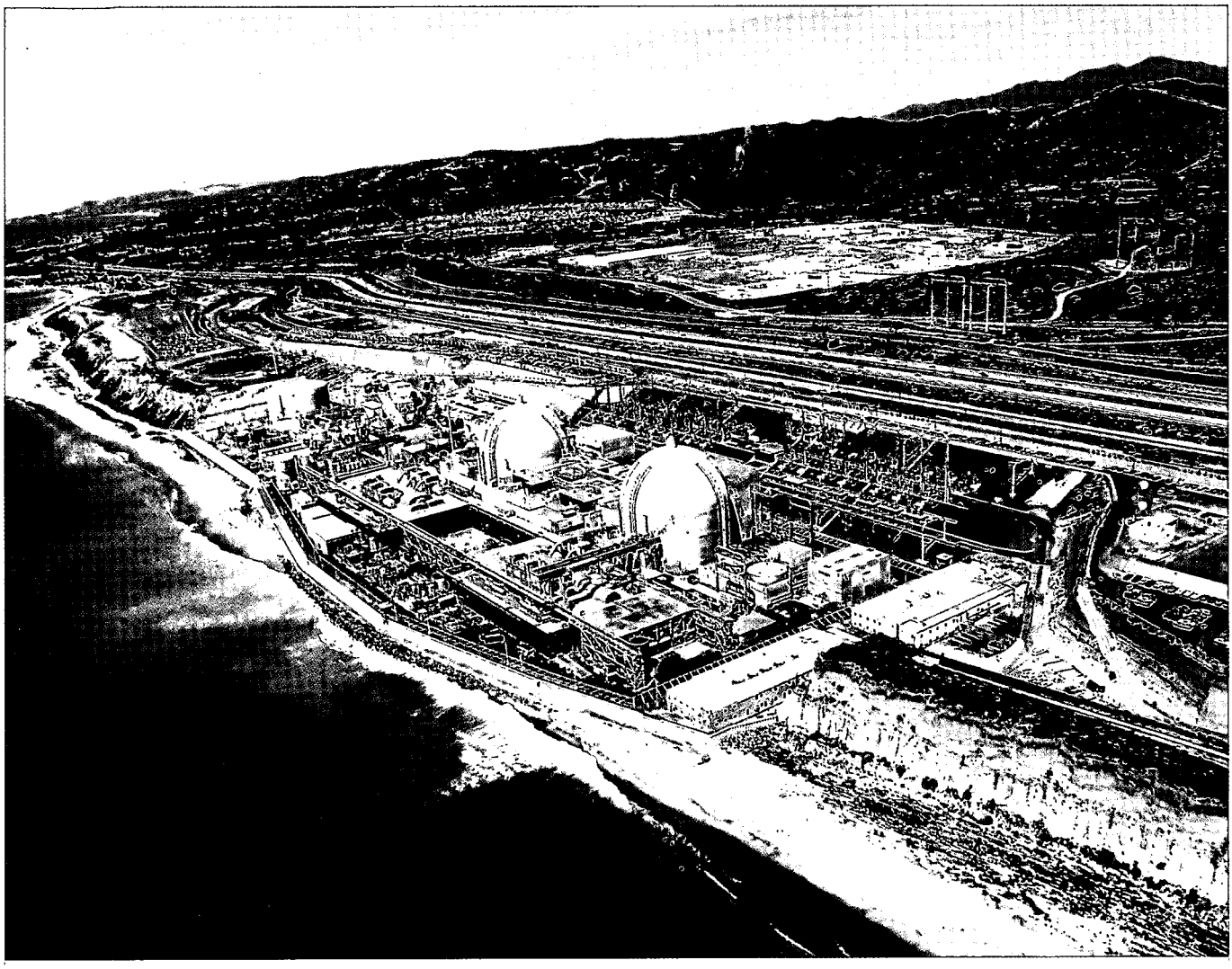

SAN ONOFRE NUCLEAR GENERATING STATION

Annual Radioactive Effluent Release Report

1995

January - December

SOUTHERN CALIFORNIA
EDISON
An EDISON INTERNATIONAL Company

PREFACE

San Onofre Nuclear Generating Station is located next to San Onofre State Beach, adjoining Camp Pendleton Marine Corps Base, in San Diego County, 64 miles south of Los Angeles, California. There are two operating pressurized water reactors with a total rated capacity of 2254 net megawatts electrical.

Unit 1, rated at 410 net megawatts electrical, was supplied by Westinghouse Electric Company and began commercial operation on January 1, 1968. The unit was permanently shutdown on November 30, 1992. It is owned by Southern California Edison (80%) and San Diego Gas and Electric (20%).

Unit 2 and Unit 3 were supplied by Combustion Engineering, Inc., with turbine generators supplied by G.E.C. Turbine Generators, Ltd., of England. The units began commercial operation on August 18, 1983, and April 1, 1984, respectively and are rated at 1127 net megawatts electrical each. The twin units are owned by Southern California Edison (75.05%), San Diego Gas and Electric (20%), City of Anaheim (3.16%), and the City of Riverside (1.79%).

P. O. Box 128
San Clemente, CA 92674-0128

S.O.N.G.S. 1

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ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

January - December

SECTION A. INTRODUCTION

This Annual Radioactive Effluent Release Report summarizes the gaseous and liquid radioactive effluent releases and radwaste shipments made from the San Onofre Nuclear Generating Station, Unit 1. This report is prepared in the general format of USNRC Regulatory Guide 1.21 and includes:

1. Quarterly Summaries of Gaseous and Liquid Effluents for "Continuous" and "Batch" Modes of Release
2. Percent of Applicable Limits
3. Estimated Total Percent Error
4. Lower Limit of Detection Concentrations
5. Batch Release Summaries
6. Previous Radioactive Effluent Release Report Addendum
7. Radwaste Shipments
8. 10 CFR 50 Appendix I Requirements
9. Changes to Offsite Dose Calculation Manual

SECTION B. GASEOUS EFFLUENTS

Table 1A, "Gaseous Effluents-Summation of All Releases," provides a detailed listing of gaseous effluents released quarterly in four categories: fission and activation gases, iodine-131, particulates with half-lives greater than eight days, and tritium. Listed for each of the four categories are:

(1) the total curies released
(2) the average release rate
(3) the percent of applicable limit
(4) the estimated total error

In addition, the particulate category lists the gross alpha radioactivity released for each quarter.

The methodology used to calculate the percent of Applicable Limit is presented in Section F of this report. The methodology used in Table 1A to calculate the estimated total error is presented in Section G of this report.

Table 1B, "Gaseous Effluents-Elevated Release," has not been included in this report since San Onofre Nuclear Generating Station Unit 1 does not conduct elevated releases.

Table 1C, "Gaseous Effluents-Ground Level Releases," provides the systematic listing by radionuclide for the quantity of radioactivity released in three categories: fission gases, iodines, and particulates. The total radioactivity for each radionuclide is listed for each quarterly period by "continuous" mode of release. Plant stack releases are considered to be "continuous" releases. As of 8/4/93, "batch" mode releases are no longer conducted because of the permanent shutdown of the reactor.

Table 1D, "Gaseous Effluents-Lower Limit of Detection," provides a listing of lower limit of detection concentrations for radionuclides not detected in Tables 1A and 1C for continuous mode releases only.

Table 1E, "Gaseous Effluents-Radiation Doses at the Site Boundary," provides a quarterly summary of doses at the site boundary for this report period.

Table 1F, "Gaseous Effluents-Batch Release Summary," has been deleted. "Batch" mode releases are no longer conducted as of 8/4/93, due to the permanent shutdown of the reactor.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

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TABLE 1A

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	First Quarter	Second Quarter	Estimated Total Error, %
A. Fission and activation gases				
1. Total release	Ci	<LLD	<LLD	3.00E+1
2. Average release rate for period	μCi/sec	0.00E+0	0.00E+0	
3. Percent of applicable limit	% MPC	0.00E+0	0.00E+0	
4. Percent Effluent Concentration Limit	% ECL	0.00E+0	0.00E+0	
B. Iodines				
1. Total iodine-131	Ci	<LLD	<LLD	1.90E+1
2. Average release rate for period	μCi/sec	0.00E+0	0.00E+0	
3. Percent of applicable limit	% MPC	0.00E+0	0.00E+0	
4. Percent Effluent Concentration Limit	% ECL	0.00E+0	0.00E+0	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	<LLD	<LLD	1.60E+1
2. Average release rate for period	μCi/sec	0.00E+0	0.00E+0	
3. Percent of applicable limit	% MPC	0.00E+0	0.00E+0	
4. Percent Effluent Concentration Limit	% ECL	0.00E+0	0.00E+0	
5. Gross alpha activity	Ci	1.49E-8	8.21E-8	5.00E+1
D. Tritium				
1. Total release	Ci	9.31E-1	1.16E+0	2.50E+1
2. Average release rate for period	μCi/sec	1.20E-1	1.48E-1	
3. Percent of applicable limit	% MPC	7.78E-4	9.59E-4	
4. Percent Effluent Concentration Limit	% ECL	1.56E-3	1.92E-3	

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TABLE 1A (Continued)

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Third Quarter	Fourth Quarter	Estimated Total Error, %
A. Fission and activation gases				
1. Total release	Ci	<LLD	<LLD	3.00E+1
2. Average release rate for period	μCi/sec	0.00E+0	0.00E+0	
3. Percent of applicable limit	% MPC	0.00E+0	0.00E+0	
4. Percent Effluent Concentration Limit	% ECL	0.00E+0	0.00E+0	
B. Iodines				
1. Total iodine-131	Ci	<LLD	<LLD	1.90E+1
2. Average release rate for period	μCi/sec	0.00E+0	0.00E+0	
3. Percent of applicable limit	% MPC	0.00E+0	0.00E+0	
4. Percent Effluent Concentration Limit	% ECL	0.00E+0	0.00E+0	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	<LLD	<LLD	1.60E+1
2. Average release rate for period	μCi/sec	0.00E+0	0.00E+0	
3. Percent of applicable limit	% MPC	0.00E+0	0.00E+0	
4. Percent Effluent Concentration Limit	% ECL	0.00E+0	0.00E+0	
5. Gross alpha activity	Ci	5.46E-8	1.40E-7	5.00E+1
D. Tritium				
1. Total release	Ci	3.70E-1	7.14E-1	2.50E+1
2. Average release rate for period	μCi/sec	4.65E-2	8.98E-2	
3. Percent of applicable limit	% MPC	3.03E-4	5.84E-4	
4. Percent Effluent Concentration Limit	% ECL	6.05E-4	1.17E-3	

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TABLE 1C

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES
CONTINUOUS MODE

Radionuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission and activation gases					
krypton-85	Ci	<LLD	<LLD	<LLD	<LLD
krypton-85m	Ci	<LLD	<LLD	<LLD	<LLD
krypton-87	Ci	<LLD	<LLD	<LLD	<LLD
krypton-88	Ci	<LLD	<LLD	<LLD	<LLD
xenon-133	Ci	<LLD	<LLD	<LLD	<LLD
xenon-133m	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135m	Ci	<LLD	<LLD	<LLD	<LLD
xenon-138	Ci	<LLD	<LLD	<LLD	<LLD
Total for period	Ci	<LLD	<LLD	<LLD	<LLD
2. Iodines					
iodine-131	Ci	<LLD	<LLD	<LLD	<LLD
iodine-133	Ci	<LLD	<LLD	<LLD	<LLD
iodine-135	Ci	<LLD	<LLD	<LLD	<LLD
Total for period	Ci	<LLD	<LLD	<LLD	<LLD
3. Particulates					
barium-140	Ci	<LLD	<LLD	<LLD	<LLD
cerium-141	Ci	<LLD	<LLD	<LLD	<LLD
cerium-144	Ci	<LLD	<LLD	<LLD	<LLD
cesium-134	Ci	<LLD	<LLD	<LLD	<LLD
cesium-137	Ci	<LLD	<LLD	<LLD	<LLD
cobalt-58	Ci	<LLD	<LLD	<LLD	<LLD
cobalt-60	Ci	<LLD	<LLD	<LLD	<LLD
iron-59	Ci	<LLD	<LLD	<LLD	<LLD
lanthanum-140	Ci	<LLD	<LLD	<LLD	<LLD
manganese-54	Ci	<LLD	<LLD	<LLD	<LLD
molybdenum-99	Ci	<LLD	<LLD	<LLD	<LLD
strontium-89	Ci	<LLD	<LLD	<LLD	<LLD
strontium-90	Ci	<LLD	<LLD	<LLD	<LLD
zinc-65	Ci	<LLD	<LLD	<LLD	<LLD

LLD Lower Limit of Detection; see Table 1D.

NOTE: Due to the permanent shutdown of S.O.N.G.S. 1, "BATCH MODE" releases are no longer conducted.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

S.O.N.G.S. 1

TABLE 1D

GASEOUS EFFLUENTS-LOWER LIMIT OF DETECTION
CONTINUOUS MODE

Radionuclides	LLD (μCi/cc)
1. Fission and activation gases	
krypton-85	2.00E-5
krypton-85m	4.80E-8
krypton-87	2.50E-7
krypton-88	1.70E-7
xenon-133	1.20E-7
xenon-133m	3.90E-7
xenon-135	5.00E-8
xenon-135m	2.00E-6
xenon-138	3.30E-6
2. Iodines	
iodine-131	1.90E-13
iodine-133	1.20E-12
iodine-135	3.20E-11
. Particulates	
barium-140	3.90E-13
cerium-141	4.90E-14
cerium-144	2.00E-13
cesium-134	1.20E-13
cesium-137	9.60E-14
cobalt-58	1.10E-13
cobalt-60	1.70E-13
iron-59	2.60E-13
lanthanum-140	6.30E-13
manganese-54	1.10E-13
molybdenum-99	5.20E-14
strontium-89	1.00E-14
strontium-90	1.00E-15
zinc-65	2.80E-13

NOTE: Due to the permanent shutdown of S.O.N.G.S. 1, "BATCH MODE" releases are no longer conducted.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

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TABLE 1E

GASEOUS EFFLUENTS-RADIATION DOSES AT THE SITE BOUNDARY

	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
A. Noble Gas					
1. Gamma Air Dose	mrad	0.00E+0	0.00E+0	0.00E+0	0.00E+0
2. Percent Applicable Limit	%	0.00E+0	0.00E+0	0.00E+0	0.00E+0
3. Beta Air Dose	mrad	0.00E+0	0.00E+0	0.00E+0	0.00E+0
4. Percent Applicable Limit	%	0.00E+0	0.00E+0	0.00E+0	0.00E+0
B. Tritium, Iodine, Particulates (at the nearest receptor)					
5. Organ Dose	mrem	3.31E-5	4.11E-5	1.31E-5	2.54E-5
6. Percent Applicable Limit	%	4.41E-4	5.48E-4	1.75E-4	3.39E-4

NOTE: Calculations performed in accordance with the ODCM utilizing the historical X/Q.

TABLE 1F

GASEOUS EFFLUENTS-BATCH RELEASE SUMMARY

NOTE: Due to the permanent shutdown of S.O.N.G.S. 1, "BATCH MODE" releases are no longer conducted.

SECTION C. LIQUID EFFLUENTS

Table 2A, "Liquid Effluents-Summation of All Releases," provides a detailed summary of liquid effluents released quarterly in three categories: fission and activation products, tritium, and dissolved and entrained gases. Listed for each of the three categories are:

(1) the total curies released
(2) the average diluted concentration
(3) the percent of applicable limit
(4) the estimated total error

In addition, Table 2A lists:

(1) the gross alpha radioactivity
(2) the volume of waste released (prior to dilution)
(3) the volume of dilution water

The methodology used to calculate the percent of applicable limit is presented in Section F of this report. The methodology used to calculate the estimated total error in Table 2A is presented in Section G of this report.

Table 2B, "Liquid Effluents," provides the systematic listing by radionuclide for the quantity of radioactivity released in each category. The total radioactivity of each radionuclide released is listed for each quarterly period by both "continuous" and "batch" modes of release.

Table 2C, "Liquid Effluents-Lower Limit of Detection," provides a listing of lower limit of detection concentrations for radionuclides not detected in Table 2B.

Table 2D, "Liquid Effluents-Radiation Doses at the Liquid Site Boundary," presents a quarterly summary of doses at the Liquid Site Boundary for this report period.

Table 2E, "Liquid Effluents-Batch Release Summary," provides summary information regarding batch releases conducted during this report period from San Onofre Nuclear Generating Station Unit 1.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

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TABLE 2A

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	First Quarter	Second Quarter	Estimated Total Error, %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	1.19E-3	3.80E-2	1.90E+1
2. Average diluted concentration during period	μCi/ml	6.95E-10	2.16E-8	
3. Percent of applicable limit	% MPC	3.38E-3	9.89E-2	
4. Percent Effluent Concentration Limit	% ECL	6.86E-2	1.02E+0	
B. Tritium				
1. Total release	Ci	2.85E-1	5.88E+0	1.90E+1
2. Average diluted concentration during period	μCi/ml	1.67E-7	3.34E-6	
3. Percent of applicable limit	% MPC	5.56E-3	1.11E-1	
4. Percent Effluent Concentration Limit	% ECL	1.67E-2	3.34E-1	
C. Dissolved and entrained gases				
1. Total release	Ci	<LLD	<LLD	1.90E+1
2. Average diluted concentration during period	μCi/ml	0.00E+0	0.00E+0	
3. Percent of applicable limit	% MPC	0.00E+0	0.00E+0	
4. Percent Effluent Concentration Limit	% ECL	0.00E+0	0.00E+0	
D. Gross alpha radioactivity				
1. Total release	Ci	<LLD	<LLD	5.00E+1
E. Volume of waste released (batch & continuous, prior to dilution)	liters	8.04E+6	1.39E+6	5.00E+0
F. Volume of dilution water used during period	liters	1.71E+9	1.76E+9	5.00E+0

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

S.O.N.G.S. 1

TABLE 2A (Continued)

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Third Quarter	Fourth Quarter	Estimated Total Error, %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	8.99E-5	3.06E-2	1.90E+1
2. Average diluted concentration during period	μCi/ml	5.14E-11	1.90E-8	
3. Percent of applicable limit	% MPC	2.91E-4	1.34E-1	
4. Percent Effluent Concentration Limit	% ECL	5.02E-3	1.61E+0	
B. Tritium				
1. Total release	Ci	1.54E-3	2.47E+0	1.90E+1
2. Average diluted concentration during period	μCi/ml	8.80E-10	1.53E-6	
3. Percent of applicable limit	% MPC	2.93E-5	5.11E-2	
4. Percent Effluent Concentration Limit	% ECL	8.80E-5	1.53E-1	
C. Dissolved and entrained gases				
1. Total release	Ci	<LLD	<LLD	1.90E+1
2. Average diluted concentration during period	μCi/ml	0.00E+0	0.00E+0	
3. Percent of applicable limit	% MPC	0.00E+0	0.00E+0	
4. Percent Effluent Concentration Limit	% ECL	0.00E+0	0.00E+0	
D. Gross alpha radioactivity				
1. Total release	Ci	<LLD	<LLD	5.00E+1
E. Volume of waste released (batch & continuous, prior to dilution)	liters	3.31E+5	1.45E+6	5.00E+0
. Volume of dilution water used during period	liters	1.75E+9	1.61E+9	5.00E+0

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

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TABLE 2B

LIQUID EFFLUENTS
CONTINUOUS MODE

Radionuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission and activation products					
barium-140	Ci	<LLD	<LLD	<LLD	<LLD
cerium-141	Ci	<LLD	<LLD	<LLD	<LLD
cerium-144	Ci	<LLD	<LLD	<LLD	<LLD
cesium-134	Ci	1.37E-4	8.76E-7	1.51E-5	8.74E-5
cesium-137	Ci	9.41E-4	7.73E-5	6.96E-5	2.88E-4
chromium-51	Ci	<LLD	<LLD	<LLD	<LLD
cobalt-58	Ci	<LLD	<LLD	9.17E-7	<LLD
cobalt-60	Ci	1.76E-6	<LLD	4.32E-6	8.78E-5
iodine-131	Ci	<LLD	<LLD	<LLD	<LLD
iron-55	Ci	<LLD	<LLD	<LLD	<LLD
iron-59	Ci	<LLD	<LLD	<LLD	<LLD
lanthanum-140	Ci	<LLD	<LLD	<LLD	<LLD
manganese-54	Ci	<LLD	<LLD	<LLD	<LLD
molybdenum-99	Ci	<LLD	<LLD	<LLD	<LLD
niobium-95	Ci	<LLD	<LLD	<LLD	<LLD
strontium-89	Ci	<LLD	<LLD	<LLD	<LLD
strontium-90	Ci	<LLD	<LLD	<LLD	<LLD
technetium-99m	Ci	<LLD	<LLD	<LLD	<LLD
zinc-65	Ci	<LLD	<LLD	<LLD	<LLD
zirconium-95	Ci	<LLD	<LLD	<LLD	<LLD
Total for period	Ci	1.08E-3	7.82E-5	8.99E-5	4.63E-4
2. Dissolved and entrained gases					
xenon-133	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135	Ci	<LLD	<LLD	<LLD	<LLD
Total for period	Ci	<LLD	<LLD	<LLD	<LLD

LLD Lower Limit of Detection; see Table 2C.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

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TABLE 2B (Continued)

LIQUID EFFLUENTS
BATCH MODE

Radionuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission and activation products					
barium-140	Ci	<LLD	<LLD	<LLD	<LLD
cerium-141	Ci	<LLD	<LLD	<LLD	<LLD
cerium-144	Ci	<LLD	<LLD	<LLD	<LLD
cesium-134	Ci	2.31E-5	4.05E-3	<LLD	6.55E-3
cesium-137	Ci	4.37E-5	8.79E-3	<LLD	1.71E-2
chromium-51	Ci	<LLD	<LLD	<LLD	<LLD
cobalt-58	Ci	<LLD	<LLD	<LLD	<LLD
cobalt-60	Ci	2.99E-5	1.32E-2	<LLD	3.03E-3
iodine-131	Ci	<LLD	<LLD	<LLD	<LLD
iron-55	Ci	1.15E-5	1.18E-2	<LLD	3.38E-3
iron-59	Ci	<LLD	<LLD	<LLD	<LLD
lanthanum-140	Ci	<LLD	<LLD	<LLD	<LLD
manganese-54	Ci	<LLD	<LLD	<LLD	<LLD
molybdenum-99	Ci	<LLD	<LLD	<LLD	<LLD
niobium-95	Ci	<LLD	<LLD	<LLD	<LLD
strontium-89	Ci	<LLD	<LLD	<LLD	3.57E-5
strontium-90	Ci	8.06E-8	3.76E-5	<LLD	2.63E-5
technetium-99m	Ci	<LLD	<LLD	<LLD	<LLD
zinc-65	Ci	<LLD	<LLD	<LLD	<LLD
zirconium-95	Ci	<LLD	<LLD	<LLD	<LLD
Total for period	Ci	1.08E-4	3.79E-2	<LLD	3.01E-2
2. Dissolved and entrained gases					
xenon-133	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135	Ci	<LLD	<LLD	<LLD	<LLD
Total for period	Ci	<LLD	<LLD	<LLD	<LLD

LLD Lower Limit of Detection; see Table 2C.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

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TABLE 2C

LIQUID EFFLUENTS-LOWER LIMIT OF DETECTION
CONTINUOUS MODE

Radionuclides	LLD (μCi/cc)
1. Fission and activation products	
barium-140	4.10E-7
cerium-141	6.70E-8
cerium-144	2.70E-7
chromium-51	4.70E-7
cobalt-58	9.70E-8
cobalt-60	1.40E-7
iodine-131	8.10E-8
iron-55	1.00E-6
iron-59	2.30E-7
lanthanum-140	7.50E-7
manganese-54	9.60E-8
molybdenum-99	8.80E-8
niobium-95	9.70E-8
strontium-89	5.00E-8
strontium-90	1.00E-8
technetium-99m	9.00E-8
zinc-65	2.40E-7
zirconium-95	1.70E-7
2. Dissolved and entrained gases	
xenon-133	3.00E-7
xenon-135	1.30E-7
3. gross alpha	1.00E-7

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

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TABLE 2C (Continued)

LIQUID EFFLUENTS-LOWER LIMIT OF DETECTION
BATCH MODE

Radionuclides	LLD (μCi/cc)
1. Fission and activation products	
barium-140	3.20E-7
cerium-141	6.10E-8
cerium-144	2.70E-7
cesium-134	1.10E-7
cesium-137	9.10E-8
chromium-51	4.20E-7
cobalt-58	9.30E-8
cobalt-60	1.40E-7
iodine-131	5.70E-8
iron-55	1.00E-6
iron-59	2.10E-7
lanthanum-140	1.70E-7
manganese-54	9.50E-8
molybdenum-99	3.40E-8
niobium-95	8.90E-8
strontium-89	5.00E-8
strontium-90	1.00E-8
technetium-99m	3.40E-8
zinc-65	2.40E-7
zirconium-95	1.60E-7
2. Dissolved and entrained gases	
xenon-133	3.00E-7
xenon-135	1.30E-7
3. gross alpha	1.00E-7

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

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TABLE 2D

LIQUID EFFLUENTS-RADIATION DOSES AT THE LIQUID SITE BOUNDARY

	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
A.					
1. Total body dose	mrem	1.25E-2	2.42E-1	9.69E-4	2.09E-1
2. Percent Applicable Limit	%	8.34E-1	1.61E+1	6.46E-2	1.39E+1
B.					
1. Limiting organ dose	mrem	1.84E-2	6.29E-1	1.38E-3	3.53E-1
2. Percent Applicable Limit	%	3.68E-1	1.26E+1	2.76E-2	7.06E+0
3. Limiting organ for period		Liver	Bone	Liver	Liver

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TABLE 2E

LIQUID EFFLUENTS-BATCH RELEASE SUMMARY

		12 month period
1.	Number of batch releases:	5 releases
2.	Total time period for batch releases:	5329 minutes
3.	Maximum time period for a batch release:	2928 minutes
4.	Average time period for a batch release:	1066 minutes
5.	Minimum time period for a batch release:	77 minutes
6.	Average saltwater flow during batch releases:	4987 gpm

SECTION D. PREVIOUS RADIOACTIVE EFFLUENT RELEASE REPORT ADDENDUM

None.

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SECTION E. RADWASTE SHIPMENTS

TABLE 3

SOLID WASTE AND IRRADIATED FUEL SHIPMENT

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not Irradiated Fuel)

1. Type of waste		Unit	12 month period	Estimated total error (%)
a.	Spent resins, filter sludges, evaporator bottoms	m^3	N/A	N/A
		Ci	N/A	
b.	Dry compressible waste, contaminated equipment	m^3	N/A	N/A
		Ci	N/A	
c.	Irradiated components, control rods	m^3	N/A	N/A
		Ci	N/A	
d.	Other	m^3	N/A	N/A
		Ci	N/A	

N/A No shipment made.

2. Estimate of major nuclide composition (by type of waste)		
a. not applicable	%	0.00E+0
b. not applicable	%	0.00E+0
c. not applicable	%	0.00E+0
d. not applicable	%	0.00E+0

3. Solid Waste Disposition

See COMMON section of this report

B. IRRADIATED FUEL SHIPMENTS (Disposition)

See COMMON section of this report

SECTION F. APPLICABLE LIMITS

Gaseous Effluents - Applicable Limits

The percent of Applicable Limits, tabulated in Sections A.3, B.3, C.3, and D.3 of Table 1A, was calculated using the following equation:

- % Applicable Limit $= \dfrac{(\text{Rel Rate})\ (X/Q)\ (100)}{MPC_{eff}}$

  where:

  Rel Rate = total curies released in each category and each quarter, divided by the seconds in a quarter; the value in Sections A.2, B.2, C.2 and D.2 of Table 1A, μCi/sec.

  X/Q = 1.30E-5 sec/m^3; the annual average atmospheric dispersion defined in the Unit 1 ODCM, Rev. 11.

- $MPC_{eff} = \dfrac{1}{\sum_{i=1}^{n} \dfrac{F_i}{MPC_i}}$

  where:

  F_i = fractional abundance of the i^{th} radionuclide obtained by dividing the activity (curies) for each radionuclide, C_i, by the sum of all the isotopic activity, C_T.

  n = total number of radionuclides identified

  MPC_i = Maximum Permissible Concentration (MPC) of the i^{th} radionuclide from 10 CFR 20 (20.1-20.602), Appendix B, Table II, Column 1.

- % ECL $= \dfrac{(\text{Rel Rate})\ (X/Q)\ (100)}{ECL_{eff}}$

  where:

  Rel Rate = total curies released in each category and each quarter, divided by the seconds in a quarter; the value in Sections A.2, B.2, C.2 and D.2 of Table 1A, μCi/sec.

  X/Q = 1.30E-5 sec/m^3; the annual average atmospheric dispersion defined in the Unit 1 ODCM, Rev. 11.

- $ECL_{eff} = \dfrac{1}{\sum_{i=1}^{n} \dfrac{F_i}{ECL_i}}$

  where:

  F_i = fractional abundance of the i^{th} radionuclide obtained by dividing the activity (curies) for each radionuclide, C_i, by the sum of all the isotopic activity, C_T.

  n = total number of radionuclides identified

  ECL_i = Effluent Concentration Limit (ECL) of the i^{th} radionuclide from 10 CFR 20 (20.1001-20.2402), Appendix B, Table 2, Column 1.

Liquid Effluents - Applicable Limits

The percent of Applicable Limits, tabulated in Sections A.3, B.3, and C.3 of Table 2A, were calculated using the following equations:

- % Applicable Limit = $\frac{(\text{Dil Conc})\ (100)}{MPC_{eff}}$

  where: Dil Conc = total curies released in each category and each quarter divided by the total volume released (sum of Sections E and F in Table 2A); the value in Sections A.2, B.2, and C.2 of Table 2A, μCi/ml.

  - MPC_{eff} = $\frac{1}{\sum_{i=1}^{n} \frac{F_i}{MPC_i}}$

    where: F_i = fractional abundance of the i^{th} radionuclide obtained by dividing the activity (curies) for each radionuclide, C_i, by the sum of all the isotopic activity, C_T.

    n = total number of radionuclides identified

    MPC_i = Maximum Permissible Concentration (MPC) of the i^{th} radionuclide from 10 CFR 20 (20.1-20.602), Appendix B, Table II, Column 2.

- % ECL = $\frac{(\text{Dil Conc})\ (100)}{ECL_{eff}}$

  where: Dil Conc = total curies released in each category and each quarter divided by the total volume released (sum of Sections E and F in Table 2A); the value in Sections A.2, B.2, and C.2 of Table 2A, μCi/ml.

  - ECL_{eff} = $\frac{1}{\sum_{i=1}^{n} \frac{F_i}{ECL_i}}$

    where: F_i = fractional abundance of the i^{th} radionuclide obtained by dividing the activity (curies) for each radionuclide, C_i, by the sum of all the isotopic activity, C_T.

    n = total number of radionuclides identified

    ECL_i = Effluent Concentration Limit (ECL) of the i^{th} radionuclide from 10 CFR 20 (20.1001-20.2402), Appendix B, Table 2, Column 2.

SECTION G. ESTIMATION OF ERROR

Estimations of the error in reported values of gaseous and liquid effluents releases have been made.

Sources of error for gaseous effluents - batch releases are:

(1) tank volumes
(2) sampling
(3) counting
(4) calibration

Sources of error for gaseous effluents - continuous releases are:

(1) fan flow rate
(2) sampling
(3) counting
(4) calibration
(5) differential pressure drop

Sources of error for liquid effluents - batch releases are:

(1) tank volumes
(2) sampling
(3) counting
(4) calibration

Sources of error for liquid effluents - continuous releases are:

(1) dilution flow rate
(2) sampling
(3) counting
(4) calibration

These sources of error are independent, and thus, the total error is calculated according to the following formula:

$$\text{Total Error} = \sqrt{\sigma_1^2 + \sigma_2^2 + \sigma_3^2 + \ldots \sigma_i^2}$$

where: σ_i = Error associated with each component.

SECTION H. 10 CFR 50 APPENDIX I REQUIREMENTS

Table 1 in Section H presents the quarterly and annual maximum dose to an individual. Six different categories are presented:

(1) Liquid Effluents - Whole Body
(2) Liquid Effluents - Organ
(3) Airborne Effluents - Tritium, Iodines and Particulates
(4) Noble Gases - Gamma
(5) Noble Gases - Beta
(6) Direct Radiation

The doses for categories 1 and 2 were calculated using the methodology of the ODCM, this data is also presented in Table 2D. Categories 3, 4, and 5 were calculated utilizing RRRGS (Radioactive Release Report Generating System) software, Regulatory Guide 1.109 methodology, and concurrent meteorology. Table 1E of gaseous effluents previously presented, however, lists data similar to categories 3, 4 and 5 using methods described in the ODCM and the historical meteorology (X/Q). Category 6 presents direct dose data measured by TLD dosimeters. Each portion of each category is footnoted to briefly describe each maximum individual dose presented.

For individuals who may, at times, be within the site boundary, the occupancy of the individual will be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the site boundary. For members of the public who traverse the site boundary via highway I-5, the residency time shall be considered negligible and hence the dose "0".

Table 2 in Section H presents the percent of Applicable Limits for each dose presented in Table 1.

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TABLE 1

	Dose * (millirems)				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
LIQUID EFFLUENTS	1)	2)	3)	4)	5)
Whole Body	1.25E-2	2.41E-1	9.69E-4	2.09E-1	4.65E-1
	6)	7)	8)	9)	10)
Organ	1.84E-2	6.29E-1	1.38E-3	3.53E-1	9.47E-1
AIRBORNE EFFLUENTS	11)	12)	13)	14)	15)
Tritium, Iodines, and Particulates	8.54E-4	8.64E-4	4.21E-4	3.77E-4	2.47E-3
NOBLE GASES **	16)	17)	18)	19)	20)
Gamma	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
	21)	22)	23)	24)	25)
Beta	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
	26)	27)	28)	29)	30)
DIRECT RADIATION	3.19E-1	3.67E-1	2.71E-1	3.00E-1	1.26E+0

* The numbered footnotes below briefly explain how each maximum dose was calculated, including the organ and the predominant pathway(s).

** Noble gas doses due to airborne effluent are in units of mrad, reflecting the air dose.

1. This data was calculated using the methodology of the ODCM.
2. This data was calculated using the methodology of the ODCM.
3. This data was calculated using the methodology of the ODCM.
4. This data was calculated using the methodology of the ODCM.
5. This data was calculated using the methodology of the ODCM.

6. This data was calculated using the methodology of the ODCM; the liver received the maximum dose primarily by the saltwater fish pathway.

7. This data was calculated using the methodology of the ODCM; the bone received the maximum dose primarily by the saltwater fish pathway.

8. This data was calculated using the methodology of the ODCM; the liver received the maximum dose primarily by the saltwater fish pathway.

9. This data was calculated using the methodology of the ODCM; the liver received the maximum dose primarily by the saltwater fish pathway.

10. This data was calculated using the methodology of the ODCM; the liver received the maximum dose primarily by the saltwater fish pathway.

11. The maximum organ dose was to a child's thyroid and was located in the NNW sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

12. The maximum organ dose was to a child's thyroid and was located in the NW sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

13. The maximum organ dose was to a child's thyroid and was located in the NNW sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

14. The maximum organ dose was to a child's thyroid and was located in the NW sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

15. The maximum organ dose was to a child's thyroid and was located in the NNW sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

16. There was no activity detected during the release period, therefore the reported air dose for gamma radiation was 0.00E+0 mrad.

17. There was no activity detected during the release period, therefore the reported air dose for gamma radiation was 0.00E+0 mrad.

18. There was no activity detected during the release period, therefore the reported air dose for gamma radiation was 0.00E+0 mrad.

19. There was no activity detected during the release period, therefore the reported air dose for gamma radiation was 0.00E+0 mrad.

20. There was no activity detected during the release period, therefore the reported air dose for gamma radiation was 0.00E+0 mrad.

21. There was no activity detected during the release period, therefore the reported air dose for beta radiation was 0.00E+0 mrad.

22. There was no activity detected during the release period, therefore the reported air dose for beta radiation was 0.00E+0 mrad.

23. There was no activity detected during the release period, therefore the reported air dose for beta radiation was 0.00E+0 mrad.

24. There was no activity detected during the release period, therefore the reported air dose for beta radiation was 0.00E+0 mrad.

25. There was no activity detected during the release period, therefore the reported air dose for beta radiation was 0.00E+0 mrad.

26. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the WSW sector.

27. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the WSW sector.

28. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the SW sector.

29. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the WSW sector.

30. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the WSW sector.

TABLE 2

SOURCE	Percent Applicable Limit				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
LIQUID EFFLUENTS					
Whole Body	8.34E-1	1.61E+1	6.46E-2	1.39E+1	1.55E+1
Organ	3.68E-1	1.26E+1	2.76E-2	7.06E+0	9.47E+0
AIRBORNE EFFLUENTS					
Tritium, Iodines, and Particulates	1.14E-2	1.15E-2	5.61E-3	5.03E-3	1.65E-2
NOBLE GASES					
Gamma	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Beta	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

NOTE: Direct Radiation is not specifically addressed in the Applicable Limits.

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SECTION I. CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

On December 6, 1995 Revision 11 to the Unit 1 Offsite Dose Calculation Manual (ODCM) was adopted and published. The Administrative Factor (AF) for gaseous releases was changed from 0.13 to 0.03. The AF was lowered due to the shutdown condition of Unit 1 and absence of expected source term in the stack flow. Table 4-3 was changed in two areas. A note was added allowing sampling of a particulate or iodine channel while only one is functional, so long as the channel is shut down for one hour or less. Two references to batch gas releases still existed in section 2. These were removed as batch releases have been discontinued since 8/4/93.

There had been concern about allowing sampling of particulate or iodine channels when that channel was the only one in service. Continuous airborne sampling, as required by the ODCM, is interrupted for a short period of time during filter change out. P.K. Chang memo to G. Moore, dated November 4, 1994, "Offsite Dose Calculation Manual (ODCM) Specification 4.2.1 Interpretation, San Onofre Nuclear Generating Station, Unit 1" referenced NRC concurrence with similar clarification as applied to Units 2 and 3. As Unit 1 is shut down with an inherently lower airborne source term, these same guidelines were applied to Unit 1.

No safety evaluations were performed for updating the radiation monitor calibration constants or implementing changes from the 1994 Land Use Census. These changes reflect results from routine updates and as such do not constitute a modification in methodology for determining activity released from the site and subsequent dose to a member of the public.

A note was removed from Tables 4-2, 4-3, and 4-4. The note explained that when the radiation monitor instrument controls were put in the "not operate" mode, the instrument did not provide control room alarm to annunciate the switch selection during batch gaseous releases. This switch position allows maintenance to be performed on the instrument. The note does not belong in the ODCM due to the unit's current SAFSTOR configuration.

The footnote delineating functional requirements for R-1254 was revised. It was changed to more accurately reflect the wording in the Permanently Defueled Technical Specifications Administration Controls Licensing Commitments Document, M.A. Wharton to R.W. Krieger, dated January 25, 1994.

Per NRC Generic Letter 89-01, no safety review was required or performed for the correction of typographical errors.

The following is a complete list of changes:

[a] Indicates typographical, sequential sectional and page numbering, and format changes

* The 1994 Land Use Census revealed increased occupancy factor at the Highway Patrol Weigh Station (Southbound) location from 1880 to 2080 hours. A new garden was identified at Cotton Point Estates which changed R_i values. The name of this location was then changed from Former Nixon Estate (no garden) to Cotton Point Estates with Garden. The location remains the same. In Sector Q, leafy vegetables were identified at the San Clemente Resident with Garden at 4.2 miles so the R_i values for this location will be used rather than the San Clemente Resident with Garden at 3.9 miles which has no leafy vegetables. TLD location #73 was added. It was placed at the South Yard Facility, a new structure within the site boundary. The former transit TLD #99 was replaced with transit controls A and B.

iv Changed the word Operability to Functionality to be consistent with text of ODCM (which was revised in Revision 10) and Unit shut down condition.

vi Replaced the previous three figures with four new figures, as supplied in the Land Use Census. The same basic information is contained in the new figures.

1-4 Added a missing article, "a". Also clarified a definition under equation for LLD.

1-5[a] Corrected typographical error.

1-23 Revised calibration constants for the liquid monitors.

2-4 Added a missing article, "a". Also clarified a definition under equation for LLD.

2-12 Revised Administrative factors from 0.13 to 0.03.

2-13 Revised Administrative factors from 0.13 to 0.03. Also added clarifying phrase "for any landward sector" in definition of X/Q.

2-19 Revised calibration constants on RT-1219.

2-20 Added clarifying phrase "for a landward sector" to X/Q definition and removed notation of "batch or continuous" since batch gas releases are no longer feasible.

2-21 Removed notation of "batch or continuous" since batch gas releases are no longer feasible.

2-22 Clarified X/Q definition by adding the term "landward".

2-23 Clarified X/Q definition by adding the term "landward".

2-24 Revised the letter reference in definition of R_{ik} and made administrative change in definition of $\sum_k R_{ik} W_k$. Under the definition of W_k, the phrase delineating X/Q for tritium was deleted. This was repetitive, as Tables 2-6 through 2-16 for X/Q values are referenced earlier under W_k.

2-28* Revised Controlling Location Factor (CLF) and location for Iodine 131 per the Land Use Census. Also modified the location name of Deer Consumer/Hunter.

2-31* Name changed from "Former Nixon Estate (no garden)" to "Cotton Point Estates with Garden". It represents the same physical location, but with a new leafy green vegetable garden. The presence of the garden results in revised R_i values for Child, Teen, and Adult food and ground pathway.

2-34[a] Corrected typographical error, added "0" to distance in header.

2-39* New data from Land Use Census found a garden at a different San Clemente residence which resulted in slightly higher R_i values. The new residence is in the same sector, just 0.3 miles farther from the plant site than the previous residence.

2-67* California Highway Patrol Weigh Station occupancy factor increased from 1880 to 2080 hours, resulting in increased R_i values.

3-5[a] Corrected typographical errors.

3-6 Corrected typographical error in equation 3-4 and added a clarifying definition for the term "0.0342." Further clarified equation 3-4 by specifying site TLDs as being within 5 miles of the site rather than being a beach TLD.

3-7 Clarified the explanation of calculating direct dose. The highest TLD within 5 miles of the site is used, not necessarily a beach TLD.

4-2 Clarified instrumentation numbers to include other loop components.

4-5 Clarified instrumentation numbers to include other loop components. Deleted the note describing the "not operate" mode switch selection.

4-8 Table 4-3 was modified to allow for the sampling of particulate and iodine channels with only the one channel functional, so long as the channel is shut down for one hour or less. Also clarified the footnote delineating functional requirements for mid-range channel of R-1254. Also changed all footnotes to numeric to be consistent. Also, deleted the note describing the "not operate" mode switch selection.

4-9[a] Corrected typographical error.

4-11 Deleted the note describing the "not operate" mode switch selection.

4-15 Figure 4-3, Solid Waste Handling, was modified to show added details on the processing of Low Level Dry Active Waste.

5-9 Added footnote "b" to tritium.

5-10 Modified the definition of Δt by removing note specifying "environmental samples, not effluent samples." Also clarified a definition under equation for LLD.

5-12 Corrected Semiannual to Annual in reference to ARERR.

5-18 Removed the "deleted" notations of locations previously deleted from Table 5-4. This is an administrative change. Also added footnote listing all deleted locations from Table 5-4.

5-19 Removed the "deleted" notations of locations previously deleted from Table 5-4. This is an administrative change. Also added footnote listing all deleted locations from Table 5-4.

5-20 Removed the "deleted" notations of locations previously deleted from Table 5-4. Added location #73, South Yard Facility, per Land Use Census. Also added two transit location TLDs and a temperature "fading" correction TLD placed alongside #54. Also added footnote listing all deleted locations from Table 5-4.

5-21[a] Removed the "deleted" notation of a location previously deleted from Table 5-4.

5-22* Added Cotton Point Estates Gardens to the listing of Local Crops. Also corrected direction for San Clement Golf Course Well.

5-26-5-29 Replaced existing three figures with new versions supplied in Land Use Census. Added a page to account for new fourth page. The same information is contained in the new figures.

6-1[a] Corrected grammatical error. This is an administrative change.

6-3 Deleted the definition for "Operable-Operability". Unit 1 Permanently Defueled Technical Specifications has replaced the term "Operable" with "Functional" within its text. Ref: Amendment No. 155 to Facility Operating License No. DPR-13 San Onofre Nuclear Generating Station, Unit No. 1 Permanently Defueled Technical Specifications (TAC No. M86377), dated 12/28/93, from Michael K. Webb to Harold B. Ray.

6-7[a] Corrected typographical error.

SECTION J. CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS

- There were no changes to the Unit 1 Radioactive Waste Treatment Systems during the reporting period, January 1, 1995 to December 31, 1995.
- See the description of the Mixed Waste Processing (MWP) Unit in Section J. of the S.O.N.G.S 2 and 3 section of this report.

SECTION K. MISCELLANEOUS

- ODCM Section 5.2.1, Action B.1 Special 30-Day Report

On August 15, 1995, a Special 30-Day Report (Docket No. 50-206) concerning the Radiological Environmental Monitoring Program, San Onofre Nuclear Generating Station, Unit 1 was provided by W. C. Marsh (SCE) to the Commission. The subject of the report was the identification of a location that yielded a calculated dose greater than the values calculated using the existing ODCM (Rev. 10). The newly identified location, where outage support workers for Units 2 and 3 temporarily resided in campers, was parking lot 4A in Sector Q at 0.5 miles from the Unit 1 release point.

- Unplanned, Uncontrolled Release from Yard Drain Sump

The Unit 1 Yard Drain Sump overflowed to the PMF Catch Basin on four occasions in 1995:

Start Date/Time	Stop Date/Time	Duration (minutes)	Estimated Curies Released	Estimated Whole Body Dose (mrem)	Estimated Liver Dose (mrem)
01/04/95 @ 1510	01/04/95 @ 1925	255	0.0E+0	0.0E+0	0.0E+0
02/14/95 @ 1450	02/14/95 @ 1515	25	0.0E+0	0.0E+0	0.0E+0
03/11/95 @ 0045	03/11/95 @ 0135	50	3.1E-5	3.4E-4	5.1E-4
03/23/95 @ 0845	03/23/95 @ 0908	23	0.0E+0	0.0E+0	0.0E+0

These events were due to heavy rainfall. It should be noted that curbs were placed to redirect runoff away from the Yard Drain Sump and the sump and pumps are routinely cleaned. These measures have been successful in reducing the duration and frequency of overflow. Based on conservative assumptions, there were no significant dose consequences as a result of these releases.

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EFFLUENT RADIATION MONITORS OUT OF SERVICE GREATER THAN 30 DAYS

January 1, 1995 - December 31, 1995

S.O.N.G.S. 1			
Monitor	Inoperability Period	Inoperability Cause	Explanation
R-1219 Plant Vent Stack Monitor	04/13/95 - 06/22/95	Lack of sample flow	Sample pump failure. System components required extensive repairs.
R-1221 Plant Vent Stack Sampler	04/13/95 - 06/22/95	Lack of sample flow	Sample pump failure. System components required extensive repairs.
R-1254 Plant Vent Stack Process Flow Monitor	08/12/88 - present	Process flow indication	Process flow instrumentation is inadequate. Design change to correct flow measurement cancelled due to permanent plant shutdown. Radiation monitor functions operable.
R-1254 Plant Vent Stack Particulate and Iodine Sampler	04/20/95 - 07/12/95 10/22/95 - 11/21/95	Heat trace unit inoperable	Required electrical panel rework and parts replacement.

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SECTION L. S O.N.G.S. 1 CONCLUSIONS

- Gaseous releases totaled 3.18E+0 curies of which noble gases were 0.00E+0 curies, iodines were 0.00E+0 curies, particulates were 2.92E-7 curies, and tritium was 3.18E+0 curies.

- The radiation doses from gaseous releases are: (a) gamma air dose: 0.00E+0 mrad at the site boundary, (b) beta air dose: 0.00E+0 mrad at the site boundary, (c) organ dose: 2.47E-3 mrem at the nearest receptor.

- Liquid releases totaled 8.71E+0 curies of which particulates and iodines were 6.99E-2 curies, tritium was 8.64E+0 curies, and noble gases were 0.00E+0 curies.

- The radiation doses from liquid releases are: (a) total body: 4.65E-1 mrem, (b) limiting organ: 9.47E-1 mrem.

- The radioactive releases and resulting doses generated from Unit 1 were below the Applicable Limits for both gaseous and liquid effluents.

S.O.N.G.S. 2 and 3

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ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

January - December

SECTION A. INTRODUCTION

This Annual Radioactive Effluent Release Report summarizes the gaseous and liquid radioactive effluent releases and radwaste shipments made from the San Onofre Nuclear Generating Station, Units 2 and 3. This report is prepared in the general format of USNRC Regulatory Guide 1.21 and includes:

1. Quarterly Summaries of Gaseous and Liquid Effluents for "Continuous" and "Batch" Modes of Release
2. Percent of Applicable Limits
3. Estimated Total Percent Error
4. Lower Limit of Detection Concentrations
5. Batch Release Summaries
6. Previous Radioactive Effluent Release Report Addendum
7. Radwaste Shipments
8. 10 CFR 50 Appendix I Requirements
9. Changes to Offsite Dose Calculation Manual

SECTION B. GASEOUS EFFLUENTS

Table 1A, "Gaseous Effluents-Summation of All Releases," provides a detailed listing of gaseous effluents released quarterly in four categories: fission and activation gases, iodine-131, particulates with half-lives greater than eight days, and tritium. Listed for each of the four categories are:

(1) the total curies released
(2) the average release rate
(3) the percent of applicable limit
(4) the estimated total error

In addition, the particulate category lists the gross alpha radioactivity released for each quarter.

The methodology used to calculate the percent of Applicable Limit is presented in Section F of this report. The methodology used in Table 1A to calculate the estimated total error is presented in Section G of this report.

Table 1B, "Gaseous Effluents-Elevated Release," has not been included in this report since San Onofre Nuclear Generating Station Units 2 and 3 do not conduct elevated releases.

Table 1C, "Gaseous Effluents-Ground Level Releases," provides the systematic listing by radionuclide for the quantity of radioactivity released in three categories: fission gases, iodines, and particulates. The total radioactivity for each radionuclide is listed for each quarterly period by both "continuous" and "batch" modes of release.

Waste gas decay tank and monitor calibration releases are considered to be "batch" releases. Containment purges and plant stack releases are considered to be "continuous" releases.

Table 1D, "Gaseous Effluents-Lower Limit of Detection," provides a listing of lower limit of detection concentrations for radionuclides not detected in Tables 1A and 1C.

Table 1E, "Gaseous Effluents-Radiation Doses at the Site Boundary," provides a quarterly summary of doses at the site boundary for this report period.

Table 1F, "Gaseous Effluents-Batch Release Summary," provides summary information regarding batch releases conducted during this report period from San Onofre Nuclear Generating Station Units 2 and 3.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

S.O.N.G.S. 2 and 3

TABLE 1A

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	First Quarter	Second Quarter	Estimated Total Error, %
A. Fission and activation gases				
1. Total release	Ci	1.58E+2	1.35E+2	3.00E+1
2. Average release rate for period	μCi/sec	2.04E+1	1.72E+1	
3. Percent of applicable limit	% MPC	3.80E-2	2.96E-2	
4. Percent Effluent Concentration Limit	% ECL	4.38E-2	2.58E-2	
B. Iodines				
1. Total iodine-131	Ci	3.79E-2	4.29E-4	1.90E+1
2. Average release rate for period	μCi/sec	4.87E-3	5.46E-5	
3. Percent of applicable limit	% MPC	2.34E-2	2.62E-4	
4. Percent Effluent Concentration Limit	% ECL	1.17E-2	1.31E-4	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	2.73E-4	2.93E-5	1.60E+1
2. Average release rate for period	μCi/sec	3.51E-5	3.72E-6	
3. Percent of applicable limit	% MPC	1.70E-5	1.06E-6	
4. Percent Effluent Concentration Limit	% ECL	7.30E-5	2.41E-6	
5. Gross alpha activity	Ci	<LLD	5.28E-7	5.00E+1
D. Tritium				
1. Total release	Ci	1.55E+1	5.77E+0	2.50E+1
2. Average release rate for period	μCi/sec	1.99E+0	7.34E-1	
3. Percent of applicable limit	% MPC	4.78E-3	1.76E-3	
4. Percent Effluent Concentration Limit	% ECL	9.57E-3	3.52E-3	

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S.O.N.G.S. 2 and 3

TABLE 1A (Continued)

GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Third Quarter	Fourth Quarter	Estimated Total Error, %
A. Fission and activation gases				
1. Total release	Ci	1.56E+2	2.47E+2	3.00E+1
2. Average release rate for period	μCi/sec	1.97E+1	3.11E+1	
3. Percent of applicable limit	% MPC	3.86E-2	5.77E-2	
4. Percent Effluent Concentration Limit	% ECL	5.09E-2	6.56E-2	
B. Iodines				
1. Total iodine-131	Ci	9.22E-3	6.57E-5	1.90E+1
2. Average release rate for period	μCi/sec	1.16E-3	8.27E-6	
3. Percent of applicable limit	% MPC	5.57E-3	3.97E-5	
4. Percent Effluent Concentration Limit	% ECL	2.78E-3	1.98E-5	
C. Particulates				
1. Particulates with half-lives >8 days	Ci	1.57E-4	1.62E-5	1.60E+1
2. Average release rate for period	μCi/sec	1.98E-5	2.04E-6	
3. Percent of applicable limit	% MPC	6.85E-6	6.14E-7	
4. Percent Effluent Concentration Limit	% ECL	2.46E-5	1.79E-6	
5. Gross alpha activity	Ci	4.19E-7	2.57E-6	5.00E+1
D. Tritium				
1. Total release	Ci	6.21E+0	1.21E+1	2.50E+1
2. Average release rate for period	μCi/sec	7.81E-1	1.52E+0	
3. Percent of applicable limit	% MPC	1.88E-3	3.65E-3	
4. Percent Effluent Concentration Limit	% ECL	3.75E-3	7.31E-3	

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TABLE 1C

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES
CONTINUOUS MODE

Radionuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission and activation gases					
argon-41	Ci	4.02E+0	1.58E+0	5.39E+0	6.04E+0
krypton-85	Ci	<LLD	<LLD	<LLD	<LLD
krypton-85m	Ci	<LLD	<LLD	2.66E-4	<LLD
krypton-87	Ci	<LLD	<LLD	<LLD	<LLD
krypton-88	Ci	<LLD	<LLD	<LLD	<LLD
xenon-133	Ci	1.52E+2	1.28E+2	1.51E+2	2.39E+2
xenon-133m	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135	Ci	5.59E-2	2.20E-2	9.48E-2	7.63E-2
xenon-135m	Ci	<LLD	<LLD	<LLD	<LLD
xenon-138	Ci	<LLD	<LLD	3.75E-3	<LLD
Total for period	Ci	1.56E+2	1.29E+2	1.56E+2	2.45E+2
2. Iodines					
iodine-131	Ci	3.79E-2	4.29E-4	9.22E-3	6.57E-5
iodine-132	Ci	2.31E-3	1.76E-7	2.18E-3	<LLD
iodine-133	Ci	1.80E-3	1.34E-3	5.52E-3	2.55E-5
iodine-134	Ci	<LLD	<LLD	<LLD	1.22E-5
iodine-135	Ci	6.71E-4	6.40E-5	1.68E-4	<LLD
Total for period	Ci	4.27E-2	1.84E-3	1.71E-2	1.03E-4

LLD Lower Limit of Detection; see Table 1D.

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S.O.N.G.S. 2 and 3

TABLE 1C (Continued)

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES
CONTINUOUS MODE

Radionuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
3. Particulates					
antimony-124	Ci	<LLD	2.16E-7	<LLD	<LLD
antimony-125	Ci	<LLD	2.28E-7	<LLD	<LLD
barium-140	Ci	<LLD	<LLD	<LLD	<LLD
bromine-82	Ci	1.32E-4	7.19E-5	1.14E-4	6.66E-5
cerium-141	Ci	<LLD	<LLD	<LLD	<LLD
cerium-143	Ci	<LLD	3.39E-7	<LLD	<LLD
cerium-144	Ci	<LLD	<LLD	<LLD	<LLD
cesium-134	Ci	2.84E-7	4.98E-7	<LLD	<LLD
cesium-137	Ci	2.19E-7	5.09E-7	1.96E-6	<LLD
cesium-138	Ci	1.90E-5	2.91E-6	5.45E-5	3.96E-4
chromium-51	Ci	<LLD	6.14E-7	1.21E-5	<LLD
cobalt-57	Ci	<LLD	6.49E-8	8.23E-7	<LLD
cobalt-58	Ci	2.18E-4	2.65E-5	1.29E-4	1.55E-5
cobalt-60	Ci	4.78E-5	3.58E-7	1.34E-5	7.01E-7
iron-59	Ci	<LLD	<LLD	<LLD	<LLD
lanthanum-140	Ci	<LLD	<LLD	<LLD	<LLD
manganese-54	Ci	6.55E-6	6.61E-7	<LLD	<LLD
molybdenum-99	Ci	<LLD	<LLD	<LLD	<LLD
niobium-95	Ci	<LLD	8.13E-8	<LLD	<LLD
rubidium-88	Ci	<LLD	<LLD	1.21E-5	<LLD
scandium-46	Ci	<LLD	3.80E-7	1.02E-6	2.17E-6
strontium-89	Ci	<LLD	<LLD	<LLD	2.34E-8
strontium-90	Ci	<LLD	<LLD	<LLD	<LLD
yttrium-92	Ci	<LLD	<LLD	<LLD	1.75E-5
zinc-65	Ci	<LLD	<LLD	<LLD	<LLD

LLD Lower Limit of Detection; see Table 1D.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

S.O.N.G.S. 2 and 3

TABLE 1C (Continued)

GASEOUS EFFLUENTS-GROUND LEVEL RELEASES
BATCH MODE *

Radionuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission and activation gases					
krypton-85	Ci	2.23E+0	5.37E+0	<LLD	2.28E+0
krypton-85m	Ci	<LLD	<LLD	<LLD	<LLD
krypton-87	Ci	<LLD	<LLD	<LLD	<LLD
krypton-88	Ci	<LLD	<LLD	<LLD	<LLD
xenon-131m	Ci	<LLD	2.63E-2	<LLD	<LLD
xenon-133	Ci	1.03E-2	2.09E-2	1.39E-2	<LLD
xenon-133m	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135m	Ci	<LLD	<LLD	<LLD	<LLD
xenon-138	Ci	<LLD	2.58E-3	<LLD	<LLD
Total for period	Ci	2.24E+0	5.42E+0	1.39E-2	2.28E+0

LLD Lower Limit of Detection; see Table 1D.

* Iodines and particulates are not analyzed prior to release via batch mode.

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TABLE 1D

GASEOUS EFFLUENTS-LOWER LIMIT OF DETECTION
CONTINUOUS MODE

Radionuclides	LLD (μCi/cc)
1. Fission and activation gases	
krypton-85	2.00E-5
krypton-85m	4.80E-8
krypton-87	2.50E-7
krypton-88	1.70E-7
xenon-133m	3.90E-7
xenon-135m	2.00E-6
xenon-138	3.30E-6
2. Iodines	
iodine-132	2.00E-11
iodine-134	2.00E-10
iodine-135	3.20E-11
3. Particulates	
antimony-124	2.20E-13
antimony-125	3.70E-13
barium-140	6.60E-13
cerium-141	1.20E-13
cerium-143	6.90E-13
cerium-144	4.70E-13
cesium-134	2.50E-13
cesium-137	2.10E-13
chromium-51	1.10E-13
cobalt-57	5.90E-14
iron-59	5.40E-13
lanthanum-140	1.30E-12
manganese-54	2.20E-13
molybdenum-99	1.20E-13
niobium-95	2.20E-13
rubidium-88	1.20E-07
scandium-46	3.30E-13
strontium-89	1.00E-13
strontium-90	1.00E-14
yttrium-92	9.00E-11
zinc-65	5.80E-13
4. gross alpha	1.00E-13

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TABLE 1D (Continued)

GASEOUS EFFLUENTS-LOWER LIMIT OF DETECTION
BATCH MODE

Radionuclides	LLD (μCi/cc)
1. Fission and activation gases	
krypton-85	1.30E-3
krypton-85m	2.60E-6
krypton-87	1.30E-5
krypton-88	9.20E-6
xenon-131m	1.60E-6
xenon-133	6.80E-6
xenon-133m	2.30E-5
xenon-135	3.00E-6
xenon-135m	4.00E-5
xenon-138	5.70E-5

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TABLE 1E

GASEOUS EFFLUENTS-RADIATION DOSES AT THE SITE BOUNDARY

	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
A. Noble Gas					
1. Gamma Air Dose	mrad	1.39E-2	9.11E-3	1.58E-2	2.14E-2
2. Percent Applicable Limit	%	1.39E-1	9.11E-2	1.58E-1	2.14E-1
3. Beta Air Dose	mrad	2.69E-2	2.28E-2	2.68E-2	4.19E-2
4. Percent Applicable Limit	%	1.35E-1	1.14E-1	1.34E-1	2.10E-1
B. Tritium, Iodine, Particulates (at the nearest receptor)					
5. Organ Dose	mrem	1.51E-2	4.63E-4	4.22E-3	4.00E-4
6. Percent Applicable Limit	%	1.01E-1	3.09E-3	2.81E-2	2.67E-3

NOTE: Calculations performed in accordance with the ODCM utilizing the historical X/Q.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

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TABLE 1F

GASEOUS EFFLUENTS-BATCH RELEASE SUMMARY

	12 month period
1. Number of batch releases:	11 releases
2. Total time period for batch releases:	4755 minutes
3. Maximum time period for a batch release:	609 minutes
4. Average time period for a batch release:	432 minutes
5. Minimum time period for a batch release:	37 minutes

SECTION C. LIQUID EFFLUENTS

Table 2A, "Liquid Effluents-Summation of All Releases," provides a detailed summary of liquid effluents released quarterly in three categories: fission and activation products, tritium, and dissolved and entrained gases. Listed for each of the three categories are:

(1) the total curies released
(2) the average diluted concentration
(3) the percent of applicable limit
(4) the estimated total error

In addition, Table 2A lists:

(1) the gross alpha radioactivity
(2) the volume of waste released (prior to dilution)
(3) the volume of dilution water

The methodology used to calculate the percent of applicable limit is presented in Section F of this report. The methodology used to calculate the estimated total error in Table 2A is presented in Section G of this report.

Table 2B, "Liquid Effluents," provides the systematic listing by radionuclide for the quantity of radioactivity released in each category. The total radioactivity of each radionuclide released is listed for each quarterly period by both "continuous" and "batch" modes of release.

Table 2C, "Liquid Effluents-Lower Limit of Detection," provides a listing of lower limit of detection concentrations for radionuclides not detected in Table 2B.

Table 2D, "Liquid Effluents-Radiation Doses at the Liquid Site Boundary," presents a quarterly summary of doses at the Liquid Site Boundary for this report period.

Table 2E, "Liquid Effluents-Batch Release Summary," provides summary information regarding batch releases conducted during this report period from San Onofre Nuclear Generating Station Units 2 and 3.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

S.O.N.G.S. 2 and 3

TABLE 2A

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	First Quarter	Second Quarter	Estimated Total Error, %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	1.37E-1	3.83E-2	1.90E+1
2. Average diluted concentration during period	μCi/ml	2.40E-10	5.73E-11	
3. Percent of applicable limit	% MPC	1.01E-3	1.23E-4	
4. Percent Effluent Concentration Limit	% ECL	1.53E-3	1.08E-3	
B. Tritium				
1. Total release	Ci	4.57E+2	2.92E+2	1.90E+1
2. Average diluted concentration during period	μCi/ml	8.02E-7	4.37E-7	
3. Percent of applicable limit	% MPC	2.67E-2	1.46E-2	
4. Percent Effluent Concentration Limit	% ECL	8.02E-2	4.37E-2	
C. Dissolved and entrained gases				
1. Total release	Ci	4.36E-1	9.29E-1	1.90E+1
2. Average diluted concentration during period	μCi/ml	7.65E-10	1.39E-9	
3. Percent of applicable limit	% MPC	3.83E-4	6.95E-4	
4. Percent Effluent Concentration Limit	% ECL	3.83E-4	6.95E-4	
D. Gross alpha radioactivity				
1. Total release	Ci	<LLD	<LLD	5.00E+1
E. Volume of waste released (batch & continuous, prior to dilution)	liters	3.01E+7	3.31E+7	5.00E+0
F. Volume of dilution water used during period	liters	5.70E+11	6.68E+11	5.00E+0

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TABLE 2A (Continued)

LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	Unit	Third Quarter	Fourth Quarter	Estimated Total Error, %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	5.52E-2	2.79E-2	1.90E+1
2. Average diluted concentration during period	μCi/ml	9.39E-11	3.65E-11	
3. Percent of applicable limit	% MPC	1.33E-4	7.67E-5	
4. Percent Effluent Concentration Limit	% ECL	7.85E-4	6.61E-4	
B. Tritium				
1. Total release	Ci	1.71E+2	5.07E+1	1.90E+1
2. Average diluted concentration during period	μCi/ml	2.91E-7	6.64E-8	
3. Percent of applicable limit	% MPC	9.69E-3	2.21E-3	
4. Percent Effluent Concentration Limit	% ECL	2.91E-2	6.64E-3	
C. Dissolved and entrained gases				
1. Total release	Ci	1.01E-2	2.74E-2	1.90E+1
2. Average diluted concentration during period	μCi/ml	1.72E-11	3.59E-11	
3. Percent of applicable limit	% MPC	8.59E-6	1.79E-5	
4. Percent Effluent Concentration Limit	% ECL	8.59E-6	1.79E-5	
D. Gross alpha radioactivity				
1. Total release	Ci	<LLD	<LLD	5.00E+1
E. Volume of waste released (batch & continuous, prior to dilution)	liters	1.60E+7	1.39E+6	5.00E+0
Volume of dilution water used during period	liters	5.88E+11	7.64E+11	5.00E+0

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TABLE 2B

LIQUID EFFLUENTS
CONTINUOUS MODE

Radionuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission and activation products					
barium-140	Ci	<LLD	<LLD	<LLD	<LLD
cerium-141	Ci	<LLD	<LLD	<LLD	<LLD
cerium-144	Ci	<LLD	<LLD	<LLD	<LLD
cesium-134	Ci	<LLD	1.96E-3	1.66E-4	<LLD
cesium-137	Ci	<LLD	2.35E-3	6.54E-4	6.15E-6
chromium-51	Ci	<LLD	3.59E-4	<LLD	<LLD
cobalt-58	Ci	<LLD	2.70E-4	<LLD	<LLD
cobalt-60	Ci	<LLD	<LLD	<LLD	<LLD
iodine-131	Ci	<LLD	<LLD	<LLD	<LLD
iron-55	Ci	<LLD	<LLD	<LLD	<LLD
iron-59	Ci	<LLD	<LLD	<LLD	<LLD
lanthanum-140	Ci	<LLD	<LLD	<LLD	<LLD
manganese-54	Ci	<LLD	5.49E-4	<LLD	<LLD
molybdenum-99	Ci	<LLD	<LLD	<LLD	<LLD
niobium-95	Ci	<LLD	<LLD	<LLD	<LLD
strontium-89	Ci	<LLD	<LLD	<LLD	<LLD
strontium-90	Ci	<LLD	<LLD	<LLD	<LLD
technetium-99m	Ci	<LLD	<LLD	<LLD	<LLD
zinc-65	Ci	<LLD	<LLD	<LLD	<LLD
zirconium-95	Ci	<LLD	<LLD	<LLD	<LLD
Total for period	Ci	<LLD	5.49E-3	8.20E-4	6.15E-6
2. Dissolved and entrained gases					
xenon-133	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135	Ci	<LLD	<LLD	<LLD	<LLD
Total for period	Ci	<LLD	<LLD	<LLD	<LLD

LLD Lower Limit of Detection; see Table 2C.

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TABLE 2B (Continued)

LIQUID EFFLUENTS
BATCH MODE

Radionuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission and activation products					
antimony-122	Ci	6.11E-5	3.07E-6	2.76E-5	<LLD
antimony-124	Ci	2.23E-3	1.26E-3	2.06E-3	1.12E-3
antimony-125	Ci	8.85E-2	2.12E-2	2.72E-2	1.28E-2
barium-140	Ci	<LLD	<LLD	<LLD	<LLD
cerium-141	Ci	<LLD	<LLD	<LLD	<LLD
cerium-144	Ci	<LLD	<LLD	<LLD	<LLD
cesium-134	Ci	4.27E-5	5.18E-4	2.88E-4	1.60E-3
cesium-136	Ci	2.01E-4	<LLD	<LLD	<LLD
cesium-137	Ci	4.18E-4	6.73E-4	8.65E-4	1.85E-3
cesium-138	Ci	3.66E-5	<LLD	<LLD	<LLD
chromium-51	Ci	3.29E-3	1.54E-3	6.18E-3	1.56E-3
cobalt-57	Ci	1.28E-4	<LLD	5.13E-5	1.17E-5
cobalt-58	Ci	2.36E-2	4.02E-3	1.09E-2	4.63E-3
cobalt-60	Ci	5.05E-3	6.35E-4	1.94E-3	1.24E-3
iodine-131	Ci	1.23E-3	<LLD	1.54E-5	<LLD
iron-55	Ci	6.47E-3	7.08E-4	2.38E-3	1.42E-3
iron-59	Ci	1.86E-4	<LLD	3.00E-5	6.54E-5
lanthanum-140	Ci	<LLD	<LLD	<LLD	<LLD
manganese-54	Ci	7.27E-4	5.47E-4	2.89E-4	1.76E-4
molybdenum-99	Ci	<LLD	<LLD	<LLD	<LLD
niobium-95	Ci	2.73E-4	8.68E-4	1.10E-3	3.52E-4
niobium-97	Ci	3.83E-5	<LLD	1.69E-5	<LLD
ruthenium-106	Ci	5.19E-4	<LLD	<LLD	<LLD
silver-110m	Ci	3.03E-3	3.03E-4	3.78E-4	7.68E-4
strontium-89	Ci	<LLD	<LLD	<LLD	<LLD
strontium-90	Ci	<LLD	<LLD	<LLD	<LLD
strontium-92	Ci	9.58E-5	<LLD	<LLD	<LLD
technetium-99m	Ci	<LLD	<LLD	<LLD	<LLD

LLD Lower Limit of Detection; see Table 2C.

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TABLE 2B (Continued)

LIQUID EFFLUENTS
BATCH MODE

Radionuclides Released	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
1. Fission and activation products (Continued)					
tellurium-132	Ci	1.08E-4	<LLD	<LLD	<LLD
tin-113	Ci	5.63E-5	<LLD	<LLD	<LLD
tin-117m	Ci	<LLD	2.67E-5	<LLD	<LLD
tungsten-187	Ci	4.90E-4	<LLD	<LLD	<LLD
zinc-65	Ci	<LLD	<LLD	<LLD	<LLD
zirconium-95	Ci	1.53E-4	4.78E-4	6.69E-4	2.37E-4
zirconium-97	Ci	1.18E-4	<LLD	<LLD	2.78E-5
Total for period	Ci	1.37E-1	3.28E-2	5.44E-2	2.79E-2
2. Dissolved and entrained gases					
krypton-85	Ci	8.97E-3	8.79E-2	<LLD	<LLD
xenon-131m	Ci	1.09E-2	1.66E-2	<LLD	8.56E-4
xenon-133	Ci	4.12E-1	8.19E-1	1.01E-2	2.63E-2
xenon-133m	Ci	3.67E-3	5.35E-3	<LLD	1.78E-4
xenon-135	Ci	6.75E-4	2.84E-5	<LLD	<LLD
Total for period	Ci	4.36E-1	9.29E-1	1.01E-2	2.74E-2

LLD Lower Limit of Detection; see Table 2C.

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TABLE 2C

LIQUID EFFLUENTS-LOWER LIMIT OF DETECTION
CONTINUOUS MODE

Radionuclides	LLD (μCi/cc)
1. Fission and activation products	
barium-140	4.10E-7
cerium-141	6.70E-8
cerium-144	2.70E-7
cesium-134	1.10E-7
cesium-137	9.10E-8
chromium-51	4.70E-7
cobalt-58	9.70E-8
cobalt-60	1.40E-7
iodine-131	8.10E-8
iron-55	1.00E-6
iron-59	2.30E-7
lanthanum-140	7.50E-7
manganese-54	9.60E-8
molybdenum-99	8.80E-8
niobium-95	9.70E-8
strontium-89	5.00E-8
strontium-90	1.00E-8
technetium-99m	9.00E-8
zinc-65	2.40E-7
zirconium-95	1.70E-7
2. Dissolved and entrained gases	
xenon-133	3.00E-7
xenon-135	1.30E-7
3. gross alpha	1.00E-7

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TABLE 2C (Continued)

LIQUID EFFLUENTS-LOWER LIMIT OF DETECTION
BATCH MODE

Radionuclides	LLD (μCi/cc)
1. Fission and activation products	
antimony-122	9.80E-8
barium-140	3.20E-7
cerium-141	6.10E-8
cerium-144	2.70E-7
cesium-136	1.50E-7
cesium-138	5.90E-5
cobalt-57	3.50E-8
iodine-131	5.70E-8
iron-59	2.10E-7
lanthanum-140	1.70E-7
molybdenum-99	3.40E-8
niobium-97	9.40E-8
ruthenium-106	7.40E-7
strontium-89	5.00E-8
strontium-90	1.00E-8
strontium-92	5.00E-7
technetium-99m	3.40E-8
tellurium-132	3.90E-8
tin-113	7.50E-8
tin-117m	3.40E-8
tungsten-187	2.80E-7
zinc-65	2.40E-7
zirconium-97	1.10E-7
2. Dissolved and entrained gases	
krypton-85	4.30E-5
xenon-131m	4.50E-6
xenon-133m	9.90E-7
xenon-135	1.30E-7
3. gross alpha	1.00E-7

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TABLE 2D

LIQUID EFFLUENTS-RADIATION DOSES AT THE LIQUID SITE BOUNDARY

	Unit	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
A.					
1. Total body dose	mrem	1.54E-3	1.08E-3	7.51E-4	4.71E-4
2. Percent Applicable Limit	%	5.13E-2	3.61E-2	2.50E-2	1.57E-2
B.					
1. Limiting organ dose	mrem	1.64E-2	2.65E-3	3.67E-3	3.82E-3
2. Percent Applicable Limit	%	1.64E-1	2.65E-2	3.67E-2	3.82E-2
3. Limiting organ for period		GI-LLI	GI-LLI	GI-LLI	GI-LLI

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TABLE 2E

LIQUID EFFLUENTS-BATCH RELEASE SUMMARY

	12 month period
1. Number of batch releases:	105 releases
2. Total time period for batch releases:	25618 minutes
3. Maximum time period for a batch release:	1116 minutes
4. Average time period for a batch release:	244 minutes
5. Minimum time period for a batch release:	6 minutes
6. Average saltwater flow during batch releases:	740000 gpm

SECTION D. PREVIOUS RADIOACTIVE EFFLUENT RELEASE REPORT ADDENDUM

None.

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SECTION E. RADWASTE SHIPMENTS

TABLE 3

SOLID WASTE AND IRRADIATED FUEL SHIPMENT

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not Irradiated Fuel)

1. Type of waste		Unit	12 month period	Estimated total error (%)
a.	Spent resins, filter sludges, evaporator bottoms	m^3	N/A	
		Ci	N/A	N/A
b.	Dry compressible waste, contaminated equipment	m^3	N/A	
		Ci	N/A	N/A
c.	Irradiated components, control rods	m^3	N/A	
		Ci	N/A	N/A
d.	Other	m^3	N/A	
		Ci	N/A	N/A

N/A No shipment made.

2. Estimate of major nuclide composition (by type of waste)			
a.	not applicable	%	0.00E+0
b.	not applicable	%	0.00E+0
c.	not applicable	%	0.00E+0
d.	not applicable	%	0.00E+0

3. Solid Waste Disposition

See COMMON section of this report

B. IRRADIATED FUEL SHIPMENTS (Disposition)

See COMMON section of this report

SECTION F. APPLICABLE LIMITS

Gaseous Effluents - Applicable Limits

The percent of Applicable Limits, tabulated in Sections A.3, B.3, C.3, and D.3 of Table 1A, was calculated using the following equation:

- % Applicable Limit $= \dfrac{(\text{Rel Rate})\ (X/Q)\ (100)}{MPC_{eff}}$

  where:

  Rel Rate = total curies released in each category and each quarter, divided by the seconds in a quarter; the value in Sections A.2, B.2, C.2 and D.2 of Table 1A, μCi/sec.

  X/Q = 4.80E-6 sec/m^3; the annual average atmospheric dispersion defined in the Units 2&3 ODCM, Rev. 28.

- $MPC_{eff} = \dfrac{1}{\sum_{i=1}^{n} \dfrac{F_i}{MPC_i}}$

  where:

  F_i = fractional abundance of the i^{th} radionuclide obtained by dividing the activity (curies) for each radionuclide, C_i, by the sum of all the isotopic activity, C_T.

  n = total number of radionuclides identified

  MPC_i = Maximum Permissible Concentration (MPC) of the i^{th} radionuclide from 10 CFR 20 (20.1-20.602), Appendix B, Table II, Column 1.

- % ECL $= \dfrac{(\text{Rel Rate})\ (X/Q)\ (100)}{ECL_{eff}}$

  where:

  Rel Rate = total curies released in each category and each quarter, divided by the seconds in a quarter; the value in Sections A.2, B.2, C.2 and D.2 of Table 1A, μCi/sec.

  X/Q = 4.80E-6 sec/m^3; the annual average atmospheric dispersion defined in the Units 2&3 ODCM, Rev. 28.

- $ECL_{eff} = \dfrac{1}{\sum_{i=1}^{n} \dfrac{F_i}{ECL_i}}$

  where:

  F_i = fractional abundance of the i^{th} radionuclide obtained by dividing the activity (curies) for each radionuclide, C_i, by the sum of all the isotopic activity, C_T.

  n = total number of radionuclides identified

  ECL_i = Effluent Concentration Limit (ECL) of the i^{th} radionuclide from 10 CFR 20 (20.1001-20.2402), Appendix B, Table 2, Column 1.

Liquid Effluents - Applicable Limits

The percent of Applicable Limits, tabulated in Sections A.3, B.3, and C.3 of Table 2A, were calculated using the following equations:

- % Applicable Limit = $\frac{\text{(Dil Conc) (100)}}{MPC_{eff}}$

  where: Dil Conc = total curies released in each category and each quarter divided by the total volume released (sum of Sections E and F in Table 2A); the value in Sections A.2, B.2, and C.2 of Table 2A, μCi/ml.

- MPC_{eff} = $\frac{1}{\sum_{i=1}^{n} \frac{F_i}{MPC_i}}$

  where:
  - F_i = fractional abundance of the i^{th} radionuclide obtained by dividing the activity (curies) for each radionuclide, C_i, by the sum of all the isotopic activity, C_T.
  - n = total number of radionuclides identified
  - MPC_i = Maximum Permissible Concentration (MPC) of the i^{th} radionuclide from 10 CFR 20 (20.1-20.602), Appendix B, Table II, Column 2.

- % ECL = $\frac{\text{(Dil Conc) (100)}}{ECL_{eff}}$

  where:
  - Dil Conc = total curies released in each category and each quarter divided by the total volume released (sum of Sections E and F in Table 2A); the value in Sections A.2, B.2, and C.2 of Table 2A, μCi/ml.

- ECL_{eff} = $\frac{1}{\sum_{i=1}^{n} \frac{F_i}{ECL_i}}$

  where:
  - F_i = fractional abundance of the i^{th} radionuclide obtained by dividing the activity (curies) for each radionuclide, C_i, by the sum of all the isotopic activity, C_T.
  - n = total number of radionuclides identified
  - ECL_i = Effluent Concentration Limit (ECL) of the i^{th} radionuclide from 10 CFR 20 (20.1001-20.2402), Appendix B, Table 2, Column 2.

SECTION G. ESTIMATION OF ERROR

Estimations of the error in reported values of gaseous and liquid effluents releases have been made.

Sources of error for gaseous effluents - batch releases are:

(1) tank volumes
(2) sampling
(3) counting
(4) calibration

Sources of error for gaseous effluents - continuous releases are:

(1) fan flow rate
(2) sampling
(3) counting
(4) calibration
(5) differential pressure drop

Sources of error for liquid effluents - batch releases are:

(1) tank volumes
(2) sampling
(3) counting
(4) calibration

Sources of error for liquid effluents - continuous releases are:

(1) dilution flow rate
(2) sampling
(3) counting
(4) calibration

These sources of error are independent, and thus, the total error is calculated according to the following formula:

$$\text{Total Error} = \sqrt{\sigma_1^2 + \sigma_2^2 + \sigma_3^2 + \ldots \sigma_i^2}$$

where: σ_i = Error associated with each component.

SECTION H. 10 CFR 50 APPENDIX I REQUIREMENTS

Table 1 in Section H presents the quarterly and annual maximum dose to an individual. Six different categories are presented:

(1) Liquid Effluents - Whole Body
(2) Liquid Effluents - Organ
(3) Airborne Effluents - Tritium, Iodines and Particulates
(4) Noble Gases - Gamma
(5) Noble Gases - Beta
(6) Direct Radiation

The doses for categories 1 and 2 were calculated using the methodology of the ODCM, this data is also presented in Table 2D. Categories 3, 4, and 5 were calculated utilizing RRRGS (Radioactive Release Report Generating System) software, Regulatory Guide 1.109 methodology, and concurrent meteorology. Table 1E of gaseous effluents previously presented, however, lists data similar to categories 3, 4 and 5 using methods described in the ODCM and the historical meteorology (X/Q). Category 6 presents direct dose data measured by TLD dosimeters. Each portion of each category is footnoted to briefly describe each maximum individual dose presented.

For individuals who may, at times, be within the site boundary, the occupancy of the individual will be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the site boundary. For members of the public who traverse the site boundary via highway I-5, the residency time shall be considered negligible and hence the dose "0".

Table 2 in Section H presents the percent of Applicable Limits for each dose presented in Table 1.

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TABLE 1

	Dose * (millirems)				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
LIQUID EFFLUENTS	1)	2)	3)	4)	5)
Whole Body	1.54E-3	1.08E-3	7.51E-4	4.71E-4	3.85E-3
	6)	7)	8)	9)	10)
Organ	1.64E-2	2.65E-3	3.67E-3	3.82E-3	2.65E-2
AIRBORNE EFFLUENTS	11)	12)	13)	14)	15)
Tritium, Iodines, and Particulates	4.20E-2	1.42E-3	1.70E-2	4.75E-3	6.10E-2
NOBLE GASES **	16)	17)	18)	19)	20)
Gamma	1.16E-2	6.32E-3	1.27E-2	1.41E-2	4.48E-2
	21)	22)	23)	24)	25)
Beta	1.61E-2	1.71E-2	2.92E-2	2.08E-2	8.31E-2
	26)	27)	28)	29)	30)
DIRECT RADIATION	3.19E-1	3.67E-1	2.71E-1	3.00E-1	1.26E+0

* The numbered footnotes below briefly explain how each maximum dose was calculated, including the organ and the predominant pathway(s).

** Noble gas doses due to airborne effluent are in units of mrad, reflecting the air dose.

1. This data was calculated using the methodology of the ODCM.
2. This data was calculated using the methodology of the ODCM.
3. This data was calculated using the methodology of the ODCM.
4. This data was calculated using the methodology of the ODCM.
5. This data was calculated using the methodology of the ODCM.

6. This data was calculated using the methodology of the ODCM; the GI-LLI received the maximum dose primarily by the saltwater fish pathway.

7. This data was calculated using the methodology of the ODCM; the GI-LLI received the maximum dose primarily by the saltwater fish pathway.

8. This data was calculated using the methodology of the ODCM; the GI-LLI received the maximum dose primarily by the saltwater fish pathway.

9. This data was calculated using the methodology of the ODCM; the GI-LLI received the maximum dose primarily by the saltwater fish pathway.

10. This data was calculated using the methodology of the ODCM; the GI-LLI received the maximum dose primarily by the saltwater fish pathway.

11. The maximum organ dose was to a child's thyroid and was located in the ESE sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

12. The maximum organ dose was to a child's thyroid and was located in the NNW sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

13. The maximum organ dose was to a child's thyroid and was located in the ESE sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

14. The maximum organ dose was to a child's thyroid and was located in the NNW sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

15. The maximum organ dose was to a child's thyroid and was located in the ESE sector. This was calculated using the assumptions of USNRC Regulatory Guide 1.109.

16. The maximum air dose for gamma radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

17. The maximum air dose for gamma radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

18. The maximum air dose for gamma radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

19. The maximum air dose for gamma radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

20. The maximum air dose for gamma radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

21. The maximum air dose for beta radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

22. The maximum air dose for beta radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

23. The maximum air dose for beta radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

24. The maximum air dose for beta radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

25. The maximum air dose for beta radiation was located in the ENE sector, at the exclusion area boundary, and calculated using the assumptions of the USNRC Regulatory Guide 1.109.

26. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the WSW sector.

27. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the WSW sector.

28. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the WSW sector.

29. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the WSW sector.

30. Measurements were made using TLD dosimeters; values are presented as site wide dose and are prorated to 300 hours per year; highest dose was measured at the Site Boundary in the WSW sector.

TABLE 2

SOURCE	Percent Applicable Limit				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
LIQUID EFFLUENTS Whole Body	5.13E-2	3.61E-2	2.50E-2	1.57E-2	6.41E-2
Organ	1.64E-1	2.65E-2	3.67E-2	3.82E-2	1.32E-1
AIRBORNE EFFLUENTS Tritium, Iodines, and Particulates	2.80E-1	9.47E-3	1.13E-1	3.17E-2	2.03E-1
NOBLE GASES Gamma	1.16E-1	6.32E-2	1.27E-1	1.41E-1	2.24E-1
Beta	8.05E-2	8.55E-2	1.46E-1	1.04E-1	2.08E-1

NOTE: Direct Radiation is not specifically addressed in the Applicable Limits.

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SECTION I. CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

On December 21, 1995 Revision 28 to the Units 2/3 Offsite Dose Calculation Manual (ODCM) was adopted and published. In this revision, the changes included: 1) modified R_i tables due to the 1994 Land Use Census, 2) deleted CCWSL system from Table 1-1, 3) added the modesty garment laundry facility as a source to the blowdown processing system (BPS) sump, and 4) deleted reference to elevated releases in section 5.

The component cooling water salt line (CCWSL) was removed from Table 1-1. The CCWSL is a closed loop system and should not be considered a routine radioactive effluent release point. Accordingly, it is not a credited release point nor does it have a radiation monitor. A separate safety evaluation has been prepared to support this change.

The Unit 2/3 Laundry Facility was rerouted from the Unit 1 Sewage Treatment Plant to the Unit 2/3 BPS sump in 1995 under design change FCN F-10518 for Unit 2 and F-10520 for Unit 3. Even though an approved safety evaluation was issued for the construction, an additional safety evaluation to specifically address effluent issues has been generated for this change and was included as part of the change package.

Section 5.2, Land Use Census, reflects the generic plan for nuclear sites in NUREG 0472. Because the generic guidance concerning elevated release sites is not applicable to San Onofre, it was removed.

Per NRC Generic Letter 89-01, no safety review was required or performed for the correction of typographical errors.

The following is a complete list of the changes:

[a] Indicates typographical, sequential and page numbering, and format changes.

The 1994 Land Use Census revealed increased occupancy factors at the Highway Patrol Weigh Station (Southbound) in sector G from 1880 to 2080 hours. One location, Former Nixon Estates, was renamed Cotton Point Estates with Garden. Because of the addition of a garden at that location, the food and ground pathway R_i values for all age groups except infant were increased. Leafy green vegetables were discovered at the San Clemente Resident with Garden at 4.4 miles in sector Q. The "food and ground" R_i values from this location were used since the San Clemente Resident with Garden at 4.1 miles did not have leafy green vegetables.

[c] The outage resident was not present during 1994 and did not appear on the Land Use Census. Therefore, the page dedicated to them is removed.

[d] The Radiological Environmental Monitoring Program (REMP) added three TLDs: #73 was placed at the South Yard Facility. Two transit TLDs (A and B) were added to replace the previous single transit #99. Also added was a "fader" TLD co-located with TLD #54 to compensate for temperature variation. A new local crop sampling location was added, Cotton Point Estates (Casa Pacifica) in sector P.

[e] The installation and partial use of the new South Yard Facility (SYF) prompted several changes. Tables of R_i values were added for applicable sectors as defined in the Land Use Census. A table of Controlling Location Factors dedicated to the SYF was also added. Two flow charts were modified to show the effect of the SYF on various processes.

iv[b] Replaced the three figures with four different figures supplied in the Land Use Census.

v[e] Added Controlling Location Factors page as well as R_i tables for the South Yard Facility.

vi[a] Corrected typographical error on a page number.

1-2 Deleted CCWSL from Table 1-1.

1-3[a] Corrected a typographical error by adding the word "only" to make it consistent with NUREG 0472.

1-26 Revised calibration constants for certain liquid monitors.

2-3[a] Corrected a typographical error by adding the word "only" to make it consistent with NUREG 0472.

2-11[a] Corrected the format of the definitions of equation 2-1.

2-12 Added clarifying phrase "for a landward sector" to X/Q definition. This is an administrative change.

2-18 Removed the label for equation 2-7a to put it on page 2-19. This is an administrative change.

2-19 Added equation 2-7a to calculate concentration at the monitor for Unit 3.

2-20 Clarified references for each unit for the maximum permissible alarm setting. This is an administrative change.

2-22 Corrected typographical error on PVS fan flow rate.

2-25 Revised calibration constants for certain gaseous monitors.

2-27 Clarified definition of X/Q by adding the term "landward". This is an administrative change.

2-29 Clarified definition of X/Q by adding the term "landward". This is an administrative change.

2-30 Clarified definition of X/Q by adding the term "landward". This is an administrative change.

2-33 Removed definition of X/Q for tritium under W_k. This was repetitive as X/Q is described earlier in the definition.

2-37[b] Added the "hunter" portion to the "deer consumer/hunter" location. This is an administrative change only.

2-39[b] Changed the name of the former Nixon Estates to Cotton Point Estates with Garden. It is the same location. Because of the new garden at this location, the R_i values were also changed for child, teen and adult food and ground pathway.

2-40a[c] Removed this page of R_i values for the Outage Resident.

2-47[b] With the discovery of a leafy vegetable garden at the San Clemente Resident with Garden at 4.4 miles in sector Q, R_i values for that location was used rather than the residence at 4.1 miles in the same sector without a garden.

2-77[b] Highway Patrol Weigh Station in sector G occupancy changed from 1880 to 2080 hours per year. This resulted in revised R_i values.

2-82 Revised explanation of direct dose calculation to better explain methodology.

2-83[e] Added listing of Control Location Factors for the South Yard Facility.

2-84[e] to 2-93 Added tables of R_i values for several locations due to the use of the South Yard Facility.

4-16[e] Modified Figure 4-5 to add the Laundry Facility flow path and remove CCWSL sampling.

4-17[e] Modified Figure 4-6 to add the South Yard Facility (SYF) flow path.

4-18 Modified Figure 4-7 to more accurately reflect the solid waste handling activities.

5-8	Added note indicating tritium sample limits of 2000 pCi/ml are for drinking water only. Also modified the title to reflect NUREG 0472.
5-11	Deleted sentence describing "elevated releases." Elevated releases are not performed at SONGS.
5-15[a]	Removed the "deleted" notations of locations previously deleted from Table 5-4. Added note listing all previously deleted and removed locations.
5-16[a]	Removed the "deleted" notations of locations previously deleted from Table 5-4. Added note listing all previously deleted and removed locations.
5-17[d]	Removed the "deleted" notations of locations previously deleted from Table 5-4. Added location #73, South Yard Facility, per Land Use Census. Also added two transit location TLDs and a temperature "fader" correction TLD placed alongside #54. Added note listing all previously deleted and removed locations.
5-18	Removed the "deleted" notation of airborne location #6.
5-19[d]	Added Cotton Point Estates Gardens (Casa Pacifica) to the Local Crops listing in the WNW direction.
5-23[b] to 5-26	Replaced existing three figures with new versions supplied in Land Use Census. Added a page to account for new fourth page. The same information is contained in the new figures.

SECTION J. CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS

Mixed Waste is defined as a chemical waste/material that is hazardous, as defined by the EPA criteria in 40 CFR and by California in 22 CCR, and is also radiologically contaminated with licensed radioactive material per 10 CFR. San Onofre Nuclear Generating Station (SONGS) generates approximately 4,000 to 5,000 gallons/year of mixed waste, primarily lubricating oil, that includes paints, solvents, caustics, acids, resins, and freon contaminated with radioactive material. Most mixed waste cannot be shipped to either low level radioactive waste or hazardous waste disposal facilities. Furthermore, the Resource Conservation and Recovery Act (RCRA) prohibits storage on site indefinitely.

DCP 7022-00SC-ASC-1, South Yard Facility (SYF), has installed a permanent mixed waste processing (MWP) unit in a dedicated room in the SYF building to treat contaminated oil only. This batch process involves two major steps: 1) separation of the aqueous phase from the organic phase (oil), and 2) purification of the organic phase. Purification is accomplished by chelating the radioactive constituents and removing particulates by filtration. Chemicals and heat (<160 °F) may be added to facilitate cleanup.

Design Calculation N-0302-007, Revision 1, Airborne Source Term for SYF and Outdoor Activities, has concluded that with the contaminated oil liquid activity concentration at or below 4.1E-2 μCi/ml, processing of one 110 gallon batch of Mixed Waste per second, each and every second during an entire year (i.e., 3.47E+9 gallons/year), will not result in exceeding 1 Effluent Concentration Limit (ECL) offsite airborne activity concentration limit.

Station Procedure SO123-IX-2.209.1, Rev. 0, Mixed Waste Processing, issued July 7, 1995, addresses the use of the MWP unit at the SYF. The safety evaluation for using the MWP unit follows:

Evaluation of Using the MWP Unit

To stay well within the DCP Design Calculation parameters, SO123-IX-2.209.1 does not allow the processing of any mixed waste that contains noble gases, tritium, or radioiodine. Furthermore, any tritium that might be present in trace quantities would likely stay associated with the aqueous phase and would be returned to plant systems for discharge through a credited radioactive liquid release point as required by site procedures. The total specific activity concentration is limited to 1.0E-4 μCi/ml, two orders of magnitude below the DCP limit. The total inventory in the MWP unit is limited to 110 gallons. The expected amount of contaminated oil processed per year is between 4000 to 5000 gallons, well below the 3.47E+9 gallons/year postulated in the Design Calculation. These administrative controls will ensure that there are minimal dose consequences to the public. In addition, station procedures require continuous sampling of the building exhaust for particulates and iodines.

Any liquid waste generated during the process will be recovered from the bottom of the system reservoir and disposed of in accordance with existing station procedures. Spill control measures for the entire SYF will ensure that there is no inadvertent release of liquid radioactive material to the environment.

Based on the administrative controls, there is no unreviewed safety question nor will there be any significant impact to the health and safety of a member of the public.

50.59 SAFETY EVALUATION

1. **May the proposed activity increase the probability of occurrence of an accident evaluated previously in the safety analysis report?**

No. The MWP unit is located in the South Yard Facility Radiological Work Area Zone and does not have direct impact on the potential accident scenarios considered in Chapter 15 of the UFSAR. The probability of a LOCA, SGTR, or fuel handling accident is in no way enhanced by the processing of small volumes of used oil. In particular, given that no fluids containing noble gases or iodines are allowed per procedure to be processed with the MWP unit, there will be no release of these constituents to atmosphere. As such, "Radioactive Waste Gas System Leak or Failure" 15.7.3.1 and 15.7.3.2, "Radioactive Waste System Leak or Failure (Release to Atmosphere) are not applicable.

The only scenario considered in Chapter 15 of the UFSAR that could remotely apply with respect to liquid waste is 15.7.3.3, "Postulated Radioactive Releases Due to Liquid Tank Failures." The MWP unit is a closed system located away from existing plant systems, with spill protection, fire protection, and airborne effluent sampling capabilities designed for the South Yard Facility Radiological Work Area. This activity cannot affect the rupture of liquid tanks inside containment, inside the auxiliary building, or outside tanks like the refueling water storage tanks or condensate storage tanks. Therefore, this modification does not increase the probability of occurrence of an accident evaluated previously in the safety analysis report.

2. **May the proposed activity increase the consequences of an accident evaluated previously in the safety analysis report?**

No. Only one scenario analyzed in the UFSAR could be considered pertinent to the proposed processing of contaminated oil at the South Yard -- the "Postulated Radioactive Releases Due to Liquid Tank Failures" in section 15.7.3.3 of the UFSAR. Given that the building in which it is housed (the SYF) will have its own spill prevention program and design features, any spillage of liquids or rupture of the system will be contained. Subsequently, the building sump will be pumped out and material returned to containers or disposed of via existing plant systems and procedures. Performing the activities described in SO123-IX-2.209.1 are bounded by the existing analysis in the UFSAR. Therefore, this modification does not increase the consequences of an accident evaluated previously in the safety analysis report.

3. **May the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety evaluated previously in the safety analysis report?**

No. The MWP unit is permanently installed as a stand-alone system with no direct interface with any equipment or system important to safety. This modification does not increase the probability of occurrence of a malfunction of equipment important to safety as evaluated previously in the safety analysis report.

4. **May the proposed activity increase the consequence of a malfunction of equipment important to safety evaluated previously in the safety analysis report?**

No. The equipment used for this process does not directly interface with other equipment important to safety. Further, provisions have been made to ensure that all releases of radioactive waste products are performed in accordance with the existing station procedures. There will be minimal dose consequences to a member of the public. This modification does not increase the consequence of a malfunction of equipment important to safety evaluated previously in the safety analysis report.

5. **May the proposed activity create the possibility of an accident of a different type than any evaluated previously in the safety analysis report?**

No. The area of the SYF designated for use by the MWP is bermed to contain the full volume of 110 gallons should the system rupture. The procedure does not allow wastes with a specific activity greater than 1E-4 μCi/ml to be processed, limiting the maximum total activity contained in the system to 40 μCi. By comparison, existing radioactive effluent specifications restrict the total curie content of an outdoor liquid waste tank which does not have secondary containment to less than 10 Ci, excluding tritium and dissolved or entrained noble gases, in accordance with NUREG-0133. The 10 Ci limit ensures that concentrations in the unrestricted area resulting from the uncontrolled release of the tank's contents are less than the limits of 10 CFR Part 20, Appendix B, Table II, Column 2. The proposed activity is therefore bounded by "Postulated Releases Due to Liquid Tank Failures" considered in section 15.7.3.3 of the Units 2/3 UFSAR and well below the limits imposed by TS 3/4.11.1.4, "Liquid Holdup Tanks".

Fire extinguishers/halon will be located adjacent to the MWP unit, enabling personnel to take immediate action should a fire occur during operation of the unit. Given that oil typically used at SONGS must be raised to a temperature above 350 °F to sustain combustion and that a fire suppression system is part of the SYF, there is a very low probability that a fire would consume the MWP unit or its contents. In the unlikely event of a design basis fire noted in Design Calculation N-0320-007, in which 110 gallons of contaminated oil at 4.1E-2 μCi/ml is burnt for a 30 minute duration, once each and every month, the offsite activity concentration limit will not exceed 50 ECL, well below 10 CFR 100 limits for a design basis emergency event.

Therefore, this modification does not create the possibility of an accident of a different type than any evaluated previously in the safety analysis report.

6. **May the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any evaluated previously in the safety analysis report?**

No. The MWP unit will be located in the South Yard Radiological Work Area Zone and will not interface with any equipment important to safety. Therefore, this modification does not create the possibility of a malfunction of equipment important to safety of a different type than any evaluated previously in the safety analysis report.

7. **Does the proposed activity reduce the margin of safety as defined in the basis for any Technical Specification?**

No. Normal operation of the MWP does not reduce the margin of safety as defined in the basis for any Technical or Licensing Specification. In the event of a design basis fire, releases of airborne effluent will be less than 50 ECLs, well within the limits of 10 CFR 100. Therefore this modification does not reduce the margin of safety as defined in any licensing specification.

Based on the responses to the above questions, adding the Mixed Waste Processing Unit to the South Yard Facility will not result in any adverse impact to the health and safety of the public.

SECTION K. MISCELLANEOUS

- Uncontrolled Release from Unit 2 Containment Purge

Permit #: 5G-0120-2

From 10/16/95, 0845 to 10/17/95, 1528, a Unit 2 routine containment purge was conducted with a non-conservative effluent monitor setpoint contrary to the requirements in Sections 2.1.1 and 2.6.3 of the Offsite Dose Calculation Manual. Review of the monitor strip chart indication for the purge period indicated that the actual purge was well within all dose limits at the site boundary. Total activity released to the atmosphere was conservatively estimated at 5.76E-1 curies. Dose consequences were minimal and were conservatively estimated at 6.29E-4 mrem gamma dose, and 2.26E-4 mrem beta dose. A Chemistry Division Investigation Report (CDIR 95-009) was written to document this event and to capture corrective actions.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

S.O.N.G.S. 2 and 3

EFFLUENT RADIATION MONITORS OUT OF SERVICE GREATER THAN 30 DAYS

January 1, 1995 - December 31, 1995

S.O.N.G.S. 2			
Monitor	Inoperability Period	Inoperability Cause	Explanation
2RT-6753 2RT-6759 Steam Generator Blowdown Monitor	12/20/94 - 05/23/95 12/20/94 - 05/21/95	Monitors removed from service	Turbine Lab redesign resulted in this monitor being inoperable during construction.
2RT-7817 BPS/FFCPD Discharge Monitor	01/02/95 - 02/03/95	Design change installation	Design installed new sample flow switch to ensure adequate sample flow monitoring.
	03/31/95 - 07/14/95	Faulty monitor alarm	Repairs prompted a design change which corrected wiring problems in the monitor.
2RT-7821 Turbine Plant Sump Monitor	01/01/95 - 02/08/95	Detector failed, new design installation	Repaired detector damage and installed new design of sample flow switch.
	02/21/95 - 06/18/95	Process flow monitor malfunction	System cleaned due to fouling from oil and sump debris. Testing conducted to determine optimum flow switch protection.
	10/19/95 - 11/22/95	False sample flow alarms	Sample flow switch required repairs and calibration.
2RT-7818B Condenser Air Ejector High Range Monitor	02/17/95 - 04/08/95	No steam flow	No steam generator pressure or steam flow due to Unit being in a refueling outage.
2RT-7828 Containment Purge Process Flow Monitor	02/03/94 - 09/20/95	Process flow indication	Radiation monitor functions remained operable during this period. New process flow probes installed.
2RT-7865 Plant Vent Stack Process Flow Monitor	04/22/92 - 02/08/96	Process flow indication	To be corrected during obsolete component design change. Radiation monitor functions operable. New flow probes installed and operable in February 1996.
2RT-7870 Condenser Air Ejector	02/17/95 - 04/08/95	No steam flow	No steam generator pressure or steam flow due to Unit being in a refueling outage.
Process Flow Monitor	05/03/95 - 06/06/95	Failed process flow reading	The process flow meter failed requiring new flow probes to be installed.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

S.O.N.G.S. 2 and 3

EFFLUENT RADIATION MONITORS OUT OF SERVICE GREATER THAN 30 DAYS

January 1, 1995 - December 31, 1995

S.O.N.G.S. 3			
Monitor	Inoperability Period	Inoperability Cause	Explanation
3RT-6753/ 3RT-6759 Steam Generator Blowdown Monitor	01/18/95 - 04/04/95	Monitors removed from service	Turbine Lab re-design resulted in these monitors being inoperable during construction.
	07/23/95 - 09/20/95	No sample flow	No steam generator pressure or steam flow due to Unit being in a refueling outage.
3RT-7817 BPS/FFCPD Discharge Monitor	09/19/94 - 02/08/95	Inaccurate sensing of sample flow	Inoperable due to sticking flow switch. Design change installed improved design.
	10/09/95 - 12/31/95	Design change installation	Design change installed that rewired the monitor panel.
3RT-7821 Turbine Plant Sump Monitor	10/08/94 - 11/15/95	Inaccurate sensing of sample flow and leaking isolation valve	New flow switch sticking caused monitor inoperability. Monitor also declared inoperable due to downstream isolation valve leakage. System cleaned and sample line replaced due to fouling from oil and sump debris. Testing conducted to determine optimum flow switch protection.
3RT-7818B Condenser Air Ejector High Range Monitor	01/25/88 - 01/11/95	Detector design deficiency	Design flaw caused channel B to be inoperable. Monitor skid design changes corrected problem.
3RT-7828 Containment Purge Process Flow Monitor	08/07/95 - 09/23/95	Improper reading during purges	Gas channel experienced erratic spiking with purge in progress. Required electrical rework.
	02/03/94 - 12/21/95	Process flow indication	Radiation monitor functions remained operable during this period. New process flow probes installed.
3RT-7865 Plant Vent Stack Process Flow Monitor	08/02/91 - 02/08/96	Process flow indication	To be corrected during obsolete component design change. Radiation monitor functions were operable during this period. New design flow probes installed and operable in February 1996.
3RT-7870 Condenser Air Ejector Process Flow Monitor	07/22/95 - 09/10/95	No steam flow	No steam generator pressure or steam flow due to Unit being in a refueling outage
	04/28/95 - 07/06/95	Process flow indication	Required flow probes to be changed out. Due to faulty replacement parts, process had to be repeated.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

S.O.N.G.S. 2 and 3

SECTION L. S O.N.G.S. 2 and 3 CONCLUSIONS

- Gaseous releases totaled 7.36E+2 curies of which noble gases were 6.96E+2 curies, iodines were 6.17E-2 curies, particulates were 1.36E-3 curies, and tritium was 3.96E+1 curies.

- The radiation doses from gaseous releases are: (a) gamma air dose: 4.48E-2 mrad at the site boundary, (b) beta air dose: 8.31E-2 mrad at the site boundary, (c) organ dose: 6.10E-2 mrem at the nearest receptor.

- Liquid releases totaled 9.72E+2 curies of which particulates and iodines were 2.58E-1 curies, tritium was 9.70E+2 curies, and noble gases were 1.40E+0 curies.

- The radiation doses from liquid releases are: (a) total body: 3.85E-3 mrem, (b) limiting organ: 2.65E-2 mrem.

- The radioactive releases and resulting doses generated from Units 2 and 3 were below the Applicable Limits for both gaseous and liquid effluents.

COMMON

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1995)

COMMON

COMMON RADWASTE SHIPMENTS

TABLE 3

SOLID WASTE AND IRRADIATED FUEL SHIPMENT

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not Irradiated Fuel)

1. Type of waste		Unit	12 month period	Estimated total error (%)
a.	Spent resins, filter sludges, evaporator bottoms	m^3	N/A	N/A
		Ci	N/A	
b.	Dry active waste (DAW), compactable and non-compactable (*,#)	m^3	1.00E+1	3.00E+1
		Ci	8.78E+0	
c.	Irradiated components, control rods	m^3	N/A	N/A
		Ci	N/A	
d.	Other (filters) (*)	m^3	9.00E-1	3.00E+1
		Ci	2.11E+1	

NOTE: Total curie content estimated.

* Material packaged into High Integrity Containers and shipped in a Type A Cask (C of C 9176).

\# Material packaged in strong, tight containers of various sizes.

N/A No shipment made.

TABLE 3 (Continued)

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not Irradiated fuel)

2. Estimate of major nuclide composition (by type of waste)		
a. Not Applicable	%	0.00E+0
b. americium-241	%	1.29E-3
antimony-125	%	1.57E+0
carbon-14	%	1.29E+0
cerium-144	%	1.06E-1
cesium-134	%	2.29E+0
cesium-137	%	1.96E+1
cobalt-58	%	6.55E+0
cobalt-60	%	1.60E+1
curium-242	%	8.47E-1
curium-243/244	%	2.20E-3
iodine-129	%	7.14E-3
iodine-131	%	2.44E-4
iron-55	%	3.85E+1
krypton-85	%	2.08E+0
manganese-54	%	2.68E+0
nickel-59	%	8.31E-2
nickel-63	%	7.20E+0
niobium-94	%	9.00E-1
plutonium-238	%	1.02E-3
plutonium-239/240	%	9.14E-4
plutonium-241	%	9.50E-2
strontium-90	%	2.16E-2
technetium-99	%	7.99E-4
tritium	%	1.57E-1
uranium-238	%	3.52E-5

TABLE 3 (Continued)

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not Irradiated fuel)

2. Estimate of major nuclide composition (by type of waste)		
c. Not Applicable	%	0.00E+0
d. americium-241	%	1.96E-2
carbon-14	%	2.52E+0
cesium-137	%	1.25E+0
cobalt-60	%	2.58E+1
curium-242	%	1.35E-2
curium-243/244	%	2.80E-2
iodine-129	%	7.29E-5
iron-55	%	5.54E+1
nickel-63	%	1.40E+1
niobium-94	%	2.21E-5
plutonium-238	%	2.07E-2
plutonium-239/240	%	6.63E-3
plutonium-241	%	8.10E-1
strontium-90	%	1.98E-2
technetium-99	%	1.66E-4
tritium	%	5.59E-2

TABLE 3 (Continued)

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not Irradiated fuel)

3. Solid Waste Disposition (S.O.N.G.S. 1, 2, and 3)		
Number of Shipments	Mode of Transportation	Destination
1 *	Kindrick Trucking Company Truck/Type A Cask	Barnwell, SC
20 #	Hitman Transport Truck/Trailer	Barnwell, SC

* All waste packaged at SONGS is staged at one location. There are no independent shipments of dry active waste made for Unit 1 or Units 2&3, and are not reported separately.

\# SONGS maintains contracts with vendor (SEG) that provides volume reduction services. These shipments were made from their processing facility. The 20 shipments made from this facility included waste from other generators. Edison's waste volume was a small fraction of the total waste volume of these shipments.

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
None	No shipments were made	N/A

C. DEWATERING

Number of Containers	Solidification Agent
None	N/A

TABLE 3 (Continued)

D. CHANGES TO THE PROCESS CONTROL PROGRAM AT SAN ONOFRE UNITS 1, 2 & 3

During the reporting period January 1, 1995 through December 31, 1995, a change to the Units 1, 2 & 3 Process Control Program via procedure SO123-VII-8.5.1 was approved and implemented on February 1, 1995. Please find the attached explanation of the changes and the justification for making the changes.

REFERENCES:

1) Unit 1 Technical Specifications, section D6.13.2.

2) Units 2 and 3 Technical Specifications, section 6.13.2.

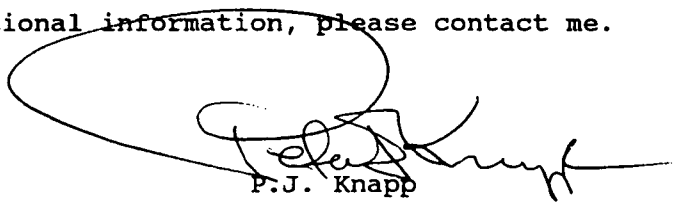
December 23, 1994

R.W. KRIEGER
R.W. WALDO
W.C. MARSH
R.J. LEE

SUBJECT: Notification of a TCN to SO123-VII-8.5.1, Process Control Program for San Onofre Units 1, 2, and 3.

In accordance with technical specifications 6.5.2.9, 6.5.2.10 and 6.13.2 of Unit 2 and 3 and the Unit 1 Permanently Defueled technical specifications D 6.5.2.9., D 6.5.2.10, and D 6.13.2, a change to the Process Control Program, via a TCN to procedure SO123-VII-8.5.1, has been approved for implementation. Please find attached a description of the approved change, and a discussion of the rationale for making that change.

If you require any additional information, please contact me.



P.J. Knapp

PJK9412.09
cc: P. Chang
S. Enright

TABLE 3 (Continued)

D. CHANGES TO THE PROCESS CONTROL PROGRAM AT SAN ONOFRE UNITS 1, 2 & 3 (Continued)

MEMORANDUM FOR FILE

December 23, 1994

SUBJECT: Notification of Change to the Process Control Program for San Onofre Unit 1, 2, and 3.

Health Physics has initiated changes to the Process Control Program via procedure SO123-VII-8.5.1. The following provides an explanation of the TCN and justification for the changes.

Description of Change(s): A TCN was initiated to correct reference numbers provided in the objectives section of the procedure. References 2.2.2 and 2.2.3 reflect new procedure title changes following revisions as described in previous Memorandum for File dated April 21, 1993. Reference 2.3.3 was changed to U.S. Ecology, Inc. Ward Valley, California State Disposal Site Licenses and Site Criteria in place of Washington State Disposal Site Licenses and Site Criteria. Reference 2.1.2 of the NRC Commitments section has been changed to reflect the Unit 1 Permanently Defueled Technical Specification numbering system whereby the technical specification number 6.13 is preceded by the letter "D". This change was also made throughout the entire procedure where reference to Unit 1 technical specification numbers are listed. The word semiannual has been changed to annual throughout the entire procedure. Section 7.2.1 has been changed. Report information from .1 thru .7 has changed to include more detailed information for entering data in reports made annually to the Nuclear Regulatory Commission. Developmental Resources 2.4.5 State of Nevada license to U.S. Ecology, No 13-11-0043-02, with amendments, 2.4.6 State of Washington license to U.S. Ecology, No. WN-1019-2, with amendments, 2.4.7 Handford Special Nuclear Material License issued to U.S. Ecology, License No. 16-19204-01 and 2.4.9 State of South Carolina, Permit for Transportation of Radioactive Waste into or within South Carolina, No. 0281-04-94-X have been deleted.

Rational for Change: Title changes to References 2.2.2 and 2.2.3 are a result of the revisions to 10 CFR Part 20, Standards for the Protection Against Radiation which necessitated a revision to the ALARA program. The Unit 1 Permanently Defueled Technical Specification has changed the section numbering by preceeding each section number with the letter "D". Changes to .1 thru .7 of section 7.2.1 and the additional information required was included so that the annual effluent report information listed in SO123-VII-8.5.1 would be consistant with the information listed in section 6.4.2 of procedure SO123-VII-8.1.6. This information is required when preparing annual reports to the Nuclear Regulatory Commission. Southern California Edison no longer ships radioactive waste to Handford, Washington, Beatty, Nevada or Barnwell, South Carolina burial sites. Reference change 2.3.3 and the deletion of Developmental Resources 2.4.5, 2.4.6 and 2.4.7 reflect the changes. The Effluents report is due annually.

Justification That the Change Does Not Reduce Conformance of the Solidified Waste to Existing Criteria: The changes described above are for editorial clarification, and do not affect conformance of the process Control Program for San Onofre Units 1, 2, and 3.

APPROVED BY: _____
Health Physics Manager

COMMON

COMMON 40 CFR 190 REQUIREMENTS

Table 1 below presents the annual site-wide doses and percent of ODCM Specification limits to members of the public. These values are calculated utilizing doses resulting from all effluent pathways and direct radiation. The different categories presented are: (1) Total Body, (2) Limiting Organ, and (3) Thyroid.

Dose Category	Units	Year
1. Total Body		
a. Total Body Dose	mrem	1.67E+0
b. Percent ODCM Specification Limit	%	6.69E+0
2. Limiting Organ		
a. Organ Dose (GI-LLI)	mrem	5.16E-1
b. Percent ODCM Specification Limit	%	2.06E+0
3. Thyroid		
a. Thyroid Dose	mrem	2.51E-2
b. Percent ODCM Specification Limit	%	3.35E-2

In addition to the dose calculated in the table above, there is the potential for incremental exposure to the public through disposal of certain solid materials at a facility outside the sphere of influence of airborne and liquid pathways. For example, Southern California Edison collects marine debris on the screens of the circulating water system and gathers dirt and sweepings during housekeeping activities. From time to time, extremely low levels of radioactivity have been detected in these wastes, placing their disposal outside NRC jurisdiction as described in 10 CFR 61. The Department of Health Services for the State of California has evaluated the potential impact to the public attributable to disposing of these materials at a municipal facility and concluded that the maximum exposure to individuals living or working at the facility is an acceptably small fraction of the designated safe limits.

COMMON CONCLUSIONS

- Gaseous releases from S.O.N.G.S. 1, 2 and 3 totaled 7.39E+2 curies of which noble gases were 6.96E+2 curies, iodines were 6.17E-2 curies, particulates were 1.36E-3 curies, and tritium was 4.28E+1 curies.

- Liquid releases from S.O.N.G.S. 1, 2 and 3 totaled 9.81E+2 curies of which particulates and iodines were 3.28E-1 curies, tritium was 9.79E+2 curies, and noble gases were 1.40E+0 curies.

- Radioactive releases and resulting doses generated from S.O.N.G.S. 1, 2 and 3 were below the Applicable Limits for both gaseous and liquid effluents.

- S.O.N.G.S. 1, 2 and 3 made 21 radwaste shipments to Barnwell, SC. Total volume was 1.09E+1 cubic meters containing 2.99E+1 curies of radioactivity.

- Meteorological conditions during the year were typical for S.O.N.G.S. Meteorological dispersion was good 32% of the time, fair 48% of the time and poor 20% of the time.

- The net result from the analysis of these effluent releases indicates that the operation of S.O.N.G.S. 1, 2 and 3 has met all the requirements of the applicable regulations and therefore has not resulted in any detrimental effects on the environment.

COMMON

APPENDIX A

GASEOUS EFFLUENTS - APPLICABLE LIMITS

A. Table 1A lists the total curies released and the release rate. The percent of applicable limit compares the released concentrations to the concentration limits of 10 CFR 20, Appendix B, Table II, Column 1.

B. Table 1E lists the air doses as calculated using the historical X/Q. The air dose due to noble gases released in gaseous effluents from S.O.N.G.S. (per reactor) to areas at and beyond the site boundary shall be limited to the following values:

1. During any calendar quarter: ≤ 5 mrad for gamma radiation and
   ≤ 10 mrad for beta radiation.

2. During any calendar year: ≤ 10 mrad for gamma radiation and
   ≤ 20 mrad for beta radiation.

C. The dose to a Member of the Public from iodines, tritium, and all radionuclides in particulate form with half-lives greater than eight days in gaseous effluents released from S.O.N.G.S. (per reactor) to areas at and beyond the site boundary shall be limited to the following values:

1. During any calendar quarter: ≤ 7.5 mrem to any organ.

2. During any calendar year: ≤ 15 mrem to any organ.

APPENDIX A (Continued)

LIQUID EFFLUENTS - APPLICABLE LIMITS

A. Table 2A lists the total curies released, the diluted concentration, and percent of the applicable limit. The percent of applicable limit compares the diluted concentration of radioactive material released to the concentrations specified in 10 CFR 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration is limited to 2.00E-4 μCi/ml.

B. Table 2D lists doses due to liquid releases. The dose commitment to a Member of the Public from radioactive materials in liquid effluents released from S.O.N.G.S. (per reactor) to unrestricted areas shall be limited to the following values:

1. During any calendar quarter: $\leq$ 1.5 mrem to the total body and
   $\leq$ 5 mrem to any organ.

2. During any calendar year: $\leq$ 3 mrem to the total body and
   $\leq$ 10 mrem to any organ.

METEOROLOGY

METEOROLOGY

The meteorology of the San Onofre Nuclear Generating Station for each of the four quarters, 1995 is described in this section. Meteorological measurements have been made according to the guidance provided in USNRC Regulatory Guide 1.23, "Onsite Meteorological Programs." A summary report of the meteorological measurements taken during each calendar quarter are presented in Table 4A as joint frequency distribution (JFD) of wind direction and wind speed by atmospheric stability class.

Hourly meteorological data for batch releases have been recorded for the periods of actual release. This data is available, as well as the hourly data for the Annual Report, but has not been included in this report because of the bulk of data records.

Table 4A lists the joint frequency distribution for each quarter, 1995. Each page of Table 4A represents the data for the individual stability classes: A, B, C, D, E, F, and G. The last page of each section is the JFD for all the stability classes. The wind speeds have been measured at the 10-meter level, and the stability classes are defined by the temperature differential between the 10-meter and 40-meter levels.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

January - March

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 94123124-95033123
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL A
EXTREMELY UNSTABLE (DT/DZ < -1.9 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	1	0	0	0	0	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0
ENE	0	0	0	1	0	0	1	0	0	0	0	0	2
E	0	2	0	0	0	0	0	0	0	0	0	0	2
ESE	0	1	0	0	0	0	0	0	1	0	0	0	2
SE	0	0	0	0	1	0	2	1	0	0	0	0	4
SSE	0	1	1	0	1	3	5	1	0	0	0	0	12
S	0	0	0	3	0	7	5	1	0	0	0	0	16
SSW	0	0	0	1	0	1	2	0	0	0	0	0	4
SW	0	0	0	4	5	11	5	0	0	0	0	0	25
WSW	0	1	0	0	8	16	16	2	0	0	0	0	43
W	0	0	0	0	6	27	51	4	2	0	0	0	90
WNW	0	0	1	0	0	8	24	5	2	0	0	0	40
NW	0	0	0	0	0	0	0	2	0	0	0	0	2
NNW	0	0	1	1	1	0	1	0	0	0	0	0	4
TOTALS	0	5	4	10	22	73	112	16	5	0	0	0	247

NUMBER OF VALID HOURS 247
NUMBER OF INVALID HOURS 22
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2160

PASQUILL B
MODERATELY UNSTABLE (-1.9 < DT/DZ ≤ -1.7 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	0	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	0	0	0	0	1	0	1	0	0	0	0	0	2
ENE	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	1	0	0	0	0	0	1
SE	0	0	0	0	0	0	2	0	0	1	0	0	3
SSE	0	0	0	0	1	2	3	0	0	0	0	0	6
S	0	0	0	0	0	0	1	1	0	0	0	0	2
SSW	0	0	0	0	2	1	2	0	0	0	0	0	5
SW	0	0	0	0	0	3	2	0	0	0	1	0	6
WSW	0	0	0	0	1	3	1	0	0	0	0	0	5
W	0	0	0	0	2	5	1	0	0	0	0	0	8
WNW	0	0	0	0	0	1	5	0	0	0	0	0	6
NW	0	0	0	0	0	0	0	0	0	0	0	0	0
NNW	0	0	0	1	0	0	0	0	0	0	0	0	1
TOTALS	0	0	0	1	7	15	19	1	0	1	1	0	45

NUMBER OF VALID HOURS 45
NUMBER OF INVALID HOURS 22
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2160

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

January - March

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 94123124-95033123
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL C
SLIGHTLY UNSTABLE (-1.7 < DT/DZ ≤ -1.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	0	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	0	0	0	0	0	0	1
E	0	0	0	0	0	0	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0	0	0	0	0	0	0
SE	0	0	0	0	0	1	1	1	0	0	0	0	3
SSE	0	0	0	0	1	2	4	0	0	0	0	0	7
S	0	0	0	1	2	4	5	3	0	0	0	0	15
SSW	0	1	0	1	3	2	0	0	0	0	0	0	7
SW	0	0	0	3	1	1	1	1	0	0	0	0	7
WSW	0	0	0	2	6	1	2	0	0	0	0	0	11
W	0	0	0	0	4	3	6	0	0	0	0	0	13
WNW	0	0	0	0	0	8	5	1	1	0	0	0	15
NW	0	0	0	0	0	1	1	0	0	0	0	0	2
NNW	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	2	0	7	17	23	25	6	1	0	0	0	81

NUMBER OF VALID HOURS 81
NUMBER OF INVALID HOURS 22
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2160

PASQUILL D
NEUTRAL (-1.5 < DT/DZ ≤ -0.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	4	4	6	7	4	0	0	0	0	0	25
NNE	0	0	2	7	16	22	7	1	1	0	0	0	56
NE	0	0	1	6	2	6	1	0	0	0	0	0	16
ENE	0	0	1	3	0	0	1	0	0	0	0	0	5
E	1	0	0	0	2	4	1	0	0	0	0	0	8
ESE	0	0	1	1	5	8	8	5	6	0	0	0	34
SE	0	1	0	4	2	18	48	49	36	5	0	0	163
SSE	0	0	1	4	10	19	24	20	6	4	1	2	91
S	0	0	1	5	6	23	18	25	14	5	3	1	101
SSW	0	1	1	6	4	12	16	10	4	0	1	0	55
SW	0	0	2	7	8	13	12	8	13	2	0	0	65
WSW	0	0	1	5	5	14	3	8	1	0	0	0	37
W	0	1	0	4	5	10	14	5	10	0	0	0	49
WNW	0	0	0	4	1	17	20	7	11	0	0	0	60
NW	0	0	2	2	3	8	16	3	4	0	0	0	38
NNW	0	0	0	3	3	11	4	2	0	0	0	0	23
TOTALS	1	3	17	65	78	192	197	143	106	16	5	3	826

NUMBER OF VALID HOURS 826
NUMBER OF INVALID HOURS 22
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2160

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

January - March

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 94123124-95033123
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL E
SLIGHTLY STABLE (-0.5 < DT/DZ ≤ -1.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	2	1	8	7	12	5	0	0	0	0	0	35
NNE	1	1	3	16	23	34	19	0	0	0	0	0	97
NE	2	0	2	4	6	4	1	1	0	0	0	0	20
ENE	0	1	2	3	3	1	1	0	0	0	0	0	11
E	0	0	2	3	2	8	4	1	5	0	0	0	25
ESE	0	0	0	2	2	3	0	0	1	0	0	0	8
SE	0	0	2	3	5	10	12	6	5	1	0	0	44
SSE	0	1	0	1	3	6	6	3	1	0	2	0	23
S	0	0	2	1	1	6	1	0	0	0	0	0	11
SSW	1	0	1	0	2	1	3	0	0	0	0	0	8
SW	1	0	0	0	1	1	0	1	2	0	0	0	6
WSW	0	1	1	3	1	2	1	0	1	0	0	0	10
W	0	0	1	0	4	4	4	0	2	0	0	0	15
WNW	0	2	0	2	6	4	2	2	1	0	0	0	19
NW	0	1	0	2	3	6	5	2	2	0	0	0	21
NNW	0	0	4	6	7	5	5	0	0	0	0	0	27
TOTALS	5	9	21	54	76	107	69	16	20	1	2	0	380

NUMBER OF VALID HOURS 380
NUMBER OF INVALID HOURS 22
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2160

PASQUILL F
MODERATELY STABLE (1.5 ≤ DT/DZ ≤ -0.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	1	0	2	9	3	4	0	0	0	0	0	19
NNE	0	0	1	14	26	55	20	3	0	0	0	0	119
NE	0	0	2	10	5	4	0	2	1	0	0	0	24
ENE	0	1	3	2	1	1	0	1	0	0	0	0	9
E	0	0	2	2	2	0	0	0	0	0	0	0	6
ESE	0	0	0	1	1	2	0	0	0	0	0	0	4
SE	1	0	0	1	0	1	1	0	0	0	0	0	4
SSE	0	0	1	0	2	1	1	0	0	0	0	0	5
S	0	0	0	3	3	1	2	0	0	0	0	0	9
SSW	0	0	0	1	2	0	0	0	0	0	0	0	3
SW	0	0	0	1	0	1	0	0	0	0	0	0	2
WSW	0	0	0	2	1	0	0	0	0	0	0	0	3
W	0	0	0	0	0	1	1	0	0	0	0	0	2
WNW	0	0	0	3	1	1	3	0	0	0	0	0	8
NW	0	0	3	1	1	2	1	0	0	0	0	0	8
NNW	0	0	0	1	2	2	0	0	0	0	0	0	5
TOTALS	1	2	12	44	56	75	33	6	1	0	0	0	230

NUMBER OF VALID HOURS 230
NUMBER OF INVALID HOURS 22
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2160

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

January - March

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 94123124-95033123
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL G
EXTREMELY STABLE (DT/DZ > 4.0 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	1	4	5	0	6	2	0	0	0	0	18
NNE	0	0	2	5	13	92	105	8	0	0	0	0	225
NE	0	1	3	6	3	6	6	0	0	0	0	0	25
ENE	0	0	0	4	3	1	0	0	0	0	0	0	8
E	0	0	0	8	2	0	0	0	0	0	0	0	10
ESE	0	0	1	2	2	0	0	0	0	0	0	0	5
SE	0	0	0	1	1	0	0	0	0	0	0	0	2
SSE	0	0	0	1	2	0	0	0	0	0	0	0	3
S	0	1	0	2	2	0	0	0	0	0	0	0	5
SSW	0	0	0	2	0	0	0	0	0	0	0	0	2
SW	0	0	2	3	0	0	0	0	0	0	0	0	5
WSW	0	0	0	3	0	0	0	0	0	0	0	0	3
W	0	0	0	2	2	2	0	0	0	0	0	0	6
WNW	0	1	0	3	0	2	1	0	0	0	0	0	7
NW	1	0	0	0	1	0	2	0	0	0	0	0	4
NNW	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTALS	1	3	9	46	36	104	120	10	0	0	0	0	329

NUMBER OF VALID HOURS 329
NUMBER OF INVALID HOURS 22
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2160

ALL STABILITY CLASSES, ALL DT/DZ
WIND SPEED (M/S) AT 10 METER LEVEL

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	3	7	18	27	22	19	2	0	0	0	0	98
NNE	1	1	8	42	78	203	151	12	1	0	0	0	497
NE	2	1	8	26	17	20	9	3	1	0	0	0	87
ENE	0	3	6	13	7	3	3	1	0	0	0	0	36
E	1	2	4	13	8	12	5	1	5	0	0	0	51
ESE	0	1	2	6	10	13	9	5	8	0	0	0	54
SE	1	1	2	9	9	30	66	57	41	7	0	0	223
SSE	0	2	3	6	20	33	43	24	7	4	3	2	147
S	0	1	3	15	14	41	32	30	14	5	3	1	159
SSW	1	2	2	11	13	17	23	10	4	0	1	0	84
SW	1	0	4	18	15	30	20	10	15	2	1	0	116
WSW	0	2	2	15	22	36	23	10	2	0	0	0	112
W	0	1	1	6	23	52	77	9	14	0	0	0	183
WNW	0	3	1	12	8	41	60	15	15	0	0	0	155
NW	1	1	5	5	8	17	25	7	6	0	0	0	75
NNW	0	0	5	12	13	19	10	2	0	0	0	0	61
TOTALS	8	24	63	227	292	589	575	198	133	18	8	3	2138

NUMBER OF VALID HOURS 2138
NUMBER OF INVALID HOURS 22
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2160

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

April - June

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95033124-95063023
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL A
EXTREMELY UNSTABLE (DT/DZ < -1.9 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	0	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	1	0	1	1	0	0	0	0	3
ESE	0	0	0	0	1	4	11	2	0	0	0	0	18
SE	0	0	0	1	1	11	19	3	0	0	0	0	35
SSE	0	0	0	1	3	12	27	3	4	0	0	0	50
S	0	0	0	2	5	17	60	11	2	0	0	0	97
SSW	0	0	0	0	0	6	16	3	0	0	0	0	25
SW	0	0	0	0	9	27	29	6	2	0	0	0	73
WSW	0	0	0	3	8	44	44	4	2	0	0	0	105
W	0	0	0	1	0	34	100	0	1	0	0	0	136
WNW	0	0	0	0	2	8	17	15	2	0	0	0	44
NW	0	0	0	0	0	0	2	0	3	0	0	0	5
NNW	0	1	2	0	0	0	0	0	0	0	0	0	3
TOTALS	0	1	2	8	30	163	326	48	16	0	0	0	594

NUMBER OF VALID HOURS 594
NUMBER OF INVALID HOURS 21
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2184

PASQUILL B
MODERATELY UNSTABLE (-1.9 < DT/DZ ≤ -1.7 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	1	0	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	1	0	0	0	0	0	1
ESE	0	0	0	0	0	1	3	1	0	0	0	0	5
SE	0	0	0	1	0	6	10	0	0	0	0	0	17
SSE	0	0	0	0	1	4	7	1	1	0	0	0	14
S	0	0	0	1	1	1	4	3	1	0	0	0	11
SSW	0	0	0	1	1	4	7	1	0	0	0	0	14
SW	0	0	0	0	3	7	6	0	1	0	0	0	17
WSW	0	0	0	0	2	5	1	0	1	0	0	0	9
W	0	0	0	1	2	2	0	0	0	0	0	0	5
WNW	0	0	0	0	2	1	0	0	0	0	0	0	3
NW	0	0	0	0	0	0	3	1	0	0	0	0	4
NNW	0	0	0	0	1	1	1	0	0	0	0	0	3
TOTALS	0	0	0	4	13	33	43	7	4	0	0	0	104

NUMBER OF VALID HOURS 104
NUMBER OF INVALID HOURS 21
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2184

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

April - June

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95033124-95063023
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL C
SLIGHTLY UNSTABLE (-1.7 < DT/DZ ≤ -1.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	1	0	1	0	2	0	0	0	0	0	0	4
NNE	0	0	0	0	1	0	0	0	0	0	0	0	1
NE	0	0	0	0	0	0	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	2	2	1	0	0	0	0	5
ESE	0	0	0	0	0	0	2	1	0	0	0	0	3
SE	0	0	0	0	0	6	8	3	0	0	0	0	17
SSE	0	0	0	0	2	1	7	2	1	0	0	0	13
S	0	0	0	1	1	6	8	4	1	0	0	0	21
SSW	0	0	0	1	0	7	4	1	0	0	0	0	13
SW	0	0	0	0	2	4	5	1	0	0	0	0	12
WSW	0	0	0	1	3	4	0	0	0	0	0	0	8
W	0	0	1	1	2	2	2	0	0	0	0	0	8
WNW	0	0	0	0	1	3	1	0	0	0	0	0	5
NW	0	0	0	0	0	3	0	1	1	0	0	0	5
NNW	0	0	0	0	0	0	2	0	0	0	0	0	2
TOTALS	0	1	1	5	12	40	41	14	3	0	0	0	117

NUMBER OF VALID HOURS 117
NUMBER OF INVALID HOURS 21
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2184

PASQUILL D
NEUTRAL (-1.5 < DT/DZ ≤ -0.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	1	5	6	9	4	1	0	0	0	0	26
NNE	0	0	1	12	16	15	1	0	0	0	0	0	45
NE	0	0	3	5	4	12	1	0	0	0	0	0	25
ENE	0	1	1	5	9	6	8	0	0	0	0	0	30
E	0	0	1	3	7	31	23	0	0	0	0	0	65
ESE	0	3	2	6	5	19	24	4	0	0	0	0	63
SE	0	0	0	7	13	45	40	12	0	0	0	0	117
SSE	0	0	3	6	14	30	47	19	4	0	0	0	123
S	0	1	1	10	14	22	32	16	7	0	0	0	103
SSW	0	0	1	3	13	22	25	6	0	0	0	0	70
SW	0	0	3	8	8	12	11	1	0	0	0	0	43
WSW	0	0	4	6	7	6	1	3	1	0	0	0	28
W	0	2	1	5	6	9	10	3	0	0	0	0	36
WNW	0	0	1	2	8	11	6	7	0	0	0	0	35
NW	0	0	2	5	3	13	11	2	0	0	0	0	36
NNW	0	1	1	2	4	9	8	1	0	0	0	0	26
TOTALS	0	8	26	90	137	271	252	75	12	0	0	0	871

NUMBER OF VALID HOURS 871
NUMBER OF INVALID HOURS 21
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2184

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

April - June

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95033124-95063023
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL E
SLIGHTLY STABLE (-0.5 < DT/DZ ≤ -1.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	1	1	3	1	3	6	6	0	0	0	0	0	21
NNE	0	1	3	5	15	23	1	0	0	0	0	0	48
NE	0	2	3	5	3	1	0	0	0	0	0	0	14
ENE	0	0	0	1	1	0	4	0	0	0	0	0	6
E	0	1	1	2	0	3	0	0	0	0	0	0	7
ESE	0	1	0	3	4	3	1	1	0	0	0	0	13
SE	0	0	0	0	2	4	2	1	0	0	0	0	9
SSE	0	0	1	3	0	5	1	0	0	0	0	0	10
S	0	0	1	3	1	0	1	1	0	0	0	0	7
SSW	0	0	0	0	0	1	1	0	0	0	0	0	2
SW	0	0	0	0	1	0	1	0	0	0	0	0	2
WSW	0	0	1	3	4	11	1	0	0	0	0	0	20
W	0	0	0	2	5	7	1	0	0	0	0	0	15
WNW	0	0	0	2	0	2	3	1	0	0	0	0	8
NW	0	0	0	0	0	0	2	0	0	0	0	0	2
NNW	0	0	0	2	1	4	2	1	0	0	0	0	10
TOTALS	1	6	13	32	40	70	27	5	0	0	0	0	194

NUMBER OF VALID HOURS 194
NUMBER OF INVALID HOURS 21
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2184

PASQUILL F
MODERATELY STABLE (1.5 ≤ DT/DZ ≤ -0.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	1	1	0	2	1	0	0	0	0	0	5
NNE	0	1	2	8	16	51	4	1	0	0	0	0	83
NE	0	0	1	9	9	4	0	0	0	0	0	0	23
ENE	0	1	0	2	1	0	0	0	0	0	0	0	4
E	0	0	0	1	0	0	0	0	0	0	0	0	1
ESE	0	0	0	0	0	0	0	0	0	0	0	0	0
SE	0	0	0	0	1	0	0	0	0	0	0	0	1
SSE	0	0	1	0	2	0	0	0	0	0	0	0	3
S	0	0	0	1	0	0	0	0	0	0	0	0	1
SSW	0	1	0	1	0	0	0	0	0	0	0	0	2
SW	0	0	1	1	0	0	0	0	0	0	0	0	2
WSW	0	0	1	3	3	7	1	0	0	0	0	0	15
W	0	0	1	3	2	4	0	0	0	0	0	0	10
WNW	0	0	0	0	0	2	1	0	0	0	0	0	3
NW	0	0	0	0	0	0	0	0	0	0	0	0	0
NNW	0	0	0	1	0	0	0	0	0	0	0	0	1
TOTALS	0	3	8	31	34	70	7	1	0	0	0	0	154

NUMBER OF VALID HOURS 154
NUMBER OF INVALID HOURS 21
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2184

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

April - June

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95033124-95063023
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL G
EXTREMELY STABLE (DT/DZ > 4.0 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	2	3	0	0	0	0	0	5
NNE	0	0	0	2	4	51	36	3	0	0	0	0	96
NE	0	0	0	1	3	4	1	0	0	0	0	0	9
ENE	0	0	0	0	1	0	0	0	0	0	0	0	1
E	0	1	1	0	0	0	0	0	0	0	0	0	2
ESE	0	0	0	0	0	0	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0	0	0	0	0	0	0
SSE	0	0	1	1	0	0	0	0	0	0	0	0	2
S	0	0	0	0	0	0	1	0	0	0	0	0	1
SSW	0	0	0	0	0	0	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0	0	0	0	0	0	0
WSW	0	0	0	0	1	3	1	0	0	0	0	0	5
W	0	0	0	0	2	3	0	0	0	0	0	0	5
WNW	0	0	0	1	0	0	0	0	0	0	0	0	1
NW	0	0	0	0	1	0	0	0	0	0	0	0	1
NNW	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTALS	0	1	2	5	12	63	43	3	0	0	0	0	129

NUMBER OF VALID HOURS 129
NUMBER OF INVALID HOURS 21
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2184

ALL STABILITY CLASSES, ALL DT/DZ
WIND SPEED (M/S) AT 10 METER LEVEL

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	1	2	5	8	9	22	14	1	0	0	0	0	62
NNE	0	2	6	27	52	140	42	4	0	0	0	0	273
NE	0	2	7	20	19	21	2	0	0	0	0	0	71
ENE	0	2	1	8	12	6	12	0	0	0	0	0	41
E	0	2	3	6	8	36	27	2	0	0	0	0	84
ESE	0	4	2	9	10	27	41	9	0	0	0	0	102
SE	0	0	0	9	17	72	79	19	0	0	0	0	196
SSE	0	0	6	11	22	52	89	25	10	0	0	0	215
S	0	1	2	18	22	46	106	35	11	0	0	0	241
SSW	0	1	1	6	14	40	53	11	0	0	0	0	126
SW	0	0	4	9	23	50	52	8	3	0	0	0	149
WSW	0	0	6	16	28	80	49	7	4	0	0	0	190
W	0	2	3	13	19	61	113	3	1	0	0	0	215
WNW	0	0	1	5	13	27	28	23	2	0	0	0	99
NW	0	0	2	5	4	16	18	4	4	0	0	0	53
NNW	0	2	3	5	6	14	14	2	0	0	0	0	46
TOTALS	1	20	52	175	278	710	739	153	35	0	0	0	2163

NUMBER OF VALID HOURS 2163
NUMBER OF INVALID HOURS 21
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2184

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

July - September

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95063024-95093023
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL A
EXTREMELY UNSTABLE (DT/DZ < -1.9 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	0	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	1	0	0	0	1	0	0	0	0	0	0	2
ESE	0	0	2	0	2	6	0	1	0	0	0	0	11
SE	0	0	0	2	1	5	3	0	0	0	0	0	11
SSE	0	0	2	4	13	26	5	1	0	0	0	0	51
S	0	0	0	1	9	43	85	1	0	0	0	0	139
SSW	0	0	0	0	3	12	12	2	0	0	0	0	29
SW	0	0	0	2	3	24	23	2	0	0	0	0	54
WSW	0	0	0	2	14	55	36	0	0	0	0	0	107
W	0	0	0	3	13	69	115	1	0	0	0	0	201
WNW	0	0	0	0	2	13	63	6	0	0	0	0	84
NW	0	0	0	0	0	1	2	1	0	0	0	0	4
NNW	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	1	4	14	60	255	344	15	0	0	0	0	693

NUMBER OF VALID HOURS 693
NUMBER OF INVALID HOURS 16
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

PASQUILL B
MODERATELY UNSTABLE (-1.9 < DT/DZ ≤ -1.7 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	0	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	1	0	0	0	0	0	1
ESE	0	0	0	0	0	0	1	1	0	0	0	0	2
SE	0	0	0	0	0	2	0	0	0	0	0	0	2
SSE	0	0	0	1	1	0	1	0	0	0	0	0	3
S	0	0	0	1	2	3	2	0	0	0	0	0	8
SSW	0	0	0	0	2	2	3	1	0	0	0	0	8
SW	0	0	0	2	2	2	0	0	0	0	0	0	6
WSW	0	0	0	1	1	4	0	0	0	0	0	0	6
W	0	0	1	1	1	5	1	0	0	0	0	0	9
WNW	0	0	0	0	2	7	4	0	0	0	0	0	13
NW	0	0	0	0	1	1	3	0	1	0	0	0	6
NNW	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	0	1	6	12	26	16	2	1	0	0	0	64

NUMBER OF VALID HOURS 64
NUMBER OF INVALID HOURS 16
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

July - September

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95063024-95093023
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL C
SLIGHTLY UNSTABLE (-1.7 < DT/DZ ≤ -1.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	0	0	0	0	0	0	0	0
NNE	0	0	0	0	0	1	0	0	0	0	0	0	1
NE	0	0	0	0	0	0	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0	0
ESE	0	0	0	0	0	2	0	0	0	0	0	0	2
SE	0	0	0	0	1	7	1	1	0	0	0	0	10
SSE	0	0	0	1	1	6	2	1	1	0	0	0	12
S	0	0	0	1	1	5	3	0	0	0	0	0	10
SSW	0	0	0	0	4	4	3	0	0	0	0	0	11
SW	0	0	0	1	2	1	4	0	0	0	0	0	8
WSW	0	0	0	0	1	0	0	0	0	0	0	0	1
W	0	0	0	3	2	3	2	0	0	0	0	0	10
WNW	0	0	0	0	0	9	3	0	0	0	0	0	12
NW	0	0	0	0	0	2	2	0	0	0	0	0	4
NNW	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	0	0	6	12	40	20	2	1	0	0	0	81

NUMBER OF VALID HOURS 81
NUMBER OF INVALID HOURS 16
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

PASQUILL D
NEUTRAL (-1.5 < DT/DZ ≤ -0.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	2	1	10	13	12	0	0	0	0	0	0	38
NNE	1	0	2	14	17	15	1	1	0	0	0	0	51
NE	0	1	0	4	7	3	0	0	0	0	0	0	15
ENE	0	1	2	2	1	6	1	0	0	0	0	0	13
E	0	0	1	5	2	10	11	4	0	0	0	0	33
ESE	0	3	3	5	9	10	16	7	0	0	0	0	53
SE	0	2	2	12	7	35	27	2	2	0	0	0	89
SSE	0	2	3	10	15	27	25	4	6	0	0	0	92
S	0	3	7	12	8	15	15	2	0	0	0	0	62
SSW	0	3	3	13	12	16	14	2	0	0	0	0	63
SW	0	1	10	13	17	11	3	0	0	0	0	0	55
WSW	2	2	7	15	18	6	2	1	0	0	0	0	53
W	0	2	6	12	13	11	3	0	0	0	0	0	47
WNW	0	2	3	12	18	16	9	3	0	0	0	0	63
NW	0	1	4	9	14	20	11	2	0	0	0	0	61
NNW	0	0	2	5	18	10	2	0	0	0	0	0	37
TOTALS	3	25	56	153	189	223	140	28	8	0	0	0	825

NUMBER OF VALID HOURS 825
NUMBER OF INVALID HOURS 16
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

July - September

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95063024-95093023
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL E
SLIGHTLY STABLE (-0.5 < DT/DZ ≤ -1.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	2	3	4	3	0	0	0	0	0	0	12
NNE	1	1	5	10	11	5	0	0	0	0	0	0	33
NE	0	0	2	5	4	2	0	0	0	0	0	0	13
ENE	0	0	4	5	0	2	0	0	0	0	0	0	11
E	0	0	2	5	2	9	1	0	0	0	0	0	19
ESE	2	1	4	7	4	7	2	4	0	0	0	0	31
SE	0	2	2	4	6	11	4	0	0	0	0	0	29
SSE	1	2	4	10	7	3	6	1	0	0	0	0	34
S	1	1	4	5	2	6	1	0	0	0	0	0	20
SSW	0	5	3	3	2	1	1	0	0	0	0	0	15
SW	0	2	2	2	3	2	0	0	0	0	0	0	11
WSW	0	1	4	13	13	9	2	0	0	0	0	0	42
W	2	2	5	4	4	4	0	0	0	0	0	0	21
WNW	0	1	3	2	1	2	6	0	0	0	0	0	15
NW	0	2	1	1	0	1	1	0	0	0	0	0	6
NNW	0	0	0	0	0	1	1	0	0	0	0	0	2
TOTALS	7	20	47	79	63	68	25	5	0	0	0	0	314

NUMBER OF VALID HOURS 314
NUMBER OF INVALID HOURS 16
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

PASQUILL F
MODERATELY STABLE (1.5 ≤ DT/DZ ≤ -0.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	3	1	2	3	2	0	0	0	0	0	11
NNE	0	0	1	7	13	25	2	0	0	0	0	0	48
NE	0	0	2	6	2	1	0	0	0	0	0	0	11
ENE	0	0	1	0	0	0	0	0	0	0	0	0	1
E	0	1	0	0	0	0	4	0	0	0	0	0	5
ESE	0	0	1	2	1	0	1	0	0	0	0	0	5
SE	0	0	2	0	0	0	0	0	0	0	0	0	2
SSE	0	0	1	3	1	1	0	0	0	0	0	0	6
S	0	0	0	0	2	0	0	0	0	0	0	0	2
SSW	0	0	0	0	1	3	0	1	0	0	0	0	5
SW	0	0	1	2	1	2	0	0	0	0	0	0	6
WSW	1	0	2	2	8	13	3	0	0	0	0	0	29
W	0	0	4	4	2	0	1	0	0	0	0	0	11
WNW	0	0	0	0	0	2	3	0	0	0	0	0	5
NW	0	1	0	0	0	0	0	0	0	0	0	0	1
NNW	0	0	0	1	0	1	1	0	0	0	0	0	3
TOTALS	1	2	18	28	33	51	17	1	0	0	0	0	151

NUMBER OF VALID HOURS 151
NUMBER OF INVALID HOURS 16
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

July - September

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95063024-95093023
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL G
EXTREMELY STABLE (DT/DZ > 4.0 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	1	1	0	0	0	0	0	2
NNE	0	0	0	3	8	14	12	1	0	0	0	0	38
NE	0	0	0	0	1	1	0	0	0	0	0	0	2
ENE	0	0	1	0	0	0	0	0	0	0	0	0	1
E	0	0	0	0	0	1	0	0	0	0	0	0	1
ESE	0	0	0	0	0	0	0	0	0	0	0	0	0
SE	0	0	0	0	2	0	0	0	0	0	0	0	2
SSE	0	0	0	0	1	0	0	0	0	0	0	0	1
S	0	0	1	0	0	0	0	0	0	0	0	0	1
SSW	0	1	0	2	0	0	0	0	0	0	0	0	3
SW	0	0	0	0	1	0	0	0	0	0	0	0	1
WSW	0	0	0	0	1	2	4	0	0	0	0	0	7
W	0	0	0	0	2	2	0	0	0	0	0	0	4
WNW	0	0	0	0	0	0	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	1	0	0	0	0	0	1
NNW	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	0	1	2	5	16	21	18	1	0	0	0	0	64

NUMBER OF VALID HOURS 64
NUMBER OF INVALID HOURS 16
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

ALL STABILITY CLASSES, ALL DT/DZ
WIND SPEED (M/S) AT 10 METER LEVEL

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	2	6	14	19	19	3	0	0	0	0	0	63
NNE	2	1	8	34	49	60	15	2	0	0	0	0	171
NE	0	1	4	15	14	7	0	0	0	0	0	0	41
ENE	0	1	8	7	1	8	1	0	0	0	0	0	26
E	0	2	3	10	4	21	17	4	0	0	0	0	61
ESE	2	4	10	14	16	25	20	13	0	0	0	0	104
SE	0	4	6	18	17	60	35	3	2	0	0	0	145
SSE	1	4	10	29	39	63	39	7	7	0	0	0	199
S	1	4	12	20	24	72	106	3	0	0	0	0	242
SSW	0	9	6	18	24	38	33	6	0	0	0	0	134
SW	0	3	13	22	29	42	30	2	0	0	0	0	141
WSW	3	3	13	33	56	89	47	1	0	0	0	0	245
W	2	4	16	27	37	94	122	1	0	0	0	0	303
WNW	0	3	6	14	23	49	88	9	0	0	0	0	192
NW	0	4	5	10	15	25	20	3	1	0	0	0	83
NNW	0	0	2	6	18	12	4	0	0	0	0	0	42
TOTALS	11	49	128	291	385	684	580	54	10	0	0	0	2192

NUMBER OF VALID HOURS 2192
NUMBER OF INVALID HOURS 16
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

October - December

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95093024-95123123
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL A
EXTREMELY UNSTABLE (DT/DZ < -1.9 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	2	0	0	3	0	0	0	0	0	5
NNE	0	0	0	0	0	2	1	0	0	0	0	0	3
NE	0	0	0	0	0	0	1	1	0	0	0	0	2
ENE	0	0	0	0	0	0	2	4	0	0	0	0	6
E	0	0	0	0	0	0	1	2	1	0	0	0	4
ESE	0	0	0	0	0	2	0	0	1	0	0	0	3
SE	0	0	0	0	1	0	4	6	4	0	0	0	15
SSE	0	0	0	0	2	3	21	12	4	0	0	0	42
S	0	0	1	3	7	18	15	4	1	0	0	0	49
SSW	0	0	0	8	11	24	10	0	0	0	0	0	53
SW	0	0	0	6	13	21	13	2	0	0	0	0	55
WSW	0	0	0	5	29	58	21	1	0	0	0	0	114
W	0	0	1	2	11	77	82	5	0	0	0	0	178
WNW	0	0	0	2	4	23	36	16	1	0	0	0	82
NW	0	0	0	0	1	2	6	1	0	0	0	0	10
NNW	0	0	1	0	1	0	0	0	0	0	0	0	2
TOTALS	0	0	3	28	80	230	216	54	12	0	0	0	623

NUMBER OF VALID HOURS 623
NUMBER OF INVALID HOURS 7
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

PASQUILL B
MODERATELY UNSTABLE (-1.9 < DT/DZ ≤ -1.7 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	1	0	0	0	0	0	0	0	1
NNE	0	0	0	0	0	1	3	0	0	0	0	0	4
NE	0	0	0	0	1	0	1	0	0	0	0	0	2
ENE	0	0	0	0	0	0	0	4	0	0	0	0	4
E	0	0	1	1	0	0	2	1	0	0	0	0	5
ESE	0	0	2	0	0	0	2	0	1	0	0	0	5
SE	0	0	0	0	0	1	3	3	0	0	0	0	7
SSE	0	0	0	0	0	1	2	2	0	0	0	0	5
S	0	0	0	1	1	1	2	0	0	0	0	0	5
SSW	0	0	0	0	0	0	0	1	0	0	0	0	1
SW	0	0	0	1	1	1	0	0	0	0	0	0	3
WSW	0	0	0	1	1	2	0	0	0	0	0	0	4
W	0	0	0	0	1	2	1	0	0	0	0	0	4
WNW	0	0	0	0	0	3	0	0	0	0	0	0	3
NW	0	1	0	0	1	0	4	0	0	0	0	0	6
NNW	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTALS	0	1	3	4	7	13	20	11	1	0	0	0	60

NUMBER OF VALID HOURS 60
NUMBER OF INVALID HOURS 7
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

October - December

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95093024-95123123
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL C
SLIGHTLY UNSTABLE (-1.7 < DT/DZ ≤ -1.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	1	0	0	0	0	0	0	1
NNE	0	0	0	0	0	4	5	0	0	0	0	0	9
NE	0	0	0	1	2	2	1	0	0	0	0	0	6
ENE	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	2	0	0	0	2
ESE	0	0	0	0	0	0	1	2	0	0	0	0	3
SE	0	0	2	0	0	2	1	0	0	0	0	0	5
SSE	0	0	0	0	2	1	3	0	1	0	0	0	7
S	0	0	0	1	1	2	2	0	0	0	0	0	6
SSW	0	0	0	0	2	3	1	0	0	0	0	0	6
SW	0	0	0	0	1	1	1	0	0	0	0	0	3
WSW	0	0	0	1	1	1	0	0	0	0	0	0	3
W	0	0	0	3	2	0	0	0	0	0	0	0	5
WNW	0	0	0	0	4	6	1	0	0	0	0	0	11
NW	0	0	0	2	0	1	3	1	0	0	0	0	7
NNW	0	0	0	0	0	1	1	0	0	0	0	0	2
TOTALS	0	0	2	8	15	25	20	3	3	0	0	0	76

NUMBER OF VALID HOURS 76
NUMBER OF INVALID HOURS 7
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

PASQUILL D
NEUTRAL (-1.5 < DT/DZ ≤ -0.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	1	0	10	9	21	5	0	0	0	0	0	46
NNE	0	0	1	8	15	39	10	2	0	0	0	0	75
NE	1	0	1	9	4	11	0	1	0	0	0	0	27
ENE	0	1	0	3	0	2	0	4	1	0	0	0	11
E	0	0	1	1	1	6	1	2	0	0	0	0	12
ESE	0	1	1	5	5	4	4	0	0	0	0	0	20
SE	0	2	0	2	3	18	37	3	0	0	0	0	65
SSE	0	0	2	5	5	13	9	2	0	0	0	0	36
S	0	0	2	2	4	4	4	0	1	0	0	0	17
SSW	0	0	2	5	1	6	5	0	0	0	0	0	19
SW	0	0	1	2	3	3	0	0	0	0	0	0	9
WSW	0	0	2	4	6	1	0	0	0	0	0	0	13
W	0	0	3	5	8	6	0	1	1	0	0	0	24
WNW	0	0	1	8	8	6	5	5	1	0	0	0	34
NW	0	2	2	6	8	16	9	1	0	0	0	0	44
NNW	0	1	5	10	5	12	5	0	0	0	0	0	38
TOTALS	1	8	24	85	85	168	94	21	4	0	0	0	490

NUMBER OF VALID HOURS 490
NUMBER OF INVALID HOURS 7
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

October - December

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95093024-95123123
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL E
SLIGHTLY STABLE (-0.5 < DT/DZ ≤ -1.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	3	6	7	14	4	1	0	0	0	0	35
NNE	0	0	3	16	29	50	37	1	0	0	0	0	136
NE	0	3	3	15	8	6	3	6	1	0	0	0	45
ENE	0	1	6	4	0	0	0	0	0	0	0	0	11
E	0	1	1	2	0	3	0	0	0	0	0	0	7
ESE	0	1	1	3	2	3	0	0	0	0	0	0	10
SE	0	0	0	0	6	5	2	0	0	0	0	0	13
SSE	0	0	2	1	1	3	0	0	0	0	0	0	7
S	0	0	1	0	0	1	0	0	0	0	0	0	2
SSW	0	0	2	1	0	0	0	0	0	0	0	0	3
SW	0	0	0	1	0	0	0	0	0	0	0	0	1
WSW	0	0	0	2	0	0	0	0	0	0	0	0	2
W	0	0	0	0	0	5	0	0	0	0	0	0	5
WNW	0	0	0	0	0	1	2	0	0	0	0	0	3
NW	0	0	0	0	2	0	1	0	0	0	0	0	3
NNW	0	0	0	1	0	1	2	0	0	0	0	0	4
TOTALS	0	6	22	52	55	92	51	8	1	0	0	0	287

NUMBER OF VALID HOURS 287
NUMBER OF INVALID HOURS 7
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

PASQUILL F
MODERATELY STABLE (1.5 ≤ DT/DZ ≤ -0.5 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	9	12	4	0	0	0	0	0	25
NNE	0	0	2	16	50	85	27	0	0	0	0	0	180
NE	0	1	3	14	15	10	3	1	0	0	0	0	47
ENE	0	1	2	2	2	0	0	0	0	0	0	0	7
E	0	3	1	3	1	0	0	0	0	0	0	0	8
ESE	0	0	3	0	0	0	0	0	0	0	0	0	3
SE	0	0	0	1	1	3	0	0	0	0	0	0	5
SSE	0	0	0	0	0	0	0	0	0	0	0	0	0
S	0	0	0	1	0	0	0	0	0	0	0	0	1
SSW	0	0	0	0	0	0	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0	0	0	0	0	0	0
WSW	0	0	0	1	0	0	0	0	0	0	0	0	1
W	0	1	0	0	0	2	2	0	0	0	0	0	5
WNW	0	0	0	0	0	1	1	0	0	0	0	0	2
NW	0	0	0	0	0	2	0	0	0	0	0	0	2
NNW	0	1	1	0	1	1	0	0	0	0	0	0	4
TOTALS	0	7	12	38	79	116	37	1	0	0	0	0	290

NUMBER OF VALID HOURS 290
NUMBER OF INVALID HOURS 7
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1994)

METEOROLOGY

October - December

TABLE 4A

SITE: SAN ONOFRE

PERIOD OF RECORD 95093024-95123123
WIND SPEED (M/S) AT 10 METER LEVEL

PASQUILL G
EXTREMELY STABLE (DT/DZ > 4.0 °C/100 METERS)

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	0	0	0	0	8	13	3	0	0	0	0	24
NNE	0	1	1	7	14	136	135	10	0	0	0	0	304
NE	0	0	0	7	10	8	5	0	0	0	0	0	30
ENE	0	0	1	2	1	1	0	0	0	0	0	0	5
E	1	1	1	2	0	0	0	0	0	0	0	0	5
ESE	0	1	0	0	1	0	0	0	0	0	0	0	2
SE	0	0	0	0	0	0	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0	0	0	0	0	0	0
WSW	0	0	0	1	0	0	0	0	0	0	0	0	1
W	0	0	0	0	0	0	1	0	0	0	0	0	1
WNW	0	0	0	0	0	0	1	0	0	0	0	0	1
NW	0	0	0	0	0	0	0	0	0	0	0	0	0
NNW	0	0	0	0	1	1	0	0	0	0	0	0	2
TOTALS	1	3	3	19	27	154	155	13	0	0	0	0	375

NUMBER OF VALID HOURS 375
NUMBER OF INVALID HOURS 7
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208

ALL STABILITY CLASSES, ALL DT/DZ
WIND SPEED (M/S) AT 10 METER LEVEL

WIND DIR	.22-.50	.51-.75	.76-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-5.0	5.1-7.0	7.1-10.0	10.1-13.0	13.1-18.0	>18	TOTAL
N	0	1	3	18	26	56	29	4	0	0	0	0	137
NNE	0	1	7	47	108	317	218	13	0	0	0	0	711
NE	1	4	7	46	40	37	14	9	1	0	0	0	159
ENE	0	3	9	11	3	3	2	12	1	0	0	0	44
E	1	5	5	9	2	9	4	5	3	0	0	0	43
ESE	0	3	7	8	8	9	7	2	2	0	0	0	46
SE	0	2	2	3	11	29	47	12	4	0	0	0	110
SSE	0	0	4	6	10	21	35	16	5	0	0	0	97
S	0	0	4	8	13	26	23	4	2	0	0	0	80
SSW	0	0	4	14	14	33	16	1	0	0	0	0	82
SW	0	0	1	10	18	26	14	2	0	0	0	0	71
WSW	0	0	2	15	37	62	21	1	0	0	0	0	138
W	0	1	4	10	22	92	86	6	1	0	0	0	222
WNW	0	0	1	10	16	40	46	21	2	0	0	0	136
NW	0	3	2	8	12	21	23	3	0	0	0	0	72
NNW	0	2	7	11	8	17	8	0	0	0	0	0	53
TOTALS	2	25	69	234	348	798	593	111	21	0	0	0	2201

NUMBER OF VALID HOURS 2201
NUMBER OF INVALID HOURS 7
NUMBER OF CALMS 0
TOTAL HOURS FOR THE PERIOD 2208