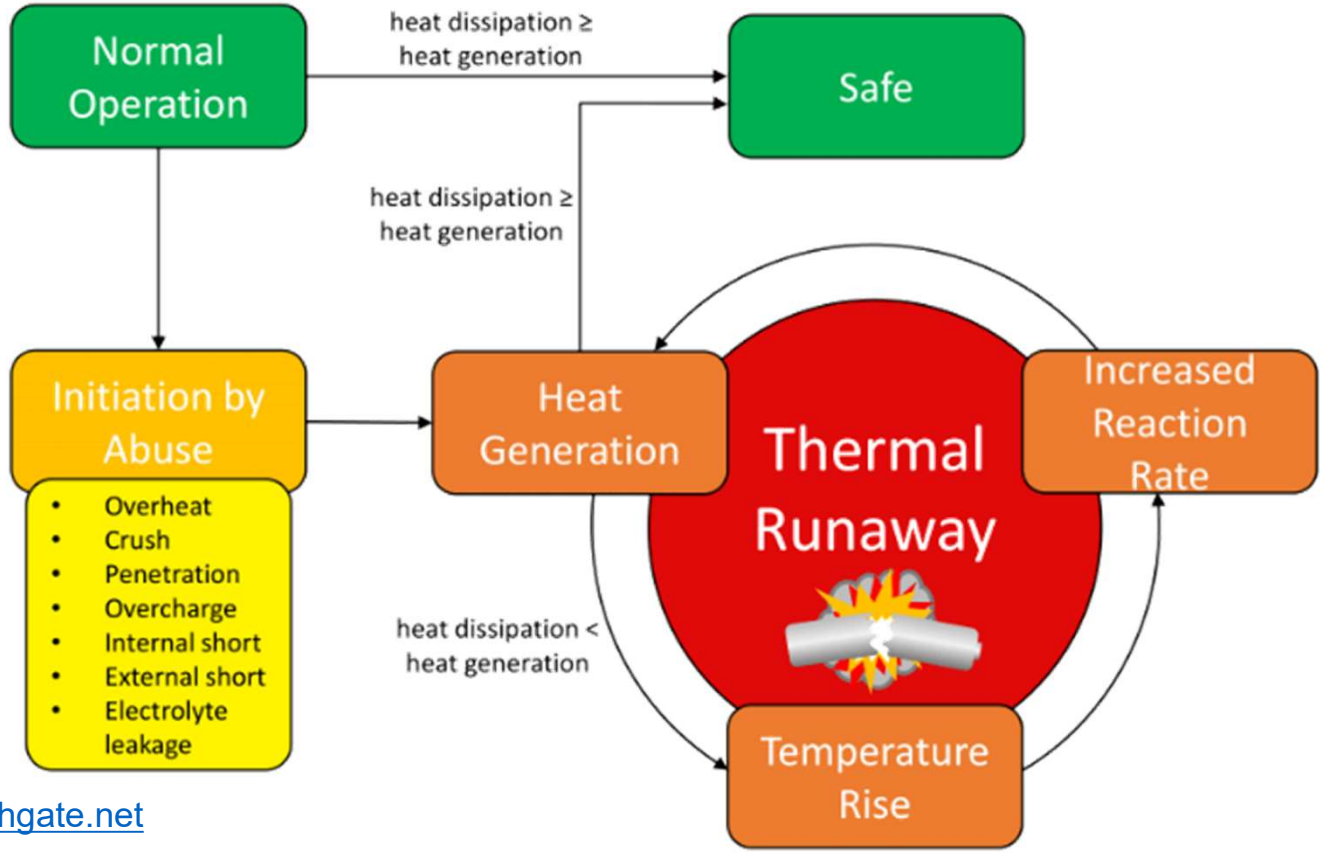
- 90% of global battery capacity is Li-Ion based
- 2023 Global Installed BESS capacity: **+50 GW**
- 2023 U.S. new BESS capacity: **16 GW**
- 2024 BESS capacity will double to **30 GW**

- **+ 400 MW BESS operating capacity in NM**
- NM state goal to have 2 GW BESS by 2034

- AES is a **global leader in BESS**
  - Safety is AES' #1 priority, company value
  - Pioneer of technology for grid storage
  - Operator of BESS for more than 15 years
  - 871 MW of BESS in operation
  - +700MW of BESS construction in 2024

Source: [BESS Failure Incident Database - EPRI Storage Wiki]

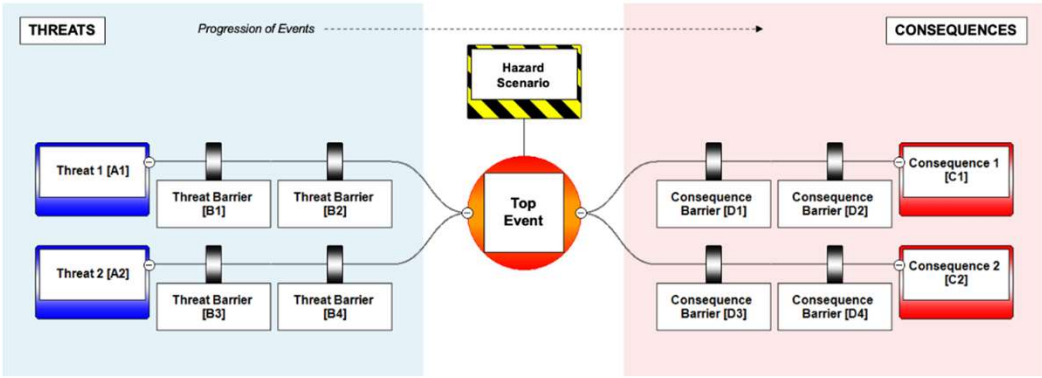
What is Lithium Ion Thermal Runaway?



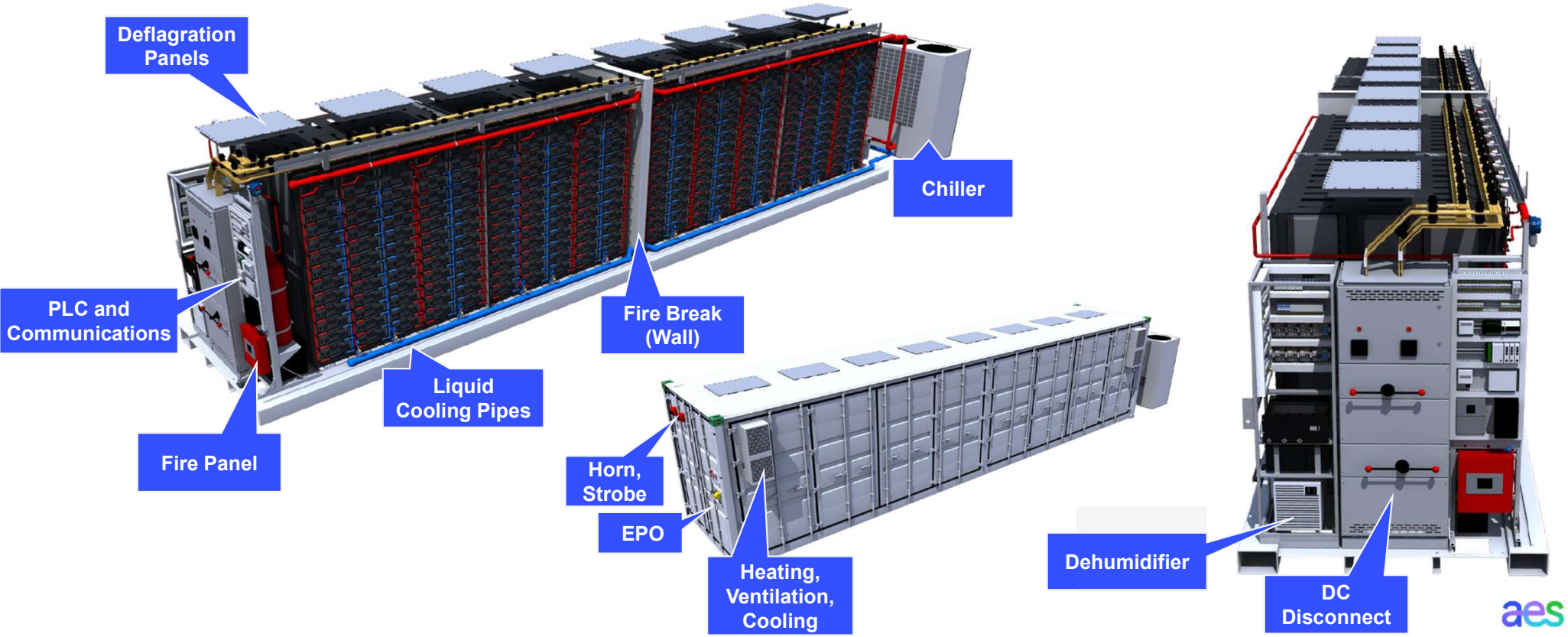
Source: researchgate.net

Equipment Safety Approaches

- Hazard Mitigation Analysis (HMA)
- Battery Management Systems
- Emergency Shutdown
- Flammable Gas Detection
- Fire Detection and Alarm
- Direct Injection Fire Suppressant
- Exhaust Ventilation
- Deflagration Venting
- First Responder Training
- Emergency Response Plans



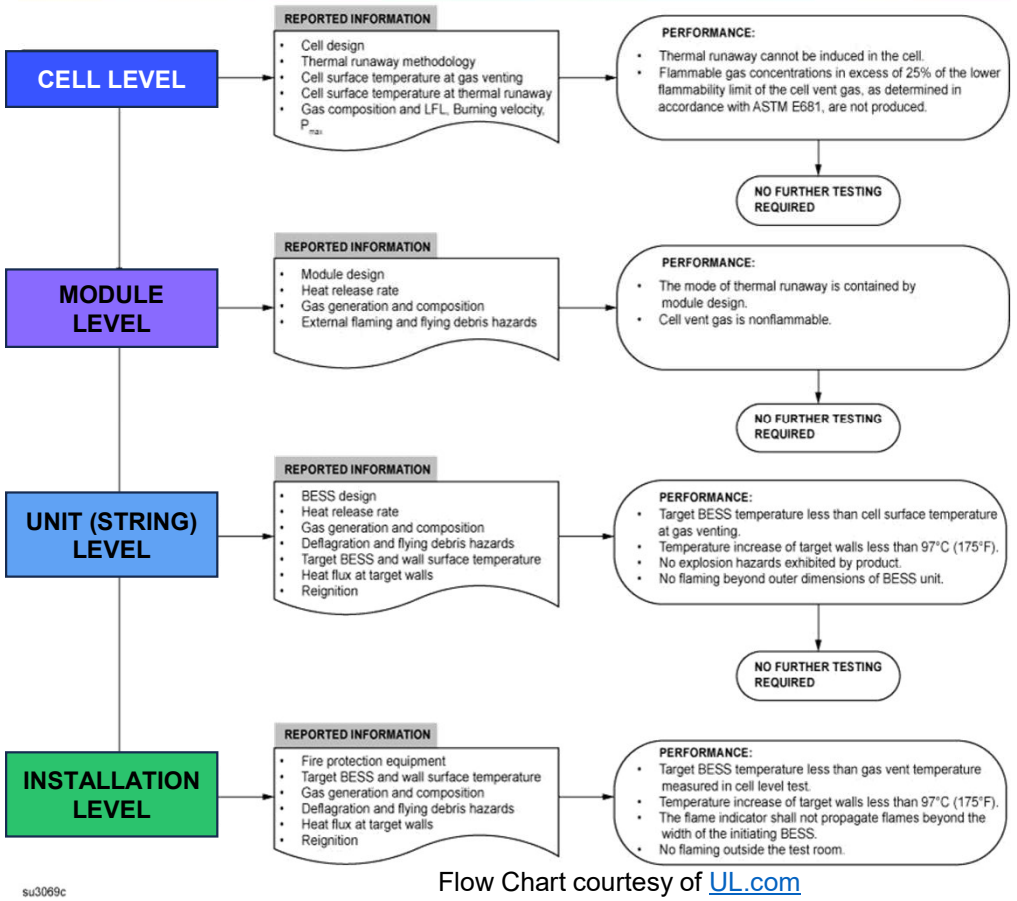
BESS Hazard Mitigation Features



Standardized Testing (UL 9540A)

Measurement of Hazard Characteristics and Severity

No Success Criteria

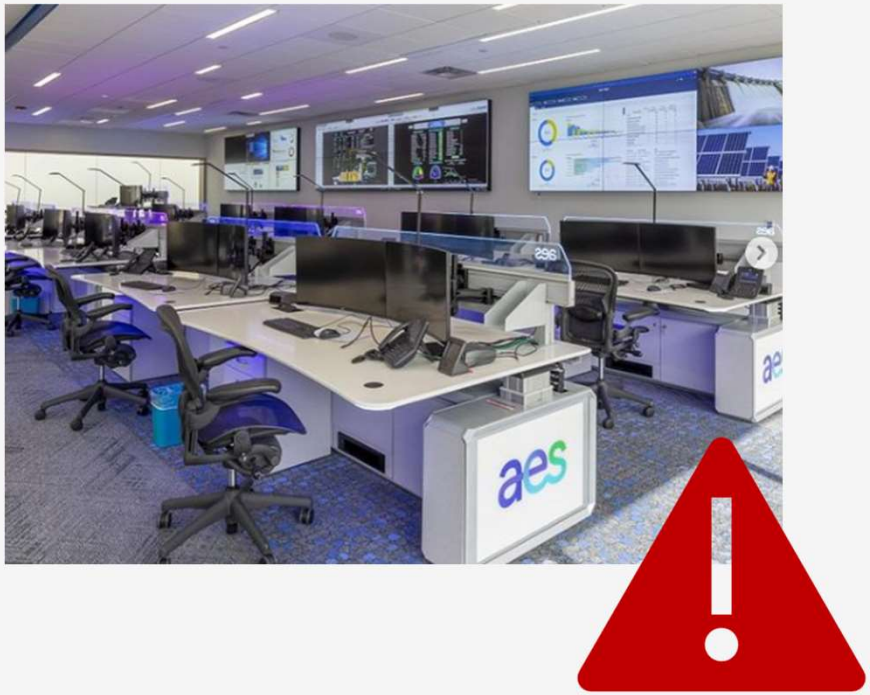


Flow Chart courtesy of UL.com

ESS Safety Features

BMS Safety Features

- Battery Management System provides observation and enforcement
- Voltage, current, and temperature state and limits
- Communication of real-time status
- Warning of functional anomalies
- Disconnect of strings when limits violated



ESS Safety Features

Passive Safety

Cell/Module Level

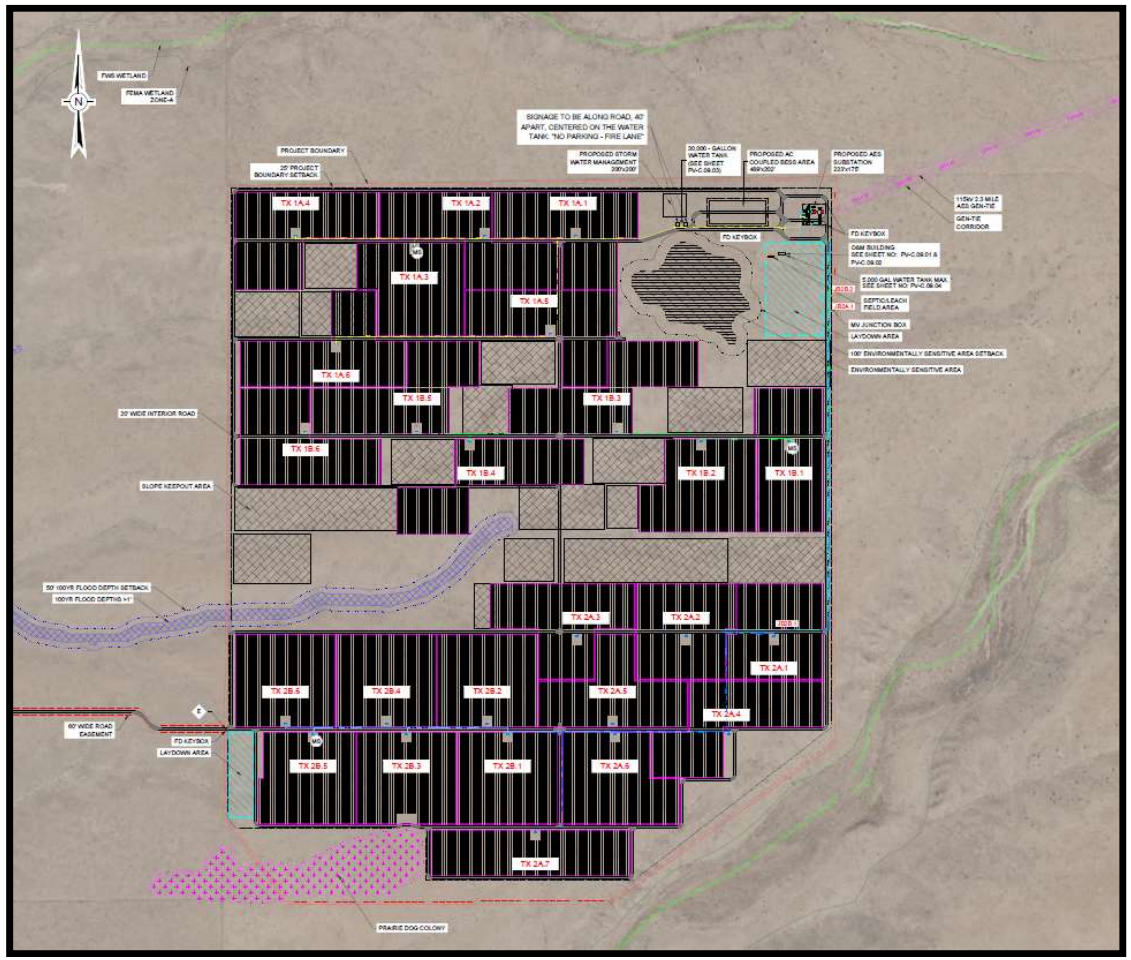
- UL 1642 and UL 1973
- Factory QA/QC
- Field verification of isolation

Enclosure Level

- Insulation
- Field QA/QC
- Environmental protection

System Level

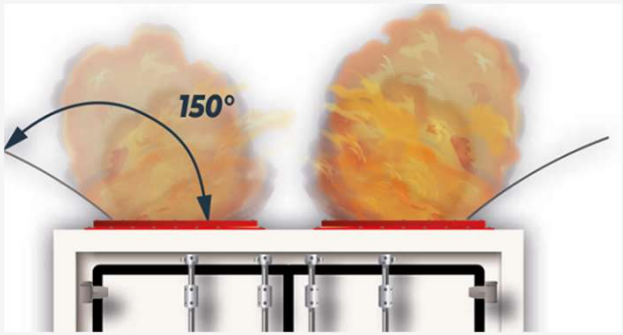
- Setbacks
- Defensible distance
- Fencing
- Monitoring



ESS Safety Features

Passive Safety
Explosion Mitigation

- Six deflagration vent panels available to provide passive relief in the unlikely event of release, buildup, then ignition of flammable gases
- Demonstrated and validated at full scale in dedicated test, June 2024



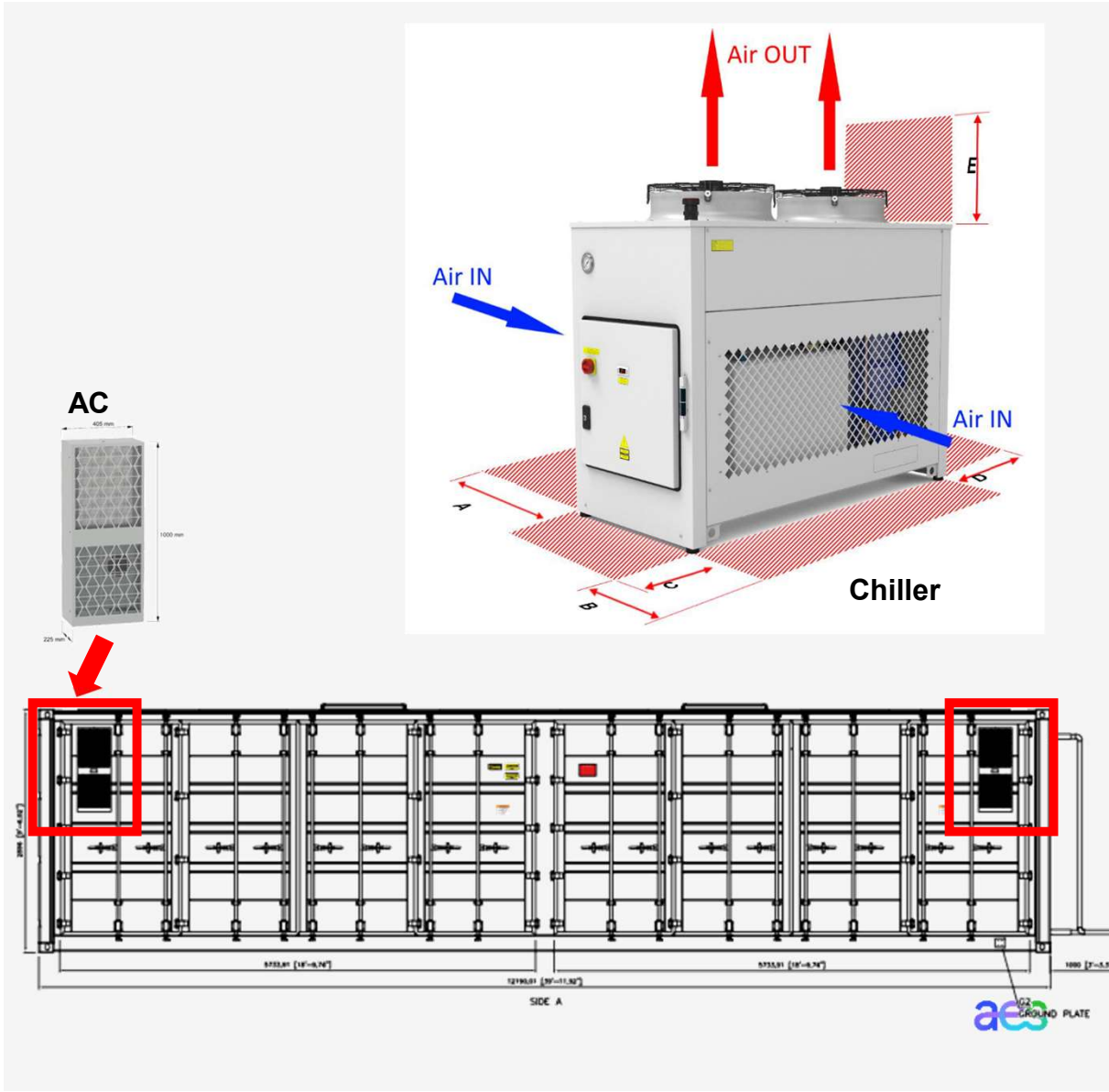
Source: Vigilex

Figure 10: Deflagration panels post-test 2

ESS Safety Features

Active Safety
Thermal Management

- Active thermal management with central chiller and AC
- Liquid cooled design maintains desired temperature of each battery module
- Supplemental air conditioning maintains climate for support equipment
- Thick mineral wool insulation reduces energy usage
- Dehumidifiers isolate hardware from harsh ambient environment



ESS Safety Features

Active Safety Control Logic

Detection (redundant)

- Smoke (distributed)
- Temperature (cell, module, string, ambient)
- Gas (both sides)

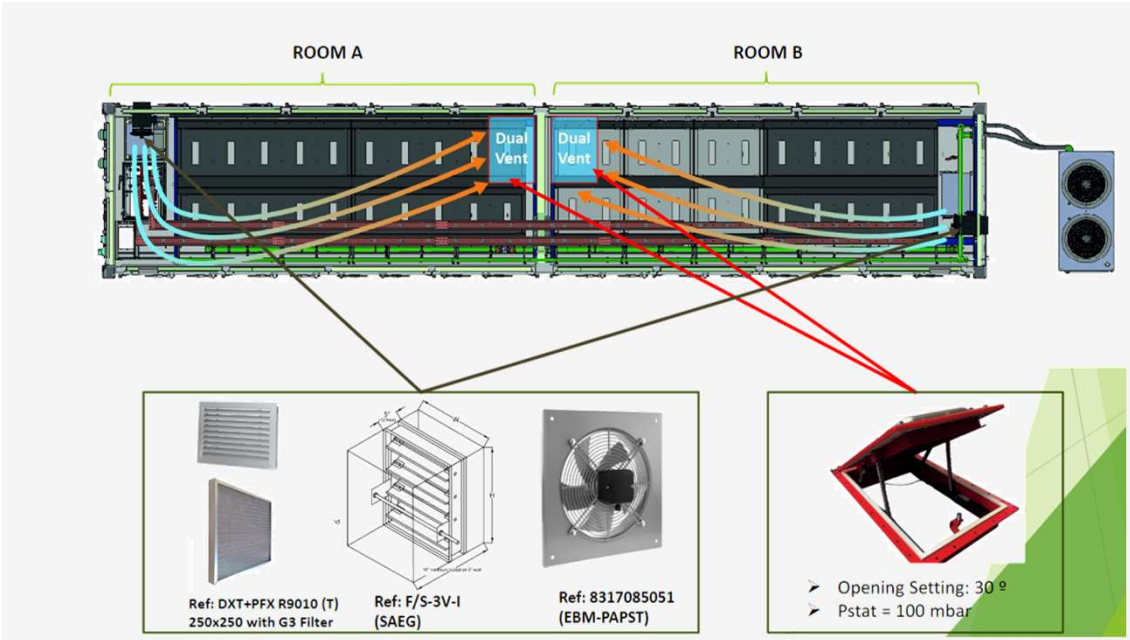
Signal Output

- Suppressant Actuator
- DC Switch
- Alarms
- Fire Panel - Operations
- Battery Backup (UPS)

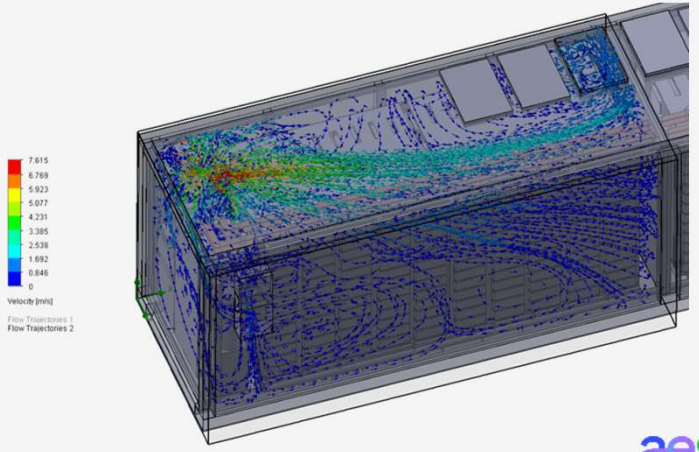
ESS Safety Features

Active Safety
Explosion Prevention

- Battery Cell Off-Gas Detection
- "Active" exhaust ventilation
- Computational Fluid Dynamics (CFD) analysis demonstrates correct engineering design



Flammable Gas Detector



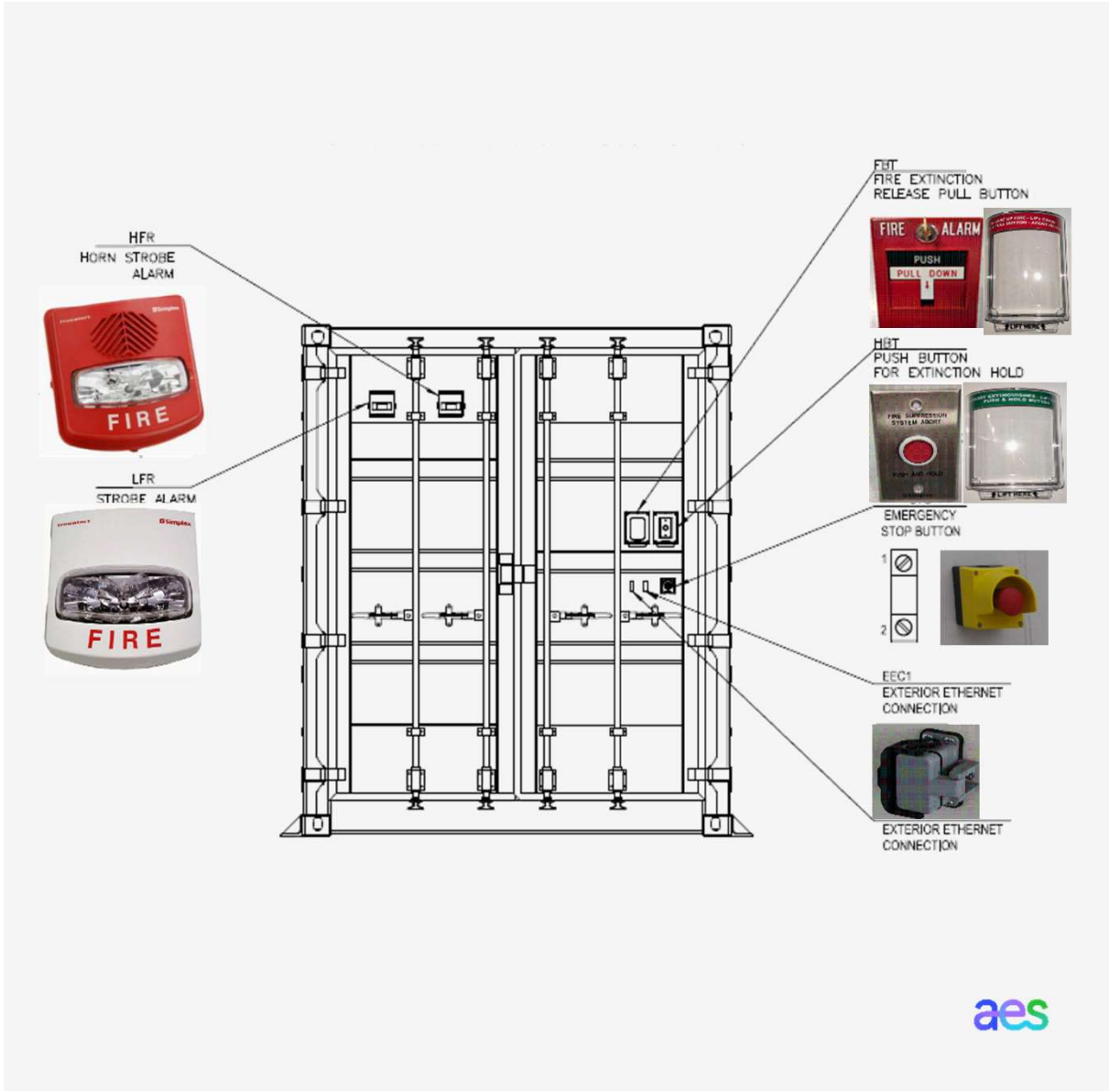
CFD: Vented Gas Dispersion

ESS Safety Features

Active Safety
Communication

Alarms
- Audible Horn and Strobe
- Strobe

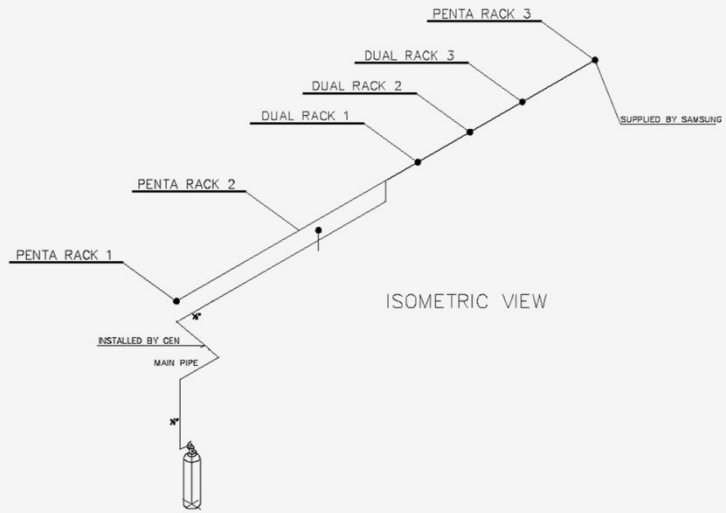
Emergency HMI
- Fire Alarm Pull
- Fire Extinguish Hold Button
- Emergency Stop Button



ESS Safety Features

Active Safety
Fire Suppression

- Direct injection fire suppression

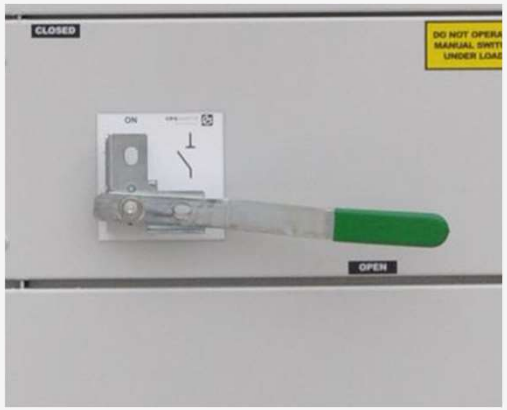


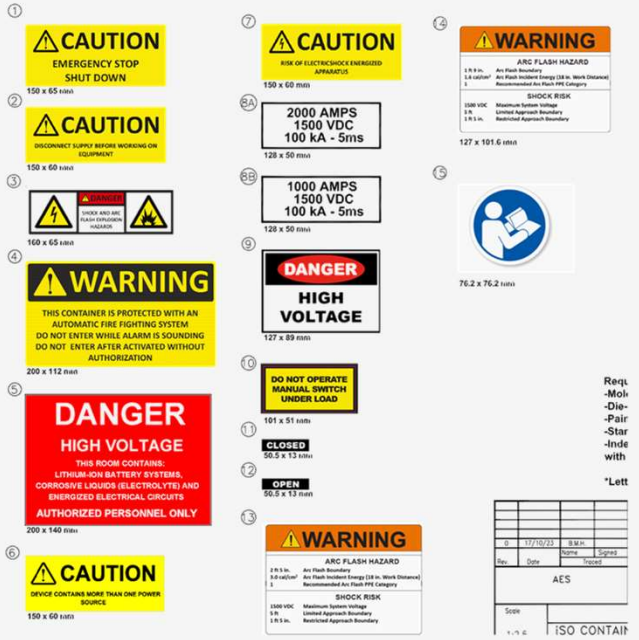
ESS Safety Features

Maintenance Provisions

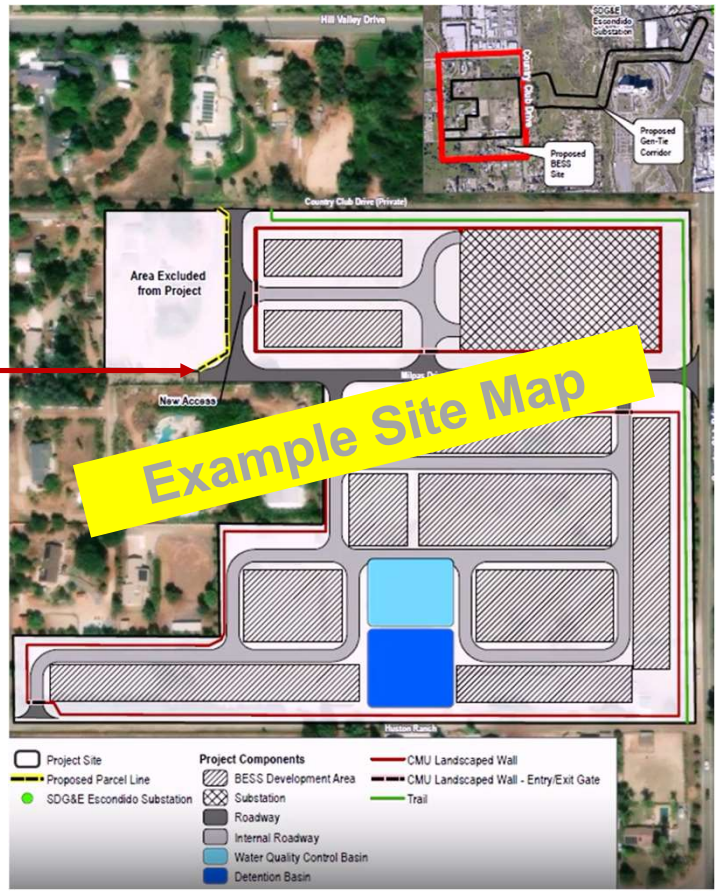
DC Disconnect Switch
- Fused
- Non-load operating
- Able to Lockout/Tagout

Clear Hazard Labels
- Arc Flash
- Shock
- E-stop



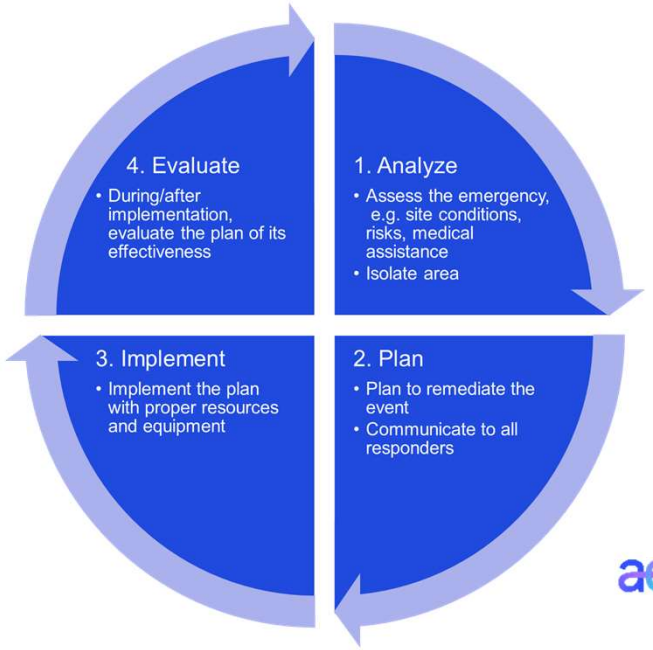


Site Navigation / Wayfinding



Key points during an emergency:

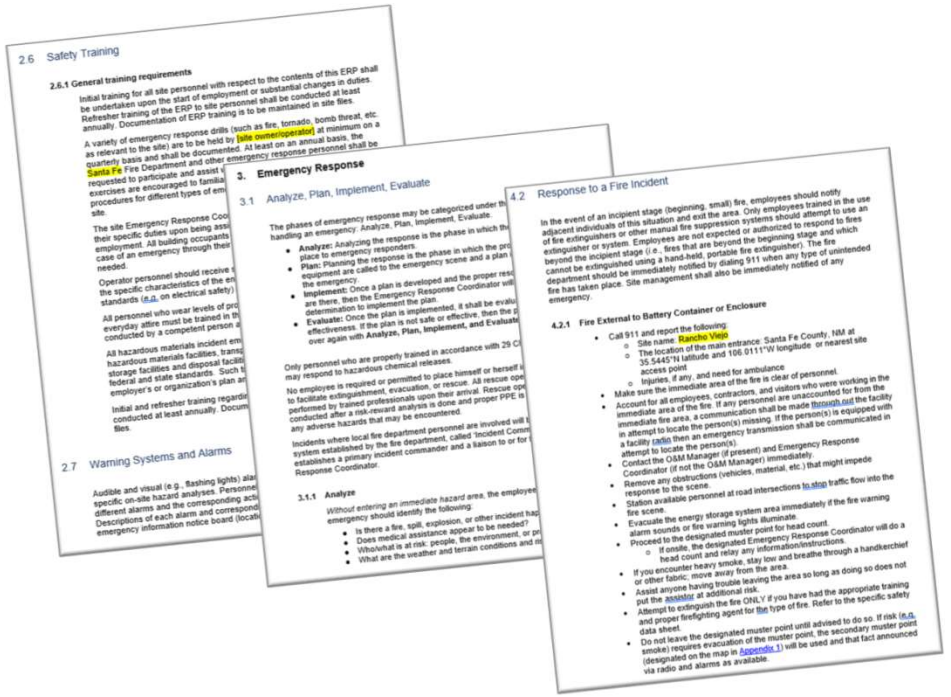
- Primary Designated Muster Point
- Fire Panel: Located at the Entrance
- Safe approach distance: **150 ft**
- Phases of Emergency Response:



Emergency Response Plans

ERP Includes

- Emergency Response Management
- Emergency Response
- Fire Incidents
- Chemical Release
- Medical Emergency
- Security Incidents
- Environmental Hazards
- Cybersecurity



Early and frequent coordination with local first responders is central to AES operations.

The UL9540A BESS Fire Safety Test Video

Project Diligence

Site Studies Performed

- **ALTA and topographical survey**
- **Aquatic Resources Inventory Report** – gen-tie to span crossing of jurisdictional feature
- **Biological Survey Report** – no federal/state T&E species, prairie dog/burrowing owl avoided
- **Phase I Environmental Site Assessment** - no REC, CREC, & HREC
- **Hydrologic and Hydraulic Study** - minimal flood hazard for solar project development
- **Cultural Resources Pedestrian Survey** – sensitive resources avoided
- **Site Thresholds Analysis** – additional traffic impact studies are not warranted
- **Visual Impact Assessment** – would not unduly impair visual resources
- **Appraisal Solar Impact Study** – no anticipated impacts to values; Matched Pair Analysis done to Uniform Standards of Appraisal Practice by Appraisal Institute

Project Diligence

Site Studies Performed

- **Environmental Impact Report** – no significant resource issues
- **Noise Technical Report** – Operational noise would not be perceived by a human observer
- **Geotechnical Investigation Report** – Completed to inform project design
- **Decommissioning Plan** – Prepared in accordance with the 2021 IFC; Section 1207.2.3 of the Santa Fe Fire Code; and the applicable sections of the Santa Fe County SLDC
- **Preliminary Hazard Mitigation Analysis** – Prepared in accordance with NFPA 855, Standard for the Installation of Energy Storage Systems and IFC
- **First Responder Mitigation Guidelines** – Developed to provide BESS response guidance, emergency planning and training to first responders and AES BESS personnel and contractors
- **Pre-Incident Plan** – Identifies fire protection, fire alarm and safety systems, special conditions and hazards, and response and staging information


AES RANCHO VIEJO 96 MWAC/115.2 MWDC SOLAR
& 48 MWAC BATTERY ENERGY STORAGE SYSTEM (BESS)
PRE-INCIDENT PLAN (4152 NM 14, Santa Fe, NM 87508)
35.5415, -106.0106

Santa Fe County FD
Review Date:
By:

FACILITY: Rancho Viejo BESS | BUILT: In Progress | #Units: 38 CENs | DATE: July 2024
24 Hr Emergency Contact: SLC ROCC - 855-679-3553 | Contents: Lithium-Ion Battery ES Array

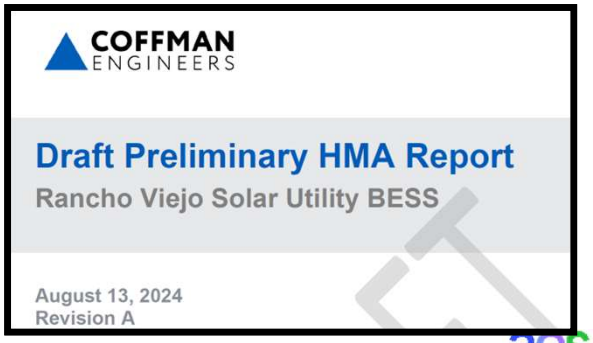
FIRE PROTECTION, FIRE ALARM & SAFETY SYSTEMS
- Battery Management System
- Novec Suppression
- Monitored 24/7 SLC ROCC
- Fire Detection
- Gas Detection (H2 & CO)
- Fire Alarm Panel
- E / F Stops
- Manual Pull Station
- Exterior Horn/Strobe
- Explosion Venting

CONSTRUCTION INFORMATION
Type: Metal | Height: 9 Ft | Length: 40 Ft | Width: 8 Ft
Occupant Load: Unmanned
Onsite Water Supply
Enclosure Design: "AES Spec" CEN Unit Samsung SDI-ESS Modules
1. 29K Gallon
Fire Flow: N/A
Exposures: •North – •South – •East – •West –

SPECIAL CONDITIONS AND HAZARDS
- STOP: (Maintain 150 ft) Emergency Responders DO NOT MAKE ENTRY into the AREA or ENCLOSURE without Prior BESS & PIP Training & BESS ESCORT
- ***LITHIUM-Ion BATTERIES & HIGH VOLTAGE***
- EMERGENCY Battery Cutoff (FOR AES USE ONLY) is located at the BESS Enclosure.
- CAUTION: Overhead High Voltage Lines.
- CAUTION: Sample BESS Area LEL Before Entry; Battery Off Gases can provide an explosive atmosphere.
- CAUTION: After power shutoff (Stranded Energy still Exists)
- CAUTION: Bulging & Heating of the Batteries, White Smoke & Hissing are signs of impending Failure.
- CAUTION: DO NOT come in contact with batteries/frames.
- Utilize SCBAs, Thermal Imaging/Gas Detection for initial entry & throughout the entire operation.
- Rescue Ops, utilize WATER Fog Pattern @ a 10 degree angle @ a 5-ft min distance. DO NOT use Class D Fire Extinguisher.
- Full PPE is Thermal, High Voltage & HazMat Rated.
- Enclosures ONE Fire Area; Lithium-Ion Battery Arrays in Open Racks throughout Each Enclosure.
- *Stranded Energy* Do not perform SALVAGE Operations.

RESPONSE AND STAGING INFORMATION
- FIRST ALARM: Stage at Main Entry and await AES / REPI
- NOTE: Water Tinder Needed for defensive water Exposure Protection, and Defensive Posture Only.
  - UNLESS Rescue is needed!
- NOTE: If horn / strobe of a Container is alarming, wait 6 hrs before approaching with AES Personnel escort, then evaluate. If heat or gas are elevated, wait another 4 hrs.

24/7 Emergency Notification: SLC ROCC | Phone: 855-679-3553


COFFMAN ENGINEERS

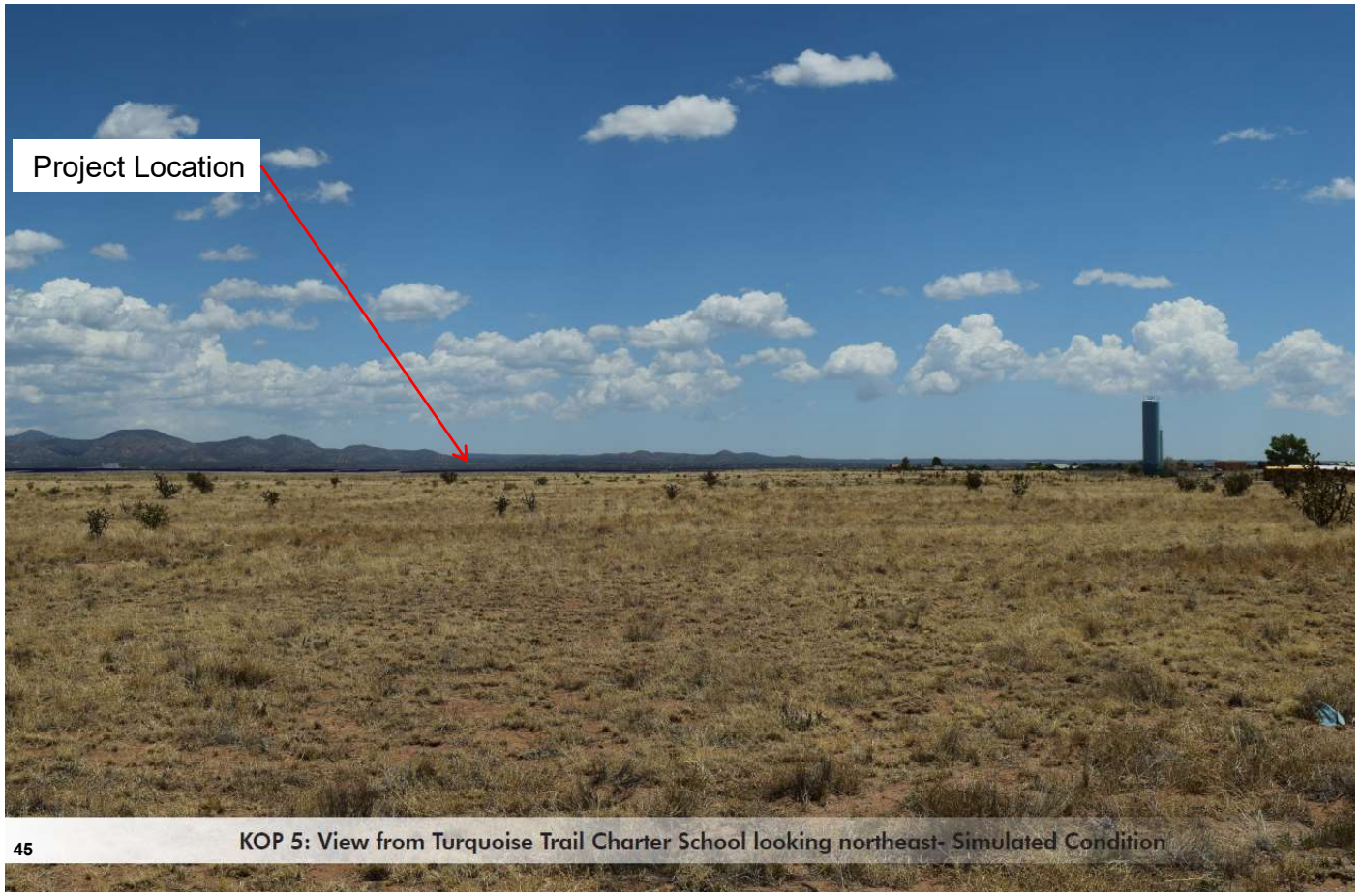
Draft Preliminary HMA Report

Rancho Viejo Solar Utility BESS

August 13, 2024
Revision A

aes

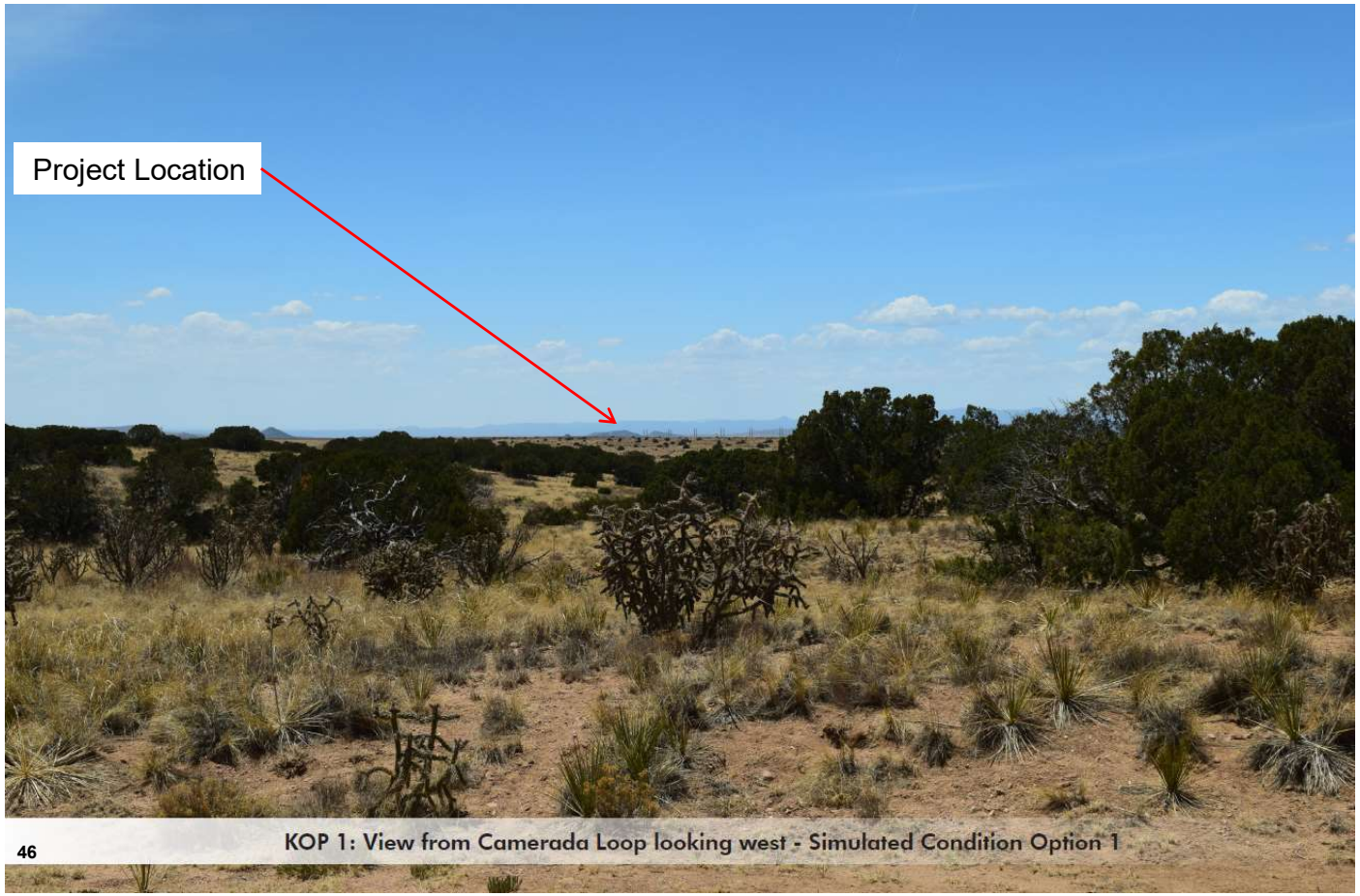
Visual Simulation – View from Hwy 14



KOP 5: View from Turquoise Trail Charter School looking northeast- Simulated Condition

Photo capture location

Visual Simulation - Camerada Loop (H-Frame)



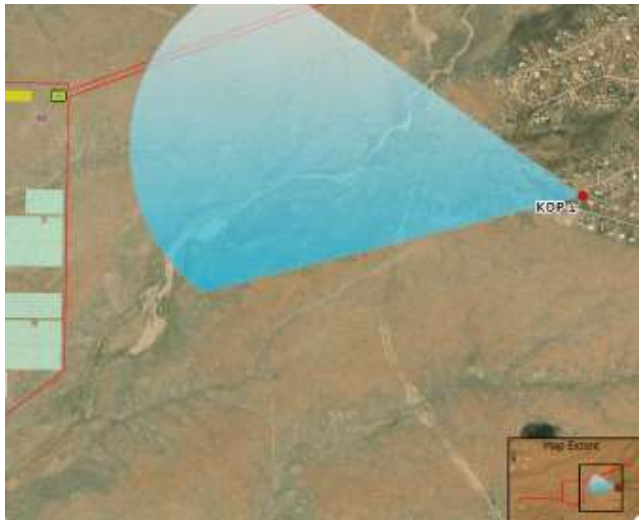
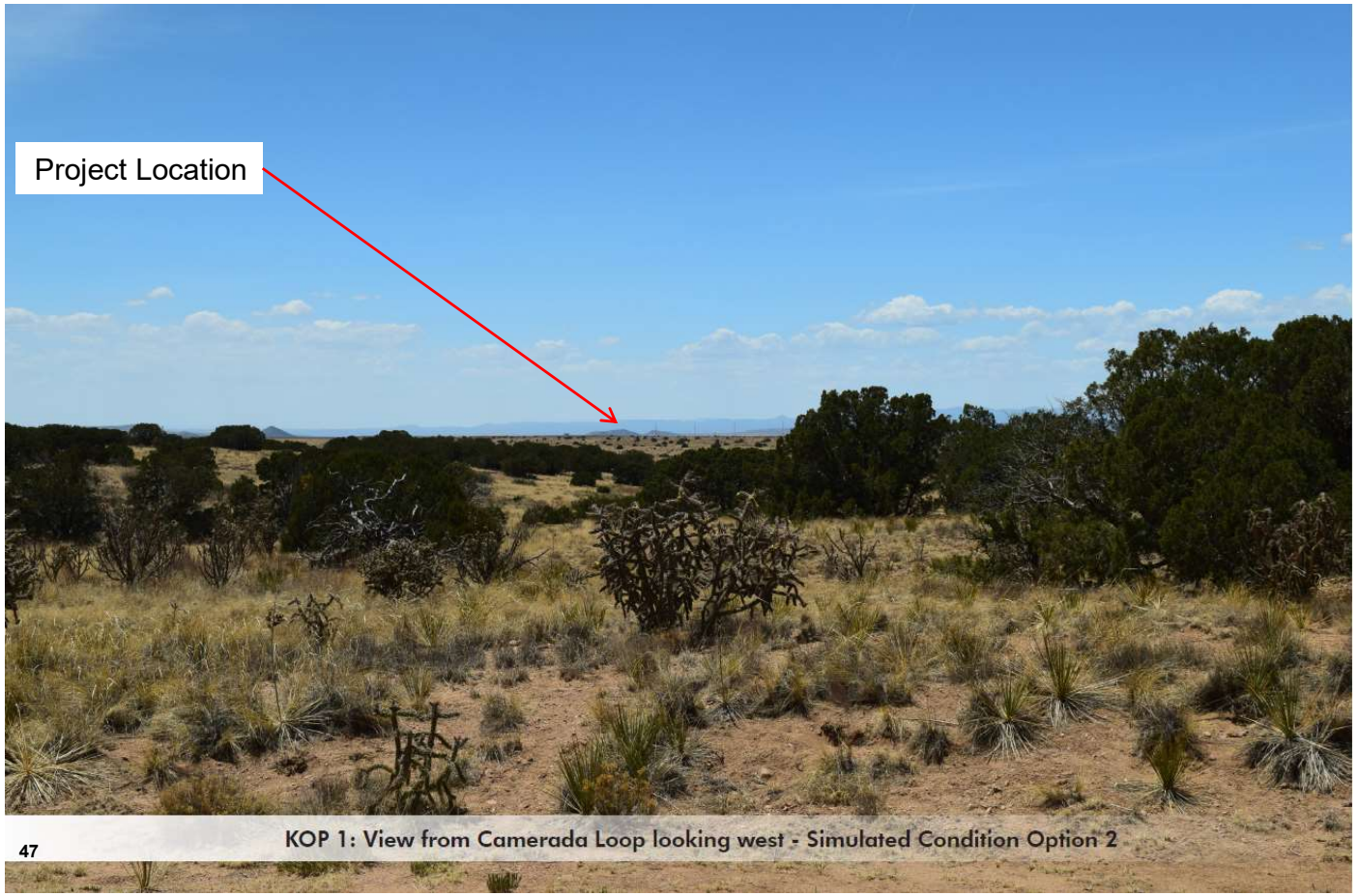


Photo capture location

H-Frames structures up to 50 feet in height with structure spans ranging from 250 feet to 350 feet.

Visual Simulation – View from Camerada Loop (Monopole)



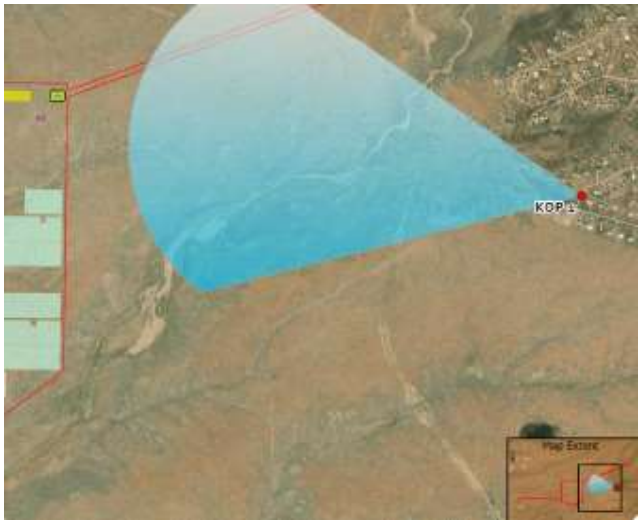
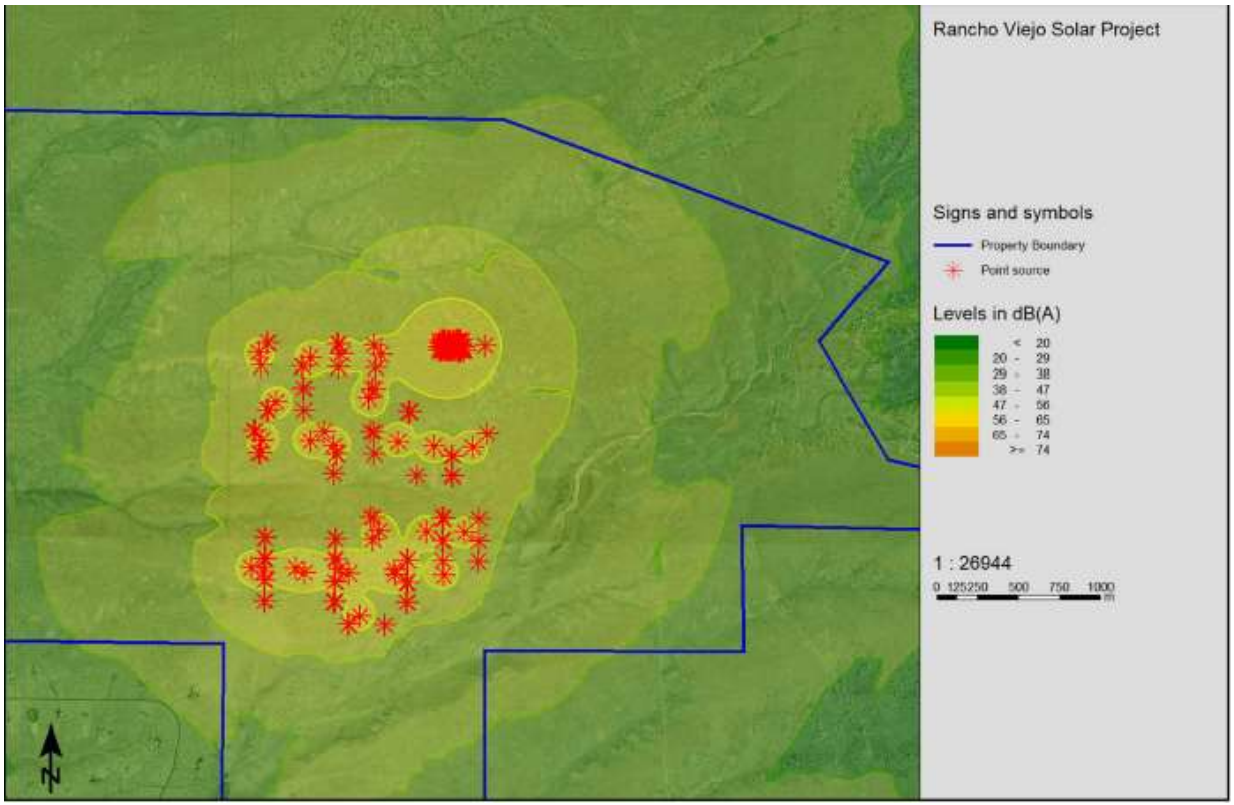


Photo capture location

Monopole structures up to 70 feet in height with structure spans ranging from 250 feet to 450 feet.

Noise Technical Study



- Detailed operation-related noise modeling completed using SoundPlan
- Noise level at the closest property boundary of 40.6 dBA during daytime hours and 38.4 dBA during nighttime hours
- Calculated noise levels emitted would be below Ordinance No. 2016-9 Chapter 7 – Sustainable Design Standards
  - Daytime: 55 dBA, or 5 dBA above ambient ; whichever is less. (note: ambient daytime noise is 38.4 dBA).
  - Nighttime: 45 dBA, or 5 dBA above ambient; whichever is less (note: ambient nighttime noise is 34.0 dBA)

FK 5-1-12 Clean Agent Fire Suppression

- Non-PBT (persistent, bio-accumulative, toxic) clean agent!
- Housed in canister within BESS enclosure
- BESS enclosures have an ingress protection (IP) rating of IP55, no leaking at low pressure.
- Applied inside the BESS enclosure **directly** at affected battery cell, vaporized upon contact
  - ➢ Not a flooded application
- Water not to be applied to affected container – no medium for groundwater contamination

Table 2.5: Halogenated gaseous agents used in total flooding applications – environmental factors

Generic Name	Ozone Depletion Potential (1)	Global Warming Potential, 100 yr. (2)	Atmospheric Life Time, yr. (2)
Halon 1301	10	7,140	65
HCFC-22 (component in HCFC Blend A)	0.055	1,760	11.9
HCFC-124 (component in HCFC Blend A)	0.022	527	5.9
HCFC-123 (component in HCFC Blend A)	0.02	79	1.3
HFC-23	0	12,400	222
HFC-125	0	3,170	28.2
HFC-227ea	0	3,350	38.9
HFC-236fa	0	8,060	242
FK-5-1-12	0	< 1	7 days
HFC-134a (component in HFC Blend B)	0	1,300	13.4
HFC-125 (component in HFC Blend B)	0	3,170	28.2

Note 1: Source: Montreal Protocol Handbook (2012)
Note 2: Source: IPCC 5th WGI Assessment Report http://www.climatechange2013.org/

Water Use - Construction and Operation

Construction Water (Temporary)

- 100 to 150 acre-feet over a 12-month construction period
- Approximately 50 percent of construction water used will be reclaimed water

Operation Water Use

- 2-to-3 acre-feet per year for panel washing, and will be primarily reclaimed water
- O&M building potable water use will be 3,000 gallons per month

Weed Management

Avoidance and Minimization

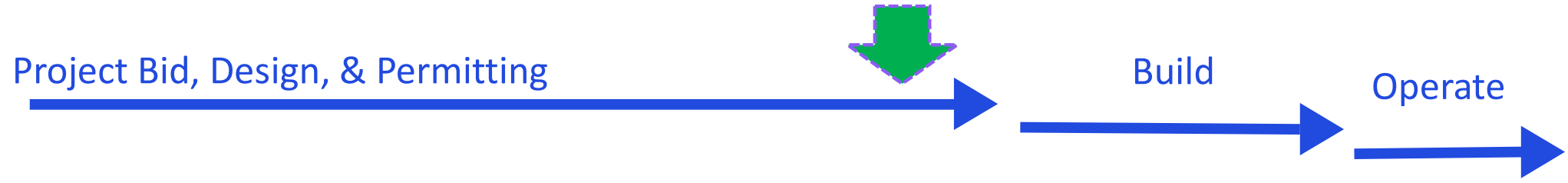
- Equipment will be cleaned and inspected prior to being brought onsite
- Soil disturbance will be limited to the minimum area feasible
- Sediment control BMPs (e.g. hay bales) and imported gravel will be certified weed free

Containment and Control

- Manual and mechanical treatment (hand pulling and weed trimmers)
- Herbicide application, by state-certified herbicide applicator per NM Pesticide Control Act, Chapter 76 Article 4 NMSA
- Herbicides will be used judiciously as an adjunct to manual and mechanical treatment

Typical vegetation/view at Rancho Viejo site

Estimated Project Timeline



2021
- TAC meeting
- Interconnection studies commence

2022
- Initial site studies commence
- 10% design complete

2023
- Initial CUP application submitted
- Site studies continue
- 30% design complete

2024
- Interconnection Agmt issued
- Site studies conclude
- Revised CUP application submitted
- Hearing Officer Meeting

2025
- PNM RFP submission
- Planning Commission Hearing
- Target permit CUP approval
- Target PPA /ESA contracting

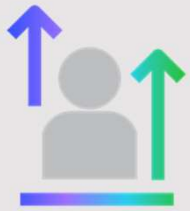
2026-2028
- 100% design complete
- Contract EPC
- Initiate Construction in 2027
- Conclude construction/ interconnection in 2028

2028 – 2063
- Operate for 35 years
- Repower or decommission project
- Restore land

Rancho Viejo Solar + Storage

Benefits: Economic

Market-competitive supply of clean energy at a long-term fixed cost to PNM ratepayers



~200 construction jobs (direct)

~Contributions to local services (accommodation, restaurants, professional services)

>$200 million capital investment

~$28 million in labor and wages

~$5 million in wages/material within Santa Fe county

~>$18M in NM mfg output

~>$10 million in property taxes

~$4 million in est. GRT tax

~$3M to County

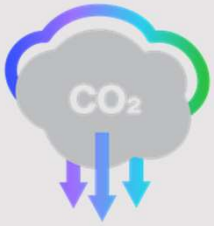
Rancho Viejo Solar + Storage

Benefits: Environmental

Low impact development that diversifies and strengthens grid resiliency in Santa Fe county

Serve **~1.1%** of all of New Mexico's load in support of its goal to procure 100% renewable energy by 2045

Renewable power for equivalent of **37,042** homes' annual electricity use



Avoid emissions equivalent of **~42,364** gasoline powered cars annually

CUP Approval Criteria

SLDC, Section 4.9.6.5, Approval Criteria. CUPs may only be approved if it is determined that the use for which the permit is requested will not:

1. be detrimental to the health, safety and general welfare of the area;
2. tend to create congestion in roads;
3. create a potential hazard for fire, panic, or other danger;
4. tend to overcrowd land and cause undue concentration of population;
5. interfere with adequate provisions for schools, parks, water, sewerage, transportation or other public requirements, conveniences or improvements;
6. interfere with adequate light and air;
7. be inconsistent with the purposes of the property's zoning classification or in any other way inconsistent with the spirit and intent of the SLDC or SGMP.

Response to Hearing Officer's Recommendations

Project is too big and close to communities

- Sized to generate clean energy equivalent to approximately the entire Santa Fe residential load/year
- BESS 1.5 miles from nearest residence
- Solar 1/3 mile from nearest residence, only 20 homes within 1 mile, most >1.5 miles

Concerns with BESS safety and previous incidents

- Prior incidents were earlier generation deployments lacking evolved safety features updated to NFPA 855 (2023) and UL9540 (2023) standards and associated fire safety codes

Ability for County to manage a potential BESS incident without a proper hazmat team

- Santa Fe County Fire Dept and Atar Fire independent consultant *"concluded that a sufficient level of information has been provided to validate the issuance of a Conditional Use Permit, as it pertains to fire and life safety code"* - **Conditional Use Permit Plan Review dated 10/11/24**

The proposed system is older, less safe type of technology

- Proposed BESS is latest generation technology designed and tested to NFPA 855 and UL9540

Response to Hearing Officer's Recommendations

Impact of PFAS from fire suppressant on groundwater

- Facility is primarily constructed and operated with solid-state materials; negligible liquids
- Not all PFAs are the same: FK 5-1-13 is non-PBT, contained, benign, and quickly evaporating in rare deployment
- Water is **not** used in a rare case of a thermal event -> no medium for groundwater contamination

Potential for wildfire

- Redundant fire safety design features diminish likelihood of a thermal event; laboratory tested
- Fire-rated enclosures, concrete pads, graveled perimeter, defensible space void of vegetation

Impact to property values and ability to obtain insurance

- Performed property appraisals conclude no likely impact to property value. No known evidence of home insurance affected by proximity of Solar and/or BESS projects to residence

Outdated/inaccurate info cited in recommendation

- *First Responder Mitigation Guidelines* cited had been updated on 10/10/2024 already, cited language had been removed to mention use of direct-injection clean agent fire suppression system

What we can do today

UNITED NATIONS

Thank you!

The sun sets on the horizon, but Rancho Viejo Solar will keep the lights on for Santa Fe into the night

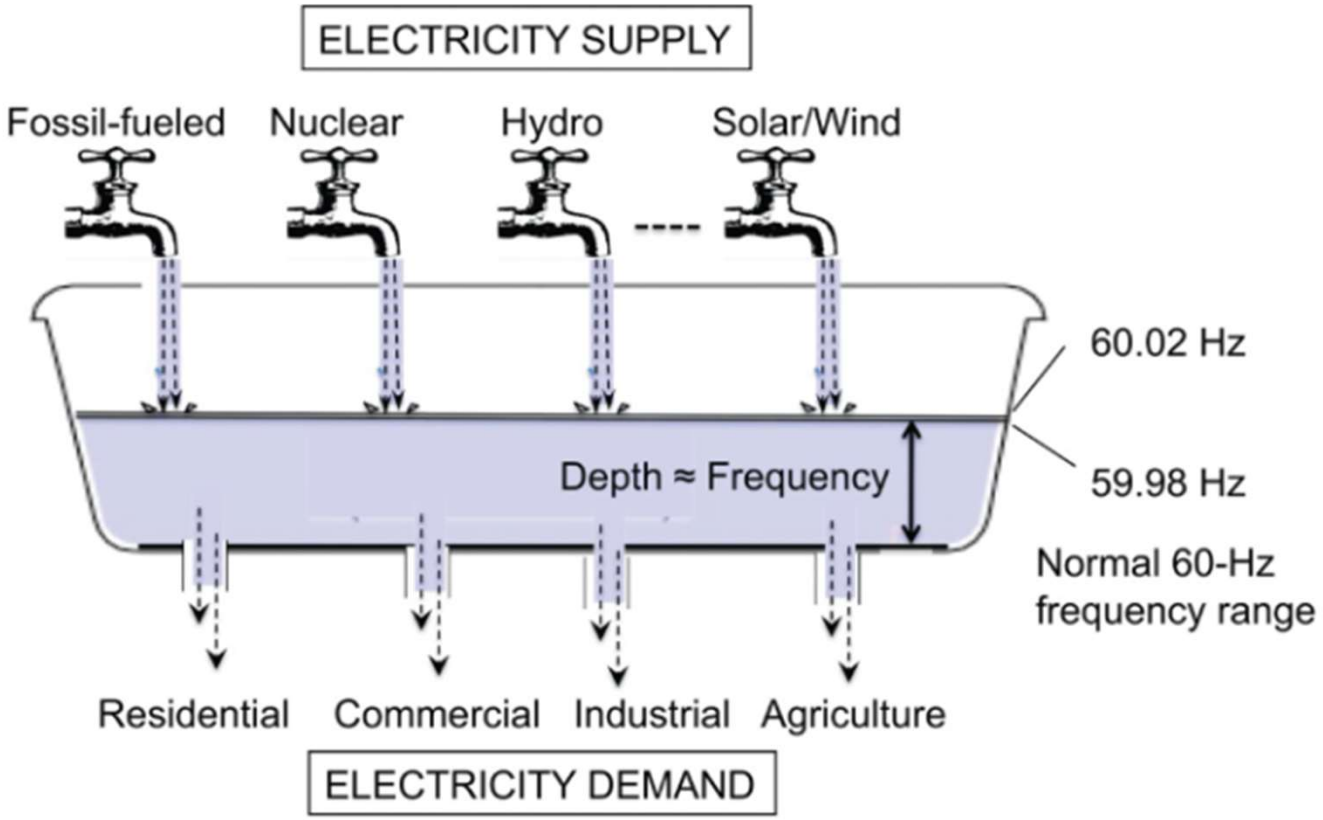
Questions?

Contact us:

Email: RanchoViejoSolar@aes.com
Web: www.aes.com

Appendices

Project Location - Where does the power go?



CUP Approval Criteria

SLDC, Section 4.9.6.5, Approval Criteria. CUPs may only be approved if it is determined that the use for which the permit is requested will not:

1. be detrimental to the health, safety and general welfare of the area;

- The project is designed and will be implemented to not adversely impact the health, safety and welfare of the surrounding area.
- The project will be developed to comply with all applicable requirements contained in the SLDC and all state and federal laws, and all codes and standards as adopted in Santa Fe County, including IFC, 2021 Edition and NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, 2023 Edition.

2. tend to create congestion in roads;

- Traffic added to NM14 primarily to support temporary construction. Operational traffic will be minimal.
- A Site Threshold Analysis (STA) was submitted to NMDOT District 5 in support of the NMDOT Access Permit. NMDOT accepted the STA and requested application for a NMDOT Access Permit.
- NMDOT Environmental Design Division provided environmental clearance of the application. NMDOT Drainage Design Bureau provided acceptance of the application.
- NMDOT Access Permit was approved.

CUP Approval Criteria (continued)

SLDC, Section 4.9.6.5, Approval Criteria. CUPs may only be approved if it is determined that the use for which the permit is requested will not:

3. create a potential hazard for fire, panic, or other danger;

- The project will comply with the most current applicable codes adopted by the State of New Mexico, Santa Fe County, and other entities.
- The project will include 20-foot-wide roads, 28-foot turning radii, and a 30,000-gallon on-site water tank.
- The BESS containers will be equipped with internal fire suppression systems.
- All information required by the first responders will be included in the first responder plan part of the final approved Hazard Mitigation Analysis (HMA).
- The Applicant will provide on-site and in-person training to the local responders prior to commercial operation of the system.

4. tend to overcrowd land and cause undue concentration of population;

- The project is a static, non-obtrusive, use of land that will not overcrowd the land nor cause undue concentration of population. The project includes 340 acres of designated natural open space which exceeds the requirements of the SLDC; and will be coupled with a TDR of 5,700ac of adjacent land

CUP Approval Criteria (continued)

SLDC, Section 4.9.6.5, Approval Criteria. CUPs may only be approved if it is determined that the use for which the permit is requested will not:

5. interfere with adequate provisions for schools, parks, water, sewerage, transportation or other public requirements, conveniences or improvements;

- The project is in a remote area of Santa Fe County and will not interfere with adequate provisions for schools, parks, water, sewerage, transportation or other public requirements.

6. interfere with adequate light and air;

- Minimal lighting is included for security and will meet SLDC requirements and be shielded and downlit.
- The “Monopole” or “H-frame” structures allows for air and wind to flow through with minimal obstruction.

7. be inconsistent with the purposes of the property's zoning classification or in any other way inconsistent with the spirit and intent of the SLDC or SGMP.

- A commercial solar energy production facility within the Rural Fringe (RUR-F) Zoning District is an allowed use with the approval of a CUP.
- Chapter 7 of the SGMP explicitly supports the development and distribution of renewable energies at a regional scale.

Response to Hearing Officer's Recommendations

Project is too big and close to communities

- The project is appropriately sized to produce the amount of carbon-free energy approximately equivalent to the entire residential energy demand of Santa Fe annually.
- The BESS is located 1.5 miles from the nearest residence, an exceptional setback compared to recently approved projects elsewhere in the state, including one in Albuquerque sited just 500 feet from densely populated neighborhoods.

Concerns with BESS safety and previous incidents

- Safety is AES' number one value and priority. AES has taken a leadership role in collaborating with industry and fire protection professionals to evaluate past incidents; revise testing, design and operational protocols; and strengthen fire safety standards to which deployed BESS must comply to prevent further incidents in the future. As a result of these industry-wide efforts, the failure rate of BESS has fallen precipitously while the deployed capacity has grown exponentially.
- The specified BESS equipment for Rancho Viejo was tested vigorously to the UL 9540a procedure by an independent, nationally recognized laboratory, and concluded that *"the installation level test did not result in propagation of a thermal runaway event from the failure of a single cell. No flaming or flying debris was observed outside of the enclosure."*

Response to Hearing Officer's Recommendations (continued)

Ability for County to manage a potential BESS incident without a proper hazmat team

- AES has worked closely with the SFCFD in its review of the project, and we are committed to providing comprehensive first responder training prior to commissioning and during operations of the Rancho Viejo facility.
- Both SFCFD and the third-party, independent fire professional consultant (ATAR Fire) hired by the County have reviewed the AES permit application and agreed that the project meets appropriate criteria for issuing a CUP.
- All fire hazards have been mitigated by a combination of layered passive and then active technologies incorporated into the BESS design and then rigorously tested. If a truly unavoidable event occurs (e.g., a plane crash into BESS containers), the large-scale fire testing of this system indicates that a fire will consume hazardous materials, leaving a plume of smoke and a pile of ash.
- Plume studies indicate that smoke will rise well above altitudes that could pose health hazards - recent examples, such as the SDG&E Escondido BESS fire, exhibit no hazardous exposure to neighbors. Ash can be disposed of by trained hazmat under the direction of AES as owner and operator. As no liquid is involved in the suppression of the fire, AES and independent reviewers both expect no water table exposure.

Response to Hearing Officer's Recommendations (continued)

The proposed system is older, less safe type of technology

- This is not true and appears to be an unsupported conclusion borrowed from a statement made by a presenting member of the project opposition.
- The BESS system proposed by AES for Rancho Viejo incorporates the latest generation of battery energy storage system technology that fully complies with NFPA 855 and all other applicable fire codes and standards, including UL 9540a testing, which demonstrated successful prevention of thermal runaway from a single cell failure.

Impact of PFAS from fire suppressant on groundwater

- Water is not employed to extinguish a BESS fire in the highly unlikely case that a thermal event or fire occurs. The industry standard guidance is for first responders to maintain a defensive perimeter (150ft away), apply water to adjacent areas to further bolster containment, and allow for the affected container to burn itself out in a matter of hours.
- In combination with the IP55 ingress protection rating of the battery enclosure, which prevents egress of leaking fluids at low pressure, there is no means for FK-5-1-12 (the fire suppression clean agent) to enter groundwater.
- FK-5-1-12 is non PBT (persistent, bio accumulative, toxic) clean agent fire suppressant

Response to Hearing Officer's Recommendations (continued)

Potential for wildfire

- The UL9540a is a *"installation level test did not result in propagation of a thermal runaway event from the failure of a single cell. No flaming or flying debris was observed outside of the enclosure."* Based on this result, and in combination with additional design measures such as adequate spacing between containers placed on concrete pads, along with an additional 30' of defensible space of crushed gravel without vegetative fuel, and a perimeter fire break, the facility has been designed to not only protect *itself* from an approaching wildfire, but also not be the cause of one.
- According to the most recent Santa Fe County Wildland Urban Interface fire risk map, the project is located in the lowest area of wildfire risk in the region. In fact, 30% of the ground within the project location is barren.

Response to Hearing Officer's Recommendations (continued)

Impact to property values and ability to obtain insurance

- AES commissioned an appraisal report using standards and practices established by the Appraisal Institute in conformance to the Uniform Standards of Appraisal Practice and invited the independent review of that report by a Santa Fe-based appraiser, in which both parties concluded that the proposed Rancho Viejo project would not have a negative impact on market values of properties in the vicinity.
- There is also no evidence or precedent for home insurance coverage being denied due to proximity to a solar or BESS facility.

Outdated/inaccurate info cited in recommendation

- Inaccurate information from an outdated sample draft of a First Responder Mitigation Guidelines document was referenced in the hearing officer's analysis when an updated version of the document was supplied to the County on October 10th.
- The updated document contains factual information about the demonstrated effectiveness of the direct injection fire suppression system at diminishing the likelihood of a thermal runaway event.