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 50-362 San Onofre Nuclear Station, Unit 3, Southern Californ 05000362
 AUTH. NAME AUTHOR AFFILIATION
 DRAKE, J. H. Southern California Edison Co.
 RECIPIENT NAME RECIPIENT AFFILIATION
 DEYOUNG, R. C. Division of Site Safety & Environmental Analysis

SUBJECT: Forwards data from 1978 Unit 1 radiological environ
 monitoring rept which includes radiological preoperational
 monitoring program for Units 2 & 3. Data supplies omissions
 from 1978 annual rept.

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2244 WALNUT GROVE AVENUE

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J. H. DRAKE
VICE PRESIDENT

TELEPHONE
213-572-2258

June 6, 1979

**RETURN TO REACTOR DOCKET
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Director, Office of Nuclear Reactor Regulation
Attn: Richard C. DeYoung, Director
Division of Site Safety
and Environmental Analysis
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. DeYoung:

Subject: San Onofre Nuclear Generating Station
Units 2 and 3
Docket Nos. 50-361 and 50-362

In accordance with the July 6, 1978 approval of the Pre-operational Monitoring Program (PMP) for San Onofre, Units 2 & 3, the results of the PMP were submitted with the 1978 Annual Operating Report for Unit 1 on March 30, 1979. These reports were sent to both the Office of Inspection and Enforcement, Region V, and the Division of Site Safety and Environmental Analysis as required by the Unit 1 Environmental Technical Specifications and the approval for the Preoperational Monitoring Program for Units 2 and 3. It was discovered in a recent Quality Assurance audit that the 1978 preoperational radiological environmental monitoring results were inadvertently omitted from the March 30, 1979 transmittal to your office. To correct this oversight, enclosed are six copies of the 1978 Unit 1 Radiological Environmental Monitoring data report which includes the radiological PMP results for Units 2 and 3.

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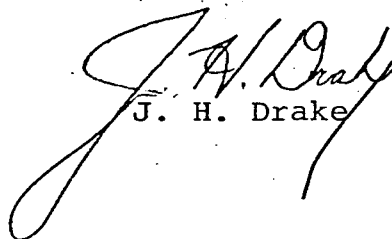
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If there are any questions, please contact Mr. D. L. Cox at
(213) 572-2641.

Sincerely,

Enclosures


J. H. Drake

ATTACHMENT 1

RADIOLOGICAL ENVIRONMENTAL MONITORING

Air Sampling

- a. Four locations were sampled.
- b. Two hundred weekly air particulate and weekly iodine samples were analyzed during this reporting period. Sixteen air particulate quarterly composite samples were analyzed for alpha, gamma and strontium-90 activities.
- c. No locations were above local background levels.
- d. The Visitor Center showed the highest airborne radioactivity levels (based on gross beta) of the locations measured. This area is located 0.1 mile from the plant at 015° magnetic north.

Beta pCi/m³

Highest 0.41 ± 0.003
Mean 0.10 ± 0.0004
Lowest 0.047 ± 0.003

I-131 pCi/m³

<LLD

Alpha pCi/m³

Highest 0.0024 ± 0.0001
Mean 0.0013 ± 0.00005
Lowest 0.0007 ± 0.0001

- e. The Sr-90 value was highest for Huntington Beach Generating Station. This area is located 37 miles from the plant at 300° magnetic north.

Sr-90 pCi/m³

Highest 0.003 ± 0.001
Mean 0.00075 ± 0.0005
Lowest 0 ± 0.001

Direct Radiation

- a. Sixteen locations were sampled. Two of these being added in the second quarter as part of the Environmental Program for Units 2 and 3.
- b. Seventy-one TLD sets were analyzed during this reporting period. Fifty-eight were quarterly samples and thirteen were yearly.

RADIOLOGICAL ENVIRONMENTAL MONITORING

Direct Radiation (continued)

- c. No locations were found to be above normal local background levels.
- d. Huntington Beach Generating Station showed the highest quarterly mean radiation level of the locations measured. This area is located 37 miles from the plant at 300° magnetic north.

mR/year (CaSO₄:Dy)

Highest	40.9 + 10
Mean	37.5 ± 5
Lowest	31.8 ± 10

- e. The highest yearly value was recorded at the Basilone Road off-ramp.

mR/yr (LiF)

Highest	119 + 10
Mean	99.9 ± 2.77
Lowest	74 ± 10

Drinking Water

- a. Three locations were sampled.
- b. Thirty-six monthly and twelve quarterly composite samples were analyzed during this reporting period.
- c. No locations were found to be above normal background levels. Gross β data were within the preoperational range. Other data were within the previously observed ranges.
- d. Water from Tri-Cities Water District showed the highest gross beta and tritium radioactivity levels in the filtrate for the quarterly composite samples analyzed. The highest gross alpha was in the monthly drinking water solid from San Clemente Well No. 6.

Beta (pCi/l)Alpha (pCi/l)H-3 (pCi/l)

Highest	21.0 ± 0.5
Mean	15.5 ± 0.144
Lowest	10.0 ± 0.5

Highest	0.3 ± 0.3
Mean	0.08 ± 0.09
Lowest	0 ± 0.3

Highest	200 ± 100
Mean	50 ± 50
Lowest	0 ± 100

RADIOLOGICAL ENVIRONMENTAL MONITORING

Ocean Water

- a. Four locations were sampled with addition of two locations for SONGS Units 2 and 3.
- b. Twenty bimonthly and six semiannual composite samples were analyzed during this reporting period.
- c. No locations were found to be above normal local background levels. All values were within previously observed ranges.
- d. The station discharge showed the highest mean tritium level measured. Gamma radioactivity levels were below LLD for both sampling locations. The station discharge is 0.5 miles from the station at 215° magnetic north. The highest beta value was measured at the Unit III outfall.

Beta pCi/l

Highest 1330 + 0.5
 Mean 1049 ± 0.25
 Lowest 880 ± 0.5

H-3 (pCi/l)

Highest 3330 + 200
 Mean 1665 ± 141.4
 Lowest 0 ± 200

Beach Sand

- a. Four locations were sampled.
- b. Eight samples were analyzed during this reporting period.
- c. No locations were found to be above normal local backgrounds.
- d. Huntington Beach located 37 miles from the plant at 300° magnetic north showed the highest radioactivity level measured.

Cs-137 nCi/kg

Highest 0.04 + 0.07
 Mean 0.034 ± 0.05
 Lowest 0.028 ± 0.07

Local Crops

- a. Two locations were sampled.
- b. Vegetable samples were analyzed during this reporting period.
- c. No locations were found to be above normal local background levels.

RADIOLOGICAL ENVIRONMENTAL MONITORING

Local Crops (continued)

- d. Yamasaki Farm located 23 miles from the plant at 135° magnetic north showed the highest Sr-90 and tritium values. Iodine-131 was below LLD at both locations.

<u>H-3 nCi/kg</u>		<u>Sr-90 nCi/kg</u>	
Highest	145 + 200	Highest	0.06 + 0.04
Mean	79.5 + 141.4	Mean	0.025 + 0.05
Lowest	14 + 200	Lowest	0 + 0.04

Non-Migratory Marine Animals

- a. Three locations were sampled.
- b. Forty-eight marine animals were analyzed during this reporting period.
- c. No samples approached reporting level values for any isotope. All values were within previously observed ranges.
- d. Samples collected near the Station discharge generally showed higher radioactivity levels than samples collected from Newport Beach. This observation is based on the detection of any given isotope in some of the sixteen samples collected near the station discharge. The discharge is 0.5 miles at 215° magnetic north from the Station. Total gamma data shown below represent a summation of highest quarterly data for samples found to contain isotopes potentially attributable to plant performance.

Gamma Isotope results for dry weight analysis in units of nCi/kg.

<u>Cs-137</u>	Highest	0.099 + 0.03
	Mean	0.033 + 0.008
	Lowest	<LLD + 0.03
<u>Co-58</u>	Highest	2.5 + 0.1
	Mean	0.475 + 0.025
	Lowest	<LLD + 0.1
<u>Co-60</u>	Highest	0.95 + 0.2
	Mean	0.168 + 0.05
	Lowest	<LLD + 0.2
<u>Cs-134</u>	Highest	0.06 + 0.005
	Mean	0.008 + 0.001
	Lowest	<LLD + 0.005
<u>Tritium</u>	Highest	60 + 200
	Mean	28.2 + 50
	Lowest	9 + 200

RADIOLOGICAL ENVIRONMENTAL MONITORING

<u>Ag-110m</u>	Highest	6.8 ± 0.4
	Mean	1.17 ± 0.1
	Lowest	$<LLD \pm 0.4$

Kelp

- a. Four locations were sampled.
- b. Eight samples were analyzed during this reporting period.
- c. All isotopes possibly attributable to plant operation were within the previously observed range.
- d. A sample collected from the San Onofre Kelp Bed showed the highest tritium activity level of the samples analyzed. The San Mateo Kelp Bed is 6 miles at 145° magnetic north from the station and showed the highest Cs-137 level. The Newport Beach Kelp Bed showed the highest I-131.
- e. The I-131 value was from Ge(Li) spectrum and not verified by radiochemical analysis.

<u>Cs-137</u>	<u>Dry Weight pCi/g</u>
Highest	0.061 ± 0.06
Mean	0.055 ± 0.004
Lowest	0.049 ± 0.06

<u>Tritium</u>	<u>Dry Weight pCi/g</u>
Highest	69 ± 10
Mean	48 ± 7.07
Lowest	27 ± 10

<u>I-131</u>	<u>Dry Weight pCi/g</u>
Highest	0.44 ± 0.2
Mean	0.29 ± 0.14
Lowest	0.14 ± 0.2

RADIOLOGICAL ENVIRONMENTAL MONITORING

Ocean Bottom Sediment

- a. Five locations were sampled with the addition of two locations for SONGS 2 and 3.
- b. Ten samples were analyzed during this reporting period.
- c. No locations were above normal local background levels. All values measured were within previously observed levels.
- d. A sample collected 0.5 miles north of the station discharge showed the highest radioactivity level. Total gamma data shown below represent a summation of isotopic data for all isotopes potentially attributable to plant operation.

Cs-137 Dry Weight pCi/g

Highest	0.23 ± 0.07
Mean	0.135 ± 0.05
Lowest	0.04 ± 0.07

Co-58 Dry Weight pCi/g

Highest	0.18 ± 0.07
Mean	0.09 ± 0.05
Lowest	0 ± 0.07

Co-60 Dry Weight pCi/g

Highest	0.12 ± 0.11
Mean	0.06 ± 0.08
Lowest	0 ± 0.11

Ag-110m Dry Weight pCi/g

Highest	0.03 ± 0.01
Mean	0.015 ± 0.007
Lowest	0 ± 0.01

RADIOLOGICAL ENVIRONMENTAL MONITORING

Soil

- a. Five locations were sampled.
- b. Five samples were analyzed during this reporting period.
- c. No gamma activity was recorded at any location.
- d. The highest Sr-90 was measured at the Basilone Road off ramp.

Sr-90 0.09 ± 0.01 nCi/Kg Dry Weight

Rabbits

- a. One location was sampled.
- b. Two samples were analyzed during this reporting period.
- c. No sample was found to be above local background levels.
- d. Iodine-131 in the thyroid and gamma emitters in the flesh were all below LLD. Strontium-90 was detected in bone structure and was within the previously observed range.

Sr-90 (pCi/g calcium)

Highest	1.9 ± 2.0
Mean	1.4 ± 1.4
Lowest	0.9 ± 2.0

- (1) Levels of radioactive material in environmental media reported here do not indicate a likelihood of public intakes in excess of 1% of those that could result from continuous exposure to the concentration values listed in Appendix B, Table II, 10 CFR 20.
- (2) Environmental data are too scattered to permit correlation with isotopic release data at this time.

A general observation indicates that bottom feeding organisms which live in localized areas consistently show low levels of cobalt-58, cobalt-60 and silver-110m. Each of these isotopes is attributable to plant operation.
- (3) No direct radiation levels greater than 25% above the control station at Huntington Beach were observed.

RADIOLOGICAL ENVIRONMENTAL MONITORING

Noted below are locations and collection times for samples with radionuclide contents greater than twice background levels. Background levels are taken to be those values determined from samples collected from control or background points during January through December 1978. Background locations are defined within the ETS.

<u>Sample Type</u>	<u>Location</u>	<u>Collection Date</u>
Air particulate-quarterly	San Clemente	April-June
Air particulate-quarterly	Visitor Center	April-June
Air particulate-quarterly	Visitor Center	July-September
Air particulate-quarterly	Visitor Center	October-December
Drinking water-monthly	Tri-Cities Water District	March
Drinking water-quarterly	Tri-Cities Water District	January-March
Drinking water-monthly	Tri-Cities Water District	April
Drinking water-monthly	Tri-Cities Water District	May
Drinking water-monthly	Tri-Cities Water District	June
Drinking water-monthly	San Clemente Well	June
Drinking water-quarterly	Tri-Cities Water District	April-June
Drinking water-monthly	Tri-Cities Water District	July
Drinking water-monthly	Tri-Cities Water District	August
Drinking water-quarterly	San Clemente Well	July-September
Drinking water-monthly	Tri Cities Water District	October
Drinking water-monthly	Tri Cities Water District	December
Drinking water-monthly	San Clemente Well	December
Ocean water-semiannual	Station Discharge	January-June
Vegetation-semiannual	San Clemente Farms	July-December
Kelp-semiannual	San Mateo Kelp Bed	July-December
Kelp-semiannual	Barn Kelp Bed	July-December
Kelp-semiannual	San Onofre Kelp Bed	July-December
Ocean bottom sediment	0.5 mi. north of SONGS 1	January-June
Ocean bottom sediment	0.5 mi. south of SONGS 1	January-June
Ocean bottom sediment	0.5 mi. north of SONGS 2/3	January-June
Ocean bottom sediment	0.5 mi. south of SONGS 2/3	January-June
Ocean bottom sediment	0.5 mi. north of SONGS 1	July-December
Ocean bottom sediment	0.5 mi. south of SONGS 1	July-December
Ocean bottom sediment	0.5 mi. north of SONGS 2/3	July-December
Soil	Basilone Road Off Ramp	December 28, 1978

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period January-March 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Air Particulate ρ Ci/M ³	β , 51	0.003	0.111 (51/51) (0.005-0.42)	Camp San Onofre 2.3mi, 043°MAG	0.127 (13/13) (0.043-0.42)	Huntington Beach 0.118 (13/13) (0.047-0.32)	0
	I-131, 51	0.04	<LLD	-	-	-	
	α , 4	0.0001	0.00045(4/4) (0.0003-0.0007)	Visitor Center 0.1 mi, 015° MAG	0.0007(1/1)	Huntington Beach 0.0004 (1/1)	0
Air Particulate Quarterly Composite ρ Ci/M ³	Sr-90, 4	0.001	< LLD	-	-	-	
	γ Isotopic, 4	0.04 γ /min/m ³					
	Be-7, 4		0.097 (4/4) (0.076-0.12)	Camp San Onofre 2.3 mi, 043°MAG	0.120 (1/1)	Huntington Beach 0.098 (1/1)	
	Zr-Nb, 4		0.0075 (4/4) (0.006-0.009)	Camp San Onofre 2.3 mi, 043°MAG	0.009 (1/1)	Huntington Beach 0.008 (1/1)	
	Ru-103, 4		0.0093(4/4) (0.005-0.013)	Camp San Onofre 2.3 mi, 043°Mag.	0.013 (1/1)	Huntington Beach 0.005 (1/1)	
	Ru-106, 4		0.0675 (4/4) (0.05-0.09)	Camp San Onofre 23 mi, 043°Mag	0.09 (1/1)	Huntington Beach 0.05 (1/1)	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period JANUARY-MARCH, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicators Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
	Cs-137, 4		0.0022 (4/4) (0.02-0.03)	Visitor Center 0.1 mi, 015°MAG	0.03 (1/1)	Huntington Beach 0.02 (1/1)	
	Ce-140, 4		0.08 (3/4) (0.05-0.10)	Visitor Center 0.1 mi, 015°MAG	0.10 (1/1)	Huntington Beach < LLD	
	Ce-141, 4		0.007 (4/4) (0.004-0.009)	Camp San Onofre 2.3mi, 043°MAG	0.009 (1/1)	Huntington Beach 0.004 (1/1)	
	Ce-144, 4		0.026 (4/4) (0.021-0.028)	Camp San Onofre 2.3 mi, 043°MAG	0.028 (1/1)	Huntington Beach 0.026 (1/1)	
Direct Radiation mR/qtr	mR, 14	10	30.3 (14/14) (25.7-368)	Camp San Mateo	36.8 (1/1)	Huntington Beach 31.8 (1/1)	0
Drinking Water Filtrate (μ Ci/l)	β , 9	0.5	11.4 (9/9) (4-21)	Tri Cities Wtr. District, 8.7 mi 320° MAG	20.3 (3/3) (19-21)	Huntington Beach 9.3 (3/3) (9-10)	0
	α , 9	5.0	< LLD	-	-	-	
Drinking water solids (μ Ci/l)	β , 9	0.1	1.24 (9/9) (0.8-2.0)	Tri-Cities Wtr. Dist., 8.7mi 320°MAG	1.53 (3/3) (1.1-1.8)	Huntington Beach 1.30 (3/3) (0.9 - 2.0)	0

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206

San Diego County, California

Reporting Period JANUARY-MARCH, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Drinking Water Quarterly Filtrate Composite (pCi/l)	α , 9	0.3	< LLD	-	-	-	0
	β , 3	0.5	11.3 (3/3) (5-19)	Tri-Cities Wtr. District, 8.7 mi 320° MAG	19 (1/1)	Huntington Beach 10 (1/1)	
	α , 3 H , 3	0.5 100	< LLD 66.7 (1/3) (0-200)	Tri-Cities Wtr. District, 8.7 mi 320° MAG	200 (1/1)	Huntington Beach < LLD	
Drinking Water Quarterly Solids Composite (pCi/l)	β , 3	0.1	1.13 (3/3) (1.0-1.2)	Tri-Cities Wtr. Dist., 8.7 mi. 320° MAG and Huntington Beach	1.2 (1.1)	Huntington Beach 1.2 (1/1)	0
	α , 3 β , 4	0.3 0.5	< LLD 1007.5 (4/4) (980-1070)	Newport Beach	1025 (2/2) (980-1070)	Newport Beach 1025 (2/2) (980-1070)	
Ocean Water pCi/l	α , 3 β , 4	0.3 0.5	< LLD 1007.5 (4/4) (980-1070)	Newport Beach	1025 (2/2) (980-1070)	Newport Beach 1025 (2/2) (980-1070)	0
	α , 3 β , 4	0.3 0.5	< LLD 1007.5 (4/4) (980-1070)	Newport Beach	1025 (2/2) (980-1070)	Newport Beach 1025 (2/2) (980-1070)	
Beach Sand (nCi/bg.dry wt.)	Cs-137, 4 Cs-137, 4	6 0.07	< LLD 0.0195 (3/4) (0-0.028)	Huntington Bch	0.028 (1/1)	Huntington Beach 0.028 (1/1)	0
	Ra-226, 4	0.07	0.258 (4/4) (0.21-0.29)	Surfing Beach NW of SONGS 1 and Huntington Beach	0.29 (1/1)	Huntington Beach 0.29 (1/1)	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206

San Diego County, California

Reporting Period JANUARY-MARCH, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Marine Animal Flesh (nCi/kg, dry wt.)	Th-232, 4	0.07	0.31 (4/4) (0.16-0.59)	Huntington Bch	0.59 (1/1)	Huntington Beach 0.59 (1/1)	0
	H-3, 12	11.0	21.2 (12/12) (8-35)	SONGS 2&3	27.75 (4/4) (19-35)	Newport Beach 16.5 (4/4) (8-28)	
	Cs-137, 12	0.03	0.023 (7/12) 0-0.065	Newport Beach	0.033 (3/4) (0-0.065)	Newport Beach 0.033 (3/4) (0-0.065)	
	Co-58, 12	0.1	0.051 (1/12) (0.-0.61)	Sta. Discharge 0.5mi, 215°MAG	0.153 (1/4) 0.0.61)	Newport Beach < LLD	
	Co-60, 12	0.2	0.085 (2/12)	Sta. Discharge 0.5mi, 215° MAG	0.255 (2/4) (0-0.95)	Newport Beach < LLD	
	Ag-110m, 12	0.4	0.198 (5/12)	Sta. Discharge 0.5mi, 215° MAG	0.538 (2/4) (0.1.54)	Newport Beach 0.014 (1/4) (0-0.054)	
	Ce-144, 12	0.01	0.027 (2/12) (0-0.21)	Sta. Discharge 0.5 mi, 215°MAG	0.053 (1/4) (0-0.21)	Newport Beach < LLD	
	Ra-226, 12	0.004	0.007 (1/12) (0.084)	Sta. Discharge 0.5 mi. 215°MAG	0.021(1/4) (0-0.084)	Newport Beach < LLD	

TABLE 1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONO FRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206

San Diego County, California

Reporting Period JANUARY-MARCH, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Rabbit							0
Thyroid (ρ Ci/g Thyroid)	I-131, 1	5.0	< LLD	-	-	None	
Flesh (ρ Ci/g dry wt.)	Cs-137, 1	0.06	< LLD	-	-	None	
	I-131, 1	0.05	< LLD	-	-	None	
	γ isotopic	-	< LLD	-	-	None	
Femur (ρ Ci/g Ca)	Sr-89, 1 Sr-90, 1	3.0 2.0	< LLD 1.9 (1/1)	<2 mi East of Station, 45°MAG	1.9 (1/1)	None None	
	Ca, 1	0.02	0.35 (1/1)	<2 mi East of Station, 45°MAG	0.35 (1/1)	None	

TABLE 2
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period APRIL-JUNE 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Air particulates ($\mu\text{Ci}/\text{m}^3$)	β , 50	0.003	0.151 (50/50) 0.041-0.45	Visitor Center 0.1mi, 043°MAG	0.145 (26/26) (0.047-0.41)	Huntington Beach 0.155 (12/12) (0.041-0.45)	0
	I-131, 50	0.04	< LLD	-	-	-	
Air particulate Quarterly Composite ($\mu\text{Ci}/\text{m}^3$)	α , 4	0.0001	0.0008 (4/4) (0.0004-0.0012)	San Clemente 5mi, 320°MAG	0.00075(2/2) (0.0003-0.0012)	Huntington Beach 0.0004 (1/1)	0
	Sr-90, 4	0.001	0.002 (4/4) (0.002-0.003)	Huntington Bch	0.0015 (1/2) (0-0.003)	Huntington Beach 0.003 (1/1)	
	γ Isotopic, 4	0.04 $\gamma/\text{min}/\text{m}^3$					
	Be-7, 4		0.131(4/4) (0.11-0.140)	Camp San Onofre 2.3mi, 043°MAG	0.13(2/2) (0.120-0.140)	Huntington Beach 0.132 (1/1)	
	Zr-Nb, 4		0.006 (4/4) (0.0024 -0.011)	Huntington Bch	0.0072 (2/2) (0.0063-0.008)	Huntington Beach 0.0063 (1/1)	
	Ru-103, 4		0.00085 (1/4) (0-0.0034)	Camp San Onofre 2.3mi, 043°MAG	0.0065 (1/2) (0-0.013)	Huntington Beach 0.0034 (1/1)	
	Ru-106, 4		0.0125 (3/4) (0-0.017)	Camp San Onofre 23mi, 043°MAG	0.053 (2/2) (0.016-0.09)	Huntington Beach 0.0017 (1/1)	
	Cs-137, 4		0.00395 (4/4) (0.0037-0.0044)	Visitor Center 0.1mi., 015°MAG	0.0034 (2/2) (0.003-0.0037)	Huntington Beach 0.0044 (1/1)	

TABLE 2
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING PLANT - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period APRIL-JUNE, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Ba-140, 4	Ce-141, 4		< LLD	Visitor Center 0.1mi, 015°MAG	0.05 (1/2) (0-0.10)	Huntington Beach < LLD	0
				Camp San Onofre 2.3 mi, 043°MAG and Visitor Ctr. 0.1mi, 015°MAG	0.0045 (1/2) (0-0.009)	Huntington Beach < LLD	
				Visitor Center 0.1mi, 015°MAG	0.035 (2/2) (0.027-0.043)	Huntington Beach 0.035 (2/2) (0.026-0.041)	
				San Clemente 5mi, 320°MAG	0.0025 (1/2) (0-0.005)	Huntington Beach 0.0029 (1/1)	
Direct Radiation (mR/qtr)	β, 9	10	37.36 (14/14) (32.6-42.6)	Camp San Onofre 2.3 mi, 043° MAG	38.1 (2/2) (35.0-41.1)	Huntington Beach 40.9 (1/1)	0
				Tri-Cities Wtr District, 8.7mi 320° MAG	17.8 (6/6) (10-21)	Huntington Beach 7.3 (3/3) (5-9)	
				-	-	-	
Drinking Water Solid (pCi/l)	α, 9	5.0	< LLD	Tri-Cities Wtr District, 8.7mi 320° MAG	1.20 (6/6) (0.3-1.3)	Huntington Beach 0.90 (3/3) (0.7-1.1)	0

TABLE 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period APRIL-JUNE, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Drinking Water Quarterly Filtrate (ρ Ci/l)	α , 9	0.3	0.04 (2/9) (0-0.2)	Tri-Cities Wtr. District, 8.7mi 320° MAG and San Clemente Farms	0.033 (6/6) (0-0.2)	Huntington Beach < LLD	0
	β , 3	0.5	10.3 (3/3) (6-17)	Tri-Cities Wtr. District, 8.7mi 320° MAG	18 (1/2) (17-19)	Huntington Beach 8 (1/1)	
	α , 3	0.5	< LLD	-	-	-	
	H-3	100	< LLD	Tri Cities Wtr. district, 8.7mi 320° MAG	100 (2/2) (0-200)	Huntington Beach < LLD	
Drinking Water Quarterly Solids Composite ρ Ci/l	β , 3	0.1	1.50 (3/3) (1.30-1.50)	Tri-Cities Wtr. District, 8.7mi 320° MAG	1.45 (2/2) (1.2-1.7)	Huntington Beach 0.8 (1/1)	0
	α , 3	0.3	< LLD	-	-	-	
Ocean Water (ρ Ci/l)	β , 4	0.5	1002.5 (4/4) (870-1110)	SONGS III Outfall	1110 (1/1)	Newport Beach 1000 (1/1)	0
	Cs-137, 4	6	< LLD	-	-	-	
	H-3, 2	100	< LLD	-	-	-	

TABLE 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period APRIL-JUNE, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Ocean Water Composite ($\mu\text{Ci/l}$)	H-3, 2	200	1650 (1/2) 0-3330	Sta. Discharge 0.5mi, 215°MAG	3330 (1/1)	Newport Beach < LLD	0
	H-3, 4	200	83.75 (4/4) (10-280)	Yamasaki Farm 23mi, 135°MAG	145 (2/2) (10-280)	Yamasaki Farm 145 (2/2) 10-280	0
Local Crops	γ isotopic, 4		< LLD	-	-	-	
	I-131	0.03					
	Cs-137	0.03	0.0265 (2/4) (0-0.065)	Yamasaki Farm 23mi, 135°MAG	0-0325 (1/2) (0-0.065)	Yamasaki Farm 0.0325 (1/2) (0-0.065)	
	Co-58	0.02	0.0175 (1/4) (0-0.07)	Yamasaki Farm 23mi, 135°MAG	0.035(1/2) (0-0.07)	Yamasaki Farm 0.035 (1/2) (0-0.07)	
	Co-60	0.01	0.015 (1/4) (0-0.06)	Yamasaki Farm 23mi, 135°MAG	0.03 (1/2) (0-0.06)	Yamasaki Farm 0.03 (1/2) (0-0.06)	

TABLE 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period APRIL-JUNE, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Marine Animal Flesh (nCi/kg.dry wt.)	Sr-90	0.04	0.025 (2/4) (0-0.06)	Yamasaki Farm 23mi, 135°MAG	0.05 (2/2) (0.04-0.06)	Yamasaki Farm 0.05 (2/2) (0.04-0.06)	0
	Ce-144	0.02	0.16 (1/4) (0-0.32)	Sn Clemente Farm 2.1mi, 320°MAG	0.16 (1/2) (0-0.32)	Yamasaki Farm < LLD	
	Ce-141	0.01	0.005 (1/4) (0-0.02)	Sn Clemente Farm 2.1mi, 320° MAG	0.01 (1/2) (0-0.02)	Yamasaki Farm < LLD	
	Zr-Nb	0.004	0.009 (1/4) (0-0.036)	Sn Clemente Farm 2.1mi, 320°MAG	0.018 (1/2) (0-0.036)	Yamasaki Farm < LLD	
	H-3, 12	11.0	23.3 (12/12) (4-56)	Sta. Discharge 0.5 mi, 215°MAG	24.5 (8/8) (9-56)	Newport Beach 19.5 (4/4) (13-24)	
	Cs-137, 12	0.03	0.019 (7/12) (0-0.04)	Newport Beach	0.023(6/8) (0-0.065)	Newport Beach 0.023 (3/4) (0-0.04)	
	Co-58, 12	0.1	0.34 (2/12) (0-3.9)	Sta. Discharge 0.5mi, 215°MAG	0.587 (3/8) (0-3.9)	Newport Beach < LLD	

TABLE 2

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period APRIL-JUNE, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Kelp (nCi/kg dry wt.)	Co-60, 12	0.2	0.06 (2/12) (0-0.68)	Sta. Discharge 0.5mi, 215°MAG	0.218 (4/8) 0-0.95	Newport Beach <LLD	0
	Ag-110m, 12	0.4	0.665 (6/12) (0-6.3)	Sta. Discharge 0.5mi, 215°MAG	1.14 (5/8) (0-6.3)	Newport Beach 0.03 (1/4) (0-0.12)	
	Ce-144, 12	0.001	0.0003 (1/12) 0-0.004	Sta. Discharge 0.5mi, 215°MAG	0.027 (2/8) (0-0.21)	Newport Beach <LLD	
	Ra-226, 12	0.004	<LLD	Sta. Discharge 0.5 mi, 215°MAG	0.011 (1/8) 0-0.084	Newport Beach <LLD	
	H-3, 4	10	44.5 (4/4) (35-69)	San Onofre Kelp Bed	69 (1/1)	Newport Beach 35 (1/1)	
	Cs-137, 4	0.06	0.05 (4/4) (0.042-0.061)	San Mateo Kelp Bed	0.061 (1/1)	Newport Beach 0.045 (1/1)	
	Co-58, 4	0.13	< LLD	-	-	-	
	Co-60, 4	0.20	< LLD	-	-	-	
	Ag-110, 4	0.07	< LLD	-	-	-	
	I-131, 4	0.2	0.098 (4/4) (0.07-0.14)	Newport Beach	0.14 (1/1)	Newport Beach 0.14 (1/1)	

TABLE 2
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period APRIL-JUNE, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Ocean Bottom Sediment (μ Ci/g dry wt.)	Cs-137, 5	0.07	0.027 (4/5) (0.014-0.05)	0.5 mi. South of SONGS I	0.05 (1/1)	Newport Beach < LLD	0
	Co-58, 5	0.07	< LLD	-	-	-	
	Co-60, 5	0.11	< LLD	-	-	-	
	Ag-110m, 5	0.07	< LLD	-	-	-	
	Ce-141, 5	0.008	0.009 (2/5) 0-0.023	0.5mi N. of SONGS 2&3	0.0023 (1/1)	Newport Beach < LLD	
	Ce-144, 5	0.02	0.01 (1/5) (0-0.05)	0.5mi N. of SONGS 2&3	0.05 (1/1)	Newport Beach < LLD	
	Ru-226, 5	0.04	0.542 (5/5) (0.25-0.83)	0.5mi N. of SONGS I	0.83 (1/1)	Newport Beach 0.25 (1/1)	
	Th-232, 5	0.05	0.58 (5/5) (0.25-1.01)	0.5 mi. N. of SONGS I	1.01 (1/1)	Newport Beach 0.25 (1/1)	

TABLE 3

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206

San Diego County, California

Reporting Period JULY-SEPTEMBER, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Highest Annual Mean Location with Highest Distance, Direction and Range	Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
Air Particulates ($\mu\text{Ci}/\text{m}^3$)	β , 50	0.003	0.045 (50/50) (0.009-0.085)	Visitor Center 0.1 mi, 043°MAG	Huntington Beach 0.045 (12/12) (0.053-0.081)	0
	I-131, 50	0.04	< LLD	-	-	
Air Particulate Quarterly Composite $\rho\text{Ci}/\text{m}^3$	α , 4	0.0001	0.00145(4/4) (0.0005-0.0024)	Visitor Center 0.1mi, 043°MAG	Huntington Beach 0.0011 (1/1)	0
	Sr-90, 4	0.001	<LLD	Huntington Beach	Huntington Beach < LLD	
	γ Isotopic, 4	0.04 γ /min/ m^3				
	Be-7, 4		0.085 (4/4) (0.08-0.094)	Camp San Onofre 2.3mi, 043°MAG	Huntington Beach 0.08 (1/1)	
	Zr-Nb, 4		<LLD	Huntington Bch	Huntington Beach <LLD	
	Ru-103, 4		<LLD	Camp San Onofre 2.3 mi, 043°MAG	Huntington Beach < LLD	

TABLE 3

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
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Reporting Period JULY-SEPTEMBER 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean		Control Locations Mean (f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean (f) Range		
Direct Radiation mR/qtr	Ru-106, 4		<LLD	Camp San Onofre 2.3 mi, 043°MAG	0.035 (2/3) (0-0.09)	Huntington Beach < LLD	0
	Cs-137, 4		0.0017(4/4) (0.0011-0.002)	Visitor Center 0.1 mi, 015°MAG	0.0029 (3/3) (0.002-0.0037)	Huntington Beach 0.002 (1/1)	
	Ce-141, 4		<LLD	Camp San Onofre 2.3mi, 043° MAG and Visitor Center 0.1 mi, 015°MAG	0.003(1/3) (0-0.009)	Huntington Beach <LLD	
	Ba-140, 4		< LLD	Visitor Center 0.1mi, 015°MAG	0.03 (1/3) (0-0.10)	Huntington Beach < LLD	
	Ce-144, 4		0.008 (4/4) (0.006-0.0011)	Visitor Center 0.1mi, 015°MAG	0.027 (3/3) (0.011-0.043)	Huntington Beach 0.009 (1/1)	
Drinking Water Filtrate pCi/l	Sb-125, 4		<LLD	San Clemente 5 mi, 320°MAG	0.0017 (1/3) (0-0.005)	Huntington Beach < LLD	0
	mR, 14	10	36.2 (14/14) (30.9-41.1)	Camp San Mateo	38.95 (2/2) 36.8-41.1)	Huntington Beach 39.8 (1/1)	0
Drinking Water Filtrate pCi/l	B, 9	0.5	9.4 (9/9) (5-15)	Tri Cities Wtr. Dist. 8.7 mi. 320°MAG	16.0 (9/9) (10-21)	Huntington Beach 6.0 (3/3) (5-8)	0

TABLE 3

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
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Reporting Period JULY-SEPTEMBER 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean Name, Distance and Direction	Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
Drinking Water Solid (pCi/l)	α , 9	5.0	< LLD	—	—	0
	β , 9	0.1	1.02 (9/9) (0.8-1.4)	Tri-Cities Wtr. Dist., 8.7 mi. 320° Mag	Huntington Beach 1.13 (3/3) (0.9-0.14)	
	α , 9	0.3	0.03 (1/9) (0-0.3)	San Clemente Farm 2.1 mi. 320° MAG	Huntington Beach < LLD	
Drinking Water Quarterly Filtrate Composite (pCi/l)	β , 3	0.5	1.13 (3/3) (0.8-1.6)	Tri-Cities Wtr. District, 8.7mi 320° MAG	Huntington Beach 0.8 (1/1)	0
	α , 3	0.5	<LLD	—	—	
	H, 3	100	<LLD	Tri-Cities Wtr. District, 8.7 mi 320° MAG	Huntington Beach < LLD	

TABLE 3

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOPE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period JULY-SEPTEMBER 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations: Mean (r) Range	Location with Highest Annual Mean: Name, Distance and Direction	Location with Highest Annual Mean: Mean (r) Range	Control Locations: Mean (r) Range	Number of Nonroutine Reported Measurements
Drinking Water Quarterly Solids Composite (ρ Ci/l)	β , 3	0.1	1.13 (3/3) (0.8-1.6)	Tri-Cities Wtr. District, 8.7mi 320° MAG	1.5 (3/3) (1.2-1.7)	Huntington Beach 0.8 (1/1)	0
	α 3	0.3	0.067 (1/3) (0-0.20)	Sn Clemente Well 3.5mi, 320° MAG	0.067 (1/3) (0-0.20)	Huntington Beach < LLD	
	β 4	0.5	949 (4/4) (865-1040)	Newport Beach 30 mi, 300° MAG	1022 (3/3) (1000-1040)	Newport Beach 1040 (1/1)	0
Beach Sand (nCi/Kg dry wt.)	CS-137, 4	6	< LLD	—	—	—	
	Cs-137, 4	0.07	0.017 (3/4) (0-0.04)	Huntington Beach	0.034 (2/2) (0.028-0.04)	Huntington Beach 0.04 (1/1)	0
	Ra-226, 4	0.07	0.029 (4/4) (0.25-0.35)	Huntington Beach	0.030 (2/2) (0.029-0.031)	Huntington Beach 0.31 (1/1)	
	Th-232, 4	0.07	0.323 (4/4) (0.20-0.63)	Huntington Beach	0.61 (2/2) (0.59-0.63)	Huntington Beach 0.63 (1/1)	

TABLE 3

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOPE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206

San Diego County, California

Reporting Period JULY-SEPTEMBER 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicators Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Local Crops	H-3,4	200	28.75 (4/4) (14-59)	Yamasaki Farm 23mi, 135° MAG	79.5 (4/4) (14-145)	Yamasaki Farm 14 (2/2) (14-14)	0
	γ Isotopic, 4						
	I-131	0.03	< LLD	-	-	-	
	Cs-137	0.03	< LLD	Yamasaki Farm 23mi 135° MAG	0.0163 (1/4) (0-0.065)	Yamasaki Farm < LLD	
	Co-58	0.02	< LLD	Yamasaki Farm 23mi, 135° MAG	0.0175 (1/4) (0-0.07)	Yamasaki Farm < LLD	
	Co-60	0.01	< LLD	Yamasaki Farm 23mi, 135° MAG	0.015 (1/4) 0-0.06	Yamasaki Farm < LLD	
	Sr-90	0.04	< LLD	Yamasaki Farm 23mi., 135° MAG	0.025 (2/4) (0-0.06)	Yamasaki Farm < LLD	
	Ce-144	0.02	< LLD	Sn Clemente Farm 2.1 mi, 320° MAG	0.08 (1/4) (0-0.32)	Yamasaki Farm < LLD	
	Ce-141	0.01	< LLD	Sn Clemente Farm 2.1mi, 320° MAG	0.005 (1/4) (0-0.02)	Yamasaki Farm < LLD	
	Zr-Nb	0.004	< LLD	Sn Clemente Farm 2.1 mi, 320° MAG	0.009 (1/4) (0-0.036)	Yamasaki Farm < LLD	

TABLE 3
 ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
 SAN ONOFE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
 San Diego County, California

Reporting Period JULY-SEPTEMBER, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicators Locations Mean (t) Range	Location with Highest Annual Mean Name, Distance, Mean (t) and Direction Range	Control Locations Mean (t) Range	Number of Nonroutine Reported Measurements
Marine Animal Flesh (nCi/Kg. dry wt.)	H-3, 12	11.0	19.9 (12/12) (0-60)	Sta. Discharge 0.5 mi, 215°MAG	Newport Beach 15.5 (3/4) (0-26)	
	Cs-137, 12	0.03	0.024 (6/12) (0-0.07)	Newport Beach 30 mi, 300°MAG	Newport Beach 0.021 (2/4) (0-0.046)	
	Co-58, 12	0.1	0.028 (1/12) (0-0.34)	Sta Discharge 0.5 mi, 215°MAG	Newport Beach < LLD	
	Co-60, 12	0.2	0.016 (1/12) (0-0.19)	Sta Discharge 0.5mi, 215°MAG	Newport Beach <LLD	
	Ag-110m, 12	0.4	0.153 (4/12) (0-0.99)	Sta. Discharge 0.5mi, 215°MAG	Newport Beach 0.03 (1/4) (0-0.121)	
	Ce-144, 12	0.001	< LLD	Sta. Discharge 0.5mi, 215°MAG	Newport Beach < LLD	
	Ra-226, 12	0.004	< LLD	Sta Discharge 0.5mi, 215°MAG	Newport Beach < LLD	

TABLE 4
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206

San Diego County, California

Reporting Period OCTOBER-DECEMBER, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean		Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
				Name, Distance and Direction	Mean(f) Range		
Air particulates ($\mu\text{Ci}/\text{m}^3$)	β , 49	0.003	0.045 (49/49) (0.057-0.104)	Visitor Center 0.1mi, 043°MAG	0.10 (52/52) (0.047-0.41)	Huntington Beach 0.0427 (12/21) (0.011 - 0.059)	0
	I-131, 49	0.04	<LLD	-	-	-	
Air particulate Quarterly Composite ($\mu\text{Ci}/\text{m}^3$)	α , 4	0.0001	0.001(4/4) 0.0006-0.0013	Visitor Center 0.1mi, 043°MAG	0.0013 (4/4) (0.0007-0.0024)	Huntington Beach 0.0006 (1/1)	0
	Sr-90,	0.001	<LLD	Huntington Bch	0.00075 (1/4) (0-0.003)	Huntington Beach <LLD	
	γ Isotopic, 4	0.04 $\gamma/\text{min}/\text{m}^3$					
	Be-7, 4		0.110 (4/4) (0.07-0.13)	Visitor Center 0.1 mi, 043°MAG	0.114 (4/4) (0.093-0.14)	Huntington Beach 0.107 (1/1)	
	Zr-Nb, 4		<LLD	Huntington Bch	0.0036 (2/4) (0-0.008)	Huntington Beach <LLD	
	Ru-103, 4		<LLD	Camp San Onofre 2.3 mi, 043°MAG	0.003 (1/4) (0-0.013)	Huntington Beach < LLD	

TABLE 4
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFRE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206
San Diego County, California

Reporting Period OCTOBER-DECEMBER, 1978

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (r) Range	Location with Highest Annual Mean Mean (r) Range	Control Locations Mean (r) Range	Number of Nonroutine Reported Measurements
	Ru-106, 4		<LLD	Camp San Onofre 2.3 mi, 043°MAG	Huntington Beach < LLD	
	Cs-137, 4		0.0053 (3/4) (0-0.018)	Visitor Center 0.1mi., 015°MAG	Huntington Beach < LLD	
	Ba-140, 4		<LLD	Visitor Center 0.1 mi, 015°MAG	Huntington Beach <LLD	
	Ce-141, 4		<LLD	Camp San Onofre 2.3 mi, 043°MAG And Visitor Ctr 0.1 mi, 015° MAG	Huntington Beach <LLD	
	Cs-134, 4		0.0021 (1/4) 0-0.0082	Visitor Center 0.1 mi, 015°MAG	Huntington Beach < LLD	
	Ce-144, 4		<LLD	Visitor Center 0.1 mi, 015°MAG	Huntington Beach <LLD	
	Sb-125, 4		<LLD	San Clemente 5 mi, 320°MAG	Huntington Beach <LLD	

TABLE 4
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM SUMMARY
SAN ONOFE NUCLEAR GENERATING STATION - UNIT 1

Docket No. 50-206

San Diego County, California

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Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean(f) Range	Location with Highest Annual Mean Name, Distance and Direction	Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
Direct Radiation mR/qtr.	mR, 16	10	30.6 (16/16) (26.6-37.4)	Huntington Bch	Huntington Beach 37.4 (1/1)	
Direct Radiation mR/yearly	mR, 13	10	99.9 (13/13) (74-119)	Basilone Rd. Off Ramp	Huntington Beach 112 (1/1)	0
Drinking Water Filtrate (pCi/l)	β , 9 α , 9	0.5 5.0	10.1 (9/9) (4.7-15) < LLD	Tri Cities Wtr Dist., 8.7 mi 320° MAG	Huntington Beach 6.2 (3/3) (4.7-8)	
Drinking Water Solid (pCi/l)	β , 9 α , 9	0.1 0.3	1.29 (9/9) (0.7-2.0) 0.03 (1/9) (0-0.3)	Tri-Cities Wtr. Dist., 8.7 mi. 320° MAG San Clemente Farm 2.1 mi 320° MAG	Huntington Beach 1.03 (3/3) (0.8-1.4) Huntington Beach < LLD	0
Drinking Water Quarterly Filtrate Composite (pCi/l)	β , 3	0.5	9.87 (3/3) (6.6-13)	Tri-Cities Wtr. Dist., 8.7 mi. 320° MAG	Huntington Beach 6.6 (1/1)	0

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				Name, Distance and Direction	Mean(f) Range		
Drinking Water Quarterly Solids Composite (pCi/l)	α , 3	0.5	<LLD	-	-	-	0
	H-3, 3	100	<LLD	Tri-Cities Wtr. Dist. 8.7 mi. 320° MAG	50 (1/4) (0-200)	Huntington Beach <LLD	
	β , 3	0.1	0.7 (3/3) (0.6-0.8)	Tri Cities Wtr. District, 8.7mi 320° MAG	1.28 (4/4) (0.6-0.17)	Huntington Beach 0.8 (1/1)	
	α , 3	0.3	<LLD	Sn Clemente Well	(0-0.20)	<LLD	
Ocean Water (pCi/l)	β , 8	0.5	1080 (8/8) (830-1380)	SONGS 2&3 Outfall	1049 (4/4) (880-1380)	Newport Beach 1080 (2/2) (1080-1080)	0
Ocean Water Composite (pCi/l)	Cs-137, 8	6	<LLD	-	-	-	
	H-3, 4	200	<LLD	Sta. Discharge 0.5mi, 215°MAG	1665 (1/2) (0-3330)	Newport Beach <LLD	
Marine Animal Flesh (nCi/kg. dry wt.)	H-3, 12	11.0	34.8 (12/12) (22-51)	Sta. Discharge 0.5mi, 215°MAG	28.2 (16/16) (9-60)	Newport Beach 27.0 (4/4) (22-34)	
	Cs-137, 12	0.03	0.049 (10/12) (0.01-0.10)	Sta. Discharge 0.5 mi, 215°MAG	0.033 (12/16) (0-0.099)	Newport Beach 0.024 (3/4) (0-0.029)	

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				Name, Distance and Direction	Mean(f) Range		
Kelp ($\mu\text{Ci/kg}$ dry wt.)	Co-58, 12	0.1	0.23 (4/12) (0-2.5)	Sta. Discharge 0.5 mi, 215°MAG	0.475 (6/16) (0-2.5)	Newport Beach < LLD	
	Co-60, 12	0.2	0.067 (3/12) (0-0.71)	Sta. Discharge 0.5 mi, 215°MAG	0.168 (7/16) (0-0.95)	Newport Beach < LLD	
	Ag-110m, 12	0.4	0.91 (8/12) (0-6.8)	Sta. Discharge 0.5 mi, 215°MAG	1.17 (9/16) (0-6.8)	Newport Beach 0.056 (2/4) (0-0.16)	
	Cs-134	0.005	0.0147 (3/12) (0-0.06)	Sta. Discharge 0.5 mi, 215°MAG	0.008 (2/16) (0-0.06)	Newport Beach < LLD	
	Ce-144, 12	0.001	< LLD	Sta. Discharge 0.5 mi, 215°MAG	0.014 (5/16) 0-0.21	Newport Beach < LLD	
	Ra-226, 12	0.004	0.025 (1/12) (0.0.04)	Sta Discharge 0.5 mi, 215°MAG	0.005 (1/16) (0-0.084)	Newport Beach < LLD	
	H-3, 4	10	37.0 (4/4) (27-51)	San Onofre Kelp Bed	48 (2/2) (27-69)	Newport Beach 51 (1/1)	
	Cs-137, 4	0.06	0.033 (3/4) (0-0.049)	San Mateo Kelp Bed	0.055 (2/2) (0.049-0.061)	Newport Beach < LLD	

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				Name, Distance and Direction	Mean(f) Range		
Ocean Bottom Sediment (pCi/kg dry wt.)	Co-58, 4	0.13	< LLD	-	-	-	
	Co-60, 4	0.20	< LLD	-	-	-	
	Ag-110m, 4	0.07	<LLD	-	-	-	
	I-131, 4	0.2	0.218 (4/4) (0.10-0.44)	Newport Beach Kelp Bed	0.29 (2/2) (0.14-0.44)	Newport Beach 0.44 (1/1)	
	Cs-137, 5	0.07	0.078 (3/5) (0-0.23)	0.5 mi North of SONGS I	0.135 (2/2) (0.04-0.23)	Newport Beach < LLD	

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Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicators Locations Mean(f) Range	Location with Highest Annual Mean Mean(f) Range	Control Locations Mean(f) Range	Number of Nonroutine Reported Measurements
Soil Sample (nCi/kg. dry wt.)	Cs-134, 5	0.01	0.008 (1/5) (0-0.04)	0.5 mi South of SONGS I	0.02 (1/2) (0-0.04)	Newport Beach < LLD
	Co-58, 5	0.07	0.068 (2/5) (0-0.18)	0.5 mi North of SONGS I	0.09 (1/2) (0-0.18)	Newport Beach < LLD
	Co-60, 5	0.11	0.04 (2/5) (0-0.12)	0.5 mi North of SONGS I	0.06 (1/2) (0-0.12)	Newport Beach < LLD
	Ag-110m, 5	0.01	0.006 (1/5) (0-0.03)	0.5 mi South of SONGS I	0.015 (1/2) (0-0.03)	Newport Beach < LLD
	Ce-141, 5	0.008	< LLD	0.5 mi North of SONGS 2 & 3	0.0016 (1/2) (0-0.0023)	Newport Beach < LLD
	Ce-144, 5	0.02	< LLD	0.5 mi North of SONGS 2 & 3	0.025 (1/2) (0-0.05)	Newport Beach < LLD
	Ra-226, 5	0.04	0.476 (5/5) (0.15 -0.80)	0.5 mi North of SONGS 2 & 3	0.80 (1/1)	Newport Beach 0.15 (1/1)
	Th-232, 5	0.05	0.44 (5/5) (0.14-0.78)	0.5 mi. North of SONGS 2 & 3	0.78 (1/1)	Newport Beach 0.14 (1/1)
	Cs-137, 5	0.02	<LLD	-	--	-
	Ra-226, 5	0.04	<LLD	-	-	-
	Th-232, 5	0.05	<LLD	-	-	-
						0

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Rabbit Thyroid ($\mu\text{Ci/g}$ thyroid) Flesh ($\mu\text{Ci/g}$ dry wt.) Femur ($\mu\text{Ci/g}$ Ca)	Sr-90, 5	0.01	0.04 (4/5) (0-0.09)	Basilone Road Off-Ramp	0.09 (1/1)	Huntington Beach 0.04 (1/1)	0
	I-131, 1	5.0	< LLD	-	-	-	
	Cs-137, 1	0.06	< LLD	-	-	-	
	I-131, 1	0.05	< LLD	-	-	-	
	Sr-89, 1	3.0	< LLD	-	-	-	
	Sr-90, 1	2.0	0.9 (1/1)	< 2 mi East of Station 45° MAG	1.4 (2/2) (0.9-1.9)	None	
	Ca, 1	0.2	0.36 (1/1)	< 2 mi East of Station 45° MAG	0.355 (2/2) (0.35-0.36)	None	