Filing Receipt

Filed Date - 2025-06-09 02:36:08 PM

Control Number - 57501

Item Number - 91

SOAH DOCKET NO. 473-25-14211
PUC DOCKET NO. 57501

APPLICATION OF EL PASO ELECTRIC COMPANY TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 100 MW SOLAR/100 MW BATTERY STORAGE FACILITY	§ § § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S
SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

TABLE OF CONTENTS

JUNE 9, 2025

SOAH DOCKET NO. 473-25-14211
PUC DOCKET NO. 57501

APPLICATION OF EL PASO ELECTRIC COMPANY TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 100 MW SOLAR/100 MW BATTERY STORAGE FACILITY	§ § § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-1:

Please provide detailed information regarding any incidents where DEPCOM Power, Inc. (or its affiliate/parent companies that will be assisting with the project, if applicable) was involved with a Battery Energy Storage System (BESS) that experienced thermal events, fires, or failure:

a. Specify the total number of such incidents in which DEPCOM has been involved, either during installation, maintenance, or operation.
b. For each incident, detail the specific environmental consequences that resulted.
c. Quantify the volume of water used in firefighting or containment effort for reach incident (in gallons).
d. Identify and quantify all fire suppressant chemicals deployed (by type and volume).
e. Provide documents environmental impact assessments showing effects on air quality (including specific contaminants released), soil contamination (depth and spread of contamination), surface water impacts (including runoff containment measures), and groundwater impacts (including any monitoring data from post-incident testing).

RESPONSE:

a. DEPCOM has not been involved in or is aware of any such incidents occurring on this platform during transportation, installation, maintenance, or operation.

b. No such incidents have occurred.

c. Water is not recommended for use in such incidents, and no incidents have occurred.

d. No such incidents have occurred.

e. No such incidents have occurred.

Preparer: Edmundo Salazar Title: Director – Project Development

Sponsor: Edmundo Salazar Title: Director - Project Development

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EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-2:

Please provide complete material safety data sheets for all battery components, including battery cells, electrolytes, thermal management fluids, and all chemicals contained within the BESS.

RESPONSE:

Please refer to CEP 6-2, Attachment 1 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

Preparer: Edmundo Salazar Title: Director – Project Development

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CEP 6-2 Attachment 1 is a CONFIDENTIAL and/or HIGHLY SENSITIVE PROTECTED MATERIALS attachment.

SOAH DOCKET NO. 473-25-14211
PUC DOCKET NO. 57501

APPLICATION OF EL PASO ELECTRIC COMPANY TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 100 MW SOLAR/100 MW BATTERY STORAGE FACILITY	§ § § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-3:

Please provide comprehensive safety documentation addressing:

a. thermal stability parameters (specific temperature thresholds)
b. storage requirements and limitations
c. heat exposure limitations (maximum safe operating temperature)
d. cold exposure limitations (minimum safe operating temperature)
e. short circuit prevention mechanisms and response protocols
f. physical damage (puncture, crush, impact) response characteristics
g. failure mode analysis for damaged components.

RESPONSE:

a. Please see section 3.4 of CEP 6-4, Attachment 1 EnerC+ Specs – HSPM for temperature thresholds.

b. Please see CEP 6-7, Attachment 1 EnerC+ SDS – HSPM for this information.

c. The maximum operating temperature is 55 Celsius.

d. The minimum operating temperature is -25 Celsius.

e. Please refer to section 2.4.2 of CEP 6-7, Attachment 4 EnerC+ Hazard Mitigation Analysis – HSPM for this information.

f. Please refer to section 2.4.1 of CEP 6-7 Attachment 4 EnerC+ Hazard Mitigation Analysis – HSPM for this information.

g. Please refer to the CEP 6-7, Attachment 4 EnerC+ Hazard Mitigation Analysis – HSPM for this information.

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EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-4

Please provide complete fire containment risk information, including:

a. Fire propagation patterns specific to the proposed battery chemistry.
b. Containment design specifications.
c. Fire-response time requirements before containment is compromised.

RESPONSE:

a. The CATL EnerC+ utilizes lithium-iron phosphate batteries and there are 104 cells in each module. UL 9540A testing was conducted to evaluate the propagation of thermal runaway. In the UL 9540A module level test, one cell was induced into thermal runaway and it propagated to two adjacent cells, one on each side of the initiating cell. The effects of thermal runaway were contained by the module design.

b. Please refer to CEP 6-4, Attachment 1 HIGHLY SENSITIVE PROTECTED MATERIAL.

c. The product is designed and tested such that fire department response is not necessary for containment of a fire.

Preparer: Edmundo Salazar Title: Director – Project Development

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EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-5

Please provide comprehensive explosion risk analysis, including:

a. Gas generation rates during thermal events.
b. Pressure buildup calculations for specific container design.
c. Explosion prevention systems.

RESPONSE:

a. The gas release rate curve is shown on Fig. 2 in the CEP 6-5, Attachment 1 EnerC+ Fire Protection Assessment HIGHLY SENSITIVE PROTECTED MATERIAL (HSPM).

b. Due to the ventilation and smoke exhaust system there is no pressure buildup in the container. Information on this system can be found in the provided CEP 6-7, Attachment 3 EnerC+ Fire Suppression System – HSPM. Additionally, the fan startup operating curve can be found in Fig. 3 of the provided CEP 6-5, Attachment 1 EnerC+ Fire Protection Assessment - HSPM.

c. Please refer to section 2.4.1.2 Barriers of the provided CEP 6-7, Attachment 4 EnerC+ Hazard Mitigation Analysis - HSPM for this information.

Preparer: Edmundo Salazar Title: Director – Project Development

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EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-6

Please provide detailed information regarding thermal management:

a. Cooling system design specifications.
b. Warning systems for cooling failures.
c. Backup cooling provisions.
d. Maximum time the system can safely operate with impaired cooling.
e. Response protocols for cooling system failures.

RESPONSE:

a. Please refer to section 6 of the provided CEP 6-4, Attachment 1 EnerC+ Specs - HSPM for this information.

b. Please review the provided CEP 6-6, Attachment 1 EnerC+ BMS Fault List - HSPM for a breakdown of the warning system. There are several that related to temperature management.

c. Please refer to section 6 of the provided CEP 6-4, Attachment 1 EnerC+ Specs - HSPM for this information.

d. The operation time in this case would be determined by the severity of the impairment. The system would continue to operate until one of the faults as noted in the provided CEP 6-6, Attachment 1 EnerC+ BMS Fault List - HSPM were triggered. In many cases Operators would be able to be identify temperature anomalies and conduct repairs prior to operation being impact as the site is remotely monitored and serviced frequently.

e. Please review the attached CEP 6-6, Attachment 1 EnerC+ BMS Fault List - HSPM for this information.

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CEP 6-6 Attachment 1 is a CONFIDENTIAL and/or HIGHLY SENSITIVE PROTECTED MATERIALS attachment.

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PUC DOCKET NO. 57501

APPLICATION OF EL PASO ELECTRIC COMPANY TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 100 MW SOLAR/100 MW BATTERY STORAGE FACILITY	§ § § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-7

Please provide a comprehensive hazard analysis for:

a. Cell leakage (electrolyte composition and containment).
b. Early warning detection capabilities for thermal events.
c. Flammable gas generation (types, quantities, and ventilation systems).
d. Explosion prevention mechanisms.
e. Thermal runaway prevention and containment systems.

RESPONSE:

a. Please refer to CEP 6-7, Attachments 1 and 2 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

b. Please refer to CEP 6-7, Attachment 3 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

c. Please refer to CEP 6-7, Attachments 1 and 2 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

d. Please refer to section 2.4.1.2 Barriers of CEP 6-7, Attachment 4 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

e. Please refer to section 2.4.1.2 Barriers of CEP 6-7, Attachment 4 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

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CEP 6-7 Attachments 1, 2, 3, 4 are CONFIDENTIAL and/or HIGHLY SENSITIVE PROTECTED MATERIALS attachments.

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EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-8

Please provide a detailed risk assessment of thermal management system failure addressing

a. system response to ambient temperature exceeding 100 degrees F, including
    i. Maximum internal temperatures reached
    ii. Time to critical thermal conditions
b. System response to ambient temperature below 30 degrees F, including
    i. Effects on battery performance and safety systems
    ii. Potential for freezing of cooling components

RESPONSE:

a. The system has no specific response to a 100 degree threshold, and can safely operate up to 131 degrees Fahrenheit. For other system responses for temperature related faults, please refer to the provided CEP 6-6 Attachment 1 EnerC+ BMS Fault List – HSPM.
    i. The thermal management system maintains a "reasonable" temperature internally for operation up to 131 degrees Fahrenheit (ambient). Details on the thermal management system can be found on the provided CEP 6-4 Attachment 1 EnerC+ Specs – HSPM.
    ii. There would be no critical thermal conditions at this temperature.

b. System responses in this case can be found on the provided CEP 6-6 Attachment 1 EnerC+ BMS Fault List – HSPM.
    i. This temperature, minus 30 degrees Fahrenheit, is below the systems operating limit so the batteries would not charge or discharge. There would be no effects on the safety system.
    ii. The thermal management system utilizes the same liquid for heating and cooling the batteries. The cooling components would not freeze as the PTC heater would be using that same liquid to warm the batteries. Please see the provided CEP 6-4 Attachment 1 EnerC+ Specs - HSPM for additional information.

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EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-9

Please provide an analysis of the sequence of events following battery management system failure when ambient temperature exceeds 100 degrees F, the time estimate from system failure to thermal event, and specific containment measures that remain functional without active management.

RESPONSE:

The system has no specific response to a 100 degree threshold and can safely operate up to 131 degrees Fahrenheit. For other system responses for temperature related faults, please refer to the provided CEP 6-6 Attachment 1 EnerC+ BMS Fault List – HSPM.

Regarding the time estimate from system failure to thermal event, there is no critical thermal conditions at 100 degrees Fahrenheit. All containment measures remain functional without active management.

Preparer: Edmundo Salazar Title: Director – Project Development

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APPLICATION OF EL PASO	§	BEFORE THE STATE OFFICE
ELECTRIC COMPANY TO AMEND	§	
ITS CERTIFICATE OF	§	OF
CONVENIENCE AND NECESSITY	§	
FOR A 100 MW SOLAR/100 MW	§	ADMINISTRATIVE HEARINGS
BATTERY STORAGE FACILITY	§	

EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-10

Please provide an analysis of the sequence of events following battery management system failure when ambient temperature is below 30 degrees F and the risks associated with system damage due to freezing.

RESPONSE:

System responses in this case can be found on the provided CEP 6-6 Attachment 1 EnerC+ BMS Fault List – HSPM. The thermal management system utilizes the same liquid for heating and cooling the batteries. The cooling components would not damage from freezing as the positive temperature coefficient (PTC) heater would be using that same liquid to warm the batteries. Please see the provided CEP 6-4 Attachment 1 EnerC+ Specs - HSPM for additional information.

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EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-11

Please provide detailed information on leakage containment:

a. Primary containment system for electrolyte leakage.
b. Secondary containment capacity (in gallons).
c. Leak detection system and response time.
d. Procedures for preventing leaked materials from reaching soil or groundwater.
e. Composition of all potentially leakable materials and their environmental persistence.

RESPONSE:

a. The LFP cells are individually hermetically sealed and do not off gas during normal operation. In addition, they do not contain any free-flowing liquids like other battery chemistries do (such as lead acid). Because of this, the International Fire Code and NFPA 855 do not require spill control or neutralization for lithium ion batteries. However, the cells are even further contained within the EnerC+ outdoor NEMA rated cabinet, which is designed and tested to prohibit water / particulate ingress/egress.

b. Containment of BESS materials is reached through the design of the container and battery cells themselves as opposed to a tank/spill over that is rated in gallons. Please refer to CEP 6-4, Attachment 1, for additional information.

c. The LFP cells are individually hermetically sealed and do not off gas during normal operation. In addition, they do not contain any free-flowing liquids like other battery chemistries do (such as lead acid). Because of this, the International Fire Code and NFPA 855 do not require spill control or neutralization for lithium ion batteries. However, the cells are even further contained within the EnerC+ outdoor NEMA rated cabinet, which is designed and tested to prohibit water / particulate ingress/egress. Because of this, there is no system in place to specifically detect leaks outside of the container. However, there

are several detection and notifications systems that exist at the start of a fire hazard as described in the provided "2. EnerC+ Fire Suppression System." Meaning that if some material were to escape the enclosure, these detections and alarms would have been activated already giving Plant Operators and First Responders time to respond.

d. The LFP cells are individually hermetically sealed and do not off gas during normal operation. In addition, they do not contain any free-flowing liquids like other battery chemistries do (such as lead acid). Because of this, the International Fire Code and NFPA 855 do not require spill control or neutralization for lithium ion batteries. However, the cells are even further contained within the EnerC+ outdoor NEMA rated cabinet, which is designed and tested to prohibit water / particulate ingress/egress.

e. Please refer to CEP 6-7, Attachments 1 and 2 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

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ELECTRIC COMPANY TO AMEND	§	
ITS CERTIFICATE OF	§	OF
CONVENIENCE AND NECESSITY	§	
FOR A 100 MW SOLAR/100 MW	§	ADMINISTRATIVE HEARINGS
BATTERY STORAGE FACILITY	§	

EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-12

Please provide detailed information on fire containment:

a. Fire suppression system specifications.
b. Secondary containment for fire suppression runoff.
c. Procedures to prevent contaminated firefighting water from reaching an aquifer.
d. Maximum design fire duration the containment systems can handle.

RESPONSE:

a. Details on the fire suppression system specifications can be found in the provided CEP 6-7 Attachment 3 EnerC+ Fire Suppression System – HSPM.

b. Containment of BESS materials is reached through the design of the container and battery cells themselves. Please refer to the provided CEP 6-4 Attachment 1 EnerC+ Specs - HSPM for additional information.

c. Industry guidance from associations such as the International Association of Fire Chiefs, International Association of Fire Fighters, and the National Fire Protection Association do not recommend applying water directly to an active BESS fire. Water cannot penetrate the BESS container and water on the batteries has the potential to cause thermal runaway in additional battery cells. Water is typically used to provide adjacent exposure cooling. BESS fires will not be extinguished until its source of fuel (battery state of charge) is fully consumed. A BESS that is actively on fire is considered a loss, and suppression is not necessary. If this guidance is followed (as we believe it will be per discussions with El Paso Fire) then there will be no runoff. These best practices will be addressed in the Third Party Emergency Response Plan.

While fires at energy storage facilities are exceedingly rare and water runoffs are highly unlikely by following battery fire response best practices, there has been extensive research to the impacts to the environment through comprehensive review of analyses of air quality, soil, and/or water. In 2023, the governor of New York directed the Division of Homeland Security and Emergency Services (DHSES) Office of Fire Prevention and Control (OFPC), New York State Energy Research and Development Authority (NYSERDA), New York State Department of Environmental Conservation (DEC), Department of Public Service (DPS), and the Department of State (DOS) to lead a new Inter-Agency Fire Safety Working Group to independently examine energy storage facility fires and safety standards. OFPC and DEC, in collaboration with the State Department of Health, concluded that there were no reported injuries, no harmful levels of toxins detected, and no long-term off-site impacts involving any migration of contaminants associated with the fires. Please refer to CEP 6-12 Attachment 1 for additional information on New York State research.

The City of Escondido, California, performed similar research after the Escondido Fire Department responded to structure fire at the SDG&E battery storage facility. The application of water to adjacent structures with additional batteries was employed as a defensive strategy. The analysis of the samples collected from the runoff water suggests that the water quality is within acceptable limits for most contaminants, especially when considering public health standards for drinking water. The low levels of metals detected, combined with the absence of more toxic elements like lead and cadmium, suggest that the water poses minimal risk both to human health and the environment. Please refer to CEP 6-12 Attachment 2 for additional information on study performed by Eurofins Calscience for the City of Escondido.

d. The product is designed and tested such that fire department response is not necessary for containment of a fire, there is not a design time limit. For additional information, please refer to CEP 6-5 Attachment 1 EnerC+ Fire Protection Assessment – HSPM.

Preparer: Edmundo Salazar Title: Director – Project Development

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NEW YORK STATE INTER AGENCY FIRE SAFETY WORKING GROUP AIR, SOIL, AND WATER DATA FINDINGS

December 2023

Executive Summary

Energy storage facilities play a critical role in New York State's environmental and economic efforts to transition from fossil-fueled energy sources and reduce the emissions that contribute to climate change. Their safe and effective operation are needed to help the state achieve its ambitious climate goals under the Climate Leadership and Community Protection Act and ensuring the protection of communities across the state.

While fires at energy storage facilities are exceedingly rare, fires at facilities in Jefferson, Orange, and Suffolk counties in summer 2023 underscored the importance of ensuring New York State and communities have the knowledge and resources necessary to prevent and address potential fires.

As such, in July 2023, Governor Kathy Hochul directed the Division of Homeland Security and Emergency Services (DHSES) Office of Fire Prevention and Control (OFPC), New York State Energy Research and Development Authority (NYSERDA), New York State Department of Environmental Conservation (DEC), Department of Public Service (DPS), and the Department of State (DOS) to lead a new Inter-Agency Fire Safety Working Group to independently examine energy storage facility fires and safety standards.

The Working Group is leveraging nationally renowned experts and national laboratories in energy storage root cause and emergency response analyses to independently assess and identify common causes, air monitoring results or other community impacts, and other factors potentially involved with energy storage fires. Among its first actions, the Working Group began compiling and reviewing available data collected during and after the four fires this summer. The Working Group gathered data and worked diligently with project developers, equipment manufacturers, and government officials to learn as much as possible about the fires at battery system facilities. The Executive Summary compiles the findings of the investigations to date.

Following a comprehensive review of analyses of air quality, soil, and/or water data collected in the days following each of the fires, OFPC and DEC, in collaboration with the State Department of Health, concluded that there were no reported injuries, no harmful levels of toxins detected, and no long-term off-site impacts involving any migration of contaminants associated with the fires.

The data assembled and analyzed by the Working Group includes:

- An air monitoring report from OFPC and soil and water sampling data received by DEC from the Chaumont site (Jefferson County) and surrounding properties;
- On-site air monitoring results collected from the Warwick (Orange County) sites by emergency responders and relayed to the Working Group by local officials; and
- An independent third-party site inspection report consisting of air monitoring and surface sampling at school buildings in the vicinity of the June 27, 2023, fire at the Warwick site.

The Working Group will continue its efforts to investigate energy storage deployment, including lithium-ion battery storage facilities, and potential fire causes and develop full recommendations on how to help prevent fires and ensure emergency responders have the necessary training and information to prepare and deploy resources in the event of a fire.

BATTERY ENERGY STORAGE SITE INCIDENT SAMPLING

East Hampton

East Hampton Energy Storage is a 4,100-square-foot battery storage facility located on a .5-acre property at 3 Cove Hollow Road in East Hampton, New York. The facility draws power from the grid during off-peak hours and stores it in the lithium-ion battery racks to later be released during high-demand hours, which is especially critical in the summer months.

On May 31, 2023, a fire occurred at the facility, impacting the lithium-ion battery system in the dedicated use building housing the system. The facility maintained the emergency sprinkler system running for approximately 30 hours to make sure the battery fire was fully extinguished. This resulted in the firewater eventually exiting the dedicated use building and discharging to an adjacent dirt road on the southwest side of the building.

On June 14, the facility had a Certified Industrial Hygienist with LiRo Engineers, Inc. take wipe samples from various items inside the dedicated use building to investigate potential contaminants from battery fire fumes. There were no background or "unimpacted" sample results to compare the results with and no conclusions could be made.

On July 13, Miller Environmental Group, Inc. prepared a Site Sampling Plan to evaluate potential impacts to soil on the southwest side of the dedicated use building where firewater migrated. The plan included taking five surficial soil samples in the form of a grid from the potentially impacted area. In addition, two samples on opposite sides of the potentially impacted area were collected and used as background or "unimpacted" samples to compare results.

On July 20, DEC approved the plan, however, out of an abundance of caution, DEC expanded the list of metals required to be sampled to 26 metals, including lithium.

On Oct. 4, under DEC oversight, soil samples were collected in accordance with the Site Sampling Plan and submitted for analysis. On Nov. 9, NextEra Energy submitted a report detailing the results of the investigation to DEC. After reviewing the report, DEC determined there was no discernable difference in the concentration of metals in the soil sample results collected from the firewater discharge area versus the site background soil samples. Since no adverse impacts to soil from the discharge of firewater were identified, DEC did not require groundwater sampling. Based on the results of this investigation, no further remedial actions are required by DEC at this time.

Warwick

Convergent Energy and Power operates two battery storage facilities located at 63 County Route 1 and at Church Street in the Village of Warwick. The lithium-ion battery facility stores extra energy for release back to the electric grid when needed.

On June 27, 2023, a fire occurred at the 63 County Route 1 site. The Orange County Hazardous Materials (HAZMAT) Response Team responded and conducted air sampling to determine if any hazards from the burning materials were present and if measures to prevent public exposure were required. Based on the results of the county's air sampling, no elevated levels of toxic contaminants were detected.

The energy storage facility was located adjacent to property owned by the Warwick Valley Central School District. The fire caused heavy smoke, leading to precautionary evacuations of the district office, Middle School, High School, and Sanfordville Elementary. The school district implemented a sampling plan to test various surfaces that could have been impacted by the smoke, including schools, buses, transportation, and facilities offices. Results came back with levels below detectable limits, including samples taken from inside the buses.

On June 29, a fire was reported at the Church Street site. Orange County HAZMAT again responded and conducted air sampling. DEC Division of Air Resources staff were also on scene for any assistance needed. Based on the sampling results, no elevated levels of toxic contaminants were detected.

No water was used by local emergency responders at either fire location so there was no water runoff and as a result, no soil samples taken by Convergent, DEC, or other first responders due to the limited potential for off-site impacts.

Chaumont

Chaumont Solar is a 22.5-megawatt solar panel and battery storage facility located on County Route 179 in Chaumont, New York. The system is owned by Convergent Energy. The facility has four discrete 5-megawatt and one 2.5-megawatt projects that generate power from on-site solar panels during peak daylight hours and stores a portion in on-site lithium-ion batteries to be released later during high-demand hours. Each solar panel project has its own modular battery storage system.

On July 27, 2023, a fire occurred at the Chaumont Solar 4 facility in one of the battery storage modules. The local fire department and county emergency management applied water to cool at-risk electrical components and suppress vapors. OFPC supplied advisors, infrared-capable drone resources, and air quality monitors at the village limits. DEC Law Enforcement was on-site for the initial response and DEC Spill Response was on-scene to observe and start building a remedial strategy.

Over the course of approximately five days, fire departments applied a large volume of water to the fire and adjacent equipment. Neighbors with private drinking water wells on adjacent properties were concerned of potentially contaminated leachate affecting their wells.

Reportedly the battery chemistry used at the facility was "lithium nickel manganese cobalt oxide." Plastics, carbon black, iron, aluminum, and fluorides typical of battery electrolytes and construction packaging were presumed present and all were considered potentially released in the resulting fire and runoff.

Groundwater samples were analyzed for volatile organics (VOCs), semi-volatile organics (SVOCs) total analyte lists and EPA 6010 metals for calcium, cobalt, iron, manganese, nickel,

lead and zinc. The lab report included representative battery chemistry metals and most related VOC/SVOC compounds from fire debris that would be present.

On Aug. 4, DEC Spill Response implemented an off-site groundwater sampling plan and mobilized a remedial investigation contractor to collect baseline groundwater data ahead of any effects from leachate reaching the local water table used for drinking water. DEC's contractor took groundwater samples from 11 wells actively used for drinking water. DEC staff, its contractor, a Convergent representative, and their environmental contractors were in attendance.

Groundwater laboratory data was received on Aug. 17. DEC reviewed the data in coordination with the New York State Department of Health's (DOH) Center for Environmental Health. No apparent fire contaminants were identified. DEC and DOH drafted test result letters for each well tested. Letters were sent to residents on Aug. 22.

On Aug. 24, Convergent environmental contractors sampled surficial on-site soils around the facility representing various baseline and downwind locations around the property. Safety buffers of 15 feet remained around the impacted power equipment, so contractors advanced two test pits 20 feet from equipment and took samples at the surface and bedrock interface.

As of Nov. 14, the failed equipment had not been removed from the site. Soil sampling directly beneath equipment is not possible until the equipment is removed. Next steps involve tracking impacted equipment removal and accessibility of native soils to sample, reviewing groundwater re-test results, and assessing whether an additional round of groundwater sampling in 2024 is warranted. Out of an abundance of caution, DEC resampled residential wells on Dec. 6 and anticipates results in early January 2024. New York State will take all necessary precautions if contamination is found to ensure protection of public health and the environment.

BESS Incident Overviews

Warwick NY- June 27th through 29th, 2023.

- 6/27/23- Fire is reported at Convergent Energy site #2, 28 Church Street Extension in the Town of Warwick adjacent to the local school bus garage; Site #1 in the Village of Warwick (behind the Warwick FD) also had an issue the same day that did not result in a fire. Local FD, Convergent Energy and Orange County Hazmat respond.
- 6/28/23- FPS V. Graves is contacted by detective Michael Hoffman of the Warwick PD re: an active fire investigation at the Convergent site #2. FPS Graves gave general overview of BESS emergencies and potential problems. Also on this date, BC Baker spoke with HM Chief Wayne Melton of Orange County HM regarding air monitoring and fire scene operations. Chief Melton indicated air monitoring for O2, CO, H2S, LEL, VOC and HCN with low levels of CO and HCN detected in the area approximately 1 meter from the affected containers and no readings outside the fence line.
- 6/29/23- In conjunction ESRG, OFPC was requested to the scene at site #2 for technical assistance. DC Jones and FPS Graves responded at 17:59 hours and on arrival (approximately 19:30 hours) witnessed the dismantling of several centipede type containers. Removal of the sections was required to isolate and prevent further fire spread. DC Jones and FPS Graves remained on scene until 22:00 hours.

Chaumont NY- July 27th through August 1st, 2023.

- 7/27/23- OFPC was requested for technical assistance at 16:49 for a fire that had started 13:10 at 2783 CR 179 in the Town of Lyme, Chaumont Fire District, Jefferson County NY. Air monitoring was conducted by OFPC for HCN specifically with no readings found at 19:41. OFPC was released from the scene by Chaumont FD and Jefferson County at 20:48 hours.
- 7/28/23- OFPC is requested to the incident by CFC Plummer and the Chaumont Fire Chief at 10:01. Staff arrives at noon and begins 24hour coverage of the scene. Staffing ramps up and will later include six or more FPS, Hazmat 2 and UAS support.
- 7/29/23- At 0500 staff reported all visible fire out, and CO detectable but very low near the perimeter of the hot zone (fence line) with readings in single digits only. Air monitoring in the Village of Chaumont showed 1ppm VOC, consistent with background or sensor drift and not deemed significant. Cooling operations which had started on day 1 continued, and at 18:37 showed temperatures of involved containers at 300-400 Fahrenheit degrees.
- 7/30/23- OFPC day shift at 0700 reports no significant changes overnight. A County UAS mission at 13:50 showed temperatures of 250 Fahrenheit degrees interior to 300 Fahrenheit degrees exterior. No readings were found with air monitors- sensors used were O2, H2S, LEL, CO, VOC and HCN. Cooling water operations ceased at 13:30. Temperatures by 17:30 had not increased.
- 7/31/23 OFPC on site all day- standing by. No significant findings to report.
- 8/1/23- OFPC UAS confirmed ambient temperatures only with one exception- the container of origin showed one area at 195 Fahrenheit degrees. Meters shoed only trace presence of CO, VOC and HCN at the base of the containers. At 13:36 entry was made to conduct a safety survey in anticipation of investigators being allowed access. Nothing

significant was reported. At 17:00 the power feed was secured from the solar field by industry members. Investigators from OFPC, NYSP and DEC made entry to document the scene with OFPC and Watertown Hazmat on standby with Chaumont FD. At 18:43 OFPC Hazmat was released from the scene by Chaumont FD and Jefferson County.

Water Quality Report

This report was prepared using data obtained from runoff water analysis conducted by Eurofins Calscience, a laboratory accredited for environmental testing. The analysis was reviewed by personnel at the City of Escondido Hale Avenue Resource Recovery Facility (HARRF) laboratory to ensure the accuracy and integrity of the results.

SDG&E Battery Fire

571 Enterprise Street

Start 9/5/2024 12:09

Incident summary

On September 5 at 12:09, units from the Escondido Fire Department responded to structure fire at the SDG&E battery storage facility at 571 Enterprise Street. Upon arrival, crews found an active fire in a Lithium-Ion battery bank. Due to the specific hazards of such fires, a defensive strategy was employed, focusing on protecting adjacent structures containing additional batteries by applying water to those adjacent structures.

Sampling

- The samples were collected on **September 5, 2024 at 18:30 and again at 18:35** and were sent to a 3rd party laboratory for analysis
- The pH of the water sample was recorded at **7.47**, with a temperature of **26.8°C** at the time of testing.

Laboratory Analysis

- The analyses were performed by **Eurofins Calscience**, a laboratory with accreditation for environmental testing (EPA and SW846 protocols were followed).
- Samples were tested for various metals, including **barium, molybdenum, vanadium, copper, zinc, and cobalt**.

Results

- **Barium** concentration was found at **0.115 mg/L**, while the detected levels of **molybdenum**, **vanadium**, **copper**, **zinc**, and **cobalt** were all within acceptable ranges based on the applied methodologies.
- No detectable concentrations of other potentially harmful metals such as **cadmium**, **antimony**, **beryllium**, and **lead** were observed.

Quality Control

- The report indicates thorough quality control (QC) measures were applied, including spike recovery tests to ensure the accuracy and reliability of the results.
- For all tested metals, the recovery rates were within acceptable limits, confirming that the sampling and testing processes were effective.

Analysis

- **Water Quality**: The pH and metal concentrations suggest the water quality was within normal or acceptable ranges for most of the analyzed contaminants. The absence of toxic metals like **cadmium** and **lead** is a positive outcome.
- **Environmental Impact**: The low levels of metals like **barium**, **copper**, and **zinc** indicate that the runoff water does not pose significant environmental hazards.

pH and Temperature:

- **pH Level**: The pH of the water sample was recorded at **7.47**, which is neutral and within the acceptable range for general water quality standards (6.5 to 8.5 for drinking water). This suggests that the water was neither too acidic nor too alkaline.
- **Temperature**: The sample temperature was **26.8°C**, which is within a typical range for water at ambient temperatures. However, temperature could affect the solubility and mobility of metals, especially if the water is in a warmer environment.

Concentration of Detected Metals

- **Barium**:
  - Detected concentration: **0.115 mg/L**.
  - **Barium** is naturally occurring but can enter water through industrial discharge or from drilling operations. According to the **EPA's maximum contaminant level (MCL)** for barium in drinking water, the limit is **2 mg/L**. The detected level of **0.115 mg/L** is well below this threshold, indicating no significant risk from barium in this water sample.
- **Molybdenum**:
  - Detected concentration: **0.0075 mg/L**.
  - **Molybdenum** is an essential trace element, but elevated levels can be harmful to aquatic life. The detected concentration is relatively low and does not raise any immediate concerns. The **WHO** suggests a guideline of **0.07 mg/L** in drinking water, which makes this result favorable.
- **Vanadium**:
  - Detected concentration: **0.0051 mg/L**.
  - **Vanadium** is present in some natural water sources but can also come from industrial activities. There is no widely established regulatory limit for vanadium in drinking water, but concentrations below **0.01 mg/L** are generally considered safe. The level in the sample is well within this range.

- **Copper**:
  - Detected concentration: **0.0216 mg/L**.
  - The **EPA** action level for copper in drinking water is **1.3 mg/L**. The detected concentration of copper in the sample is far below this limit, indicating that the water is safe from copper-related toxicity.
- **Zinc**:
  - Detected concentration: **0.0767 mg/L**.
  - **Zinc** is essential for human health, but at higher concentrations, it can impart a metallic taste to water and cause health issues. The **EPA** has set a secondary maximum contaminant level (SMCL) of **5 mg/L** for zinc, primarily for aesthetic concerns. The concentration in this sample is well below this level, indicating no risk from zinc contamination.
- **Cobalt**:
  - Detected concentration: **0.0014 mg/L**.
  - **Cobalt** is another essential element but can be toxic at higher levels. There are no specific regulatory limits for cobalt in drinking water, but the detected amount in the sample is extremely low and does not pose any immediate health concerns.

Non-Detected Metals

- **Cadmium**, **antimony**, **beryllium**, **thallium**, **nickel**, **silver**, **arsenic**, **lead**, **selenium**, and **chromium** were **not detected** in the samples. This is a positive result as these metals are known for their potential toxicity and environmental persistence. The absence of these contaminants suggests that the water is not exposed to significant industrial pollution or corrosion from pipes that could introduce these metals.

Mercury Analysis

- **Mercury** was **not** detected in the samples, which is significant because mercury is highly toxic, especially in its methylated form. Even small amounts of mercury can have serious health and ecological impacts. The non-detect result (ND) indicates that the water is free from mercury contamination.

Comparative Toxicity and Environmental Impact

- The presence of trace amounts of metals like **zinc**, **copper**, and **barium** is typical in urban environments where water can come into contact with various materials and sediments. However, the levels detected in this sample do not indicate a significant environmental or health hazard.
- The absence of **toxic metals** such as **lead**, **cadmium**, and **mercury** further support that this water is unlikely to contribute to significant contamination of the environment.
- Laboratory personnel at the Hale Avenue Resource Recovery Facility (HARRF) laboratory were consulted regarding the results of the runoff water analysis and confirmed that there were no concerns with this water entering the environment.

Conclusion:

The analysis of the samples collected from the runoff water suggests that the water quality is within acceptable limits for most contaminants, especially when considering public health standards for drinking water. The low levels of metals detected, combined with the absence of more toxic elements like **lead** and **cadmium**, suggest that the water poses minimal risk both to human health and the environment.

Information Requests:

San Diego Gas & Electric/ Eurofins Calscience

(877) 866-20266

SOAH DOCKET NO. 473-25-14211
PUC DOCKET NO. 57501

APPLICATION OF EL PASO ELECTRIC COMPANY TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 100 MW SOLAR/100 MW BATTERY STORAGE FACILITY	§ § § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

EL PASO ELECTRIC COMPANY'S RESPONSE TO
CITY OF EL PASO'S SIXTH REQUESTS FOR INFORMATION
QUESTION NOS. CEP 6-1 THROUGH CEP 6-16

CEP 6-13

Please provide engineering analysis addressing:

a. The structural integrity of the container during a prolonged thermal event.
b. Maximum temperatures the container can withstand before structural failure.
c. Secondary containment measures if primary container is compromised.
d. Specific metals and fluids that could be released and their quantities.
e. Groundwater contamination prevention measures in case of container breach.

RESPONSE:

a. This system had a large scale fire test (a test in which a module was artificially triggered into thermal runaway using electrical heaters) and the structure experienced no integral damage during the 14 hours it took the module to burn and self-extinguish.

b. The exact temperature the container can withstand before failure is not known. During a large scale fire test (a test in which a module was artificially triggered into thermal runaway using electrical heaters) and the structure experienced no integral damage during the 14 hours it took the module to burn and self-extinguish.

c. The LFP cells are individually hermetically sealed and do not off gas during normal operation. In addition, they do not contain any free-flowing liquids like other battery chemistries do (such as lead acid). Because of this, the International Fire Code and NFPA 855 do not require spill control or neutralization for lithium ion batteries. However, the cells are even further contained within the EnerC+ outdoor NEMA rated cabinet, which is designed and tested to prohibit water / particulate ingress/egress.

d. Please refer to the provided CEP 6-2 Attachment 1 EnerC+ SDS – HSPM and CEP 6-7 Attachment 2 EnerC+ MSDS – HSPM for this information.

e. The LFP cells are individually hermetically sealed and do not off gas during normal operation. In addition, they do not contain any free-flowing liquids like other battery chemistries do (such as lead acid). Because of this, the International Fire Code and NFPA 855 do not require spill control or neutralization for lithium ion batteries. However, the cells are even further contained within the EnerC+ outdoor NEMA. If some material does escape the BESS, emergency leak measures are laid out in section 6 of the provided CEP 6-2 Attachment 1 EnerC+ SDS – HSPM and CEP 6-7 Attachment 2 EnerC+ MSDS – HSPM.

While fires at energy storage facilities are exceedingly rare and water runoffs are highly unlikely by following battery fire response best practices, there has been extensive research to the impacts to the environment through comprehensive review of analyses of air quality, soil, and/or water. In 2023, the governor of New York directed the Division of Homeland Security and Emergency Services (DHSES) Office of Fire Prevention and Control (OFPC), New York State Energy Research and Development Authority (NYSERDA), New York State Department of Environmental Conservation (DEC), Department of Public Service (DPS), and the Department of State (DOS) to lead a new Inter-Agency Fire Safety Working Group to independently examine energy storage facility fires and safety standards. OFPC and DEC, in collaboration with the State Department of Health, concluded that there were no reported injuries, no harmful levels of toxins detected, and no long-term off-site impacts involving any migration of contaminants associated with the fires. Please refer to CEP 6-12 Attachment 1 for additional information on New York State research.

The City of Escondido, California, performed similar research after the Escondido Fire Department responded to structure fire at the SDG&E battery storage facility. The application of water to adjacent structures with additional batteries was employed as a defensive strategy. The analysis of the samples collected from the runoff water suggests that the water quality is within acceptable limits for most contaminants, especially when considering public health standards for drinking water. The low levels of metals detected, combined with the absence of more toxic elements like lead and cadmium, suggest that the water poses minimal risk both to human health and the environment. Please refer to CEP 6-12 Attachment 2 for additional information on study performed by Eurofins Calscience for the City of Escondido.

Preparer: Edmundo Salazar Title: Director – Project Development

Sponsor: Edmundo Salazar Title: Director - Project Development

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CEP 6-14

Please provide a security and vulnerability assessment addressing:

a. Physical security measures protecting the facility.
b. System response to penetrative damage (such as from hunting rifle calibers).
c. System response to externally initiated fires.
d. Measures to prevent cascade failures from damaged cells.

RESPONSE:

a. During construction, the facility's design features a combination chain-link (6' fabric plus 1' barbed wire) and wrought iron (7') fence. Access is controlled through 3 locking 20' vehicle gates. Before commissioning the project to become commercially operational, both facilities will meet the requirements and standards for critical infrastructure protection (CIP) set by the North American Electric Reliability Corporation (NERC).

b. Please refer to section 2.4.1 addressing physical damage caused by puncture or crushing of CEP 6-7, Attachment 4 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

c. If a fire hazard was caused by internal factors, or external factors such as a wild-fire, the four tier fire suppression system, as detailed in the CEP 6-7, Attachment 3, would activate.

d. The EnerC+ is provided with a battery management system (BMS) that can identify possible risks to the battery system by monitoring battery cell temperature, voltage, current, and dry contact switching value in real-time. The BMS function is intended to prevent the risk of thermal runaway by preventing the risks of overcharge, over-discharge, over-temperature, and overcurrent. It provides thermal runaway risk

protection by safely disconnecting the batteries in case of fault conditions. The BMS can be regarded as three levels:

- Cell Sensor Circuit (CSC) and Current Sensor Unit (CSU)
  - The CSC collects cell data inside the battery module and transmits cell voltage and temperature data to the SBMU. The CSC completes the balance between cells in the battery module according to commands given by the SBMU.
- Slave Battery Management Unit (SBMU)
  - The SBMU receives voltage and temperature data from the CSC and current data from the CSU. The SBMU performs calculations and determines appropriate State of Charge (SOC) corrections, as required. The system also manages pre-charging, charging and discharge of units, and data upload to the MBMU.
- Master Battery Management Unit (MBMU) and ETH (communication interface between BESS system and EMS)
  - Maintains operation and management of the entire battery system. The MBMU receives the data uploaded by the SBMU and controls the system accordingly. The MBMU and ETH are located in the container Master Control Box.
  - Table 2-11: Barriers to Thermal Runaway in the provided "3. EnerC+ Hazard Mitigation Analysis" describes this in detail.

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CEP 6-15

Please provide detailed information about the fire suppression system:

a. Technical specifications of the "dry pipe system".
b. Independent testing results showing effectiveness rates.
c. Scenarios where the system may be insufficient.
d. Secondary fire suppression measures.
e. Consequences and mitigation measures for fires that exceed primary suppression capabilities.
f. Environmental impacts of prolonged firefighting efforts.

RESPONSE:

a. For the technical specifications of the dry pipe system, please refer to section 5.2.3.2 of the CEP 6-4, Attachment 1 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

b. For independent testing results and effectiveness, please refer to the Hazard Mitigation Analysis Report provided in the CEP 6-7, Attachment 3 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

c. Please refer to CEP 6-15, Attachment 1 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

d. The EnerC+ utilizes a four-tier fire suppression system. First Level- Alarm Warning, Second Level- Ventilation and Smoke Exhaust, Third Leve- Aerosol is Released, Fourth-Level: Water Spraying. Please refer to CEP 6-7, Attachment 3 HIGHLY SENSITIVE AND PROTECTED MATERIAL for details.

e. Please refer to CEP 6-7, Attachment 3 HIGHLY SENSITIVE AND PROTECTED MATERIAL.

f. Per section 2.4.3.7. of the provided CEP 6-7 Attachment 4, manual firefighting efforts are conducted as a "defensive approach" that focuses on preventing propagation to neighboring containers. This has been discussed with the El Paso Fire Department and will be outlined in detail in the final third party Emergency Response Plan. Additionally, environmental reports from previous BESS fires have shown that runoff water used for fire suppression do not contain elevated levels of toxic contaminants.

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PUBLIC

CEP 6-15 Attachment 1 is a CONFIDENTIAL and/or HIGHLY SENSITIVE PROTECTED MATERIALS attachment.