2.0 SITE CHARACTERISTICS

This section describes the San Onofre site, and the location of the SONGS 1 facility. Descriptions are provided of the site characteristics, geography and demographics, the exclusion area, low population zone, and development of the atmospheric dispersion factors.

Hydrological, meteorological and some population data have been moved to Appendix A, Historical Information. This information and its impact to the facility design is not expected to change during Decommissioning (through license termination).

Changes to the Site Characteristics section are no longer required.

2.1 GEOGRAPHY AND DEMOGRAPHY

2.1.1 SITE LOCATION AND DESCRIPTION

2.1.1.1 Specification of Location

The SONGS site is located on the coast of Southern California in San Diego County, approximately 62 miles southeast of Los Angeles and 51 miles northwest of San Diego. The site is located entirely within the boundaries of the United States Marine Corps Base, Camp Pendleton, California, near the northeast end of its 18-mile shoreline.

The coordinates for SONGS 1 are latitude 33º22'10" N and longitude 117º33'30"W.

2.1.1.2 Site Area Map

The plant property line, which is also the site boundary, and the location of the original major structures of the facilities are delineated in Figure 2-1. The site, comprising 83.63 acres, is about 4500 feet long and 800 feet wide. The SONGS 1 power block was located northwest of Units 2 and 3, occupies 11.7 acres. The SONGS 2 and 3 power block occupies 19.5 acres. A spur of The Burlington Northern and Santa Fe Railway line extends into the site area.

The SONGS site exclusion area is a common area for SONGS 1, 2, and 3 and is roughly formed by two semicircles with radii of 1967.5 feet each, centered on the SONGS 2 containment and a point 134 feet southwest of the SONGS 3 containment. The minimum exclusion area distance for SONGS 1 is 996 feet (282 meters) measured from the center of Unit 1 containment northwestward to the nearest point on the exclusion area boundary. The exclusion area boundary is delineated in Figure 2-2. At the northwest and southeast site boundaries, the exclusion area is tangential to, but does not exceed, the site boundary. There are no industrial, commercial, institutional, or residential structures within the exclusion area boundary.

The Pacific Ocean is located immediately west of the site and traverses the seaward side of the exclusion area. The San Onofre State Beach includes sections of the coast on both sides of the site. Access to open beach areas up and down the coast from the exclusion area is provided by a walkway (the beach passageway) adjacent to the SONGS 1, 2, and 3 seawall. The passageway extends the 2200-foot length of the seawall and is bounded on the seaward side by a concrete wall extending approximately three (3) feet above the passageway surface.

A typical cross-section through the beach passageway is shown in Figure 2-3. The passageway is 15 feet in total width with a hard surface which can accommodate pedestrian traffic only Two removable vehicle barriers are installed along the beach passageway (one at the northwest corner of Unit 2 boundary and another at the southwest corner of Unit 3 boundary) as part of SONGS security enhancements following NRC's order issued on April 29, 2003 to upgrade the plant's security. A 3-foot wide, 20-foot long removable pedestrian bridge is also installed along the passageway at the intake structure area of Units 2 and 3 to permit pedestrian access when the saltwater cooling system of Units 2 and 3 is discharging to the beach, during which the passageway will be flooded. The seaward side of the walkway is formed by a concrete retaining wall which is protected by riprap in the event of infrequent beach erosion caused by wave action.

Old Highway 101 is immediately adjacent to the east boundary line of the site. The highway is currently being used for access the south end of the State Beach. The Burlington Northern and Santa Fe Railway right of way is east of Highway 101. Interstate Highway 5 is adjacent to the railroad right of way.

2.1.1.3 Boundaries for Establishing Effluent Release Limits

The site-restricted area defined for the purpose of establishing effluent release limits coincides with the exclusion area boundary as shown in Figure 2-2. The procedures for control of individual access and a description of the boundary are presented in Section 2.1.2.

The Unit 1 Offsite Dose Calculation Manual describes the administrative controls and calculation methodology applied to maintain effluent releases within regulatory limits.

2.1.2 EXCLUSION AREA AUTHORITY AND CONTROL

2.1.2.1 Authority

The applicant's authority to control all activities within the exclusion area was acquired by grant of easement from the United States of America made by the Secretary of the Navy pursuant to the authority of Public Law 88-82. This easement is recorded in the official records of the Recorder of San Diego County, California, on page 85887, Series 5, Book 1964.

In order to remove any ambiguities contained in the original grant of easement with respect to the applicant's authority to control activities in the exclusion area, an amendment to the grant of easement was executed on September 18, 1975, and is reproduced below, in part:

"In order to protect the public health and safety, and in accordance with the rules, regulations and requirements of the United States Nuclear Regulatory Commission, successor to the United States Atomic Energy Commission, applicable to the Nuclear Station, the Grantees may determine all activities including exclusion or removal of personnel and property from such exclusion area as is established from time to time by or with the approval of the United States Nuclear Regulatory Commission and is located within the lands described in Exhibit B. Subject to the foregoing, such exclusion area may be used by the Government, its successor or assigns, for military operations (provided same do not endanger operation of the Nuclear Station), agricultural, recreational and such other uses as may be compatible with operation of the Nuclear Station, provided that any and all uses of the exclusion area shall be in accordance with and subject to the rules, regulations and requirements of the United States Nuclear Regulatory Commission applicable to the Nuclear Station, and further provided that no significant hazards to the public health and safety shall result from any such uses."

This amendment to the grant of easement expires on May 12, 2024.

All mineral rights in the land portion of the exclusion area are held by the United States Government.

The Pacific Ocean, Interstate Highway 5 (San Diego Freeway), old U.S. Highway 101, The Burlington Northern and Santa Fe Railway right-of-way, and the beach passageway constitute traverses of the site exclusion area as allowed by 10CFR100.3(a).

2.1.2.2 Control of Activities Unrelated to Plant Operation

Recreational activities, such as sunbathing or picnicking, are not permitted within the landward portion of the exclusion area (the area landward of the contour of mean high tide). The seaward portion of the exclusion area (the area seaward of the contour of mean high tide) may be occupied by small numbers of people for passageway transit between the public beach areas upcoast and downcoast from the plant. Additional small numbers of people may be anticipated to occasionally be in the water.

Transient access to an approximately 5-acre area at the southwest corner of the site for the purposes of viewing the scenic bluffs and barrancas will be on an unimproved walkway. The improved walkway affords landward passage between the two beach areas.

Physical features and administrative controls are planned to control activities in the landward portion of the exclusion area. These features and controls will have the effect of minimizing use of the seaward portion so that it will be predominately passageway use.

The following enforcement measures are planned in order to ensure that use of the beach exclusion area, not related to operation of the facility, will be minimized and will be predominantly passageway transit:

A. Beach areas within the exclusion area will be subject to periodic surveillance by direct means.

B. If use of beach areas within the exclusion area is observed to be other than for transient use, an announcement may be made over the public address system, or other means, to request the movement of persons out of the exclusion area.

C. Should actions described above prove to be unsuccessful, plant security personnel will request the assistance of the California State Park Rangers or Camp Pendleton Military Police.

2.1.2.3 Arrangements for Traffic Control

The environs of the Site are the Pacific Ocean and the beach passageway on the west, the San Diego Freeway (Interstate 5), old U.S. Highway 101, and the Burlington Northern and Santa Fe railroad on the southeast and north.

In the event of an emergency, all traffic within the roadways and waterways is subject to control by agencies of state and local governments. Surveillance measures discussed in paragraph 2.1.2.2 will control the use of the beach passageway.

Detailed information concerning the arrangements for control of traffic within the exclusion area traverse zones is presented in the SONGS emergency plan.[(1)]

2.1.2.4 Abandonment or Relocation of Roads

There are no public roads that were subject to abandonment or relocation as a result of construction of SONGS 1, 2, and 3.

2.1.3 LOW POPULATION ZONE

The low population zone (LPZ) is the area contained within 1.95 miles of the plant site. This distance is established to ensure that the guidelines of 10CFR100 are met with respect to the LPZ and the population center. The LPZ is shown in Figure 2-4 along with transportation routes that may be used by Marine Corps personnel for evacuation purposes.

Population estimates are included in Appendix A, Historical Information.

2.1.4 REFERENCES

1. Southern California Edison Company, Emergency Plan for San Onofre Nuclear Generation Station Units 1, 2, and 3

2. "San Onofre Generating Station Unit 1, Updated Final Safety and Analysis Report," Docket 50-206

2.2 HYDROLOGY AND METEOROLOGY

The hydrological and meteorological data and information developed and verified for the SONGS site are included in Appendix A, Historical Information. A general review has determined that this information, its basis, and its impact to the facility design will not change during Decommissioning (through license termination).

2.3 SHORT-TERM (ACCIDENT) DIFFUSION ESTIMATES

The atmospheric dispersion factors used for the operating plant license, were calculated as part of the Nuclear Regulatory Commission safety evaluation report of SEP Topic II-2.C.,[3] using the direction-dependent method described in Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants."[3] This model incorporates the results of recent atmospheric tracer tests and considers the directionally dependent atmospheric dispersion conditions.[4]

Specifically, the modified dispersion model considers the following effects:

(1) Lateral plume meander, as a function of atmospheric stability, wind speed, and distance from the source, during periods of low wind speeds (< 6m/s) and neutral and stable atmospheric conditions;

(2) Exclusion area boundary distance as a function of direction from the plant;

(3) Atmospheric dispersion conditions when the wind is blowing in a specific direction; and

(4) The fraction of time that the wind can be expected to blow into each of the 16 compass directions.

The evaluation included meteorological data collected at the SONGS site for 3 years, January 25, 1973 to January 24, 1976. Wind direction and speed were measured at the 10-meter level, and estimates of atmospheric stability were based on vertical temperature differences.

Short term χ/Q values for a ground level release have been computed for various time intervals at the exclusion area boundary (EAB), varying over land from 282 to 1046 meters, and the outer boundary of the low population zone (LPZ), a circle with a radius of 2898 meters. A building wake factor of 3 was used in the analysis based on a cross sectional area of 1000 square meters.

The estimated zero - 2 hour χ/Q values will be exceeded on the average no more than 44 hours a year (0.5% of the total time) and were calculated at the EAB and LPZ for SONGS 1 for each sector. Of the onshore sectors, the northwest downwind sector was found to have the highest χ/Q values at both the EAB and LPZ. These values are used in the evaluation of short-term accidental releases and are listed in Table 2.1. (χ/Q values for some over-water sectors at both the EAB and LPZ, which were excluded from the analysis, are greater than the maximum onshore sector values.) The χ/Q values that were appropriate for estimating exposures from postulated accidents under the operating license are included in Appendix A, Historical Information in Table A2.7-4.

TABLE 2-1

SHORT-TERM RELATIVE DISPERSION VALUES
APPLICABLE FOR ACCIDENT ANALYSES

Time Period	Location	χ/Q (s/m^3)
0 - 2 hours	EAB	9.5×10^{-4}
0 - 8 hours	LPZ	2.7×10^{-5}
8 - 24 hours	LPZ	1.9×10^{-5}
1 - 4 days	LPZ	8.2×10^{-6}
4 - 30 days	LPZ	2.7×10^{-6}

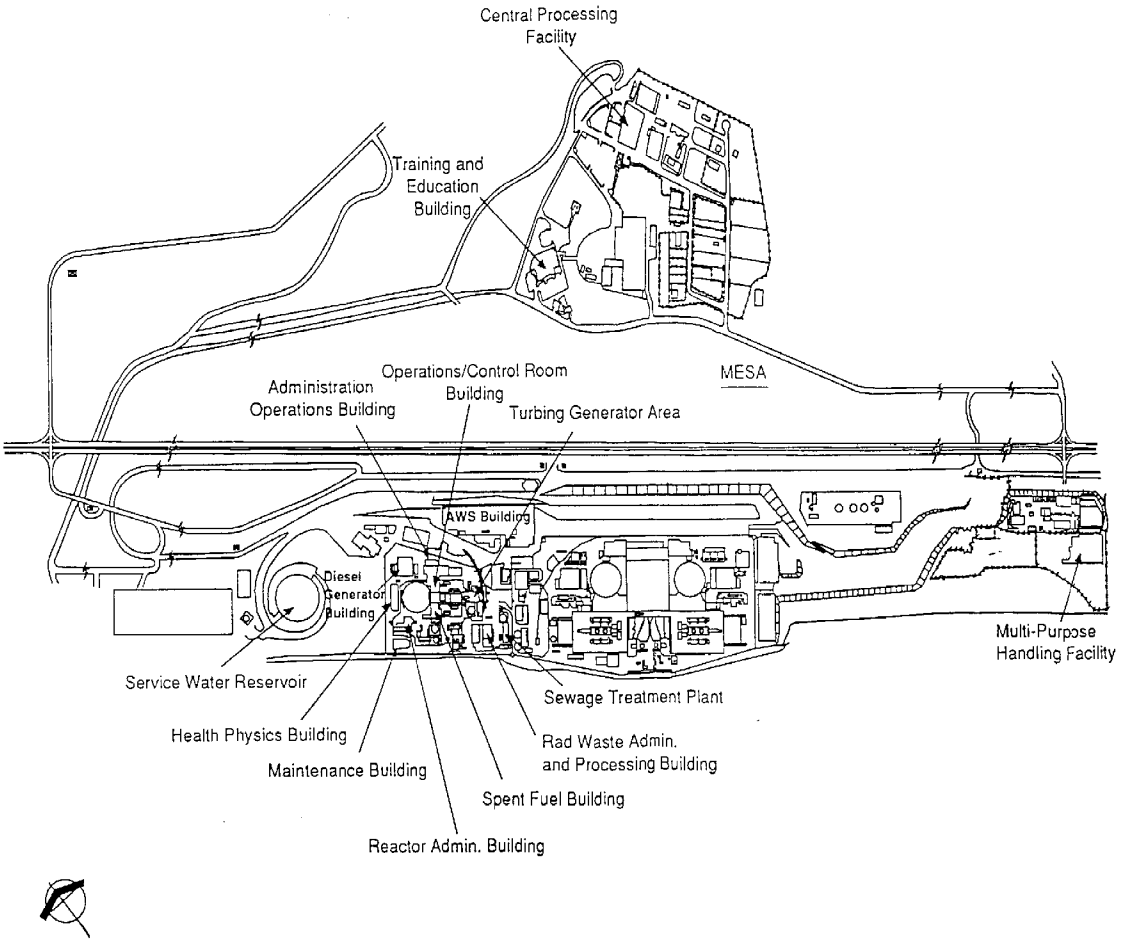
2.4 BIBLIOGRAPHY

1. Updated Final Safety Analysis Report, San Onofre Nuclear Generating Station, Unit 2 & 3, Southern California Edison Company, Dockets 50-361, 50-362.

2. U.S. Nuclear Regulatory Commission: Safety Evaluation Supporting Amendment No. 25 to Preliminary/Operating License No. DPR-13, Final Evaluation of Atmospheric Transport and Diffusion Characteristics for Accident Analysis - San Onofre (SEP Topic II-2.C), November 18, 1981.

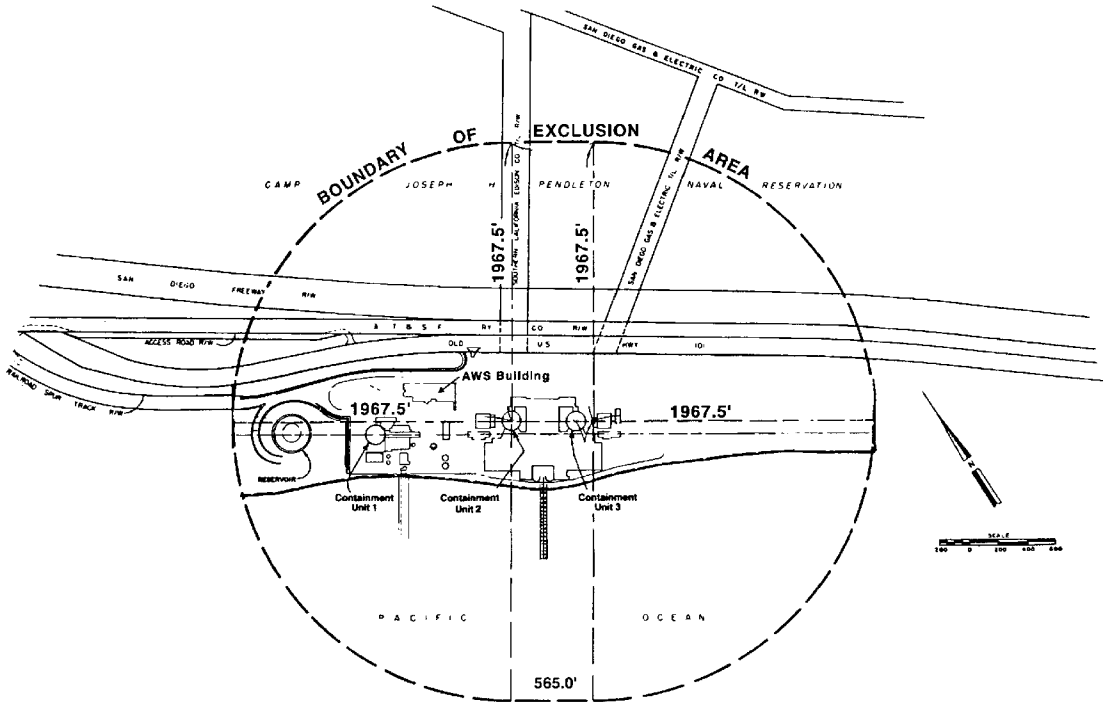
3. J.I.P. Jones and F. Pasquill, "An Experimental System for Directly Recording Statistics of the Intensity of Atmospheric Turbulence," Quarterly Journal Royal Meteorology Society, 85, 365, pp. 225-236, (1959).

4. M. Septoff, A. E. Mitchell, and L. H. Teuscher, Final Report of the Onshore Tracer Tests Conducted December 1976 Through March 1977 at the San Onofre Nuclear Generating Station. NUS-1927, NUS Corporation, Rockville, Maryland, (1977).

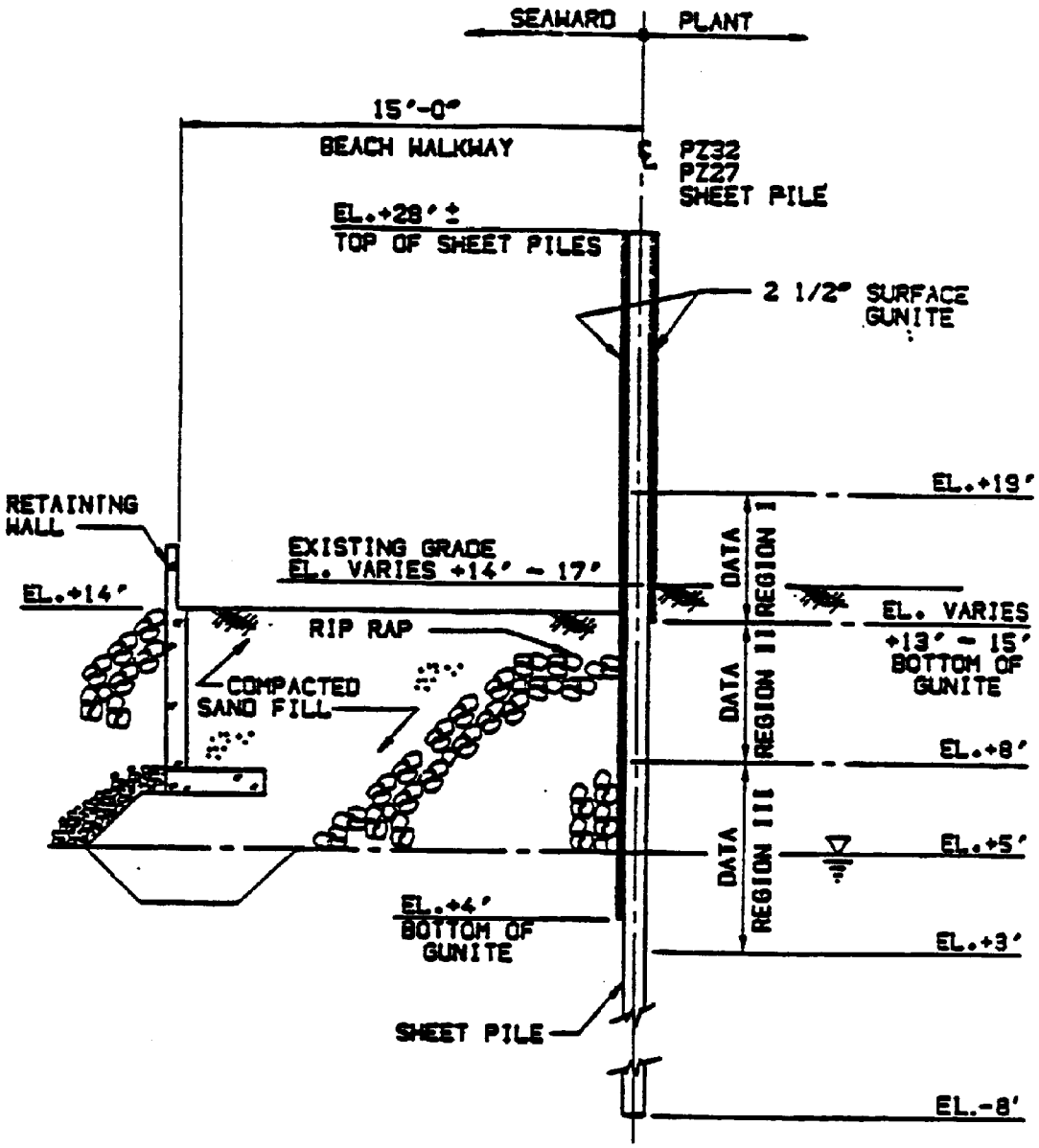


NOTE: The Site Plan for the operating plant is shown for reference and does not include changes made for Decommissioning.

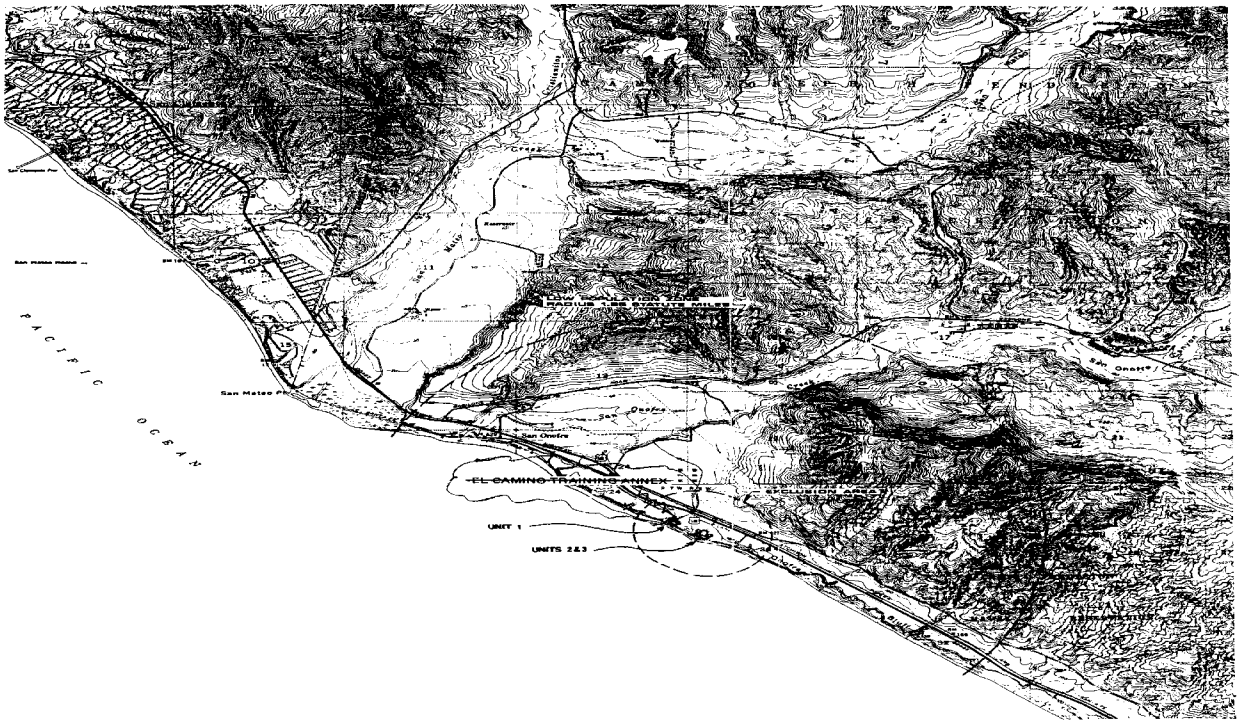
SAN ONOFRE NUCLEAR GENERATING STATION Unit 1 Defueled Safety Analysis Report
Site Plan (Operating Plant)
Figure 2-1



SAN ONOFRE NUCLEAR GENERATING STATION
Unit 1
Defueled Safety Analysis Report
Exclusion Area Boundary
Figure 2-2



SAN ONOFRE NUCLEAR GENERATING STATION Unit 1 Defueled Safety Analysis Report
Beach Passageway and Seawall Section
Figure 2-3



SAN ONOFRE NUCLEAR GENERATING STATION Unit 1 Defueled Safety Analysis Report
Low Population Zone
Figure 2-4