



Decommissioning **San Onofre**

Nuclear Generating Station

Sea-level Rise and Monitoring

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Waste and Radiation
Protection



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Sea Level Rise Monitoring

- During the 2020 2nd Quarter CEP meeting questions were raised about the potential impact of Sea Level Rise (SLR) on the SONGS site
- SCE assesses and reports the potential impact of SLR using California Ocean Protection Council (OPC) SLR guidance
- 2019 assessments and reporting conclude that
 - Revetment (aka “rip-rap”) is in good condition and able to withstand extreme SLR through at least 2050
 - Beaches fronting SONGS have narrowed to pre-construction widths
 - Holtec ISFSI support foundation remains above the groundwater table through 2050



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SLR Monitoring Requirement

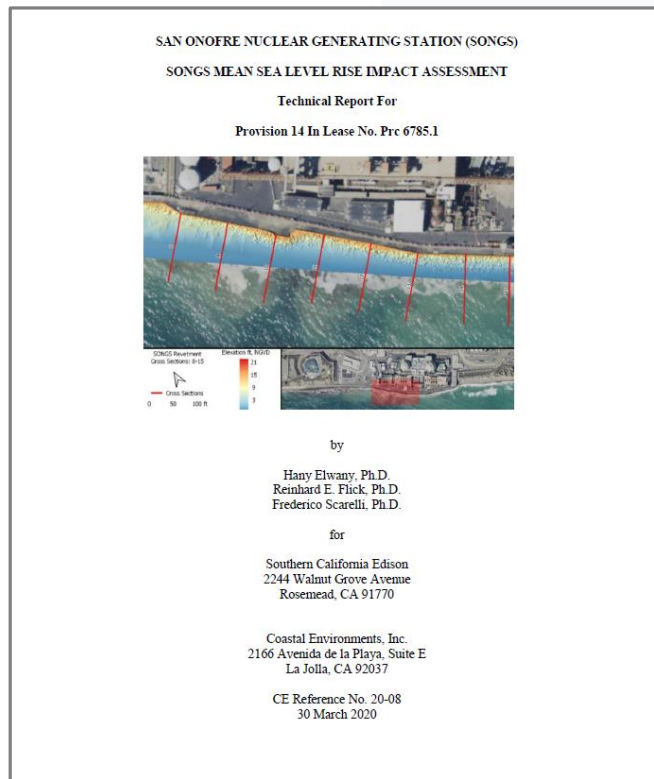
- CA State Lands Commission Lease Provision 14 requires preparation of an annual report to assess SLR vulnerability, structural integrity, and adaptation capacity for the SONGS site based on
 - Ocean Protection Council (OPC) Medium-high and H++ extreme SLR projections combined with annual, 20-year and 100-year-storm events, as well as King Tides and,
 - Quarterly ground water elevation data collected from onsite monitoring wells

RECORDED AT THE REQUEST OF AND WHEN RECORDED MAIL TO: STATE OF CALIFORNIA California State Lands Commission Attn: Title Unit 100 Howe Avenue, Suite 100-South Sacramento, CA 95825-8202	
STATE OF CALIFORNIA OFFICIAL BUSINESS Document entitled to free recordation pursuant to Government Code Section 27383	
County: San Diego	SPACE ABOVE THIS LINE FOR RECORDERS USE
LEASE NO. PRC 6785.1	
This Lease consists of this summary and the following attached and incorporated parts:	
Section 1	Basic Provisions
Section 2	Special Provisions Amending or Supplementing Section 1 or 3
Section 3	General Provisions
Exhibit A	Land Description
Exhibit B	Site and Location Map
Exhibit C	Mitigation and Monitoring Program
Exhibit D	Lease Management Reimbursement Agreement
Exhibit E	Performance Guaranty
SECTION 1	
BASIC PROVISIONS	
THE STATE OF CALIFORNIA, hereinafter referred to as Lessor acting by and through the CALIFORNIA STATE LANDS COMMISSION (100 Howe Avenue, Suite 100-South, Sacramento, California 95825-8202) (Commission), pursuant to Division 6 of the Public Resources Code and Title 2, Division 3 of the California Code of Regulations, and for consideration specified in this Lease, does hereby lease, demise, and let to Southern California Edison Company, San Diego Gas and Electric Company, and the City of Riverside, hereinafter individually or collectively, as the context may	



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Sea Level Rise Impact Assessment Report



- Prepared annually and provided to the CA State Lands Commission (CSLC)
- Posted on SONGS website
- Assesses impact of SLR through year 2050 on SONGS
 - Revetment stability
 - Seasonal beach profile changes
 - Ground water elevation

[Link: 2019 SLR Impact Assessment](#)



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Revetment (Rip-Rap) Stability Analysis

- Performed laser scan survey to produce digital elevation model (DEM) of revetment
- Compared 21 modeled transects to historical data
- Measured rocks to produce detailed estimation of rock weights
- Revetment stability calculated based on measured data and design wave estimates for SLR medium-high and H⁺⁺ projections for years 2020 and 2050
- *Revetment stability analysis indicates that the rocks are of sufficient size and weight to withstand at least the median expected combined design wave height and maximum sea level expected between now and 2050*

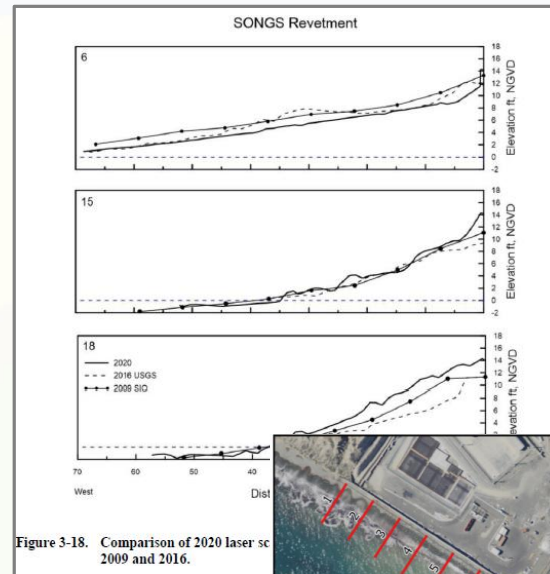


Figure 3-18. Comparison of 2020 laser scan data with 2009 and 2016 USGS data.





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Seasonal Beach Profile Assessment

- Quarterly beach profile surveys started in March 2017
- 2019 assessment based on 12 seasonal surveys performed through October 2019
- Each survey covers seven transects
- Standard survey methods used onshore and digital acoustic echo sounder used for offshore
- Onshore & offshore data integrated on a laptop computer to create a profile for each transect
- Profiles compared to historical data to estimate seasonal cycles and long-term trends in beach width

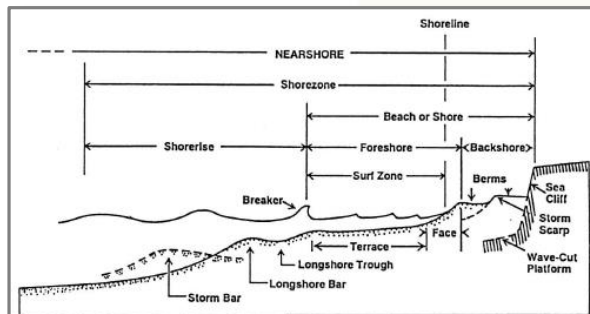
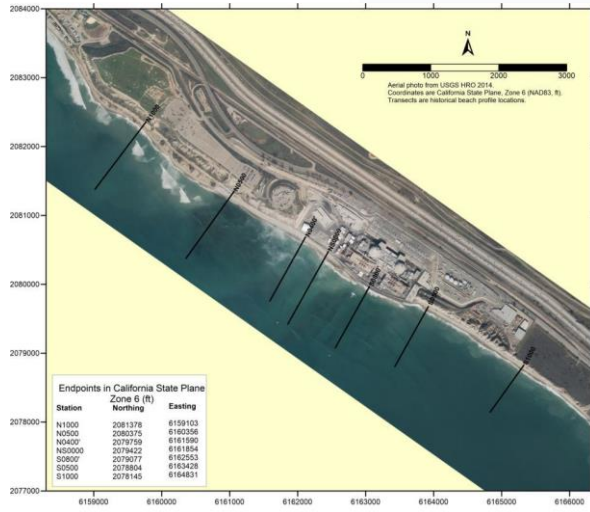


Figure 3-1. Typical Southern California beach profile (Inman, 1980).



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Seasonal Beach Profile Assessment

Conclusions

- Construction activities at SONGS over the 20-years from 1965 to 1984 resulted in substantial increases in beach width adjacent to and north of the plant
- Since the removal of the Units 2/3 laydown pad in 1985, the beaches have narrowed and returned to their pre-construction configuration
- From 2000 to 2019 beaches have narrowed due to limited sand supply from the surrounding creeks and rivers since the last wet period in 1998
- The average seasonal beach width fluctuation from 2017 to 2019 is about 26 feet

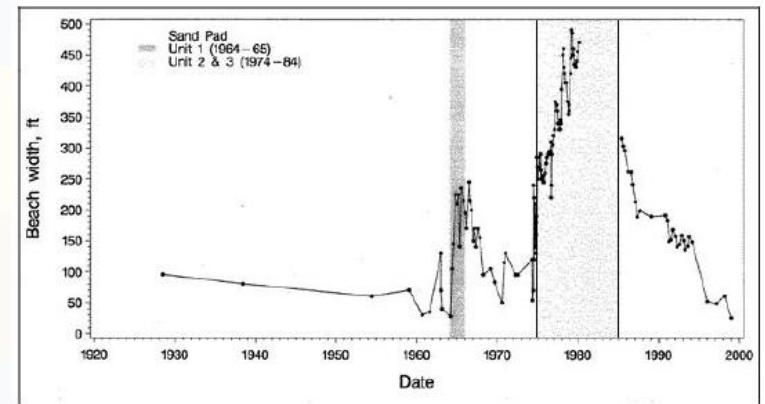


Figure 7-5. Historical beach width adjacent to Unit 1, 1928-2000. Vertical columns show periods when laydown pads were present.





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Ground Water Elevation Monitoring



Figure 2-2. Locations of Group 1 SONGS groundwater wells.

- Quarterly water level data from SONGS site groundwater monitoring wells collected and trended against tidal data
- Each of the wells was assigned to one of three groups based on their elevation and location within SONGS
- Group 1 wells occupy the lowest ground surface elevation and are located between the shoreline and Holtec ISFSI
- Groups 2 and 3 wells occupy the middling and higher ground elevations on the site
- Group 1 data used to determine the distance between groundwater level and the Holtec ISFSI support foundation

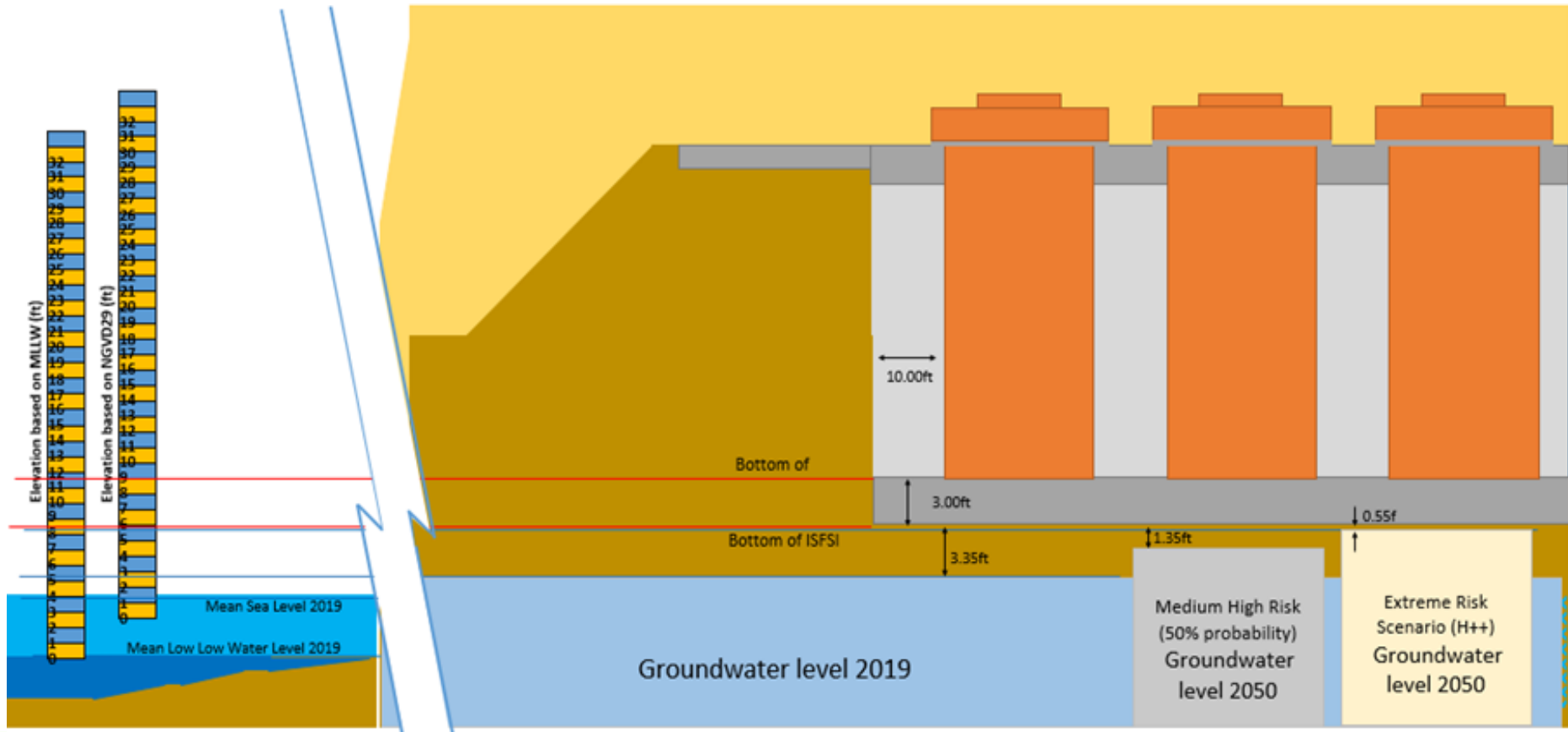


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Correction 11/23/20: concrete vertical width changed from 15ft to 10ft

Ground Water Elevation Monitoring

Groundwater Level Based on OPC-2018 SLR Projections





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Summary

- Revetment is in good condition and able to withstand H⁺⁺ SLR through at least 2050
- The beaches fronting SONGS have narrowed to pre-construction widths and are mainly influenced by dry weather conditions since the early 2000s
- Even considering H⁺⁺ SLR scenario, the Holtec ISFSI support foundation remains above the water table through 2050