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STAFF REPORT: PERMIT AMENDMENT

Application No.:	**E-00-014-A2**
Applicant:	**Southern California Edison**
Location:	San Onofre Nuclear Generating Station (SONGS), 5000 Pacific Coast Highway, San Diego County
Project Description:	Modify permit condition to extend authorization for the NUHOMS waste storage facility at SONGS by 13 years to November 15, 2035.
Staff Recommendation:	Approval with conditions

SUMMARY OF STAFF RECOMMENDATION

Southern California Edison (SCE), on behalf of itself and the other co-owners of the San Onofre Nuclear Generating Station (SONGS), San Diego Gas and Electric, the City of Anaheim, and the City of Riverside, requests an amendment to Coastal Development Permit (CDP) No. E-00-014 to extend the authorization term of the Nuclear Horizontal

Modular Storage (NUHOMS) nuclear waste storage facility[1] at the SONGS site to November 15, 2035. The NUHOMS waste storage facility was approved by the Commission in 2001 and has been in continuous use since it was constructed soon thereafter. The NUHOMS waste storage facility currently holds 53 of its authorized 104 canisters of radioactive material from SONGS.

No construction is proposed as part of the requested permit amendment. The proposed extension would only authorize the waste storage facility through November 15, 2035, an additional 13 years beyond the current expiration of CDP No. E-00-014 on November 15, 2022. This is a shorter authorization term than the 20-year term in the original CDP for this waste storage facility. In addition, the proposed expiration date of November 15, 2035, would better align with the expiration date of a second waste storage facility at SONGS, the Holtec waste storage facility. The Holtec waste storage facility, which also stores canisters of radioactive material from SONGS, was authorized for construction in 2015 in a separate CDP (CDP No. 9-15-0228).[2] The authorization term for the Holtec waste storage facility is currently set to expire on October 6, 2035. Thus, with the proposed amendment, the expiration dates for the two waste storage facilities would nearly coincide. The Commission established limited terms for the CDPs issued for the SONGS waste storage facilities in order to allow for periodic re-assessment of both operations and for any development of potential offsite storage facilities, including a federally approved national repository for radioactive waste from nuclear generating stations. Based on information received from SCE and independent research by Commission staff, storing radioactive material at SONGS remains necessary because no feasible alternative storage facilities or locations have been developed.

The United States Nuclear Regulatory Commission has exclusive jurisdiction over all radiological aspects of SONGS. Under federal law, the state is preempted from imposing upon operators of nuclear facilities any regulatory requirements concerning radiation hazards and nuclear safety. The state may, however, impose requirements related to other issues, including consistency with the Coastal Act. The key Coastal Act issues raised by the proposed project and within the Commission's jurisdiction are risks associated with geologic and coastal hazards. These include earthquakes and seismic hazards, tsunami hazards, coastal flooding and sea level rise, as well as coastal erosion and bluff retreat.

Several special conditions would help minimize potential effects on coastal resources. These include certain conditions modeled on those the Commission previously required for the separate Holtec waste disposal facility. In addition to the modification to limit the waste storage facility's authorization through 2035, **Special Condition 4** would also

[1] The technical term for the dry storage facility is an Independent Spent Fuel Storage Installation (ISFSI). Prior staff reports for this facility used this term and this acronym appears in the recommended special conditions and may also appear in some quotes within these findings.

[2] In this present CDP application, the applicant is not proposing any changes to the separate CDP issued in 2015 (CDP No. 9-15-0228) for the Holtec waste disposal facility.

require that SCE provide an analysis of current and future coastal hazards if it seeks a future CDP amendment for authorization beyond 2035. **Special Condition 6** would set up a process for a third-party independent review of key elements of the existing Aging Management Program (and its Implementing Procedures) for the NUHOMS waste storage facility and help ensure that the canisters remain in transportable condition for offsite relocation when an alternative storage facility becomes available to accept the waste. In addition, **Special Condition 7**, which is an entirely new requirement for any CDP relating to SONGS, would require SCE to report once every two years on the status of offsite alternative waste storage facilities and on its efforts to secure an offsite facility to accept canisters from SONGS. This would help ensure that SCE continues to pursue options for removing the waste canisters from the SONGS site and that its progress towards that end is regularly reported to the Commission throughout the term of this CDP.

Commission staff recommends the Commission find that, with these special conditions, the project would be carried out consistent with the Coastal Act. Staff therefore recommends the Commission **APPROVE** CDP amendment application E-00-014-A2, as conditioned. The motion is on page 5. The standard of review is Chapter 3 of the Coastal Act.

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APPENDICES

EXHIBITS

I. MOTION AND RESOLUTION

Motion:

*I move that the Commission **approve** Coastal Development Permit Amendment No. E-00-014-A2 pursuant to the staff recommendation.*

Staff Recommendation:

Staff recommends a **YES** vote on the forgoing motion. Passage of this motion will result in approval of the amendment as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves the coastal development permit amendment on the grounds that the development, as amended and subject to the conditions, will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit amendment complies with the California Environmental Quality Act because either: 1) feasible mitigation measure and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the amended development on the environment, or 2) there are no feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the amended development on the environment.

Original Conditions of CDP E-00-014:

The original conditions of CDP E-00-014 are stated below:

Special Conditions

1. **Construction Debris.** Construction debris generated as part of the proposed project shall at the earliest practicable opportunity be disposed of at an appropriate offsite facility. Any construction debris or material present on-site, including construction debris or material subject to removal in accordance with the preceding requirement, that could potentially contribute to increased sediment loading shall be covered and/or contained during precipitation events.
2. **Sump Monitoring and Maintenance.** Sediment and other material that collects in the onsite sump from the project site's yard (storm water) drains shall be monitored and removed before such sediment or material reach quantities sufficient to pose a risk to the proper functioning of the sump.
3. **Sump Maintenance Fund.** To assure that sufficient financial resources are available to monitor and maintain the sump and yard drains in working order, prior to commencement of project construction, the applicants shall enter into an agreement, in substantially the same form and content as the draft "SONGS ISFSI Yard Sump Maintenance Trust Account" attached hereto as Exhibit 19 and

incorporated herein by reference, with a state or federally chartered financial institution of the applicants' choice for the purpose of establishing a sump maintenance fund. Southern California Edison (SCE) may unilaterally establish this entire trust fund on behalf of the other co-applicants. The applicants shall deposit into the fund $136,000, which represents the present value of the Units 2 and 3 share of the full costs of monitoring and maintaining the sump for the life of the project. The sump maintenance fund shall be reviewed and approved by the Executive Director, in coordination with the applicants. Prior to commencement of project construction, the applicant shall provide a copy of the fully executed agreement and evidence that the funds were deposited as described above to the Executive Director. The other co-applicants (San Diego Gas and Electric and the Cities of Anaheim and Riverside) are not required to provide a separate trust fund' for the cost of sump maintenance and monitoring if SCE establishes and maintains the entire trust fund consistent with this condition.

4. **Permit Expiration.** Unless extended by action of the Commission pursuant to an application submitted prior thereto, this permit shall terminate and be of no further force and effect on November 15, 2022.
5. **Future Development Restriction.** This permit is only for the development described in the project description set forth in this staff report dated May 24, 2001. Pursuant to Title 14 California Code of Regulations Section 13253(b)(6), the exemptions otherwise provided in Public Resources Code Section 30610(b) shall not apply to the project. Accordingly, any future substantive physical or structural improvements to the permitted structure, including but not limited to an increase in storage capacity of spent nuclear fuel or the storage of spent nuclear fuel from nuclear power plants other than the San Onofre Nuclear Generating Station Units 2 and 3 shall require an amendment to coastal development permit E-00-014 from the Commission. Subject to the other provisions of this condition, this prohibition is not intended to require a permit for the storage of materials authorized by NRC regulations or the SONGS Units 2 and 3 NRC licenses.

Standard Conditions

1. **Notice of Receipt and Acknowledgement.** The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. **Expiration.** If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. **Compliance.** All development must occur in strict compliance with the proposal as set forth in the application for permit, subject to any special conditions set

forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.

4. **Interpretation.** Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.
5. **Inspections.** The Commission staff shall be allowed to inspect the site and the development during construction, subject to 24-hour advance notice.
6. **Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
7. **Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to· bind all future owners and possessors of the subject property to the terms and conditions.

Modified Conditions of CDP No. E-00-014-A2

Except as modified herein, the original conditions of CDP E-00-014 shall remain in effect. Additions are marked in underline and deletions in ~~strikethrough~~.

Special Conditions

4. **Permit Expiration.** Unless extended by action of the Commission pursuant to an application submitted prior thereto, this permit shall terminate and be of no further force and effect on ~~November 15, 2022~~ November 15, 2035. No later than twelve months prior to the end of this authorization period, the Permittee shall apply for an amendment to this coastal development permit to retain, remove, or relocate the Nuclear Horizontal Modular Storage Independent Spent Fuel Storage Installation (NUHOMS ISFSI) facility. This application shall be supported by:
    a. An evaluation of current and future coastal hazards based on the best available information;
    b. An analysis examining the merits and feasibility of offsite and on-site alternatives, including potential locations that are landward and/or at a higher elevation within areas made available by the decommissioning of Units 2 and 3 of the San Onofre Nuclear Generating Station;
    c. Evidence that the fuel storage canisters will remain in a physical condition sufficient to allow offsite transport, pursuant to the Aging Management Program and Implementing Procedures (AMP) (described in Special Condition 6), which is designed to ensure that the canisters remain transportable for the full life of the authorized project; and
    d. An evaluation of the effects on visual resources of retaining the project, an analysis of available project alternatives and their implications for coastal visual resources, and proposed mitigation measures to minimize adverse impacts to coastal views.

6. **Aging Management Program Review and Reporting of Inspection Results.**
    a. By January 1, 2024, the permittee shall fund an independent, third-party review of the following in permittee's existing AMP and Implementing Procedures (AMP) for the NUHOMS ISFSI: (1) The canister inspection, monitoring and maintenance techniques that will be implemented, including prospective non-destructive examination techniques and remote surface inspection tools; (2) what data will be collected and reporting frequency; (3) all available evidence related to the physical condition of the canisters and their susceptibility to degradation processes such as stress corrosion cracking; and (4) remediation measures that will be implemented, including the submission of a coastal development permit amendment application, if the results of the canister inspection and maintenance do not ensure that the fuel storage canisters will remain in a physical condition sufficient to allow on-site transfer and offsite transport for the term of the project as authorized under Special Condition 4.
    b. The third-party reviewer(s) shall be selected by the Executive Director, and the Executive Director shall have full discretion for the development and completion of products resulting from this review. All such products provided to the permittee shall also be provided directly to the Executive Director at the same time. The permittee's provision of funds: (1) shall not in any way be contingent on the hiring of any specific person or firm; (2) shall not be dependent on the work product, including but not limited to any recommendation of any person hired to review the AMP, (3) shall not be dependent on the result of any Commission action pertaining to the applicant's CDPs; and (4) shall not exceed $115,000.
    c. The independent third party must have qualifications that include the following:
        i. No current (or within the prior year) direct employment or other direct financial benefit provided by the permittee.
        ii. Degree in engineering with commercial industry work experience and familiarity with non-destructive examination techniques and weld repairs.
        iii. Disclosure of work done regarding spent fuel storage or transportation, or related topics, including within California or nationally.
        iv. Understanding of technical and regulatory aspects of spent nuclear fuel handling and storage systems, including: aging mechanisms, effects, and management, maintenance, or surveillance programs; spent nuclear fuel container transportability; Nuclear Regulatory Commission (NRC) regulations and technical reports (i.e., NUREG-1927 "Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel") and related publications; American Society of Mechanical

Engineers (ASME) standards and requirements; or other related subjects.

v. Prefer familiarity with the types of spent nuclear fuel handling and storage systems used at SONGS.

e. The findings of the independent, third-party review shall be reported in writing to the Executive Director by July 1, 2024, to help inform their review. Additional time may be provided for the independent, third-party review by the Executive Director based on reasonable cause and demonstrated progress. If the Executive Director's review, informed by the report prepared by the independent, third-party reviewer, indicates that additional and/or different inspection, evidence, reporting, and/or remediation measures from those in the AMP should be taken to ensure that spent fuel storage canisters will remain in a physical condition sufficient to allow offsite transport and remain transportable for the full life of the authorized project, the Executive Director shall provide a written list of those additional and/or different inspection, evidence, reporting, and/or remediation measures to the permittee and one of the following shall occur:

i. The permittee shall, within 180 days of receiving the written list from the Executive Director, modify the AMP and/or its Implementing Procedures to incorporate the inspection, evidence, reporting, and/or remediation measures recommended by the Executive Director and seek any required NRC approval of such modification by that date. The permittee shall submit any such modified AMP to the Executive Director for review and approval upon approval by the NRC; or

ii. The permittee shall, within 180 days of receiving the written list from the Executive Director, submit a complete application to the Commission for a CDP amendment for continued authorization of the ISFSI in a manner consistent with the additional and/or different inspection, evidence, reporting, and/or remediation measures identified on the written list provided by the Executive Director.

d. As part of the AMP, the permittee shall perform required inspections of the ISFSI and spent fuel canisters no less frequently than once every five years with the first inspection starting in 2026. The permittee shall provide a report to the Executive Director within 180 days of the completion of each canister inspection (i.e. every five years). The report shall contain the following:

i. Information regarding the canisters inspected and their location within the ISFSI.

ii. Inspection results and analysis, including trending of the data as compared to previous inspections.

iii. Any corrective actions taken as a result of the inspection

iv. Evaluation of the inspection interval, and whether inspection intervals will be adjusted based on the inspection data collected.
v. Evaluation of the inspection data to determine if canister degradation is proceeding at a rate which may impact the canister ability to be transferred on-site or transported offsite during the term of the project as authorized under Special Condition 4.
vi. A summary of the ISFSI facility system inspections.
vii. The results of any updated statistical analyses incorporating data from the inspection.

7. **Biennial Reporting on Alternative Waste Storage Facilities.** The permittee shall submit a biennial report to the Executive Director for review and approval beginning on June 15, 2023. The report shall include:

    a. The status of the permittee's efforts to identify and evaluate alternative offsite facilities where canisters from the NUHOMS ISFSI may be accepted. These may include, but are not limited to, commercial consolidated interim storage facilities, and permanent disposal facilities;
    b. The permittee's activities to advance the establishment of offsite facility locations and the status of permittee efforts to secure an offsite facility to accept canisters from the NUHOMS ISFSI facility;
    c. Information on the United States Department of Energy activities related to the federal spent nuclear fuel management program;
    d. Information on Congressional activities to address needed changes to federal legislation;
    e. Current information and status of transportation planning to facilitate the transfer of canisters offsite; and
    f. International developments related to spent fuel management and their relevance to the domestic spent fuel management program.

8. **Liability for Costs and Attorneys Fees.** SCE shall reimburse the Coastal Commission in full for all Coastal Commission costs and attorneys fees -- including (1) those charged by the Office of the Attorney General, and (2) any court costs and attorneys fees that the Coastal Commission may be required by a court to pay – that the Coastal Commission incurs in connection with the defense of any action brought by a party other than Permittee against the Coastal Commission, its officers, employees, agents, successors and assigns challenging the approval or issuance of this permit, the interpretation and/or enforcement of permit conditions, or any other matter related to this permit. The Permittee shall reimburse the Coastal Commission within 60 days of being informed by the Executive Director of the amount of such costs and fees. The Coastal Commission retains complete authority to conduct and direct the defense of any such action against the Coastal Commission.

9. **Assumption of Risk, Waiver of Liability and Indemnity.** By acceptance of this permit, the Permittee acknowledges and agrees:
    a. That the site may be subject to hazards from coastal erosion, storm conditions, wave uprush, and tsunami runup;
    b. To assume the risks to the Permittee and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development;
    c. To unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and,
    d. To indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards.

II. FINDINGS AND DECLARATIONS

A. FACTUAL AND LEGAL BACKGROUND

Background

The Commission approved construction and use of the Nuclear Horizontal Modular Storage nuclear waste dry storage facility (NUHOMS waste storage facility or waste storage facility) in 2001 under CDP No. E-00-014. The purpose of the waste storage facility is to hold radioactive spent fuel and material from the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3, and it has been in continuous use since it was constructed.

When the Commission considered the waste storage facility in 2001, the information available at the time indicated that the U.S. Department of Energy would establish a federal repository for spent nuclear fuel and would begin accepting spent fuel from commercial facilities, including SONGS, by 2010. The Commission found that the NUHOMS waste storage facility could become unnecessary after that date, and thus placed a finite authorization term on the CDP through **Special Condition 4**. The Commission elected to place a permit expiration date of November 15, 2022, on the waste storage facility because the Federal Nuclear Regulatory Commission (NRC) operating licenses for SONGS Units 2 and 3 expired in February and November of 2022, respectively. SONGS subsequently ceased energy generation operations and has begun decommissioning activities. Further, as discussed below, the U.S. Department of Energy did not establish a federal repository for spent nuclear fuel and no repository is currently available. The NRC, however, recently granted a license term extension request to Southern California Edison (SCE) for the waste storage facility, authorizing it through February 5, 2063.

In this CDP amendment application, SCE[3] requests that the Commission modify the expiration date in **Special Condition 4** of CDP No. E-00-014 from November 15, 2022, to November 15, 2035. This new proposed date was selected because it would closely align with the authorization term established by the Commission in 2015 through CDP No. 9-15-0228[4] for the second of the two waste storage facilities at the SONGS site, the Holtec waste storage facility (discussed further below) that is authorized through October 6, 2035.

In 2015, through CDP No. 9-15-0228, the Commission approved construction of a second waste storage facility at the SONGS site, the Holtec waste storage facility. The Holtec waste storage facility provided the necessary capacity to store the remaining spent fuel from SONGS Units 2 and 3 that would not fit within the previously constructed NUHOMS facility. The NUHOMS waste storage facility and Holtec waste storage facility are located adjacent to each other in the SONGS North Industrial Area, with the Holtec waste storage facility located seaward of the NUHOMS facility, as shown in **Exhibit 1**.[5]

At the time the Commission reviewed the Holtec waste storage facility proposal in 2015, there was no NRC-approved Aging Management Program (AMP) yet for that facility. The NRC requires licensees to develop and implement an AMP to provide for the continued safe dry canister storage of spent fuel by requiring a plan for monitoring and inspection of the storage canisters (among other requirements). Therefore, to help ensure that spent fuel storage canisters remain in a physical condition for transport to any appropriate future location,[6] the Commission required a condition for its 2015 approval of the Holtec waste storage facility that SCE develop an "Inspection and Maintenance Program" (IMP) with certain required elements. Furthermore, in the subsequent 2019 action to approve a CDP for SCE's decommissioning project, the

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[3] SCE has submitted the amendment application and is acting as the applicant on behalf of itself and all the co-owners of SONGS. In addition to SCE, the co-owners include: San Diego Gas and Electric, the City of Anaheim, and the City of Riverside.

[4] Prior to pursuing this CDP, SCE submitted CDP amendment application No. E-00-014-A1 to expand the NUHOMS facility. This application was subsequently withdrawn and an application for a new CDP was submitted to construct a second facility, the Holtec facility for which CDP No.9-15-0228 was issued.

[5] After approval of the Holtec waste storage facility, CDP 9-15-0228 was challenged in litigation. (*Citizens Oversight, Inc. et al. v. California Coastal Commission, Southern California Edison Company, et al.*, Superior Court for County of San Diego Case No. 37-2015-00037137-CU-WM-CTL*)*. That litigation was resolved by a settlement between Citizens Oversight, Inc. and SCE. Through the settlement, SCE agreed to take various actions including the following: (1) Make a request to solicit an agreement from Palo Verde Nuclear Generating Station (in Arizona) for potential offsite storage; (2) develop a strategic plan to support the development of a commercially reasonable offsite storage facility for spent nuclear fuel; (3) develop a conceptual plan for the transportation of SONGS spent fuel to and offsite storage facility assumed to be located in the southwestern U.S.; (4) develop the "Inspection and Maintenance Program" required by CDP No. 9-15-0228 two years earlier than required under the permit condition; and (5) provide an expert review of the inspection and maintenance plan prepared for the Holtec ISFSI.

[6] In 2015, the Commission noted with respect to the Holtec facility, the IMP was necessary to ensure that canisters remain in a physical condition sufficient to ensure transportability "given the potential coastal hazards at the site" such as sea level rise, tsunami inundation, and seismic hazards.

Commission included a condition requiring independent, third-party review of SCE's IMP for the Holtec facility (CDP No. 9-19-0914). In July 2020, following the independent, third-party review of the IMP, the Commission approved the IMP for the Holtec facility.

Unlike the then-proposed Holtec facility in 2015, which had no NRC-approved AMP, there is an AMP for the NUHOMS facility (which NRC approved in 2021). Nonetheless, Commission staff recommends the same type of condition requiring SCE to fund an independent, third-party review of the same inspection and maintenance elements as in the CDP for the Holtec facility. This would help ensure consistency in the approach and methodology used to evaluate transportability of the canisters from a coastal hazards standpoint, as discussed further below.

SCE is in the process of decommissioning the onshore portions of SONGS Units 2 and 3, and that decommissioning project was approved with conditions by the Commission under CDP No. 9-19-0194 in 2019. Decommissioning activities will continue through approximately 2028.

As of September 2022, the NUHOMS waste storage facility holds 50 canisters containing spent fuel and three canisters containing greater-than-class-C material.[7] If the authorization term of CDP No. E-00-014 were to be extended, SCE would install up to 10 additional canisters containing greater-than-class-C material from SONGS decommissioning in the NUHOMS waste storage facility, which is below its initially authorized limit of 104 total waste canisters. That initially authorized limit is not expected to be reached because the facility was not fully built-out and it was established prior to construction and authorization of the Holtec storage facility and the additional storage capacity it provides.

Waste Storage Facility Details

The NUHOMS waste storage facility is comprised of an array of concrete spent fuel storage modules located on a reinforced concrete pad. A stainless steel canister containing spent fuel assemblies or radioactive materials is secured on rails within the fuel storage module. A cross section of the spent fuel storage module with canister placement is available in **Exhibit 2**. In total, the NUHOMS waste storage facility has a capacity under its current build-out for 63 steel reinforced spent fuel storage modules on top of three steel-reinforced concrete pads.

The concrete pads are reinforced with rebar and are a minimum of three feet thick, with the top being at existing grade elevation, approximately 20 ft mean lower low water (MLLW)[8], and are approximately 43 ft wide. The length of the concrete pads varies to accommodate the module array. The spent fuel storage modules are shaped like rectangular boxes and the modules are no more than 20 ft in height above the existing grade. The modules are nine feet wide and 23 ft long. The spent fuel storage modules

[7] Greater-than-class-C material refers to parts of the reactors or structures that require the same type of storage as spent nuclear fuel.
[8] SCE uses MLLW from the 1941-1959 tidal datum epoch for consistent use across old engineering drawings; MLLW in this case can be converted to NAVD88 by subtracting 0.62 ft.

are also constructed with reinforced concrete. The modules are tied together in arrays with a combination of bolts and rebar.

Each spent fuel storage module houses an NRC-licensed stainless steel canister that may contain up to 24 spent fuel assemblies. A fuel assembly consists of 236 zircalloy metal tubes approximately 12.8 ft long and 3/8 inch in diameter, in which ceramic uranium dioxide fuel pellets are placed. Known as fuel pins, the tubes are completely sealed with welded end plugs. Each fuel assembly has an overall length of about 15 ft and weighs approximately 1,500 lbs. Photos of the waste storage facility, a model spent fuel assembly, and other relevant visual aids, are available in **Exhibit 2**.

Preemption of State Regulation

The NRC has exclusive jurisdiction over radiological aspects of SONGS. Under federal law, the state is preempted from imposing upon operators of nuclear facilities any regulatory requirements concerning radiation hazards and nuclear safety. The state may, however, impose requirements related to other issues. The U.S. Supreme Court, in *Pacific Gas and Electric Company v. State Energy Commission*, 461 U.S. 190, 205 (1983), held that the federal government has preempted the entire field of "radiological safety aspects involved in the construction and operation of a nuclear plant, but that the states retain their traditional responsibility in the field of regulating electrical utilities for determining questions of need, reliability, costs, and other related state concerns." The Coastal Commission findings herein address only those state concerns related to conformity to applicable policies of the Coastal Act, and do not evaluate or condition the amendment with respect to nuclear safety or radiological issues.

B. PROJECT DESCRIPTION

Project Location

SONGS is located along the coast of northern San Diego County, approximately 2.5 miles south of the City of San Clemente; see **Exhibit 1** for a general location map. SONGS is located within Marine Corps Base Camp Pendleton, on lands owned by the U.S. Department of the Navy. It is bounded seaward by the Pacific Ocean and landward by Old Pacific Coast Highway and San Onofre State Beach. The NUHOMS waste storage facility, which is the subject of the proposed amendment, is located within the SONGS North Industrial Area, which was formerly the site of SONGS Unit 1; see **Exhibit 1** for the location of the waste storage facility within the SONGS site.

Proposed Amendment Purpose

The proposed amendment would extend the authorization of the waste storage facility through November 15, 2035. The waste storage facility is currently authorized through November 15, 2022, under **Special Condition 4** of CDP E-00-014. SCE has proposed the extension because there is currently no available alternative offsite facility that the NUHOMS waste canisters could be transferred to. In addition, the proposed extension would closely align the expiration of this CDP to the expiration of the CDP for the Holtec waste storage facility. SCE's application states:

> *In 2035, SCE will submit an application to amend the Holtec ISFSI [dry storage facility] CDP to retain, remove or relocate the Holtec ISFSI. At that time, the Coastal Commission will reevaluate the location of the ISFSI facility based on any new information that has become available, including an assessment of coastal hazards. While there are currently various projections for future sea level rise, by 2035, more information and scientific understanding will be available to more accurately predict the amount of sea level rise expected. It would be prudent to consolidate the Coastal Commission's future review of the Holtec and NUHOMS ISFSIs in 2035 based on updated information and science that will be relevant to the site shared by both ISFSIs. Depending on the availability of offsite storage locations, the Coastal Commission can then determine whether the ISFSIs should be retained or relocated after 2035.*

Alternative Storage Facilities

As discussed in prior staff reports, including those prepared for CDP Nos. E-00-014 and 9-15-0228, storage of spent nuclear fuel on-site is required because no permanent disposal facility exists. Development of a permanent spent fuel disposal facility is the responsibility of the United States Department of Energy (DOE), and the DOE has a longstanding statutory and contractual obligation to take commercial spent fuel from nuclear energy facilities, including SONGS. Moreover, SCE customers contributed to the Nuclear Waste Fund for many years and pre-paid for waste disposal at a national repository.

DOE has begun to consider consolidated interim storage for spent nuclear fuel, as well as permanent storage. In December 2021, the DOE issued a request for information on consent-based siting for federal consolidated interim storage facilities for spent nuclear fuel. Consent-based siting is an approach to siting facilities that focuses on the needs and concerns of people and communities where the facilities could be located. Other countries, including Sweden, Finland, France, Canada, and Spain have used a consent-based siting process to progress on identifying locations for long-term nuclear waste storage (Blue Ribbon Commission 2012). Consolidated interim storage may be the best opportunity to move SONGS spent fuel offsite, but it would likely take many years for the DOE to identify suitable locations for an interim storage facility, perform necessary environmental review, license, and construct the facility.

In addition to the slowly moving consent-based siting efforts of DOE, Commission staff is also aware of two proposals to develop private interim storage facilities that would, if built, accept commercial spent fuel. A company called Interim Storage Partners received a license from the NRC to construct and operate a consolidated interim storage facility in 2021 (NRC 2021). The facility is planned for construction in Andrews County, Texas. However, the project's licensing approval and Environmental Impact Statement are now being litigated by the State of Texas. This brings uncertainty to when

or if the facility may be constructed and available to accept waste (Powers and Rubin 2022).

Holtec International is also pursuing authorization for a privately operated interim storage facility but is earlier in the licensing process than Interim Storage Partners. The NRC issued its final Environmental Impact Statement for a waste storage facility to be operated by Holtec International in Lea County, New Mexico in July of 2022. As part of this issuance, NRC staff recommended issuance of a license to Holtec to construct and operate the facility. As of the publication of these findings, the NRC has not issued a license for the Holtec facility in New Mexico. Similar to the Interim Storage Partners Project, the State of New Mexico has filed suit against the NRC to prevent the licensing process, which adds uncertainty to when and if this facility would be constructed and available to accept spent nuclear fuel as well.

C. Other Agency Approvals and Coordination

No other agency approvals are required at this time for the continued operation of the NUHOMS waste storage facility. Other agencies with jurisdictions and other entities that the Commission has coordinated with are discussed below.

United States Nuclear Regulatory Commission (NRC)

The NRC regulates spent fuel through a combination of regulatory requirements, licensing review, safety and security oversight, operational experience evaluations, and regulatory support activities. The NRC's safety and security oversight program for spent fuel storage includes inspections, performance assessment and enforcement. The oversight program is designed to prevent radiation-related deaths and illnesses, protect the environment, and safeguard the material from terrorist threats. The oversight program includes inspections and assessments of licensee and vendor activities with a focus on minimizing risk to public health and safety.

Under NRC regulations, there are two acceptable storage methods for spent fuel after it is removed from the reactor vessel:

- Spent Fuel Pools (wet storage) – Currently, most spent nuclear fuel is stored in specially designed pools at individual reactor sites around the country.
- Dry Cask Storage (dry storage) – Licensees may also store spent nuclear fuel in dry cask storage systems at independent spent fuel storage facilities (ISFSIs). Dry storage facilities may be located at the reactor site, at decommissioned reactor sites, or at a consolidated interim storage facility.

The NRC has determined that both methods (spent fuel pools and dry cask storage) provide adequate protection of the public health and safety and the environment. Note that initially all spent fuel must be placed into wet storage until such time as the heat generated by the spent fuel has decayed to the point when ambient air cooling is sufficient for dry cask storage (typically 3-5 years).

Commission staff coordinated with NRC staff during the preparation of the staff report. The NRC previously reviewed the NUHOMS waste storage facility license extension and, in 2021, granted a license term extension request for the waste storage facility. As part of the license extension review, the NRC also reviewed and approved the Aging Management Program for the NUHOMS waste storage facility. The NRC license for the waste storage facility now runs through February 5, 2063.

United States Department of the Navy

SCE operates the SONGS site under the terms of a grant of easement from the U.S. Department of the Navy (Navy). The grant of easement was executed on May 12, 1964, and is effective through May 12, 2024. SCE is in the process of applying for an extension of the grant of easement from the Navy.

Tribal Consultation

In August 2022, Commission staff provided formal tribal consultation invitations to representatives of Native American Tribes with potential cultural or historic connections to the project area. Commission staff contacted 28 Tribes and received one response, from the Jamul Indian Village.

Commission staff held a virtual consultation meeting with the Jamul Indian Village in September 2022. During the consultation, staff discussed the geologic hazards analysis carried out for the project, the Coastal Commission's jurisdiction, and the scope of its review. The Jamul Indian Village representative indicated that because no ground disturbance would occur as a part of the proposed permit amendment, a site visit was not necessary, and adverse impacts to archaeological resources would not be expected.

D. SCOPE OF REVIEW

Review of this permit amendment application focuses on changed conditions or new information that has come to light since the original CDP for the NUHOMS waste storage facility was approved in 2001. As mentioned above, in 2015 the Commission approved a CDP for construction of another waste storage facility (Holtec) adjacent to the NUHOMS waste storage facility. As part of the analysis and findings for the Holtec waste storage facility, the Commission completed a detailed analysis of the geologic hazards of the site where both dry storage facilities are located. The findings below update this 2015 analysis with new information and considers potential changed environmental conditions at the site.

E. GEOLOGIC HAZARDS

Section 30253 states, in relevant part:

> *New development shall do all of the following: (a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard, (b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or*

> *surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs…*

The NUHOMS waste storage facility at SONGS is located on a heavily modified coastal bluff, approximately 325 ft inland of the seawall installed as part of the initial construction of the SONGS facility. The site is potentially subject to several geologic and coastal hazards including seismic activity, tsunamis, coastal flooding and sea level rise, as well as coastal erosion and bluff retreat. Although the Commission is proscribed from applying Section 30253 – or any section of the Coastal Act – to issues related to nuclear and radiological safety, the waste storage facility must still minimize hazards and assure geologic stability and structural integrity for the duration of the proposed permit amendment in order to conform to the California Coastal Act. The analysis and findings below relate to the susceptibility of the proposed development to geologic hazards pursuant to the Coastal Act but do not attempt to address the consequences of these hazards in terms of nuclear safety.

Earthquake and Seismic Hazards

SONGS lies in the peninsular ranges geomorphic province of southern California. Like most of coastal California, it is an area that is subject to earthquakes. Several active faults are relatively close to SONGS. SONGS is approximately 5 mi from the Newport-Inglewood-Rose Canyon (NIRC) fault system, 25 mi from the Elsinore Fault, 45 mi from the San Jacinto Fault, and about 60 mi from both the San Andreas Fault and several prominent offshore fault zones.

Several smaller faults are located closer to SONGS, but are considered to be inactive. The Cristianitos fault lies south and east of the SONGS site, intersecting the sea cliff approximately 1 mile south of SONGS. The Cristianitos fault separates two zones of distinct bedrock, but is overlain by undisturbed terrace deposits, indicating that the fault has not been active in at least the last 125,000 years (Coastal Environments 2022a). In considering the other (Holtec) waste storage facility, the Commission found that:

> *In general, seismicity in the vicinity of SONGS has historically been relatively quiet compared to much of the rest of southern California, probably because of the relatively great distance from the San Andreas Fault, which accommodates most of the plate motion in the area, and the relatively low slip rates of the nearer faults (Petersen et al., 1996). A magnitude (M_L) 5.4 earthquake, associated with an unusually large swarm of aftershocks, occurred near the offshore San Diego Trough Fault Zone in 1986, but no other moderate or large (>M 5.0) earthquake has occurred within 50 km in historic time.*[9]

[9] M_L refers to locally-measured Richter scale magnitude.

The discussion below covers three types of seismic hazards: ground shaking, surface rupture, and liquefaction. Slope stability and tsunami hazards are covered in their own subsequent section.

Ground Shaking

Of all of the faults in the region, the NIRC fault system is expected to generate the strongest ground shaking at the waste storage facility. Although the San Andreas fault system is capable of producing larger earthquakes, it is distant enough from the waste storage facility site that ground shaking would be less than during an earthquake on the NIRC fault system.

SONGS Units 2 and 3 were designed considering ground shaking from a hypothetical "design basis" earthquake: a M7.0 earthquake on the NIRC fault system, which would result in ground shaking with a high frequency component peaking at 0.67g[10]. In comparison, the NUHOMS waste storage facility at issue here was designed to withstand much stronger levels of ground shaking. Expressed in terms of peak ground acceleration (PGA) (see footnote 10), the waste storage facility was designed to withstand ground shaking of 1.5g in each horizontal direction and 1.0g in a vertical direction (Coastal Environments 2022a). The seismic design of the waste storage facility also greatly exceeded the ground accelerations projected in a probabilistic seismic hazard assessment conducted by SCE in 1995 (CCC 2001) and by the USGS ground motion hazard tools available in 2001 (Petersen et al. 1996). The Commission thus concluded in its original approval of the NUHOMS facility that a much larger earthquake or a much lower epicentral distance, or both, would not produce ground shaking exceeding the design of the waste storage facility.

Since the time that the Commission considered the construction of the waste storage facility in 2001, new information has become available on how the faults offshore SONGS move and interact, and several large magnitude earthquakes have occurred on similar or analogous offshore fault systems in other parts of the world. Past evaluations of seismic hazards at SONGS have focused on surface faulting and fault rupture less than 11,700 years old, which is consistent with Alquist-Priolo Act "active" fault definitions. In recent decades, however, there has been a greater awareness of the hazards posed by "blind" faults which lack surface expression, and the potential for large earthquakes, producing significant ground shaking, that do not result in surface

[10] Seismic hazards are often discussed in terms of the strength or intensity of ground shaking rather than earthquake magnitude. Measures of ground-shaking account for the attenuation of seismic waves due to distance from a rupture and amplification or damping due to substrate types (e.g., soft sediments vs. hard rock) and thus provide a better estimate of the amount of damage that may occur at a given site. Ground shaking is often measured as the *acceleration* experienced by an object during an earthquake, expressed as a fraction of the acceleration of gravity (9.81 m/s^2), 1.0 "g". The *spectral acceleration* occurs at different oscillation frequencies, which can be plotted to form a ground shaking *response spectrum*. The *peak ground acceleration* (PGA) is a measure of the maximum force experienced by a small mass located at the surface of the ground during an earthquake, and is used seismic design as a hazard index for short, stiff structures.

fault rupture or that occur on faults that were unknown or not recognized as active. California has experienced many earthquakes like this, including the 1989 Loma Prieta Earthquake, the 1994 Northridge Earthquake, and two earthquakes in Ridgecrest in 2019.

Newer research has also revealed the complexity of the Coastal Fault System offshore of SONGS, creating the need to update and refine previous hazards assessments that relied on simple horizontal ("slip-strike") motion along the NIRC fault zone as the primary source of damaging earthquakes. Recent studies indicate that the NIRC is just one component of a linked system of offshore faults, also including the San Mateo-Carlsbad and San Onofre fault zones, that forms a complex zone of tectonic deformation experiencing both slip-strike and oblique or vertical fault motion (Coastal Environments 2022a). Moreover, there is evidence that the Oceanside blind thrust low angle fault system and the deeper Thirtymile Bank detachment may provide linkages between NIRC and the San Mateo-Carlsbad faults to produce large, complex, multi-fault ruptures (Coastal Environments 2022a).[11] Such a multi-fault rupture could result in larger earthquakes and greater ground shaking at SONGS than were evaluated in previous hazard assessments.

In response to this new information, SCE has worked with geological experts to update seismic hazards assessments for SONGS. In 2010, new, probabilistic modeling was completed that included the potential for multi-fault ruptures as well as scenarios evaluating both strike-slip faulting on the NIRC fault zone and, separately, low angle blind thrust faulting on the Oceanside fault (Coastal Environments 2022a). As discussed in the adopted findings for CDP No. 9-15-0228, the risk of projected levels of strong ground shaking were somewhat lower in the 2010 study compared to the 1995 seismic assessment, and comparable to the ground-shaking projected using USGS and CGS ground-motion analysis tools. For an earthquake with a 2% in 50-year probability of exceedance (2,475-yr event), the 2010 study projected a PGA of 0.48 g, a level of ground-shaking well below the design values for the waste storage facility.

As part of its current CDP amendment application submittal, SCE provided a supplementary ground-shaking hazard analysis that addresses the potential for the large multi-fault ruptures and potential offshore fault linkages postulated by recent research (Coastal Environments 2022a). The new analysis relies on a deterministic modeling of several potential earthquake events, including a M 7.62, nine-segment Coastal Fault System earthquake extending from Huntington Beach to La Jolla and involving both the NIRC and other linked fault systems. The modeling used updated

[11] The 2019 MW 7.8 earthquake in Kaikōura, New Zealand (Hamling et al., 2017) provides a present-day example of a multi-fault rupture on an offshore fault system similar to the Coastal Fault System near SONGS. The Kaikōura earthquake produced substantial surface rupture on at least 12 shallow faults underlain by a deeper blind thrust fault associated with oblique subduction beneath the north end of the South Island. In addition to severe ground shaking (PGA >1.0g), a tsunami of up to 3 m height was observed along the coasts adjacent to the vertical fault displacements.

ground motion prediction equations, and, in contrast to previous efforts, accounted for both strike-slip and oblique-reverse fault motion. Calculated median PGA values for the nine-segment M7.6 source event ranged from 0.65g to 0.77g, depending on the shaking attenuation equations used. These values are similar to the design basis for the power plant (0.67g), and well below the 1.5g that was used for the design of NUHOMS waste storage facility. The 1.5g peak ground acceleration established for waste storage facility design remains conservative for the seismic hazards identified for the SONGS site, even in light of the new modeling information that accounts for recent earthquake information.

However, it remains important to compare the facility design to its as-built condition – and its condition after over a decade of operation and use – to further ensure that it is capable of withstanding the level of ground acceleration that may result from earthquake activity that could occur in the project area. In response to requests for information regarding the current fidelity of the facility to its design, SCE provided Commission staff with an analysis indicating that through its AMP inspections in November 2021 of the canisters, storage modules and concrete pad, the waste storage facility condition is consistent with its design and it is expected to perform to its design capacity for seismic, containment, and all other safety criteria.

Accordingly, the Commission finds that the proposed amendment assures stability and structural integrity relating to seismic ground-shaking hazards, consistent with section 30253 of the Coastal Act.

Surface Rupture

At the time SONGS was constructed, no active faults were found on the site. Geologic studies relating to construction found several minor faults and fractures in the San Mateo Formation sandstone underlying Units 2 and 3, but they were truncated by overlaying marine terrace deposits, which have been dated back to 125,000 years ago. This indicates that there had been no movement on the surface faults for 125,000 years or more (Coastal Environments 2022a). The largest fault near the SONGS site is the Cristianitos fault, which passes less than one mile south of the SONGS site. Like the faults found on the SONGS site, the Cristianitos fault is also overlain by unruptured marine terrace deposits, indicating that there has been no movement on it for at least 125,000 years. The California Geological Survey considers the Cristianitos fault to be inactive (Jennings and Bryant 2010).

While the available evidence indicates that the Cristianitos and other smaller faults and fractures in the near vicinity of SONGS are inactive in geologically-recent time, SCE's geologic hazards report (Coastal Environments 2022a) does discuss potential scenarios for seismic activity at or near the waste storage facility site. The report notes that the Capistrano Embayment area immediately offshore of SONGS has experienced several small earthquakes (M3-4) in historical time, the causes of which are not well understood. Uplift or folding within the Capistrano Embayment during a large (M>7) multi-fault earthquake, as discussed above, could potentially produce subsurface

fractures in more brittle rock such as to observed in the coastal bluff at SONGS. However, based on the existing fractures observed during plant construction, displacement along such fractures is expected to be small (a few inches) and would not adversely affect the waste storage facility given its 3-foot thick, reinforced concrete slab support foundation, rigid construction, and the allowance for lateral displacement included in its design (SCE 2022). Accordingly, the Commission finds that the proposed amendment assures stability and structural integrity with respect to surface rupture, consistent with Section 30253 of the Coastal Act.

Liquefaction

The SONGS site is underlain by dense sands of the San Mateo Formation. The upper terrace deposits which formerly overlaid the San Mateo Formation were removed during construction of SONGS units 1, 2, and 3. When the waste storage facility was originally considered in 2001, the Commission found that SCE had adequately addressed the liquefaction hazard at the site. The high factor of safety in the waste storage facility design, the empirical evidence that liquefaction was unlikely during the design basis earthquake, and the lack of historical evidence that very large earthquakes have liquefied sediments as dense as those at SONGS informed the Commission's findings.

When the Commission considered the Holtec waste storage facility in 2015, it reached the same conclusion, based in part on a more recent geotechnical study (CCC 2015) reaffirming that the geologic substrate underlying the SONGS North Industrial Area was at very low risk of liquefaction. Since the time that the NUHOMS waste storage facility was originally approved in 2001, researchers have found evidence of past earthquake-induced liquefaction and lateral spreading events in other dense geologic substrates in coastal north San Diego County (CCC 2015). However, there is still no evidence of liquefaction within the Miocene-aged San Mateo Formation, which underlies the waste storage facility. Rather, the fractures in the San Mateo Formation identified during excavation for Units 2 and 3 suggest brittle behavior, indicating that liquefaction of the soil beneath the waste storage facility remains unlikely. SCE's most recent geologic hazards analysis also concluded that liquefaction was not a significant hazard at the site (Coastal Environments 2022a).

Due to the absence of new research indicating liquefaction in the San Mateo Formation and the high factor of safety evident in site-specific empirical studies, the Commission finds that the stability of the site with respect to liquefaction can be assured to the greatest extent feasible, consistent with section 30253 of the Coastal Act.

Slope Stability

The waste storage facility is located near two cut slopes to the northwest and northeast. The toe of the cut slope to the northwest is approximately 105 ft from the waste storage facility and is approximately 81 ft high. The cut slope to the northeast is approximately 200 ft from the waste storage facility and is approximately 78 ft high. The slopes are largely covered in gunite. When the waste storage facility was considered in 2001, SCE

had conducted a slope stability analysis to determine the minimum factor of safety of the slopes during seismic shaking of the design basis earthquake (0.67g). The analyses were performed on four cross sections of the slopes and found minimum factors of safety ranging from 1.77 to over 3 (CCC 2001).[12] The study concluded that only minor sloughing of the near slope surface material is likely to occur during the design basis earthquake. SCE also performed an additional evaluation to determine, if a slope failure were to occur, what distance the soil could be expected to travel. The evaluation indicated that the maximum distance the soil would travel would be 120 ft and that the waste storage facility site was located to be isolated from the potential runout zone (CCC 2001).

Additional analyses prepared before the Holtec waste storage facility was considered in 2015 found that the adjacent slopes had safety factors of greater than 1.5 and projected slope runout distances between 91 and 107 ft (CCC 2015). Hinkle (2011) performed a third-party review of prior slope failure studies and found that when conservatively assuming a slope failure during the design basis earthquake or tsunami, the expected slope run-out distance of the adjacent slope would be 91 ft (Coastal Environments 2022a). More recently, Coastal Environments (2022a) estimated a slope runout distance of 50-70 ft for the northwest bluff, based an assumed 20º to 25º angle of repose for the failed slope. The study concluded that any slope failures from the north bluff would remain more than 20 ft away from the NUHOMS waste storage facility and that any failures from the east bluff would be a greater distance away.

Based on these previous studies, failure of the gunite-encased cut slopes adjacent to the waste storage facility is very unlikely. If such an event occurred, the waste storage facility is located and designed to avoid damage from potential runout. Accordingly, the Commission finds that the site stability with respect to surrounding slope stability can be assured to the greatest extent feasible, consistent with 30253 of the Coastal Act.

Tsunami Hazards

The science of predicting and understanding tsunami hazards has advanced since the NUHOMS waste storage facility was originally considered by the Commission in 2001. The waste storage facility modules are located approximately 20 ft above the mean lower low water (MLLW) and a minimum of 325 ft away from the SONGS seawall. When the waste storage facility was originally considered in 2001, the worst-case scenario for tsunami was believed to be a M7.5 earthquake occurring 8 km offshore along the NIRC fault system. The scenario analyzed in 2001 predicted a tsunami runup elevation of 7.6 ft MLLW; when the tsunami water height was added to a 7-foot high tide and a one-foot storm surge to replicate an extreme-case scenario, the maximum still water level was found to be 15.6 ft MLLW. Since the waste storage facility foundation pad is at an elevation of 20 ft MLLW, it was found to be about 4.4 ft higher than the predicted

[12] A factor of safety of 1.0 means the forces working against a stable condition (primarily from gravity) are equal to those working to resist failure. A factor of safety of 1.5 means the forces resisting failure are 50% greater than those working towards failure.

tsunami runup. SCE also modeled breaking storm waves, with the maximum wave being 8.8 ft high. This additional water brought the water level up to 18.8 ft MLLW, which remained 1.2 ft below the pad grade. Additionally, inundation in up to 50 ft of water was factored into the waste storage facility design, and the Commission concluded that a tsunami would not adversely affect the stability of the site.

Significant advancements in scientific understanding of tsunamis and the ability to model them occurred between 2001 (when the NUHOMS facility was originally considered) and 2015 (when the Holtec waste storage facility was considered). These advancements included the knowledge that large tsunamis may be generated from distant sources, as well as local assessments for tsunami inundation from underwater landslides. In 2013, SCE commissioned a site-specific tsunami inundation analysis, which included both local and distant sources of tsunami events as well as local tsunamis from submarine landslides (CCC 2015). This analysis found that tsunami wave runup elevations would range from 8.5-22 ft MLLW, with the largest potential tsunamis produced by earthquakes in the eastern Aleutian Islands. Models of local source tsunamis found maximum run-up elevations ranging from 10-21.5 ft MLLW. The maximum tsunami wave runup elevations were similar to those from independent evaluations carried out in 2009 which suggested a credible upper bound of inundation to be 20-23 ft MLLW (State of California 2009). In short, from the analysis in 2015, the NUHOMS waste storage facility site may experience inundation from a worst-case scenario tsunami.

To understand the current tsunami hazards at the waste storage facility based on information available in 2022, SCE prepared an updated tsunami hazard report (Coastal Environments 2022b). The assessments used a conservative maximum still water level called an “extreme water level.” This extreme water level includes astronomical tides, storm surge, limited wave setup caused by breaking waves, and sea level rise using the extreme H++ scenario (2.8 ft in 2050) (OPC 2018). Based on this updated information, the starting extreme water level from which a tsunami would then runup onto the site in 2050 is estimated to be 10.4 ft MLLW (Coastal Environments 2022b).

Far-field tsunamis

The updated analysis found that tsunamis originating from earthquakes on the Alaska-Aleutians subduction zone, particularly the eastern portion of the subduction zone, would produce the highest tsunami wave heights offshore of SONGS. Tsunami sources from this region were used to model a worst-case scenario for tsunamis on top of the extreme water level discussed above.

The worst-case hypothetical far-field tsunami would come from a M9.5 earthquake in the eastern Aleutians. In the worst-case scenario, which would include 2.8 ft of sea level rise (H++ projection for 2050), the maximum potential water elevation at the waste storage facility would be 29.8 ft MLLW, with a water depth above ground surface of 9.1 ft around the NUHOMS waste storage facility. This would be below the top of the NUHOMS waste storage facility concrete module height of 32.5 ft MLLW, and much

lower than the waste storage facility water submergence design depth of 50 ft. The worst-case scenario was modeled without the seawall present in order to demonstrate that the waste storage facility was not reliant on existing shoreline protection devices. The presence of the seawall is expected to reduce the waste storage facility exposure to tsunamis.

Near-field tsunamis

Near-field tsunamis may also be generated by earthquakes on the NIRC fault system. The hypothetical near-field modeling conducted by SCE included earthquakes ranging from M7.62 to M7.44 and with seafloor uplift ranging from 13.1 ft to 8.2 ft. The analysis found a maximum potential water elevation at the waste storage facility of 23.6 ft MLLW, with a water depth above ground surface of 3.9 ft. Although inundation would be present in this scenario, the predicted water levels are lower than those predicted to be generated from a worst-case far-field tsunami source.

Submarine landslide tsunamis

Finally, offshore submarine landslides occurring along the steep escarpments present on the southern California seafloor have also been considered as potential tsunami sources. Prior simulations performed for SCE have found that tsunami runup from submarine landslides along the Thirtymile Bank formation towards the San Diego Trough and from the Fortymile Bank formation into the North San Clemente Basin are the most significant potential local landslide sources of tsunamis (Coastal Environments 2022b). One of these simulations found high water levels on the cliffs adjacent to SONGS of 21.7 ft MLLW from Thirtymile Bank and 18.7 ft MLLW from Fortymile Bank (Coastal Environments 2022b). Although significant, both of these predictions are lower than the water levels predicted to be generated from a worst-case far-field tsunami source. The worst-case far-field tsunami therefore remains the most extreme worst-case tsunami scenario. The frequency of large offshore landslides capable of producing significant tsunamis in this region appears to be very low, with an estimated recurrence interval of around 7,500 years or more.

In conclusion, the worst-case scenario tsunamis from far-field, near-field, and local landslide sources may all inundate the waste storage facility site. Most predicted inundation is expected to be below 4 ft. The maximum depth of inundation is expected to be 9.1 ft from a far-field source in the eastern Aleutians after a M9.53 earthquake.

SCE compared the results of their analysis with the results of ASCE 7-22's Tsunami Design Geodatabase, which is used for the design of critical infrastructure and used the modeling results of a probabilistic tsunami hazard analysis for a 2,475-year tsunami event which has a 2% probability of occurring over a 50-year lifespan. SCE's analysis, which used a deterministic assessment of worst-case events and has no associated probability, resulted in more extreme offshore tsunami wave conditions and had substantial agreement with onshore inundation extents and runup elevations. This demonstrates a conservative assessment of extreme tsunami hazards.

All of these inundation depths are below the concrete module height of 32.5 ft, and are much lower than the waste storage facility submergence design of 50 ft. SCE also analyzed the potential effects of moving water during a tsunami by comparing projected tsunami flow velocities to those the waste storage facility structure was designed to resist (SCE 2022a). Under the most extreme conditions, discounting the reductions that might occur because of the seawall, the analysis found that flow velocities near the waste storage facility were generally below 10 ft/s, did not exceed 13 ft/s, and remained below the design velocity of 15 ft/s. As discussed above in the seismic hazards section, based on inspections from 2021, the waste storage facility remains capable of performing at its design capacity in the event of a tsunami. Based on these analyses, inundation would not cause damage to the waste storage facility or storage canisters. Therefore the Commission finds that the stability of the site with respect to tsunami hazard can be assured consistent with section 30253 of the Coastal Act.

Coastal Flooding and Sea Level Rise

In 2001 when the NUHOMS waste storage facility was initially considered, the Commission found that the sea level rise that was expected to occur over the life of the facility was not expected to affect the waste storage facility site, given its elevation of 20 ft MLLW and its setback from the SONGS seawall. Since 2001, scientific understanding of the processes driving sea level rise and our ability to provide sea level rise predictions has increased dramatically. When the Holtec waste storage facility was considered in 2015, the Commission found that by 2050, sea level rise combined with extreme high tides and maximum wave runup could result in temporary flooding up to 25 ft MLLW where the Holtec waste storage facility is sited (in a location more seaward than the NUHOMS waste storage facility).

Since the Holtec waste storage facility was considered, updated sea level rise projections have been developed and the Commission has updated its sea level rise guidance based on those projections. As part of its application, SCE provided a mean sea level rise impact assessment to show the potential impacts of sea level rise on the NUHOMS waste storage facility. SCE's assessment uses the extreme H++ projection scenario from the Ocean Protection Council's 2018 guidance to assess the impacts of sea level rise at the site. SCE also examined the sea level rise projections from the latest International Panel on Climate Change reports, but those projections were lower than the H++ projection. In the interest of providing a worst-case scenario, the H++ projection was used. The H++ projection was included in the Ocean Protection Council's Guidance to account for the remote possibility that:

> *Rapid ice sheet loss on Antarctica could drive rates of sea level rise in California above 50 mm/year (2 inches/year) by the end of the century, leading to potential sea level rise exceeding 10 feet. This rate of sea level rise would be about 30-40 times faster than the sea level rise experienced over the last century.*

The H++ scenario predicts 2.8 ft of sea level rise near SONGS by 2050 compared to the average sea level from 1991 to 2009, raising the elevation of mean sea level to approximately 5.5 ft MLLW. As mentioned above, SCE used the H++ scenario to calculate extreme water levels that would occur with storm surge, astronomical tides, and wave setup on top of the H++ scenario. The extreme still water level expected near SONGS in 2050 is 10.4 ft MLLW (Coastal Environments 2022b). The NUHOMS waste storage facility is located at 20 ft MLLW, making it high enough to not be inundated by extreme ocean water levels.

Wave runup and overtopping can also contribute to coastal flooding. SCE provided a coastal hazards assessment that analyzed the potential for wave runup and overtopping at the existing revetment. While there is the potential for overtopping at the project site, as demonstrated by the analysis conducted for the Holtec waste storage facility (Coastal Environments 2022c), the project has been designed to resist temporary inundation, wave run-up and water contact.

Sea level rise may also affect groundwater elevations beneath the project site, where the surficial aquifer is hydraulically connected to the ocean. Based on recent monitoring results, the mean groundwater elevation below the NUHOMS waste storage facility is currently 5.0 ft MLLW, or about 14.7 ft below the concrete support pad. Under the H++ scenario, the mean groundwater elevation is projected to be at 7.8 ft MLLW by 2050, still 11.9 ft below the waste storage facility pad (which is three feet thick). (Coastal Environments 2022a)

In conclusion, the NUHOMS waste storage facility is not expected to be inundated by extreme ocean water levels; however, there is the potential for some wave overtopping in areas of the SONGS site. The waste storage facility has been designed to accommodate much more extreme flows than would be expected from extreme wave and water level conditions. Additionally, although sea level rise is expected to raise groundwater levels, the groundwater is not expected to frequently contact the waste storage facility foundation. Therefore, the proposed development, as conditioned, will minimize flooding hazards consistent with Section 30235 of the Coastal Act.

Coastal Erosion and Bluff Retreat

When the waste storage facility was considered in 2001, the Commission found that little appreciable bluff retreat or headward erosion had occurred at the SONGS site in bluffs composed of the San Mateo Formation during the past 120 years (CCC 2001). Given the setback of the proposed buildout of the NUHOMS waste storage facility pad of at least 180 ft from the seawall, the Commission found that the NUHOMS waste storage facility should be safe from coastal erosion for its anticipated useful life.[13] The

[13] As part of this review, the Commission found documentation of substantial erosion of the bluffs south of the SONGS site. However, these bluffs are composed of Monterey Formation rock overlain by terrace deposits and are known to experience relatively high rates of erosion both in the San Onofre area and elsewhere along the southern California coast. The landslides that occur in the Monterey Formation do not affect the SONGS site, which is underlain by the dense sandstones of the San Mateo Formation.

NUHOMS waste storage facility was not fully built out (thus reducing its total capacity), and the constructed facility pad is approximately 247 ft from the seawall, and the concrete spent fuel storage modules themselves are 325 ft from the seawall.

In 2007, studies undertaken by the U.S. Geological Survey found that coastal bluffs to the north and south of SONGS experienced bluff retreat ranging from 6-20 inches per year at the base of unprotected slopes within the San Mateo Formation (CCC 2015). In its 2015 consideration of the Holtec waste storage facility, the Commission used the rate of 20 inches per year as a conservative estimate for bluff retreat, assuming no seawall was present at the site. The Commission found that, if no seawall existed and assuming a bluff retreat rate of 20 inches a year (1.67 ft/yr), the maximum amount of bluff retreat over 35 years would be 58 ft (CCC 2015). This was about half the distance to the Holtec waste storage facility pad, and about 189 ft away from the NUHOMS waste storage facility pad.

As part of the current application, SCE completed a shoreline and bluff retreat analysis for the SONGS site that included modeling of future retreat using the H++ sea level rise projections. The model projected bluff retreat, through 2050, for the bluffs to the north, south, and across the SONGS site for two scenarios, one where the seawall remains in place and one where the seawall is removed in 2030. The year 2030 was selected because this was the earliest year that the feasibility of removing the SONGS seawall would be known. For unprotected bluffs (i.e., bluffs north and south of SONGS, and SONGS bluffs after 2030 in the seawall removal scenario), modeled bluff retreat rates ranged from about 0.2 to 3.25 ft/yr (Coastal Environments 2022c). For the period 2022 – 2050, this translates into total bluff retreat ranging from 6 – 91 ft. Given that the closest part of the NUHOMS waste storage facility remains approximately 247 ft from the seawall and about 255 ft from the face of the remnant bluff (beneath the public access walkway) the maximum projected erosion of up to 91 ft would not threaten the NUHOMS waste disposal facility during this period.

Reasonably Foreseeable Long-Term Hazards

As discussed in the 2015 staff report for the Holtec waste storage facility and in the background section above, there remains significant doubt as to when, or if, an offsite repository for the SONGS spent nuclear fuel may become available. If the DOE is unable to fulfill its commitment to accept spent fuel from nuclear power plants, or if the shipment of spent fuel to an offsite location is otherwise delayed, storage in the waste storage facility could be required beyond 2035 and, in the worst-case scenario, no alternative storage location would be developed, resulting in waste storage remaining on the SONGS site indefinitely.

In this scenario, or any other in which the waste storage facility remained in its proposed location for potentially many decades, there would come a time when the facility would be exposed to geologic hazards, and when the proposed project configuration and design could no longer assure stability and structural integrity without requiring

shoreline protection, and would thus no longer fulfill the requirements of Coastal Act Section 30253.

For example, the H++ sea level rise scenario predicts means sea levels of 19.2 ft by 2140 and 22.0 ft by 2150, which is high enough to regularly inundate the waste storage facility site. Given the long projection period, these predictions have high levels of scientific uncertainty, but they illustrate that although the waste storage facility location is appropriate through 2035, it will likely not be appropriate for very extended time periods. Even if the waste storage facility was designed to withstand frequent flooding, inundation and exposure to ocean waves, a location within the surf zone would place major practical constraints on SCE's ability to load and unload fuel-filled canisters, monitor and maintain the waste storage facility components, and eventually decommission and remove the facility without adverse impacts to marine resources. Thus, it is important to consider options for relocating the waste storage facility on-site if no offsite locations are available in 2035.

Future on-site alternatives and managed retreat

The remainder of the SONGS facilities are currently in the process of being decommissioned. Thus, beginning in the early 2030s, there will be a number of additional locations within the area covered by the SONGS NRC site license where a waste storage facility could conceivably be built but which were not available at the time SCE initially conducted its alternatives analysis. A number of these locations are at higher elevations (+30 to 80 ft MLLW) and greater distances from the shoreline (up to 900 ft) than the current NUHOMS waste storage facility site and may prove to be safe from coastal hazards over a longer period of time. If the proposed waste storage facility must remain on-site beyond 2051 for a long or an indefinite period of time, it may prove necessary to relocate the waste storage facility to another site within the SONGS site better able to minimize hazards and assure the stability of the facility over the long-term.

In order to guard against the possibility that the proposed waste storage facility would remain in place beyond 2051 *and* become exposed to geologic hazards in the future, the Commission amends **Special Condition 4**, to extend the term of of E-00-014 through November 15, 2035, and to require that, at least twelve months prior to the end of this term, SCE apply for a CDP Amendment to retain, remove or relocate the proposed waste storage facility. It is intended that the future CDP amendment application for the NUHOMS waste storage facility be synchronized with the amendment application for the Holtec waste storage facility. The CDP Amendment application shall be supported by (a) an evaluation of current and future coastal hazards based on the best available information; and (b) an alternatives analysis examining the merits and feasibility of both offsite and onsite alternatives, including potential locations within areas made available by the decommissioning of SONGS Units 2 and 3.

Canister Transportability and Removal of the Waste Storage Facility

Ultimately, SCE's ability to avoid long term coastal hazards and the need for shoreline protection, thus helping assure consistency with Coastal Act Section 30253, depends on its ability to eventually remove the waste storage facility from the proposed site. In turn, the removal of the waste storage facility depends on the spent fuel storage canisters remaining in a condition adequate to allow safe removal from the storage modules and transfer to a new location. This is true regardless of the timing and circumstances of the waste storage facility removal, whether in 2051, with the spent fuel being transferred to a permanent repository, in 2035, in conjunction with relocation to a new on-site waste storage facility, or at some future date as a part of a plan of managed retreat to avoid coastal hazards

As described previously, the Commission is preempted from imposing regulatory requirements concerning radiation hazards and safety. However, in order to find the project consistent with the geologic hazards policies of the Coastal Act and in recognition that the project itself proposes interim temporary storage for eventual transport to a federal or other offsite repository, the Commission must have reasonable assurance that the SONGS spent fuel will continue to be transportable, and the waste storage facility itself removable, as long as the facility occupies its proposed location. The 41-year NRC licensing and certification of the structural adequacy of the NUHOMS waste storage facility system provides such assurance within this limited timeframe, and is roughly consistent with the limited available evidence on when stress corrosion cracking may begin to affect certain stainless steel components in marine environments. Thus, in order to minimize the possibility that the proposed waste storage facility would become unremovable, and thus subject to long-term geologic hazards necessitating the use of shoreline protection devices, **Special Condition 6** would require a process for a third-party independent review of SCE's existing Aging Management Program (AMP) and Implementing Procedures. The results of the independent review would be provided to the Executive Director to inform their review of the AMP. If the Executive Director's review indicates that additional or different inspection, evidence, reporting, and/or remediation measures from those in the AMP[14] should be taken, SCE shall either (1) incorporate the new or different measures into the AMP, seek any required NRC approval of the modification, and submit the modified AMP to the Executive Director for review and approval, or (2) incorporate the new or different measures into its operations through an application to the Commission for a CDP amendment for continued authorization of the NUHOMS waste storage facility consistent with the new or different measures recommended by the Executive Director. **Special Condition 6** would also require SCE to report the findings of canister inspections conducted under the AMP to the Executive Director within 180 days of the completion of each inspection to ensure ongoing canister transportability.

[14] Note that the acronym "AMP" refers to both the Aging Management Program and its Implementation Procedures.

Finally, for canisters to be removed from the NUHOMS waste storage facility, there must be a location that is available, and which has agreed to accept the canisters. As mentioned in the background, SCE is engaged in efforts to identify and evaluate offsite locations for spent nuclear spent fuel storage. **Special Condition 7** requires biennial reporting on (1) the status of SCE's efforts to identify and evaluate alternative offsite facilities where canisters from the NUHOMS waste storage facility may be accepted; (2) SCE's activities to advance the establishment of offsite facility locations and the status of their efforts to secure an offsite facility to accept canisters from the NUHOMS waste storage facility; (3) information on federal activities relating to the spent nuclear fuel management program and Congressional activities to address needed changes to Federal legislation; (4) current status of transportation planning to facilitate the transfer of canisters offsite; and (5) international developments related to spent fuel management and their relevance to domestic spent fuel management. This will allow the Commission to evaluate the progress of SCE's efforts on relocating the spent fuel offsite.

Conclusion

Based on the proposed permit amendment described, and with the conditions described above, the Commission finds that the proposed project, as conditioned, is consistent with the Coastal Act Section 30253 (a) and (b).

F. Marine Resources and Water Quality

Section 30231 of the Coastal Act states:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Part of the Commission's 2001 review of SCE's application for construction and operation of the NUHOMS waste storage facility focused on construction-related impacts to water quality, specifically stormwater. Because no construction is proposed as part of the current proposed amendment and no liquid discharges occur during operation of the waste storage facility, the analysis below focuses on groundwater quality. In late 2021, as part of a NRC license requirement, SCE took three groundwater samples near the waste storage facility. The samples were analyzed for chlorides, sulfates, and pH. This sampling was done to help determine if any leaching from the waste storage facility pad was occurring and whether the condition of the waste storage

facility pad was sound. The acceptance criteria for the groundwater samples was approved by the NRC as follows:

- Chlorides: less than or equal to 500 parts per million (ppm)
- Sulfates: less than or equal to 1500 ppm
- pH: greater than or equal to 5.5.

The analysis found that all groundwater samples met the acceptance criteria. This result indicates that leaching is not occurring, and the waste storage facility concrete pad is not experiencing degradation. Based on the information provided with the permit amendment application, the Commission finds that the proposed project is consistent with Coastal Act Section 30231.

G. ENVIRONMENTAL JUSTICE

Coastal Act Section 30604(h) states:

> *When acting on a coastal development permit, the issuing agency, or the Commission on appeal, may consider environmental justice, or the equitable distribution of environmental benefits throughout the state.*

Section 30604(h) provides for the Commission to evaluate environmental justice considerations when making permit decisions. As defined in Section 30107.3(a) of the Coastal Act, "environmental justice" means "the fair treatment and meaningful involvement of people of all races, cultures, incomes and national origins, with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." Section 30107.3(b)(4) states that environmental justice includes, "[a]t a minimum, the meaningful consideration of recommendations from populations and communities most impacted by pollution into environmental and land use decisions."

In March 2019, the Commission adopted an environmental justice policy ("EJ Policy") to guide and inform its implementation of Section 30604(h) in a manner that is fully consistent with the standards in, and furthers the goals of, Chapter 3 of the Coastal Act and certified local coastal programs. The EJ Policy further articulates environmental justice as the following:

> *The term 'environmental justice' is currently understood to include both substantive and procedural rights, meaning that in addition to the equitable distribution of environmental benefits, underserved communities also deserve equitable access to the process where significant environmental and land use decisions are made.*

Ensuring access to the Commission's proceedings means making sure that those who are affected by proposed development have a meaningful and equitable opportunity to voice concerns in an open and transparent public process. Substantively, the EJ Policy describes how the Commission will work to help ensure equitable access to the coast,

support measures that protect existing affordable housing, and help ensure that environmental justice communities are not disproportionately affected by climate change, water contamination, overuse or diminished environmental services. The Commission also has the mandate and the authority to maximize public participation in its decision-making process, including by ensuring that it solicits and carefully considers the viewpoints of communities that have been historically underserved or marginalized by government and that it ensures such communities have meaningful opportunities to be involved in the decision-making. (See, e.g., Coastal Act Sections 30006; 15 C.F.R. § 930.42.)

Identifying Environmental Justice Communities

The Commission's EJ Policy was created to provide a framework to consider fair outcomes and requires staff to reach out to and include the voices of environmental justice community members who have been historically marginalized in the governmental review process and whose households have been disproportionately burdened by environmental hazards often stemming from industrial development. In order to evaluate the distribution of the project's environmental burdens and benefits and cumulative impacts on environmental justice communities, it is critical to understand the existing socioeconomic and demographic profiles of those communities as well as existing environmental burdens. Here, the term "environmental justice communities" refers to low-income communities, communities of color, and other populations with higher exposure and/or sensitivity to adverse project impacts due to historical marginalization, discriminatory land use practices, and/or less capacity to mitigate adverse impacts. To identify these communities, staff evaluated various quantitative and qualitative sources of information for an area roughly 10 miles from SONGS[15], which may be most affected by the proposed permit amendment. Quantitative indicators used to identify communities of concern include the percentage of low-income households identified under AB1550 thresholds[16], housing burden, population of color,[17] and linguistically isolated households and limited English proficiency.[18] Staff also used the

[15] A 10-mile radius was selected based on the Federal Emergency Management Agency's 10-mile emergency planning zone used for emergency preparedness at nuclear power plants.
[16] AB 1550 defines "low income communities" as census tracts with median household incomes at or below 80 percent of the statewide median income or with median household incomes at or below the threshold designated as low income by the Department of Housing and Community Development's list of state income limits adopted pursuant to Section 50093 of the Health and Safety Code. This provides a more reliable measure of low-income communities due to higher costs and wages in California than the Federal Poverty Level.
[17] Population of color refers to anyone that identifies as Hispanic (of any race) and anyone who identifies as non-Hispanic but as a race other than white on the Census, such as Black or African American, Asian, or American Indian.
[18] Linguistic isolation is a term used by the US Census Bureau for limited English-speaking households. More than 40 percent of Californians speak a language other than English at home. About half of those do not speak English well or at all.

CalEnviroScreen (CES) 4.0 index which identified areas with multiple sources of pollution and populations with high sensitivity to pollution.[19]

Using the indicators above, there are very few census tracts with environmental justice communities within 10 miles of SONGS. Areas with these census tracts include Capistrano Beach, San Clemente, and just over the 10-mile radius in Oceanside and San Juan Capistrano. Portions of these communities have low incomes, may experience higher pollution burdens, and include a high proportion of individuals with greater vulnerability to pollution exposure. Most of these communities do not appear to be linguistically isolated, although there are high percentages of individuals with limited English proficiency in some of these census tracts. Selected maps showing environmental justice indicators within 10 miles of SONGS are available in **Exhibit 3**.

The largest and closest community of concern identified using the criteria above is on Camp Pendleton Marine Corps Base. This community is considered low-income under AB 1550 definitions and has higher pollution exposure than over 90% of the state. However, the community on Camp Pendleton is not especially vulnerable to pollution (e.g. the community does not have high rates of asthma or heart disease). The community on Camp Pendleton is also not directly comparable to civilian communities outside of the base, considering the federal military wages are very low for new recruits.[20] Nevertheless, the military provides essential services, such as allowances for housing and subsistence, for servicemembers. Additionally, it is a population is in constant flux as a training camp for marines; thus, analysis is difficult using the existing census data.

Environmental Justice Coastal Act Analysis

To evaluate and address any potential environmental justice impacts, the Commission reached out to environmental justice organizations active in northern San Diego County and southern Orange County and informed them of the proposed permit amendment. Commission staff also created a Frequently Asked Questions (FAQ) handout and provided it on the Commission's website and directly to environmental justice organizations known to be active near the project area. Additionally, SCE is working with the broader community through a coalition with the goal of removing spent nuclear fuel from SONGS. SCE has a community outreach website at www.songscommunity.com/, where community members can get involved with the SONGS community engagement panel, learn more about the dry storage facilities at SONGS, and request a walking tour. Although all issues relating to radiological safety are outside the scope of these findings, it is worth noting that SCE coordinates with local government on its emergency planning and provides emergency planning information to the community on its website.[21] SCE also works closely with unions such

[19] CalEnviroScreen 4.0 identifies California communities most affected by pollution and ranks census tracts in California based on potential exposures to pollutants, adverse environmental conditions, socioeconomic factors and the prevalence of certain health conditions.
[20] Military Pay Calculator for 2022 - With BAH and BAS (federalpay.org)
[21] https://www.songscommunity.com/safety/emergency-planning-during-decommissioning

as Laborers International Union of North America and Val Macedo to ensure that on-site workers at SONGS receive updates on decommissioning and other relevant activities. SCE provided early information at its community meetings in August about this proposed permit amendment.

The Commission also evaluated possible pollution burdens from the project that may affect nearby environmental justice communities. During operation of the dry storage facilities, no air emissions or liquid discharges occur so continued use of the waste storage facility for the additional 13 years requested in the permit amendment is not expected to add to adverse pollution burdens in local environmental justice communities. Many communities and interested parties are concerned about the risk of geologic and coastal hazards on the waste storage facility. A discussion of geologic and coastal hazards and the risk they pose to the waste storage facility is covered in the Geologic Hazards section of these findings. Since the waste storage facility is not a source of pollution to nearby environmental justice communities and ongoing community engagement is occurring, the Commission finds that the project will not result in any significant environmental justice impacts.

H. VISUAL RESOURCES

Section 30251 of the Coastal Act states:

> *The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and where feasible, to restore and enhance visual quality in visually degraded areas.*

The SONGS site is situated adjacent to the Pacific Ocean and in close proximity to several scenic areas, including San Onofre State Beach and Camp Pendleton, which were identified in the *California Coastline Preservation and Recreation Plan*. Existing structures at SONGS are partially visible from public roads, including Interstate 5 and Old Pacific Coast Highway, and from nearby beach and shoreline vantage points. However the NUHOMS waste storage facility site is one of the least visible portions of SONGS. Due to the relatively low grade of the site, the NUHOMS waste storage facility is situated below the lines of sight of drivers on public roads inland of the site. The 14 ft tall SONGS seawall blocks views of the waste storage facility site from the public walkway and the beach. The NUHOMS waste storage facility is located on an industrial site and is consistent with the character of that site. However, as SONGS Units 2 and 3 continue the process of decommissioning, the NUHOMS waste storage facility will be one of the most visible structures left on the site. Once the decommissioning process for Units 2 and 3 is complete in approximately 2028, the only structures aside from the two dry storage facilities that will remain on the site are the revetment, walkway, seawall, and electrical switchyard. The NUHOMS waste storage facility pad is at grade and the NUHOMS waste storage facility structures are approximately 22 ft in height above

grade. In contrast, the Holtec waste storage facility is constructed partially below grade, and has a height above grade of 12.25 ft. Once the remainder of the SONGS facility is removed, the NUHOMS waste storage facility will be the tallest waste storage facility structure on the site. Given the uncertainty of when an offsite repository would be available to accept waste, the adverse visual effects of the waste storage facility could persist indefinitely.

In order to minimize adverse impacts to scenic resources, assure that the proposed development would be visually compatible with the character of the surrounding area and allow for the restoration and enhancement of visual quality in a visually degraded area to the maximum extent feasible, the Commission adopts **Special Condition 4**, which will require SCE to submit an application for a new or amended CDP supported by an evaluation of the effects on visual resources of retaining the project, an analysis of available project alternatives and their implications for coastal visual resources, and proposed mitigation measures to minimize adverse impacts to coastal views.

As conditioned, the Commission finds that the proposed project is consistent with Section 30251 of the Coastal Act.

I. ATTORNEY'S FEES AND COSTS

Coastal Act section 30620(c)(1) authorizes the Commission to require applicants to reimburse the Commission for expenses incurred in processing CDP applications. See also 14 C.C.R. § 13055(e). Thus, the Commission is authorized to require reimbursement for expenses incurred in defending its action on the pending CDP application. Therefore, consistent with Section 30620(c), the Commission imposes **Special Condition 7**, requiring reimbursement of any costs and attorneys' fees the Commission incurs "in connection with the defense of any action brought by a party other than the Applicant/Permittee…challenging the approval or issuance of this permit."

J. THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Section 13096 of the Commission's administrative regulations requires Commission approval of CDP applications to be supported by a finding showing the application, as modified by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act ("CEQA"). Section 21080.5(d)(2)(A) of CEQA prohibits approval of a proposed development if there are feasible alternatives or feasible mitigation measures available that would substantially lessen any significant impacts that the activity may have on the environment. The project as conditioned herein incorporates measures necessary to avoid any significant environmental effects under the Coastal Act, and there are no less environmentally damaging feasible alternatives or mitigation measures. Therefore, the proposed project is consistent with CEQA.

The Coastal Commission's review and analysis of CDP applications has been certified by the Secretary of Resources as being the functional equivalent of environmental review under CEQA. As a responsible agency, the Commission conducted its analysis

of the potential impacts of the proposed development that the Commission is authorized by the Coastal Act to review. The Commission has reviewed the relevant coastal resource issues associated with the proposed project and has identified appropriate and necessary conditions to assure protection of coastal resources consistent with the requirements of the Coastal Act. The staff report discusses the relevant coastal resource issues with the proposed development. All public comments received to date have been addressed in the staff report. The Commission incorporates its findings on Coastal Act consistency at this point as if set forth in full. As conditioned, there are no additional feasible alternatives or feasible mitigation measures available, beyond those required, which would substantially lessen any significant adverse environmental effect that approval of the proposed project, as modified, would have on the environment. Therefore, the Commission finds that the proposed project can be found to be consistent with the Coastal Act and CEQA Section 21080.5(d)(2)(A).