



Carolina Power & Light Company
P.O. Box 10429
Southport, NC 28461-0429

FEB 23 2000

10 CFR 50.36a

SERIAL: BSEP 00-0027

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
RADIOACTIVE EFFLUENT RELEASE REPORT

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.36a and Technical Specification (TS) 5.6.3, Carolina Power & Light Company submits the enclosed Radioactive Effluent Release Report for the Brunswick Steam Electric Plant. This report covers the period from January 1, 1999, through December 31, 1999. During the reporting period, changes were made to the Offsite Dose Calculation Manual (ODCM). Therefore, per the requirements of TS 5.5.1, the Radioactive Effluent Release Report includes a complete copy of the ODCM.

Please refer any questions regarding this submittal to Mr. Warren J. Dorman, Manager - Regulatory Affairs, at (910) 457-2068.

Sincerely,

C. J. Gannon
Plant General Manager
Brunswick Steam Electric Plant

MAT/mat

Enclosure:
Radioactive Effluent Release Report

IE48

Document Control Desk
BESP 00-0027

cc (with enclosure, excluding the ODCM):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Luis A. Reyes, Regional Administrator
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303-8931

U. S. Nuclear Regulatory Commission
ATTN: Mr. Theodore A. Easlick, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

U. S. Nuclear Regulatory Commission
ATTN: Mr. Allen G. Hansen (Mail Stop OWFN 8G9)
11555 Rockville Pike
Rockville, MD 20852-2738

Ms. Jo A. Sanford
Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

Brunswick Steam Electric Plant
Radioactive Effluent Release Report
January 1, to December 31, 1999

<u>ATTACHMENTS</u>	<u>PAGES</u>
1. Supplemental Information	2 - 6
2. Effluent and Waste Disposal Data	7 - 23
3. Environmental Monitoring Program	24 - 26
4. Effluent Instrumentation	27 - 30
5. Major Modification to the Radioactive Waste Treatment Systems	31
6. Meteorological Data	32
7. Annual Dose Assessment	33 - 49
8. Off-Site Dose Calculation Manual and Process Control Program Revisions	50

ATTACHMENT 1

Supplemental Information

January 1, to December 31, 1999

EFFLUENT AND WASTE DISPOSAL REPORT
Supplemental Information

Facility: Brunswick Steam Electric Plant
Licensee: Carolina Power and Light Company

1. Regulatory Limits

A. Fission and activation gases (Off-Site Dose Calculation Manual Specification (ODCMS) 7.3.8)

(1) Calendar Quarter*

- (a) ≤ 10 mrad gamma
- (b) ≤ 20 mrad beta

(2) Calendar Year

- (a) ≤ 20 mrad gamma
- (b) ≤ 40 mrad beta

B. Iodine-131, iodine-133, tritium, and particulates with half-lives greater than eight days (ODCMS 7.3.9)

(1) Calendar Quarter*

- (a) ≤ 15 mrem to any organ

(2) Calendar Year

- (a) ≤ 30 mrem to any organ

(3) Calendar Quarter for Burning Contaminated Oil*

- (a) < 0.1 % of limits for calendar quarter of (1)
- (b) 436 μCi (ODCM Appendix H)

(4) Calendar Year for Burning Contaminated Oil

- (a) < 0.1 % of limits for calendar year
- (b) 872 μCi (ODCM Appendix H)

C. Liquid effluents (ODCMS 7.3.4)

(1) Calendar Quarter**

- (a) ≤ 3 mrem to total body
- (b) ≤ 10 mrem to any organ

(2) Calendar Year

- (a) ≤ 6 mrem to total body
- (b) ≤ 20 mrem to any organ

NOTE: Dose calculations are determined in accordance with the Off-Site Dose Calculation Manual (ODCM)

* Used for percent of ODCMS limit determination in Attachment 2, Table 1A.

**Used for percent of ODCMS limit determination in Attachment 2, Table 2A.

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
Supplemental Information

2. Maximum permissible concentration and dose rates which determine maximum instantaneous release rates.

A. Fission and activation gases (ODCMS 7.3.7.a)

- (1) ≤ 500 mrem/year to total body
- (2) ≤ 3000 mrem/year to the skin

B. Iodine-131, iodine-133, tritium, and particulates with half-lives greater than eight days (ODCMS 7.3.7.b)

- (1) ≤ 1500 mrem/year to any organ

C. Liquid effluents (ODCMS 7.3.3)

The concentration of radioactive material released in liquid effluents to unrestricted areas after dilution in the discharge canal shall be limited to 10 times the concentrations specified in Appendix B, Table 2, Column 2 to 10 CFR 20.1001 - 20.2401 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to the value given in the ODCM specifications.

- (1) Tritium: limit = $1.00E-03$ $\mu\text{Ci/ml}^{**}$
- (2) Dissolved and entrained noble gases: limit = $2.00E-04$ $\mu\text{Ci/ml}^{**}$

3. Measurements and Approximations of Total Radioactivity

A. Fission and activation gases

- (1) Analysis for specific radionuclides in representative grab samples by gamma spectroscopy.

B. Iodines

- (1) Analysis for specific radionuclides collected on charcoal cartridges by gamma spectroscopy.

C. Particulates

- (1) Analysis for specific radionuclides collected on filter papers by gamma spectroscopy.

D. Particulates for Burning Oil

- (1) Analysis for specific radionuclides by grab samples of each batch of oil to be burned.

E. Liquid Effluents

- (1) Analysis for specific radionuclides of individual releases by gamma spectroscopy.

** Used as applicable limits for Attachment 2, Table 2A.

Nuclear counting statistics are reported utilizing 1-sigma error. Total error where reported represents a best effort to approximate the total of all individual and sampling errors.

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
Supplemental Information

4. Batch Releases

A. Liquid

(1) Number of batch releases:	8.40E+01
(2) Total time period for batch releases:	7.27E+03 Minutes
(3) Maximum time period for a batch release:	2.53E+02 Minutes
(4) Average time period for a batch release:	8.66E+01 Minutes
(5) Minimum time period for a batch release:	1.30E+01 Minutes
(6) Average stream flow during periods of release of effluent into a flowing stream:	6.67E+05 Gallons per Minute

B. Gaseous

(1) Number of batch releases:	0.00E+00
(2) Total time period for batch releases:	0.00E+00 Minutes
(3) Maximum time period for a batch release:	0.00E+00 Minutes
(4) Average time period for a batch release:	0.00E+00 Minutes
(5) Minimum time period for a batch release:	0.00E+00 Minutes

5. Abnormal releases*

A. Liquid

(1) Number of releases:	0.00E+00
(2) Total activity released:	0.00E+00 Curies

B. Gaseous

(1) Number of releases:	0.00E+00
(2) Total activity released:	0.00E+00 Curies

* There were no abnormal releases that exceeded 10 CFR 20 or 10 CFR 50 limits. See page 6 for a discussion of release events that occurred.

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
Supplemental Information

1. Discussion of Tritium in the Storm Drain Collection Pond

Approximately $9.32\text{E}+07$ gallons containing $7.95\text{E}+01$ curies of tritium were released from the Storm Drain Collection Pond (SDCP) to the Intake Canal during this reporting period. This resulted in an estimated maximum dose to the individual of $1.24\text{E}-04$ mrem. The SDCP is a permitted release point.

2. Discussion of releases from the Storm Drain Collector Basin

The Storm Drain Collector Basin (SDCB) was released directly to the Intake Canal on three separate incidences during 1999. Each incident was related to severe weather conditions due to hurricanes. The SDCB is a permitted release point during periods of inclement weather to protect plant personnel and equipment.

Hurricane Dennis

In August of 1999, approximately $5.01\text{E}+05$ gallons containing $1.10\text{E}-01$ curies of tritium and $5.72\text{E}-04$ curies of iodine were released from the SDCB directly to the Intake Canal due to heavy rains associated with Hurricane Dennis. This resulted in an estimated maximum dose, to the limiting organ (Thyroid), of $2.26\text{E}-04$ mrem. Total body dose related to this release is estimated at $7.23\text{E}-07$ mrem.

Hurricane Floyd

In September of 1999, approximately $1.71\text{E}+05$ gallons containing $3.10\text{E}-02$ curies of tritium and $4.48\text{E}-05$ curies of iodine were released from the SDCB directly to the Intake Canal due to heavy rains associated with Hurricane Floyd. This resulted in an estimated maximum dose, to the limiting organ (Thyroid), of $3.57\text{E}-05$ mrem. Total body dose related to this release is estimated at $6.52\text{E}-08$ mrem.

Hurricane Irene

In October of 1999, approximately $2.48\text{E}+04$ gallons containing $2.80\text{E}-02$ curies of tritium and $3.35\text{E}-05$ curies of iodine were released from the SDCB directly to the Intake Canal due to heavy rains associated with Hurricane Irene. This resulted in an estimated maximum dose, to the limiting organ (Thyroid), of $6.53\text{E}-06$ mrem. Total body dose related to this release is estimated at $5.35\text{E}-08$ mrem.

3. Summary

Storm Drain Collection Pond and Collector Basin curie totals are included in the quarterly summaries for FISSION AND ACTIVATION PRODUCTS and TRITIUM on Attachment 2, Table 2A when applicable.

The quantity of rainwater released from the Storm Drain Collection Basin and/or the Storm Drain Collection Pond is not included in the average diluted concentration determination or VOLUME OF WASTE on Attachment 2, Table 2A.

ATTACHMENT 2

Brunswick Steam Electric Plant

Effluent and Waste Disposal Data

January 1, to December 31, 1999

- Table 1A: Gaseous Effluents - Summation of all Releases
- Table 1B: Gaseous Effluents - Elevated Releases
- Table 1C: Gaseous Effluents - Ground Level Releases
- Table 1D: Gaseous Effluents - Ground Level Releases for Burning Contaminated Oil
- Table 2A: Liquid Effluents - Summation of all Releases
- Table 2B: Liquid Effluents - Batch Mode
- Lower Limits of Detection
- Table 3A: Solid Waste and Irradiated Fuel Shipments - Waste Class A
- Table 3B: Solid Waste and Irradiated Fuel Shipments - Waste Class B
- Table 3C: Solid Waste and Irradiated Fuel Shipments - Waste Class C
- Combustion of Waste Oil

TABLE 1A
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Gaseous Effluents - Summation of all Releases

A. FISSION AND ACTIVATION GASES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	4.72E+02	4.00E+02	3.52E+02	3.29E+02	4.50E+01
2. Average release rate for period	μCi/sec	6.07E+01	5.09E+01	4.43E+01	4.14E+01	
3. Percent of ODCM limit	%	1.13E-01	8.79E-02	7.41E-02	7.40E-02	

B. IODINES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total Iodine - 131 release	Ci	1.13E-02	7.16E-03	2.27E-02	1.00E-02	3.50E+01
2. Average release rate for period	μCi/sec	1.45E-03	9.11E-04	2.86E-03	1.26E-03	

C. PARTICULATES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	6.17E-03	1.64E-03	1.80E-03	1.58E-03	3.50E+01
2. Average release rate for period	μCi/sec	7.93E-04	2.09E-04	2.26E-04	1.99E-04	
3. Gross Alpha	Ci	6.32E-07	5.92E-07	2.93E-07	3.20E-06	

D. TRITIUM

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	1.57E+01	9.85E+00	2.05E+01	3.19E+01	3.00E+01
2. Average release rate for period	μCi/sec	2.02E+00	1.25E+00	2.58E+00	4.01E+00	

E. IODINE-131, IODINE-133, TRITIUM AND PARTICULATES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	
1. Total release	Ci	1.58E+01	9.89E+00	2.06E+01	3.20E+01	
2. Average release rate for period	μCi/sec	2.03E+00	1.26E+00	2.59E+00	4.03E+00	
3. Percent of ODCM limit	%	4.02E-01	2.57E-01	7.73E-01	3.39E-01	

TABLE 1A (cont.)
 Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
 Gaseous Effluents - Summation of all Releases

F. PARTICULATES VIA BURINING CONTAMINATED OIL

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Total release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2. Average release rate for period	μCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3. Percent of ODCM limit	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 1B
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Gaseous Effluents - Elevated Releases
Continuous Release

Nuclides Released

1. FISSION GASES

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
krypton-85m	Ci	5.04E+00	3.66E+00	3.42E+00	4.10E+00
krypton-87	Ci	7.19E+00	5.59E+00	5.87E+00	4.45E+00
krypton-88	Ci	5.02E+00	5.09E+00	2.20E-01	1.96E+00
xenon-133	Ci	1.73E+01	1.12E+01	2.84E+01	1.01E+01
xenon-135	Ci	2.90E+01	3.80E+01	2.73E+01	1.42E+01
xenon-135m	Ci	5.66E+01	4.03E+01	2.94E+01	3.21E+01
xenon-137	Ci	1.06E+02	1.15E+02	1.23E+02	1.09E+02
xenon-138	Ci	1.56E+02	1.03E+02	8.19E+01	8.95E+01
<u>total for period</u>		<u>3.82E+02</u>	<u>3.22E+02</u>	<u>2.99E+02</u>	<u>2.65E+02</u>

2. GASEOUS IODINES

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
iodine-131	Ci	9.93E-03	6.41E-03	2.22E-02	9.77E-03
iodine-132	Ci	3.54E-02	1.97E-02	1.82E-02	2.34E-02
iodine-133	Ci	4.31E-02	3.29E-02	1.02E-01	3.44E-02
iodine-134	Ci	4.99E-02	3.05E-02	2.90E-02	4.82E-02
iodine-135	Ci	6.28E-02	4.43E-02	5.42E-02	4.88E-02
<u>total for period</u>		<u>2.01E-01</u>	<u>1.34E-01</u>	<u>2.26E-01</u>	<u>1.64E-01</u>

3. PARTICULATES

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
manganese-54	Ci	≤LLD	2.89E-06	≤LLD	1.39E-06
cobalt-58	Ci	≤LLD	2.58E-05	≤LLD	≤LLD
cobalt-60	Ci	≤LLD	9.15E-05	1.38E-05	1.60E-05
strontium-89	Ci	3.98E-04	2.33E-04	2.37E-04	2.71E-04
strontium-90	Ci	1.77E-06	1.39E-06	1.88E-06	1.80E-06
ruthenium-106	Ci	≤LLD	3.69E-05	≤LLD	≤LLD
cesium-134	Ci	4.44E-06	4.32E-06	≤LLD	3.85E-06
cesium-137	Ci	3.50E-06	1.02E-05	≤LLD	7.24E-06
barium-140	Ci	4.97E-04	3.35E-04	4.63E-04	4.51E-04
lanthanum-140	Ci	8.50E-04	6.25E-04	8.01E-04	7.91E-04
<u>total for period</u>		<u>1.75E-03</u>	<u>1.37E-03</u>	<u>1.52E-03</u>	<u>1.54E-03</u>

4. TRITIUM

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
hydrogen-3	Ci	4.83E+00	2.57E+00	1.12E+01	1.23E+01

TABLE 1C
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Gaseous Effluents - Ground Level Releases
Continuous Release

Nuclides Released

1. FISSION GASES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
xenon-133	Ci	1.83E+00	7.43E-01	1.12E+00	≤LLD
xenon-135	Ci	2.60E+01	2.19E+01	1.50E+01	1.74E+01
<u>xenon-135m</u>	Ci	6.19E+01	5.58E+01	3.61E+01	4.70E+01
total for period		8.97E+01	7.84E+01	5.22E+01	6.44E+01

2. GASEOUS IODINES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
iodine-131	Ci	1.40E-03	7.47E-04	4.80E-04	2.47E-04
iodine-132	Ci	1.23E-02	6.31E-03	4.05E-03	1.23E-03
iodine-133	Ci	1.41E-02	5.64E-03	5.26E-03	2.15E-03
iodine-134	Ci	3.00E-02	2.86E-03	3.31E-04	1.35E-03
<u>iodine-135</u>	Ci	2.38E-02	9.17E-03	8.43E-03	2.03E-03
total for period		8.15E-02	2.47E-02	1.85E-02	7.01E-03

3. PARTICULATES

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
chromium-51	Ci	1.33E-03	7.06E-05	5.01E-05	1.11E-05
cobalt-58	Ci	2.20E-04	2.12E-05	2.00E-05	≤LLD
cobalt-60	Ci	4.05E-04	1.55E-04	8.21E-05	2.12E-05
zinc-65	Ci	4.75E-05	≤LLD	9.27E-06	≤LLD
strontium-89	Ci	5.30E-05	1.29E-05	6.23E-06	2.24E-06
strontium-90	Ci	1.43E-06	≤LLD	≤LLD	≤LLD
cesium-134	Ci	2.83E-05	2.44E-06	≤LLD	≤LLD
cesium-137	Ci	5.85E-05	8.74E-06	≤LLD	1.64E-06
barium-140	Ci	8.74E-04	6.60E-07	6.79E-05	≤LLD
lanthanum-140	Ci	1.39E-03	9.58E-07	4.77E-05	≤LLD
<u>cerium-141</u>	Ci	4.13E-06	≤LLD	≤LLD	≤LLD
total for period		4.41E-03	2.72E-04	2.83E-04	3.61E-05

4. TRITIUM

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
hydrogen-3	Ci	1.09E+01	7.27E+00	9.31E+00	1.96E+01

TABLE 1D
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Gaseous Effluents - Ground Level Releases
For Burning Contaminated Oil

Nuclides Released

1. PARTICULATES

Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 2A
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Liquid Effluents - Summation of all Releases

A. FISSION AND ACTIVATION PRODUCTS (NOTE 1)

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release (excluding tritium, gases, and alpha)	Ci	2.27E-03	9.56E-03	7.42E-03	3.47E-04	4.00E+01
2. Average diluted concentration (NOTE 2)	μCi/ml	6.62E-10	1.02E-09	2.42E-09	1.40E-10	
3. Percent of applicable limit	%	2.23E-03	2.60E-02	8.58E-03	3.37E-04	

B. TRITIUM (NOTE 1)

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	7.98E+00	3.42E+01	2.80E+01	2.72E+01	4.50E+01
2. Average diluted concentration (NOTE 2)	μCi/ml	2.32E-06	3.64E-06	9.13E-06	1.10E-05	
3. Percent of applicable limit	%	2.32E-01	3.64E-01	9.13E-01	1.10E+00	

C. DISSOLVED AND ENTRAINED GASES (NOTE 1)

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	2.31E-04	6.45E-02	5.80E-05	9.50E-06	4.00E+01
2. Average diluted concentration (NOTE 2)	μCi/ml	6.71E-11	6.86E-09	1.89E-11	3.85E-12	
3. Percent of applicable limit	%	3.36E-05	3.43E-03	9.45E-06	1.93E-06	

D. GROSS ALPHA RADIOACTIVITY

	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Estimated Total Percent Error
1. Total release	Ci	≤ LLD	≤ LLD	≤ LLD	≤ LLD	4.00E+01

NOTE 1: Includes radionuclides released via abnormal and/or non-routine releases.

NOTE 2: Does not include rainwater (i.e. Storm Drain Collection Basin and/or Storm Drain Collection Pond)

TABLE 2A (cont.)
 Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
 Liquid Effluents - Summation of all Releases

E. VOLUME OF WASTE RELEASED (NOTE 2)

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>	<u>Estimated Total Percent Error</u>
1. Total volume	liters	4.17E+05	2.30E+06	2.92E+05	2.32E+05	1.50E+01

F. VOLUME OF DILUTION WATER

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
1. Total volume (used during release for average diluted concentration)	liters	3.44E+09	9.39E+09	3.07E+09	2.47E+09

G. VOLUME OF COOLING WATER DISCHARGED FROM PLANT

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
1. Total volume	liters	3.97E+11	3.98E+11	5.05E+11	4.62E+11

NOTE 1: Includes radionuclides released via abnormal and/or non-routine releases.

NOTE 2: Does not include rainwater (i.e. Storm Drain Collection Basin and/or Storm Drain Collection Pond)

TABLE 2B
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Liquid Effluents - Batch Mode

Nuclides Released

1. FISSION AND ACTIVATION PRODUCTS

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
chromium-51	Ci	≤LLD	2.07E-04	≤LLD	≤LLD
manganese-54	Ci	7.49E-07	1.56E-04	7.24E-05	≤LLD
iron-55	Ci	2.57E-05	1.28E-03	2.02E-03	5.60E-05
cobalt-58	Ci	≤LLD	8.00E-05	7.34E-05	≤LLD
cobalt-60	Ci	1.29E-03	7.26E-03	3.56E-03	1.41E-04
strontium-89	Ci	≤LLD	≤LLD	5.28E-05	≤LLD
strontium-90	Ci	≤LLD	≤LLD	≤LLD	≤LLD
yttrium-91m	Ci	1.03E-06	≤LLD	≤LLD	≤LLD
technetium-99m	Ci	≤LLD	6.86E-06	≤LLD	≤LLD
iodine-131	Ci	2.73E-04	8.01E-06	2.33E-04	3.46E-05
iodine-133	Ci	2.52E-04	2.87E-05	7.57E-04	3.12E-05
cesium-134	Ci	8.87E-05	1.61E-04	2.54E-04	1.98E-05
iodine-135	Ci	7.35E-05	≤LLD	≤LLD	≤LLD
cesium-137	Ci	2.63E-04	3.33E-04	6.87E-04	6.46E-05
lanthanum-140	Ci	≤LLD	4.42E-04	1.10E-05	≤LLD
<u>total for period</u>	Ci	<u>2.27E-03</u>	<u>9.56E-03</u>	<u>7.42E-03</u>	<u>3.47E-04</u>

2. DISSOLVED AND ENTRAINED GASES

	<u>Unit</u>	<u>Quarter 1</u>	<u>Quarter 2</u>	<u>Quarter 3</u>	<u>Quarter 4</u>
xenon-133	Ci	1.10E-04	8.34E-03	2.64E-05	9.50E-06
xenon-135	Ci	8.82E-05	5.61E-02	3.16E-05	≤LLD
xenon-135m	Ci	3.27E-05	6.37E-05	≤LLD	≤LLD
<u>total for period</u>	Ci	<u>2.31E-04</u>	<u>6.45E-02</u>	<u>5.80E-05</u>	<u>9.50E-06</u>

Lower Limit of Detection
January 1, to December 31, 1999

Units: $\mu\text{Ci/ml}$

1. LIQUID RELEASES

Alpha	2.07E-08
Cr-51	1.19E-07
Mn-54	1.78E-08
Fe-55	2.13E-08
Co-58	2.05E-08
Fe-59	1.41E-08
Co-60	2.00E-08
Zn-65	4.46E-08
Sr-89	3.07E-08
Sr-90	1.35E-08
Y-91m	2.56E-08
Mo-99	1.56E-07
Tc-99m	1.31E-08
I-131	1.95E-08
I-133	1.64E-08
Cs-134	2.92E-08
I-135	1.01E-08
Cs-137	2.40E-08
La-140	2.93E-08
Ce-141	2.66E-08
Ce-144	1.20E-07
Kr-87	4.48E-08
Kr-88	5.38E-08
Xe-133	4.42E-08
Xe-133m	1.18E-07
Xe-135	1.45E-08
Xe-135m	7.23E-08
Xe-138	1.92E-07

2. GASEOUS RELEASES

Kr-87	1.54E-08
Kr-88	1.55E-08
Xe-133	9.40E-09
Xe-133m	4.09E-08
Xe-135	4.57E-09
Xe-137	7.41E-07
Xe-138	1.14E-07

3. IODINES AND PARTICULATES

Alpha	4.69E-15
Cr-51	3.84E-13
Mn-54	6.24E-14
Co-57	4.99E-14
Co-58	7.22E-14
Fe-59	1.75E-14
Co-60	7.97E-14
Zn-65	6.74E-14
Sr-89	2.98E-15
Sr-90	1.00E-15
Mo-99	1.95E-13
Ru-106	3.75E-13
I-131	4.79E-14
Cs-134	5.71E-14
Cs-137	5.94E-14
Ba-140	2.02E-13
La-140	6.16E-14
Ce-141	8.94E-14
Ce-144	3.08E-13

NOTES:

1. The above values represent typical "a priori" LLDs for isotopes where values of " $\leq\text{LLD}$ " are indicated in Tables 1A, 1B, 1C, 2A, and 2B. Also included are isotopes specified in ODCMS 7.3.3 and 7.3.7.
2. Where activity for any nuclide is reported as "Less than LLD", that nuclide is considered not present and the LLD activity listed is not considered in the summary data.

TABLE 3A
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Solid Waste and Irradiated Fuel Shipments

Waste Class A

1. <u>Total volume shipped</u> (cubic meters)	2.83E+02
Total curie quantity (estimated)	2.92E+01

2. Type of Waste

	<u>Unit</u>	<u>Period</u>	<u>Estimated Total %Error</u>
a. Spent resins, filter, sludges	meter ³ Curies	0.00E+00 0.00E+00	N/A
b. Dry active waste, compacted/non-compactd	meter ³ Curies	2.83E+02 2.92E+01	1.00E+01
c. Irradiated components	meters ³ Curies	0.00E+00 0.00E+00	N/A
d. Others (describe)	meters ³ Curies	0.00E+00 0.00E+00	N/A

3. Estimate of major radionuclides composition

- a. N/A
- b. Cr-51 6.83E-01 %
 Mn-54 2.03E+00 %
 Fe-55 6.11E+01 %
 Co-58 3.92E-01 %
 Co-60 3.33E+01 %
 Zn-65 1.39E-01 %
 Cs-137 2.79E-01 %
 Ce-144 1.10E-01 %
- c. N/A
- d. N/A

NOTE:

Solid Radioactive Waste was shipped for processing, however, only the above mentioned portion of waste generated was shipped for disposal at the Envirocare disposal facility in Utah. The aforementioned waste was shipped directly from the processor to the burial site as co-mingled shipments with other waste generators making it very difficult to determine the number of shipments. No shipments were shipped from the Brunswick plant directly to Envirocare for disposal. Access to the burial facility at Barnwell, South Carolina was not available.

TABLE 3A (cont.)
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Solid Waste and Irradiated Fuel Shipments

4. Cross reference table, waste stream, form, and container type

<u>Stream</u>	<u>Form</u>	<u>Container Type</u> Type A/Type B	<u>No. of shipments</u>
a. Resin	Dewatered & Solidified*	N/A	N/A
b. Dry active waste	Compacted/ Non-compacted	N/A	N/A
c. Irradiated components		N/A	N/A
d. Others (describe)		N/A	N/A

*Solidification agent or absorbent (i.g., cement, urea formaldehyde)

5. Shipment Disposition

a. Solid Waste

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	N/A	N/A

b. Irradiated Fuel

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	N/A	N/A

TABLE 3B
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Solid Waste and Irradiated Fuel Shipments

Waste Class B

1. <u>Total volume shipped</u> (cubic meters)	0.00E+00
Total curie quantity (estimated)	0.00E+00

2. Type of Waste

	<u>Unit</u>	<u>Period</u>	<u>Estimated Total %Error</u>
a. Spent resins, filter, sludges	meter ³	0.00E+00	
	Curies	0.00E+00	N/A
b. Dry active waste, compacted/non-compacted	meter ³	0.00E+00	
	Curies	0.00E+00	N/A
c. Irradiated components	meters ³	0.00E+00	
	Curies	0.00E+00	N/A
d. Others (describe)	meters ³	0.00E+00	
	Curies	0.00E+00	N/A

3. Estimate of major radionuclides composition

- a. N/A
- b. N/A
- c. N/A
- d. N/A

NOTE:

Solid Radioactive Waste was shipped for processing, however, not for final disposal during report period. Access to the burial facility at Barnwell, South Carolina was not available.

TABLE 3B (cont.)
 Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
 Solid Waste and Irradiated Fuel Shipments

4. Cross reference table, waste stream, form, and container type

<u>Stream</u>	<u>Form</u>	<u>Container Type</u> Type A/Type B	<u>No. of shipments</u>
a. Resin	Dewatered & Solidified*	N/A	N/A
b. Dry active waste	Compacted/ Non-compacted	N/A	N/A
c. Irradiated components		N/A	N/A
d. Others (describe)		N/A	N/A

*Solidification agent or absorbent (i.g., cement, urea formaldehyde)

5. Shipment Disposition

a. Solid Waste

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	N/A	N/A

b. Irradiated Fuel

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	N/A	N/A

TABLE 3C
Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
Solid Waste and Irradiated Fuel Shipments

Waste Class C

1. <u>Total volume shipped</u> (cubic meters)	0.00E+00
Total curie quantity (estimated)	0.00E+00

2. Type of Waste

	<u>Unit</u>	<u>Period</u>	<u>Estimated Total %Error</u>
a. Spent resins, filter, sludges	meter ³ Curies	0.00E+00 0.00E+00	N/A
b. Dry active waste, compacted/non-compacted	meter ³ Curies	0.00E+00 0.00E+00	N/A
c. Irradiated components	meters ³ Curies	0.00E+00 0.00E+00	N/A
d. Others (describe)	meters ³ Curies	0.00E+00 0.00E+00	N/A

3. Estimate of major radionuclides composition

- a. N/A
- b. N/A
- c. N/A
- d. N/A

NOTE:

Solid Radioactive Waste was shipped for processing, however, not for final disposal during report period. Access to the burial facility at Barnwell, South Carolina was not available.

TABLE 3C (cont.)
 Effluent and Waste Disposal Annual Report for January 1, to December 31, 1999
 Solid Waste and Irradiated Fuel Shipments

4. Cross reference table, waste stream, form, and container type

<u>Stream</u>	<u>Form</u>	<u>Container Type</u> Type A/Type B	<u>No. of shipments</u>
a. Resin	Dewatered & Solidified*	N/A	N/A
b. Dry active waste	Compacted/ Non-compacted	N/A	N/A
c. Irradiated components		N/A	N/A
d. Others (describe)		N/A	N/A

*Solidification agent or absorbent (i.g., cement, urea formaldehyde)

5. Shipment Disposition

a. Solid Waste

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	N/A	N/A

b. Irradiated Fuel

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
9	Rail Car/ IF-300 Cask Sole Use	CP&L/Shearon Harris Nuclear Plant

ATTACHMENT 2 (cont.)

Combustion of Waste Oil

January 1, to December 31, 1999

No contaminated waste oil was incinerated during this report period.

ATTACHMENT 3

Environmental Monitoring Program

January 1, to December 31, 1999

Enclosure 1: Milk and Vegetable Sample Location

Enclosure 2: Land Use Census

ATTACHMENT 3 (Cont.)

ENCLOSURE 1

Milk and Vegetation Sample Location

January 1, to December 31, 1999

No milk animals are located in the area evaluated by the last Land Use Census, therefore, no milk sampling locations were available during this time period.

Vegetation sample locations remained unchanged.

ATTACHMENT 3 (Cont.)

ENCLOSURE 2

Land Use Census

January 1, to December 31, 1999

The 1999 Land Use Census did not identify any locations that are reportable in the Annual Radioactive Effluent Release Report. The following is a summary of the nearest resident and garden locations identified within 5 miles of the plant. No milk or beef animals were identified.

<u>Direction</u>	<u>Residence</u>	<u>Garden</u>
NNE	0.8 miles	1.2 miles
NE	None	None
ENE	None	None
ESE	1.5 miles	1.5 miles
SE	0.9 miles	None
SSE	1.0 miles	None
S	1.2 miles	1.2 miles
SSW	1.2 miles	1.5 miles
SW	1.0 miles	2.9 miles
WSW	1.2 miles	1.4 miles
WSW	0.8 miles	0.8 miles
WNW	0.8 miles	1.2 miles
NW	0.9 miles	1.0 miles
NNW	0.8 miles	4.4 miles
N	0.7 miles	0.7 miles

ATTACHMENT 4

Effluent Instrumentation

January 1, to December 31, 1999

Enclosure 1: Radioactive Liquid Effluent Monitoring Instrumentation

Enclosure 2: Radioactive Gaseous Effluent Monitoring Instrumentation

Enclosure 3: Liquid Hold-Up Tank

ATTACHMENT 4 (Cont.)

ENCLOSURE 1

Radioactive Liquid Effluent Monitoring Instrumentation

January 1, to December 31, 1999

No Radioactive Liquid Effluent Monitoring Instruments were inoperable for a period of greater than 30 days.

ATTACHMENT 4 (Cont.)

ENCLOSURE 2

Radioactive Gaseous Effluent Monitoring Instrumentation

January 1, to December 31, 1999

No Radioactive Gaseous Effluent Monitoring Instruments were inoperable for a period of greater than 30 days.

ATTACHMENT 4 (Cont.)

ENCLOSURE 3

Liquid Hold-Up Tank

January 1, to December 31, 1999

No Liquid Hold-Up Tank exceeded the 10 Curie limit of ODCMS 7.3.6 during this reporting period.

ATTACHMENT 5

Major Modification to the Radioactive Waste Treatment System

January 1, to December 31, 1999

In accordance with ODCMS 7.5.1, major changes to the liquid, gaseous, and solid Radioactive Waste Treatment Systems shall be reported to the NRC as part of the Radioactive Effluent Release Report or as part of the UFSAR update. Any major modifications to the radioactive waste treatment systems will be submitted with the Updated Final Safety Analysis Report.

ATTACHMENT 6

Meteorological Data

January 1, to December 31, 1999

Per Technical Specification 5.6.3 and ODCMS 7.4.2, the annual summary of meteorological data collected over the calendar year was submitted to a file and is available for NRC review upon request.

ATTACHMENT 7

Annual Dose Assessment

January 1, to December 31, 1999

Enclosure 1: Annual Liquid Dose Assessment

Enclosure 2: Annual Gaseous Dose Assessment

Enclosure 3: Dose Assessment Summary

ATTACHMENT 7 (continued)

ENCLOSURE 1

1999 Annual Liquid Dose Assessment

Included are:

Site Specific Data

Source Term

As Low As Reasonably Achievable Maximum Individual Dose

Summary - Total Integrated and Recreation Population Dose

Site Specific Data

BSEP UNITS 1 AND 2 LIQUID RELEASES 1999,

DISCHARGE = 1.97E+03 CFS

SOURCE TERM MULTIPLIER = 1.00E+00

SALTWATER SITE

NO RECONCENTRATION MODEL

50-MILE POPULATION = 3.18E+05

FRACTION ---

ADULT=0.71
TEENAGER=0.11
CHILD=0.18

DOSE FACTOR LIBRARY CONTAINS 698 ENTRIES

Source Term

* * * COST-BENEFIT ANALYSIS * * *

NUCLIDE	RELEASE CI/YR	PERSON-REM DOSE		PERSON-REM PER CURIE	
		TOTAL BODY	THYROID	TOTAL BODY	THYROID
1H 3	9.73E+01	1.99E-03	1.99E-03	2.05E-05	2.05E-05
24CR 51	2.07E-04	4.67E-08	2.76E-08	2.26E-04	1.34E-04
25MN 54	2.29E-04	2.63E-05	2.17E-07	1.15E-01	9.36E-04
26FE 55	3.39E-03	1.20E-03	1.72E-12	3.54E-01	5.08E-10
27CO 58	1.53E-04	6.21E-06	4.11E-08	4.05E-02	2.68E-04
27CO 60	1.22E-02	1.68E-03	1.90E-04	1.37E-01	1.55E-02
38SR 89	5.28E-05	2.32E-07	2.69E-12	4.39E-03	5.10E-08
39Y 91M	1.03E-05	8.28E-11	8.28E-11	8.01E-06	8.01E-06
43TC 99M	6.86E-06	1.39E-11	1.39E-11	2.03E-06	2.03E-06
53I 131	5.49E-04	2.45E-06	1.39E-03	4.46E-03	2.53E+00
53I 133	7.68E-04	1.22E-08	2.45E-06	1.59E-05	3.18E-03
53I 135	7.34E-05	2.05E-09	2.05E-09	2.79E-05	2.79E-05
54XE 133	8.49E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
54XE 135	5.62E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
54XE 135M	9.63E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
55CS 134	5.24E-04	4.91E-04	2.41E-06	9.37E-01	4.61E-03
55CS 137	1.35E-03	7.55E-04	1.17E-05	5.60E-01	8.70E-03
57LA 140	5.52E-05	2.51E-09	2.51E-09	4.55E-05	4.54E-05
TOTAL		6.16E-03	3.59E-03		

As Low As Reasonably Achievable Maximum Individual Dose (Page 1 of 2)

* * * AS LOW AS REASONABLY ACHIEVABLE * * *

ADULT DOSES (MREM PER YEAR INTAKE)

		DOSE						
PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.33E-05	1.62E-05	1.03E-05	8.05E-06	4.94E-06	8.32E-06	2.85E-05
INVERT		1.80E-05	1.61E-05	9.61E-06	6.14E-06	1.12E-06	7.74E-06	5.51E-05
SHORELINE	2.22E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04
SWIMMING		1.16E-07	1.16E-07	1.16E-07	1.16E-07	1.16E-07	1.16E-07	1.16E-07
BOATING		5.81E-08	5.81E-08	5.81E-08	5.81E-08	5.81E-08	5.81E-08	5.81E-08
TOTAL	2.22E-04	2.20E-04	2.21E-04	2.09E-04	2.03E-04	1.95E-04	2.05E-04	2.72E-04
USAGE (KG/YR,HR/YR)		DILUTION		TIME(HR)	SHOREWIDTH FACTOR=0.5			
FISH	21.0		30.0	24.00				
INVERT	5.0		30.0	24.00				
SHORELINE	500.0		30.0	0.00				
SWIMMING	100.0		30.0	0.00				
BOATING	100.0		30.0	0.00				

TEEN DOSES (MREM PER YEAR INTAKE)

		DOSE						
PATHWAY	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.40E-05	1.60E-05	8.56E-06	6.95E-06	4.13E-06	8.50E-06	2.05E-05
INVERT		1.88E-05	1.68E-05	9.55E-06	5.61E-06	9.15E-07	9.03E-06	3.90E-05
SHORELINE	2.22E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04
SWIMMING		1.16E-07	1.16E-07	1.16E-07	1.16E-07	1.16E-07	1.16E-07	1.16E-07
BOATING		5.81E-08	5.81E-08	5.81E-08	5.81E-08	5.81E-08	5.81E-08	5.81E-08
TOTAL	2.22E-04	2.22E-04	2.22E-04	2.07E-04	2.01E-04	1.94E-04	2.06E-04	2.48E-04
USAGE (KG/YR,HR/YR)		DILUTION		TIME(HR)	SHOREWIDTH FACTOR=0.5			
FISH	16.0		30.0	24.00				
INVERT	3.8		30.0	24.00				
SHORELINE	500.0		30.0	0.00				
SWIMMING	100.0		30.0	0.00				
BOATING	100.0		30.0	0.00				

As Low As Reasonably Achievable Maximum Individual Dose (Page 2 of 2)

* * * AS LOW AS REASONABLY ACHIEVABLE * * *

CHILD DOSES (MREM PER YEAR INTAKE)

PATHWAY	DOSE							
	SKIN	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI
FISH		1.82E-05	1.47E-05	7.93E-06	6.70E-06	3.44E-06	7.26E-06	8.70E-06
INVERT		2.55E-05	1.65E-05	1.10E-05	5.98E-06	7.90E-07	8.15E-06	1.48E-05
SHORELINE	2.22E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04	1.89E-04
SWIMMING		1.16E-07	1.16E-07	1.16E-07	1.16E-07	1.16E-07	1.16E-07	1.16E-07
BOATING		5.81E-08	5.81E-08	5.81E-08	5.81E-08	5.81E-08	5.81E-08	5.81E-08
TOTAL	2.22E-04	2.33E-04	2.20E-04	2.08E-04	2.01E-04	1.93E-04	2.04E-04	2.12E-04
	USAGE (KG/YR,HR/YR)		DILUTION	TIME(HR)	SHOREWIDTH FACTOR=0.5			
FISH	6.9		30.0	24.00				
INVERT	1.7		30.0	24.00				
SHORELINE	500.0		30.0	0.00				
SWIMMING	100.0		30.0	0.00				
BOATING	100.0		30.0	0.00				

Summary - Total Integrated and Recreation Population Dose

CP&L
LADTAP

SEMI-ANNUAL RADIOLOGICAL EFFLUENT REPORTING
RADIATION DOSES FROM LIQUID EFFLUENTS

RUN DATE: 02/10/00
RUN TIME: 10:15:36

TOTAL INTEGRATED AND RECREATION POPULATION DOSES FROM LIQUID EFFLUENTS
(PERSON-REM)

PATHWAY	BONE	LIVER	TOTAL BODY	THYROID	KIDNEY	LUNG	GI-LLI	SKIN
SPORT FISH	8.011E-03	8.930E-03	5.464E-03	3.171E-03	2.574E-03	4.588E-03	1.357E-02	0.000E+00
COM FISH	4.413E-04	4.921E-04	3.013E-04	1.586E-04	1.419E-04	2.529E-04	7.479E-04	0.000E+00
SPORT INVERT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
COM INVERT	3.649E-04	3.064E-04	1.857E-04	5.576E-05	1.927E-05	1.498E-04	8.679E-04	0.000E+00
DRINKING WATER	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SHORELINE	2.037E-04	2.037E-04	2.037E-04	2.037E-04	2.037E-04	2.037E-04	2.037E-04	2.395E-04
SWIMMING	3.313E-07	3.313E-07	3.313E-07	3.313E-07	3.313E-07	3.313E-07	3.313E-07	0.000E+00
BOATING	1.569E-07	1.569E-07	1.569E-07	1.569E-07	1.569E-07	1.569E-07	1.569E-07	0.000E+00
IRRI VEG	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IRRI LEAFY VEG	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IRRI MILK	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IRRI MEAT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ALL PATHWAYS	9.021E-03	9.933E-02	6.1563E-03	3.590E-03	2.940E-03	5.194E-03	1.539E-02	2.395E-04

ATTACHMENT 7 (continued)

ENCLOSURE 2

1999 Annual Gaseous Dose Assessment

Included are:

Source term for the three release modes and the site aggregate.

Total 50 mile Integrated Population Dose by pathways and organs.

Hypothetical maximum individual organ dose to Iodines, Particulates, and Tritium for a cow milk pathway at 4.75 miles Northeast.

Maximum site boundary dose by age group and organs for all pathways.

Estimated individual organ dose using the 1999 Land Use Census for the worst sector and existing pathways.

Maximum site boundary dose due to Iodines, Particulates, and Tritium for existing pathways.

Source Term for the three release modes and the site aggregate (Page 1 of 2)

GR99YREC
GR99YRGC
GR99YRMC
1CP&L

SEMI-ANNUAL RADIOLOGICAL EFFLUENT REPORTING
INPUT SOURCE TERMS

RUN DATE: 02/14/00
RUN TIME: 06:47:02

1999 SOURCE TERM (ELEVATED MODE) BSEP UNITS 1&2

1 H - 3	3.090E+01
25 MN- 54	4.280E-06
27 CO- 58	2.580E-05
27 CO- 60	1.210E-04
36 KR- 85 M	1.620E+01
36 KR- 87	2.310E+01
36 KR- 88	1.230E+01
38 SR- 89	1.140E-03
38 SR- 90	6.850E-06
44 RU-106	3.690E-05
53 I -131	4.830E-02
53 I -132	9.670E-02
53 I -133	2.130E-01
53 I -134	1.580E-01
53 I -135	2.100E-01
54 XE-133	6.690E+01
54 XE-135	1.080E+02
54 XE-135 M	1.580E+02
54 XE-137	4.530E+02
54 XE-138	4.300E+02
55 CS-134	1.260E-05
55 CS-137	2.090E-05
56 BA-140	1.750E-03
57 LA-140	3.070E-03

SOURCE TERM (GROUND LEVEL) 1999 BSEP UNITS 1 AND 2

1 H - 3	4.250E+01
38 SR- 89	2.310E-07
53 I -131	3.020E-04
53 I -132	1.080E-04
53 I -133	1.240E-03
53 I -135	7.740E-04
54 XE-133	4.380E-01
54 XE-135	1.750E+01
54 XE-135 M	1.050E+01
56 BA-140	6.600E-07
57 LA-140	9.580E-07

Source Term for the three release modes and the site aggregate (Page 2 of 2)

SEMI-ANNUAL RADIOLOGICAL EFFLUENT REPORTING
INPUT SOURCE TERMS

RUN DATE: 02/14/00
RUN TIME: 06:47:02

BRUNSWICK UNITS 1 AND 2, MIXED MODE CONTINUOUS GASEOUS RELEASES, 1999

1 H - 3	4.590E+00
24 CR- 51	1.490E-03
27 CO- 58	2.620E-04
27 CO- 60	6.630E-04
30 ZN- 65	5.680E-05
38 SR- 89	6.540E-05
38 SR- 90	1.430E-06
53 I -131	2.570E-03
53 I -132	2.370E-02
53 I -133	2.580E-02
53 I -134	3.460E-02
53 I -135	4.260E-02
54 XE-133	3.250E+00
54 XE-135	6.100E+01
54 XE-135 M	1.930E+02
55 CS-134	3.070E-05
55 CS-137	6.890E-05
56 BA-140	9.420E-04
57 LA-140	1.440E-03
58 CE-141	4.130E-06

AGGREGATE SOURCE TERM

1 H - 3	7.7990E+01
24 CR- 51	1.4900E-03
25 MN- 54	4.2800E-06
27 CO- 58	2.8780E-04
27 CO- 60	7.8400E-04
30 ZN- 65	5.6800E-05
36 KR- 85 M	1.6200E+01
36 KR- 87	2.3100E+01
36 KR- 88	1.2300E+01
38 SR- 89	1.2056E-03
38 SR- 90	8.2800E-06
44 RU-106	3.6900E-05
53 I -131	5.1172E-02
53 I -132	1.2051E-01
53 I -133	2.4004E-01
53 I -134	1.9260E-01
53 I -135	2.5337E-01
54 XE-133	7.0588E+01
54 XE-135	1.8650E+02
54 XE-135 M	3.6150E+02
54 XE-137	4.5300E+02
54 XE-138	4.3000E+02
55 CS-134	4.3300E-05
55 CS-137	8.9800E-05
56 BA-140	2.6927E-03
57 LA-140	4.5110E-03
58 CE-141	4.1300E-06

Total 50 mile Integrated Population Dose by pathways and organs

1CP&L
GASRPT

SEMI-ANNUAL RADIOLOGICAL EFFLUENT REPORTING
ALARA ANNUAL INTEGRATED POPULATION DOSE SUMMARY (MANREM)

RUN DATE: 02/14/00
RUN TIME: 06:47:02

1999 SOURCE TERM (ELEVATED MODE) BSEP UNITS 1&2
SOURCE TERM (GROUND LEVEL) 1999 BSEP UNITS 1 AND 2
BRUNSWICK UNITS 1 AND 2, MIXED MODE CONTINUOUS GASEOUS RELEASES, 1999

	TOTAL BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
** TOTAL **	3.790E-02	3.809E-02	1.286E-02	3.802E-02	3.818E-02	9.517E-02	3.839E-02	5.646E-02
PLUME	9.869E-03 26.04%	9.869E-03 25.91%	9.869E-03 76.72%	9.869E-03 25.95%	9.869E-03 25.84%	9.869E-03 10.37%	1.009E-02 26.29%	2.814E-02 49.84%
GROUND PLANE	2.501E-03 6.60%	2.501E-03 6.57%	2.501E-03 19.45%	2.501E-03 6.58%	2.501E-03 6.55%	2.501E-03 2.63%	2.501E-03 6.51%	2.943E-03 5.21%
INHALATION	2.182E-02 57.58%	2.191E-02 57.52%	1.601E-04 1.24%	2.193E-02 57.68%	2.206E-02 57.76%	5.722E-02 60.13%	2.216E-02 57.73%	2.174E-02 38.51%
VEGETATION	2.405E-03 6.35%	2.411E-03 6.33%	3.095E-04 2.41%	2.417E-03 6.36%	2.447E-03 6.41%	2.094E-02 22.00%	2.347E-03 6.11%	2.346E-03 4.15%
COW MILK	6.363E-05 0.17%	6.199E-05 0.16%	4.689E-06 0.04%	6.565E-05 0.17%	6.794E-05 0.18%	1.331E-03 1.40%	6.113E-05 0.16%	6.106E-05 0.11%
MEAT & POULTRY	1.236E-03 3.26%	1.338E-03 3.51%	1.831E-05 0.14%	1.238E-03 3.26%	1.243E-03 3.25%	3.310E-03 3.48%	1.227E-03 3.20%	1.227E-03 2.17%

Hypothetical maximum individual organ dose due to Iodines, Particulates, and Tritium for a cow milk pathway at 4.75 mile NE

1CP&L SEMI-ANNUAL RADIOLOGICAL EFFLUENT REPORTING RUN DATE: 02/14/00
 GASRPT RADIATION DOSES AT SELECTED LOCATIONS RUN TIME: 06:47:02

1999 SOURCE TERM (ELEVATED MODE) BSEP UNITS 1&2
 SOURCE TERM (GROUND LEVEL) 1999 BSEP UNITS 1 AND 2
 BRUNSWICK UNITS 1 AND 2, MIXED MODE CONTINUOUS GASEOUS RELEASES, 1999

SPECIAL LOCATION METERS DIR PL GR IN V CM GM M
 #43 COW MILK 7644.0 NE 0 1 1 1 1 0 0

ANNUAL BETA AIR DOSE = 1.451E-03 MILLRADS
 ANNUAL GAMMA AIR DOSE = 1.793E-03 MILLRADS

	TOTAL BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.313E-03	3.317E-03	4.802E-04	3.358E-03	3.423E-03	3.925E-02	3.224E-03	3.249E-03
GROUND PLANE	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.630E-04
INHALATION	8.770E-04	8.804E-04	4.259E-06	8.806E-04	8.846E-04	1.831E-03	8.856E-04	8.746E-04
VEGETATION	1.621E-03	1.647E-03	1.714E-04	1.622E-03	1.630E-03	9.809E-03	1.580E-03	1.579E-03
COW MILK	5.908E-04	5.663E-04	8.093E-05	6.324E-04	6.848E-04	2.739E-02	5.342E-04	5.329E-04
TEENAGER	3.745E-03	3.724E-03	6.107E-04	3.839E-03	3.941E-03	5.426E-02	3.628E-03	3.645E-03
GROUND PLANE	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.630E-04
INHALATION	8.833E-04	8.867E-04	5.780E-06	8.883E-04	8.938E-04	2.120E-03	8.971E-04	8.801E-04
VEGETATION	1.853E-03	1.874E-03	2.355E-04	1.857E-03	1.859E-03	8.649E-03	1.810E-03	1.807E-03
COW MILK	7.848E-04	7.389E-04	1.458E-04	8.703E-04	9.647E-04	4.326E-02	6.967E-04	6.941E-04
CHILD	5.132E-03	4.984E-03	1.088E-03	5.284E-03	5.428E-03	1.015E-01	4.920E-03	4.937E-03
GROUND PLANE	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.630E-04
INHALATION	7.819E-04	7.819E-04	7.554E-06	7.862E-04	7.910E-04	2.287E-03	7.925E-04	7.783E-04
VEGETATION	2.870E-03	2.846E-03	5.054E-04	2.873E-03	2.867E-03	1.327E-02	2.803E-03	2.799E-03
COW MILK	1.257E-03	1.133E-03	3.510E-04	1.402E-03	1.546E-03	8.573E-02	1.101E-03	1.097E-03
INFANT	2.631E-03	2.380E-03	9.301E-04	3.066E-03	3.122E-03	2.094E-01	2.353E-03	2.374E-03
GROUND PLANE	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.236E-04	2.630E-04
INHALATION	4.501E-04	4.491E-04	5.655E-06	4.548E-04	4.558E-04	1.828E-03	4.586E-04	4.475E-04
COW MILK	1.958E-03	1.707E-03	7.008E-04	2.388E-03	2.443E-03	2.073E-01	1.671E-03	1.664E-03

Maximum site boundary dose by age group and organs for all pathways (Page 1 of 2)

1CP&L
GASRPT

SEMI-ANNUAL RADIOLOGICAL EFFLUENT REPORTING
RADIATION DOSES AT SELECTED LOCATIONS

RUN DATE: 02/14/00
RUN TIME: 06:47:02

1999 SOURCE TERM (ELEVATED MODE) BSEP UNITS 1&2
SOURCE TERM (GROUND LEVEL) 1999 BSEP UNITS 1 AND 2
BRUNSWICK UNITS 1 AND 2, MIXED MODE CONTINUOUS GASEOUS RELEASES, 1999

SPECIAL LOCATION	METERS DIR	PL	GR	IN	V	CM	GM	M
# 3 SITE BOUNDARY	1127.0 NE	1	1	1	1	1	1	1

ANNUAL BETA AIR DOSE = 2.242E-02 MILLRADS
ANNUAL GAMMA AIR DOSE = 1.961E-02 MILLRADS

	TOTAL BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.048E-01	1.047E-01	1.968E-02	1.059E-01	1.072E-01	8.740E-01	1.030E-01	1.237E-01
PLUME	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.320E-02	3.352E-02
GROUND PLANE	2.510E-03	2.510E-03	2.510E-03	2.510E-03	2.510E-03	2.510E-03	2.510E-03	2.953E-03
INHALATION	1.774E-02	1.775E-02	1.556E-05	1.776E-02	1.778E-02	2.180E-02	1.776E-02	1.774E-02
VEGETATION	3.249E-02	3.277E-02	1.861E-03	3.250E-02	3.260E-02	1.249E-01	3.203E-02	3.201E-02
COW MILK	1.146E-02	1.118E-02	9.052E-04	1.193E-02	1.252E-02	3.137E-01	1.082E-02	1.081E-02
GOAT MILK	2.299E-02	2.246E-02	1.346E-03	2.359E-02	2.416E-02	3.855E-01	2.209E-02	2.204E-02
MEAT & POULTRY	4.641E-03	5.072E-03	6.326E-05	4.650E-03	4.662E-03	1.258E-02	4.603E-03	4.601E-03
TEENAGER	1.185E-01	1.176E-01	2.216E-02	1.209E-01	1.230E-01	1.260E+00	1.159E-01	1.365E-01
PLUME	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.320E-02	3.352E-02
GROUND PLANE	2.510E-03	2.510E-03	2.510E-03	2.510E-03	2.510E-03	2.510E-03	2.510E-03	2.953E-03
INHALATION	1.786E-02	1.787E-02	2.140E-05	1.788E-02	1.790E-02	2.311E-02	1.788E-02	1.785E-02
VEGETATION	3.716E-02	3.739E-02	2.553E-03	3.721E-02	3.723E-02	1.139E-01	3.668E-02	3.665E-02
COW MILK	1.510E-02	1.458E-02	1.631E-03	1.606E-02	1.713E-02	4.943E-01	1.410E-02	1.408E-02
GOAT MILK	3.009E-02	2.928E-02	2.421E-03	3.146E-02	3.248E-02	6.049E-01	2.880E-02	2.871E-02
MEAT & POULTRY	2.773E-03	3.030E-03	5.136E-05	2.784E-03	2.794E-03	8.521E-03	2.746E-03	2.745E-03

Maximum site boundary dose by age group and organs for all pathways (Page 2 of 2)

1CP&L
GASRPT

SEMI-ANNUAL RADIOLOGICAL EFFLUENT REPORTING
RADIATION DOSES AT SELECTED LOCATIONS

RUN DATE: 02/14/00
RUN TIME: 06:47:02

1999 SOURCE TERM (ELEVATED MODE) BSEP UNITS 1&2
SOURCE TERM (GROUND LEVEL) 1999 BSEP UNITS 1 AND 2
BRUNSWICK UNITS 1 AND 2, MIXED MODE CONTINUOUS GASEOUS RELEASES, 1999

SPECIAL LOCATION	METERS	DIR	PL	GR	IN	V	CM	GM	M
# 3 SITE BOUNDARY	1127.0	NE	1	1	1	1	1	1	1
CHILD	1.638E-01	1.605E-01	3.082E-02	1.680E-01	1.712E-01	2.393E+00	1.594E-01	1.799E-01	
PLUME	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.320E-02	3.352E-02	
GROUND PLANE	2.510E-03	2.953E-03							
INHALATION	1.580E-02	1.579E-02	2.839E-05	1.581E-02	1.583E-02	2.216E-02	1.581E-02	1.578E-02	
VEGETATION	5.754E-02	5.728E-02	5.474E-03	5.759E-02	5.753E-02	1.750E-01	5.681E-02	5.677E-02	
COW MILK	2.404E-02	2.264E-02	3.927E-03	2.568E-02	2.731E-02	9.770E-01	2.228E-02	2.224E-02	
GOAT MILK	4.762E-02	4.583E-02	5.816E-03	5.011E-02	5.163E-02	1.191E+00	4.550E-02	4.537E-02	
MEAT & POULTRY	3.353E-03	3.484E-03	9.291E-05	3.365E-03	3.378E-03	1.204E-02	3.317E-03	3.316E-03	
INFANT	1.345E-01	1.281E-01	3.465E-02	1.463E-01	1.468E-01	5.237E+00	1.277E-01	1.481E-01	
PLUME	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.298E-02	1.320E-02	3.352E-02	
GROUND PLANE	2.510E-03	2.953E-03							
INHALATION	9.085E-03	9.080E-03	2.177E-05	9.104E-03	9.109E-03	1.491E-02	9.098E-03	9.075E-03	
COW MILK	3.705E-02	3.423E-02	7.847E-03	4.190E-02	4.253E-02	2.354E+00	3.382E-02	3.374E-02	
GOAT MILK	7.288E-02	6.930E-02	1.129E-02	7.982E-02	7.966E-02	2.853E+00	6.907E-02	6.883E-02	

Estimated individual organ dose using the 1999 Land Use Census for the worst sector and existing pathway

1CP&L SEMI-ANNUAL RADIOLOGICAL EFFLUENT REPORTING RUN DATE: 02/14/00
 GASRPT RADIATION DOSES AT SELECTED LOCATIONS RUN TIME: 11:56:24

1999 SOURCE TERM (ELEVATED MODE) BSEP UNITS 1&2
 SOURCE TERM (GROUND LEVEL) 1999 BSEP UNITS 1 AND 2
 BRUNSWICK UNITS 1 AND 2, MIXED MODE CONTINUOUS GASEOUS RELEASES, 1999

SPECIAL LOCATION METERS DIR PL GR IN V CM GM M
 #22 RESIDENCE 1931.0 S 1 1 1 1 0 0 0

ANNUAL BETA AIR DOSE = 1.237E-02 MILLRADS
 ANNUAL GAMMA AIR DOSE = 1.035E-02 MILLRADS

	TOTAL BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.326E-02	4.332E-02	7.863E-03	4.327E-02	4.331E-02	7.090E-02	4.327E-02	5.428E-02
PLUME	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.978E-03	1.791E-02
GROUND PLANE	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.902E-04
INHALATION	1.276E-02	1.276E-02	8.547E-06	1.277E-02	1.278E-02	1.513E-02	1.276E-02	1.276E-02
VEGETATION	2.314E-02	2.320E-02	4.984E-04	2.314E-02	2.318E-02	4.841E-02	2.303E-02	2.302E-02
TEENAGER	4.668E-02	4.674E-02	8.052E-03	4.670E-02	4.674E-02	7.072E-02	4.669E-02	5.770E-02
PLUME	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.978E-03	1.791E-02
GROUND PLANE	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.902E-04
INHALATION	1.284E-02	1.285E-02	1.181E-05	1.285E-02	1.287E-02	1.590E-02	1.285E-02	1.284E-02
VEGETATION	2.649E-02	2.654E-02	6.842E-04	2.649E-02	2.651E-02	4.746E-02	2.637E-02	2.636E-02
CHILD	5.974E-02	5.966E-02	8.842E-03	5.975E-02	5.976E-02	9.553E-02	5.968E-02	7.068E-02
PLUME	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.978E-03	1.791E-02
GROUND PLANE	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.902E-04
INHALATION	1.136E-02	1.136E-02	1.575E-05	1.137E-02	1.138E-02	1.505E-02	1.136E-02	1.135E-02
VEGETATION	4.102E-02	4.095E-02	1.471E-03	4.102E-02	4.103E-02	7.312E-02	4.084E-02	4.083E-02
INFANT	1.389E-02	1.389E-02	7.368E-03	1.390E-02	1.390E-02	1.727E-02	1.401E-02	2.503E-02
PLUME	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.854E-03	6.978E-03	1.791E-02
GROUND PLANE	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.016E-04	5.902E-04
INHALATION	6.533E-03	6.530E-03	1.216E-05	6.543E-03	6.546E-03	9.916E-03	6.535E-03	6.527E-03

Maximum site boundary dose due to Iodines, Particulates, and Tritium for existing pathways

1CP&L
GASRPT

SEMI-ANNUAL RADIOLOGICAL EFFLUENT REPORTING
RADIATION DOSES AT SELECTED LOCATIONS

RUN DATE: 02/14/00
RUN TIME: 12:04:08

1999 SOURCE TERM (ELEVATED MODE) BSEP UNITS 1&2
SOURCE TERM (GROUND LEVEL) 1999 BSEP UNITS 1 AND 2
BRUNSWICK UNITS 1 AND 2, MIXED MODE CONTINUOUS GASEOUS RELEASES, 1999

SPECIAL LOCATION	METERS DIR	PL	GR	IN	V	CM	GM	M
# 8 SITE BOUNDARY	1127.0 SSE	0	1	1	0	0	0	0

ANNUAL BETA AIR DOSE = 3.573E-02 MILLRADS
ANNUAL GAMMA AIR DOSE = 2.900E-02 MILLRADS

	TOTAL BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.886E-02	4.887E-02	8.276E-04	4.889E-02	4.891E-02	5.538E-02	4.886E-02	4.899E-02
GROUND PLANE INHALATION	8.062E-04 4.806E-02	8.062E-04 4.806E-02	8.062E-04 2.144E-05	8.062E-04 4.808E-02	8.062E-04 4.810E-02	8.062E-04 5.457E-02	8.062E-04 4.805E-02	9.486E-04 4.804E-02
TEENAGER	4.917E-02	4.918E-02	8.360E-04	4.920E-02	4.924E-02	5.756E-02	4.917E-02	4.930E-02
GROUND PLANE INHALATION	8.062E-04 4.837E-02	8.062E-04 4.837E-02	8.062E-04 2.989E-05	8.062E-04 4.840E-02	8.062E-04 4.843E-02	8.062E-04 5.675E-02	8.062E-04 4.836E-02	9.486E-04 4.835E-02
CHILD	4.358E-02	4.357E-02	8.464E-04	4.361E-02	4.364E-02	5.369E-02	4.357E-02	4.370E-02
GROUND PLANE INHALATION	8.062E-04 4.277E-02	8.062E-04 4.277E-02	8.062E-04 4.026E-05	8.062E-04 4.280E-02	8.062E-04 4.283E-02	8.062E-04 5.289E-02	8.062E-04 4.277E-02	9.486E-04 4.275E-02
INFANT	2.541E-02	2.540E-02	8.377E-04	2.543E-02	2.544E-02	3.468E-02	2.540E-02	2.553E-02
GROUND PLANE INHALATION	8.062E-04 2.460E-02	8.062E-04 2.459E-02	8.062E-04 3.156E-05	8.062E-04 2.463E-02	8.062E-04 2.463E-02	8.062E-04 3.387E-02	8.062E-04 2.459E-02	9.486E-04 2.458E-02

ATTACHMENT 7 (continued)

ENCLOSURE 3

1999 Dose Assessment Summary

I. Liquid Effluents:

<u>Maximum Dose to Individual: (mrem)</u>	<u>Limit: (mrem)</u>	
Adult GI-LLI	2.72E-04	2.00E+01
Adult Total Body	2.08E-04	6.00E+00
<u>Total Integrated and Recreation Population Dose: (person-rem)</u>		
Total Body	6.16E-03	

II. Gaseous Effluents

<u>Noble Gas Air Dose at Site Boundary: (mrad)</u>	<u>Limit: (mrad)</u>	
Gamma	2.90E-02	2.00E+01
Beta	3.57E-02	4.00E+01
<u>Iodine-131, Iodine-133, Tritium and Particulates: (mrem)</u>	<u>Limit: 3.00E+01</u>	
Maximum hypothetical dose at site boundary for all pathways (infant thyroid):	5.24E+00	
Maximum hypothetical dose due to iodines, particulates, and tritium at 4.75 miles for the cow milk pathway per ODCM (infant thyroid):	2.65E-01	
Estimated organ dose due to iodines, particulates, and tritium for existing pathways to maximum exposed individual (child thyroid):	9.55E-02	
<u>Total 50 mile Annual Integrated Population Dose: (person-rem)</u>		
Thyroid:	9.52E-02	
Total Body:	3.79E-02	

ATTACHMENT 8

Off-Site Dose Calculation Manual (ODCM) and Process Control Program (PCP) Revisions

January 1, to December 31, 1999

The PCP was not revised during the report period.

The ODCM was revised twice during the reporting period. The following are summaries of the changes for each revision:

1. The ODCM was revised in January 1999 (Revision 23) to incorporate the following:
 - Clarification of the compensatory measures in Section 7.3.2 to initiate actions to install auxiliary sampling. Previous terminology stated to verify auxiliary sampling is continuously collecting samples from the associated pathway.
 - Expansion of the ODCM compensatory measures to include an allowable time for completion of test requirements. The safety analysis defines 45 minutes to complete these specific tasks.
 - Added the reference for the completion of post maintenance testing to the compensatory measures.
 - Added provisions to the bases for the installation of auxiliary sampling if the monitor fails instead of immediate isolation of the pathway.
 - Corrected the "List of Effective Pages".
2. The ODCM was revised in May 1999 (Revision 24) to incorporate the following:
 - A Updated Final Safety Analysis Report revision that permits the addition of low purity, low activity liquid waste to the salt water release tanks. The liquid effluents section (i.e., Section 2.1) and the associated release flow diagram was edited to reflect this change.
 - Updated Table 3.2-2 to reflect the results of the 1999 Land Use Census.
 - Updated Table 4.0-1, identification of water samples, to clarified that the Ocean Discharge pumps are the location for environmental monitoring samples.

A complete copy of the ODCM, including the revised sections is included.