



Commonwealth Edison
Byron Nuclear Station
4450 North German Church Road
Byron, Illinois 61010

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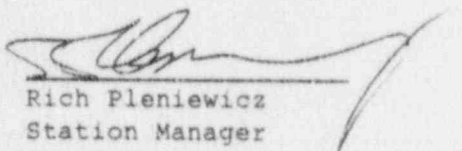
Mr. Bert Davis
Administrator
Nuclear Regulatory Commission Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Mr. Davis

Enclosed is the 1990 Byron Station Annual Radiological Environmental Operating Report Docket Numbers 50-454 and 50-455. This report contains the results of the Radiological Environmental and Meteorological Monitoring Programs.

Two copies of the report are provided for your use. Two copies will be forwarded to the Document Control Desk and one copy to the Resident Inspector.

Sincerely yours,



Rich Pleniewicz
Station Manager
Byron Nuclear Power Station

RP/BM/dd

BYRON STATION

ANNUAL RADIOLOGICAL
ENVIRONMENTAL OPERATING
REPORT

1990

MARCH 1991

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INTRODUCTION

Byron Station, a two-unit PWR plant, is located about two miles east of the Rock River and approximately three miles southwest of Byron in Ogle County, north central Illinois. Each reactor is designed to have a capacity of 1120 MW net. Unit No. 1 loaded fuel in November 1984 and went on line February 2, 1985. Unit No. 2 went on line January 9, 1987. The plant has been designed to keep releases to the environment at levels below those specified in the regulations.

Liquid effluents from Byron Station are released into the Rock River in controlled batches after radioassay of each batch. Gaseous effluents are released to the atmosphere and are calculated on the basis of analyses of daily grab samples of noble gases and continuously collected composite samples of iodine and particulate matter. The results of effluent analyses are summarized on a monthly basis. Airborne concentrations of noble gases, I-131 and particulate radioactivity in offsite areas are calculated using isotopic composition of effluents effluent and meteorological data.

Environmental monitoring is conducted by sampling at indicator and reference (control) locations in the vicinity of the Byron Station to measure changes in radiation or radioactivity levels that may be attributable to plant operations. If significant changes attributable to Byron Station are measured, these changes are correlated with effluent releases. External gamma radiation exposure from noble gases and I-131 in milk are the most critical pathways at this site; however, an environmental monitoring program is conducted which includes other pathways of less importance.

SUMMARY

Gaseous and liquid effluents for the period remained at a fraction of the Technical Specification limits. Calculations of environmental concentrations based on effluent, Rock River flow, and meteorological data for the period indicate that consumption by the public of radionuclides attributable to the plant are well below the regulatory limits. Radiation exposure from radionuclides released to the atmosphere represented the critical pathway for the period with a maximum individual dose estimated to be $1.14\text{E-}03$ mrem for the year, when a shielding and occupancy factor of 0.7 is assumed. The assessment of radiation doses is performed in accordance with the Offsite Dose Calculation Manual (ODCM). The results of analysis confirm that the station is operating in compliance with 10CFR50 and 40CFR190.

An assessment of radiation doses from liquid and gaseous effluents to members of the public due to their activities inside the site boundary during the reporting period is not included because it is not applicable to Byron Station.

There were no additional operational controls implemented which affected the areas of radiological effluents in 1990.

There were no measurements which exceeded the reporting levels, including any which would not have been attributable to plant effluents.

The results of the current radiological environmental monitoring program approximate those found during the preoperational studies conducted at Byron Station.

1.0 EFFLUENTS

1.1 Gaseous Effluents to the Atmosphere

Measured concentrations and isotopic composition of noble gases, radioiodine, and particulate radioactivity released to the atmosphere during the year, are listed in Table 1.1-1. A total of $1.24\text{E}+03$ curies of fission and activation gases was released with a maximum monthly release rate of $2.51\text{E}+04$ $\mu\text{Ci/sec}$.

A total of $4.41\text{E}-03$ curies of I-131 and I-133 was released during the year.

A total of $3.80\text{E}-05$ curies of beta-gamma emitters and $6.13\text{E}-06$ curies of alpha emitters were released as airborne particulate matter.

A total of 1.07 curies of tritium was released.

1.2 Liquids Released to the Rock River

A total of $6.37\text{E}+07$ liters of radioactive liquid waste (prior to dilution) containing 1.16 curies (excluding tritium, gases, and alpha) were discharged after dilution with a total of $2.66\text{E}+10$ liters of water. These wastes were released at a monthly average concentration of $4.92\text{E}-08$ $\mu\text{Ci/ml}$, discharged on an unidentified nuclide basis. An undetectable amount of alpha radioactivity and $9.98\text{E}+02$ curies of tritium were released. Monthly release estimates and principal radionuclides in liquid effluents are given in Table 1.2-1.

2.0 SOLID RADIOACTIVE WASTE

Solid radioactive wastes were shipped to Barnwell Nuclear Center, South Carolina and Richland, Washington. The record of waste shipments is summarized in Table 2.0-1.

3.0 DOSE TO MAN

3.1 Gaseous Effluent Pathways

Gamma Dose Rates

Gamma air and whole body dose rates offsite were calculated based on measured release rates, isotopic composition of the noble gases, and average meteorological data for the period (Table 3.1-1). Isodose contours of whole body dose are shown in Figure 3.1-1 for the year.

Based on measured effluents and meteorological data, the maximum dose to an individual would be $1.14\text{E-}03$ mrem for the year, with an occupancy or shielding factor of 0.7 included. The maximum gamma air dose was $4.24\text{E-}03$ mrad.

Beta Air and Skin Rates

The range of beta particles in air is relatively small (on the order of a few meters or less); consequently, plumes of gaseous effluents may be considered "infinite" for purpose of calculating the dose from beta radiation incident on the skin. However, the actual dose to sensitive skin tissues is difficult to calculate because this depends on the beta particle energies, thickness of inert skin, and clothing covering sensitive tissues. For purposes of this report the skin is taken to have a thickness of 7 mg/cm^2 and an occupancy factor of 1.0 is used. The skin dose from beta and gamma radiation for the year was $8.78\text{E-}03$ mrem.

The air concentrations of radioactive noble gases at the offsite receptor locations are given in Figure 3.1-2. The maximum offsite beta air dose for the year was $1.64\text{E-}02$ mrad.

Radioactive Iodine

The human thyroid concentrates ingested or inhaled iodine and the radionuclide I-131. Minimal levels released during routine operation of the plant, may be made available to man thus resulting in a dose to the thyroid. The pathway of interest for this radionuclide is ingestion of radioiodine in milk by an infant. Calculations are performed annually but the levels released from the station in previous years indicate that contributions to doses from inhalation of I-131 and I-133, and I-131 in milk, are negligible.

Iodine-131 Concentrations in Air

The calculated concentration contours for I-131 in air are shown in Figure 3.1-3. Included in these calculations is an iodine cloud depletion factor which accounts for the phenomenon of elemental iodine deposition on the ground. The maximum offsite concentration is estimated to be $5.23\text{E-}04$ pCi/ m^3 for the year.

Dose to Infant's Thyroid

The hypothetical thyroid dose to an infant living near the plant via ingestion of milk was calculated. The radionuclide considered was I-131 and the source of milk was taken to be the nearest dairy farm with the cows pastured from May to October. The maximum infant's thyroid dose was $1.34\text{E-}02$ mrem during the year (Table 3.1-1).

Concentrations of Particulates in Air

Concentration contours of radioactive airborne particulates are shown in Figure 3.1-4. The maximum offsite level is estimated to be $4.48\text{E-}06$ pCi/m³.

Summary of Doses

Table 3.1-1 summarizes the doses resulting from releases of airborne radioactivity via the different exposure pathways.

3.2 Liquid Effluent Pathways

The three principal pathways through the aquatic environment for potential doses to man from liquid waste are ingestion of potable water, eating aquatic foods, and exposure while walking on the shoreline. Not all of these pathways are applicable at a given time or station but a reasonable approximation of the dose can be made by adjusting the dose formula for season of the year or type and degree of use of the aquatic environment. NRC* developed equations were used to calculate the doses to the whole body, lower GI tract, thyroid, bone and skin; specific parameters for use in the equations are given in the Commonwealth Edison Offsite Dose Calculation Manual. The maximum whole body dose for the year was $2.30\text{E-}02$ mrem and no organ dose exceeded $8.12\text{E-}02$ mrem.

3.3 Direct Radiation

In Section 3/4.11 of the Byron Technical Specifications, 40CFR190 calculations of total dose due to the Uranium Fuel Cycle are required only when calculated doses from liquid or gaseous releases of radioactivity exceed certain levels. These levels are twice the following limits:

- The RETS limits on dose or dose commitment to a Member of the Public due to radioactive materials in liquid effluents from each reactor unit (1.5 mrem to the whole body and 5 mrem to any organ during any calendar quarter; 3.0 mrem to the whole body and 10 mrem to any organ during any calendar year).

* Nuclear Regulatory Commission, Regulatory Guide 1.109 (Rev. 1).

- The RETS limits on air dose in noble gases released in gaseous effluents to a Member of the Public from each reactor unit (5 mrad for gamma radiation or 10 mrad for beta radiation during any calendar quarter; 10 mrad for gamma radiation or 20 mrad for beta radiation during any calendar year).
- The RETS limits on dose to a Member of the Public due to iodine-131, iodine-133, tritium, and radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from each reactor unit (7.5 mrem to any organ during any calendar quarter; 15 mrem to any organ during any calendar year).

During the period January to December 1990, Byron Station did not exceed these criteria offsite and members of the public (occasional visitors to the site) did not exceed these criteria either when onsite.

4.0 SITE METEOROLOGY

A summary of the site meteorological measurements taken during each quarter of the year is given in Appendix II. The data are presented as cumulative joint frequency distributions of 250' level wind direction and wind speed class by atmospheric stability class determined from the temperature difference between the 250' and 30' levels. Data recovery for these measurements was about 99.8%.

5.0 ENVIRONMENTAL MONITORING

Tables 5.0-1 and 5.0-2 provide an outline of the Radiological Environmental Monitoring Program as required in the Technical Specifications. Sampling locations are shown in Figures 5.0-1 through 5.0-4. Concentrations of radioactivity in various media are summarized in Tables 5.0-3 through 5.0-6. Tables listing all data are presented in Appendix III.

Specific findings for various environmental media are discussed below.

5.1 Gamma Radiation

External radiation dose was measured at nine indicator and three reference (control) locations using $\text{CaSO}_4:\text{Dy}$ thermoluminescent dosimeters (TLD). Additional TLDs, a total of 64, were installed on September 28, 1981, such that each sector was covered at both five miles and the site boundary. Quarterly external radiation dose at twelve air sampling locations averaged (14.5 ± 2.0) mR and was

similar to that measured in 1985 (14.4 mR), 1986 (14.9 mR), 1987 (15.3 mR), 1988 (15.2 mR), and 1989 (14.6 mR). The differences are not statistically significant.

5.2 Airborne I-131 and Particulate Radioactivity

Locations of air samplers are shown in Figures 5.0-1 and 5.0-2. Airborne I-131 concentration remained below the LLD of 0.07 pCi/m³ throughout the year in all samples.

Gross beta concentrations ranged from 0.004 to 0.049 pCi/m³ and averaged 0.021 pCi/m³, which was slightly lower than the average concentrations in 1985 (0.026 pCi/m³), 1986 (0.026 pCi/m³, except for the period from May 12 through June 9 when it was influenced by the reactor accident at Chernobyl), 1987 (0.027 pCi/m³), 1988 (0.031 pCi/m³), and 1989 (0.026 pCi/m³).

All gamma-emitting isotopes activities were below their respective LLD levels. No radioactivity attributable to plant operation was detected in any of the samples.

5.3 Terrestrial Radioactivity

Vegetables were collected in August and analyzed for gamma-emitting isotopes. In addition, green leafy vegetables were analyzed for iodine-131. All isotopes were below the limits of detection, indicating that there was no measurable amount of radioactivity attributable to the station releases. Identical results were obtained during the period 1985 through 1989.

Well water was collected monthly from two offsite wells and analyzed for gross beta, and gamma-emitting isotopes. Quarterly composites were analyzed for tritium. Gross beta concentration averaged 2.7 pCi/L and was similar to that measured in 1988 (2.0 pCi/L) and lower than in 1985 (7.3 pCi/L), 1986 (7.5 pCi/L), and 1987 (7.5 pCi/L). Tritium was below the LLD level of 200 pCi/L in all samples and was similar to that in 1985 (232 pCi/L), 1986 (<200 pCi/L), 1987 (<200 pCi/L), 1988 (260 pCi/L), and 1989 (236 pCi/L). All other results were below the lower limits of detection. The results were similar to those obtained in 1988 and 1989.

5.4 Aquatic Radioactivity

Surface water samples were collected weekly from three locations. Weekly samples were composited monthly and analyzed for gamma-emitters. Quarterly composites were analyzed for tritium. Cesium-134 and -137 concentrations were below the LLD level of 10 pCi/L. Tritium concentration was below the LLD of 200 pCi/L in all samples collected from Woodland Creek (BY-09) and Upstream (BY-13). These levels were similar to those obtained in 1985 through 1989.

Downstream from discharge, tritium averaged 675 pCi/L, ranging from less than 200 to 1231 pCi/L. Cs-134 and Cs-137 levels were below the LLD level of 10 pCi/L. All other gamma-emitters were below their respective LLDs. Elevated levels of tritium downstream from discharge pipe are attributable to the station operation. These levels were similar to those obtained in 1905 through 1989.

Sediment samples were collected twice, from one control and one indicator location, and analyzed for gamma-emitters. Cesium-134 was below the LLD level of 0.1 pCi/g dry weight in all samples. Cesium-137 was detected in two samples (one control and one indicator) and averaged 0.36 pCi/g dry weight. All other gamma-emitting isotopes, except naturally occurring gamma-emitters, were below detection limits.

Levels of gamma radioactivity in fish were measured and found in all cases to be below the lower limits of detection for the program. The results were identical to those obtained in 1985 through 1989.

5.5 Milk

Milk samples were collected monthly from November through April and bi-weekly from May through October and analyzed for iodine-131 and gamma-emitting isotopes. Iodine-131 level was below the LLD level of 0.5 pCi/L in all samples.

Cs-134 and Cs-137 were below the LLD level of 5 pCi/L. All other gamma-emitting isotopes, except naturally-occurring K-40, were below their respective LLDs. There was no indication of the effect on the environment due to station operation. The results for I-131, Cs-134 and Cs-137 were identical to those obtained during the period 1985 through 1989, except during several months following accident at Chernobyl, which occurred on April 26, 1986. During those months I-131 ranged from 0.9 to 58.6 pCi/L, Cs-134 ranged from 5.8 to 10.7 pCi/L and Cs-137 ranged from 5.3 to 17.8 pCi/L.

5.6 Sample Collections

All samples were collected as scheduled except those listed in Listing of Missed Samples, Appendix III.

5.7 Program Modifications

In March of 1990, the milk farm at Location BY-25 (B. Leupken Farm, 3.7 miles S 190°) which was destroyed by fire was replaced by R. Oltman Dairy, 2.2 miles S 180°. In June 1990, Witten Holstein Dairy (BY-17), located 8.5 miles at 250°, went out of business and was replaced by Hazzard Dairy (BY-26), located 13.5 miles S 355°.

In October 1990, Druen Dairy (BY-27), located 5.3 miles @ 236°, was added to the program. The sampling of milk at this dairy is not required by the Technical Specifications.

6.0 ANALYTICAL PROCEDURES

Procedures used during the period covered by this report remained essentially unchanged. A summary of the procedures used for analyzing radioactivity in environmental samples is given in Appendix V of the report for the period January-December 1988.

7.0 MILCH ANIMALS AND NEAREST CATTLE CENSUSES

A census of milch animals was conducted within five miles of the Station. The survey was conducted by "door-to-door" canvas and by information from Illinois agricultural agents. The censuses were conducted by L. Coleman on July 2 and 9, 1990.

8.0 NEAREST RESIDENCES CENSUS

The census of nearest residences within a five (5) mile radius was conducted by L. Coleman on July 9, 1990.

Results of the milch animals, nearest cattle, and nearest residence censuses are presented in Appendix III.

9.0 INTERLABORATORY COMPARISON PROGRAM RESULTS

Interlaboratory Comparison Program Results are presented in Appendix IV.

10.0 ADDENDA

Addenda for January - December, 1990 Effluent and Waste Disposal Semi-annual Reports are presented in Appendix V.

APPENDIX I

DATA TABLES AND FIGURES

TABLE 1.1-1

U-1 Docket Number 51N 50-454

BNP 1100-17

Revision 0

BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR Jan - June 1990
GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES

	UNITS	Jan	Feb	Mar	QUARTER	April	May	June	QUARTER
A. Fission and Activation Gas Releases									
1. Total Release Activity	CI	3.25E+2	1.22E+1	1.04E+0	3.48E+2	9.54E+0	3.44E+1	2.17E+1	6.56E+1
2. Maximum Release Rate	μCi/sec	2.51E+4	1.11E+3	7.09E+2	2.51E+4	1.24E+3	2.55E+3	2.02E+3	2.55E+3
3. % of 10CFR20 Limits*									
a. Whole Body (500 mrem/year)	%	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.02
b. Skin (3000 mrem/year)	%	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.02
4. % of 10CFR50 Limits									
a. Gamma Quarterly (15 mrad)	%	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00
b. Beta Quarterly (18 mrad)	%	0.05	0.00	0.00	0.05	0.00	0.00	0.00	0.00
c. Gamma Annual (18 mrad)	%	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
d. Beta Annual (20 mrad)	%	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00
B. Iodine Releases									
1. Total I-131 and I-133 Activity	CI	19.22E+4	19.04E+5	19.00E+0	1.03E+3	19.00E+0	19.00E+0	1.12E+6	1.12E+6
2. % of 10CFR20/10CFR50 Limits**									

* % of 10CFR20 limits is based on the maximum release rate for the period considered.

** Iodine, particulate, and tritium limits are expressed as a total limit. See Step E.

TABLE 1.1-1 (continued)

BRP 1100-T1
Revision 0

U-1 Docket Number STM 50-454

BYRON NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR Jan. - June 1990

GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES

	UNITS	Jan	Feb	Mar	Quarter	April	May	June	Quarter
C. Particulate (> 8 day half-life) Releases									
1. Gross Activity	CI	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.12E-5	0.00E+0	0.00E+0	2.12E-5
2. Gross Alpha Activity	CI	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.13E-6	6.16E-19	6.16E-19	6.13E-6
3. % of 10CFR20/10CFR50 Limits**									
D. Tritium Releases									
1. Total Release Activity	CI	1.75E-2	6.96E-2	2.15E-2	4.60E-2	3.95E-2	4.22E-2	3.31E-2	1.15E-1
2. % of 10CFR20/10CFR50 Limits**									
E. Sum of Iodine, Particulate (> 8 day half-life), and Tritium Releases									
1. Total Activity	CI	1.184E-2	7.05E-3	2.15E-2	4.70E-2	3.95E-2	4.22E-2	3.31E-2	1.15E-1
2. % of 10CFR20 Limit									
a. Any Organ (1500 mrem/year)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. % of 10CFR50 Limit									
a. Quarterly Any Organ (7.5 mrem)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
b. Annual Any Organ (15.0 mrem)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

** Iodine, particulate, and tritium limits are expressed as a total limit. See Step E.

TABLE 1.1-1 (continued)

U-1 LOCKET NUMBER STN-50-454
 BYRON NUCLEAR POWER STATION
 EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR July-Dec 1990
 GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES

BRP 1100-17
 Revision 0

	UNITS	JULY	AUG	SEPT	3rd QUARTER	OCT	NOV	DEC	4th QUARTER
A. Fission and Activation Gas Releases									
1. Total Release Activity	ci	2.13E+1	6.98E-1	6.43E+0	2.84E+1	8.15E-2	1.42E-1	5.01E-1	7.26E-1
2. Maximum Release Rate	uCi/sec	2.12E+3	9.71E+2	1.42E+3	2.12E+3	2.05E+0	1.16E+1	8.23E+1	8.23E+1
3. % of 10C/R20 Limits*									
a. Whole Body (500 mrem/year)	%	0.02	0.01	0.01	0.02	0.00	0.00	0.00	0.00
b. Skin (3000 mrem/year)	%	0.02	0.01	0.01	0.02	0.00	0.00	0.00	0.00
4. % of 10C/R50 Limits									
a. Gamma Quarterly (5 mrad)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
b. Beta Quarterly (10 mrad)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
c. Gamma Annual (10 mrad)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. Beta Annual (20 mrad)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B. Iodine Releases									
1. Total I-131 and I-133 Activity	ci	15.07E-4	1.12E-4	9.69E-5	7.16E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0
2. % of 10C/R20/10C/R50 Limits**									

* % of 10C/R20 limits is based on the maximum release rate for the period considered.

** Iodine, particulate, and tritium limits are expressed as a total limit. See Step E.

TABLE 1.1-1 (continued)

U-1 DOCKET NUMBER STN 50-454
 BYRON NUCLEAR POWER STATION
 EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR July-Dec 1990
 GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES

BRP 1100-1
 Revision 0

	UNITS	JULY	AUG	SEPT	3rd QUARTER	OCT	NOV	DEC	4th QUARTER
C. Particulate (> 8 day half-life) Releases									
1. Gross Activity	ci	5.80E-6	0.00E+0	2.00E+0	5.80E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0
2. Gross Alpha Activity	ci	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19
3. % of 10CFR20/10CFR50 Limits**									
D. Tritium Releases									
1. Total Release Activity	ci	5.06E-2	3.42E-2	3.44E-2	1.19E-1	4.01E-2	3.16E-2	4.39E-2	1.16E-1
2. % of 10CFR20/10CFR50 Limits**									
E. Sum of Iodine, Particulate (> 8 day half-life), and Tritium Releases									
1. Total Activity	ci	5.11E-2	3.43E-2	3.45E-2	1.20E-1	4.01E-2	3.16E-2	4.39E-2	1.16E-1
2. % of 10CFR20 Limit									
a. Any Organ (1500 pCi/year)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. % of 10CFR50 Limit									
a. Quarterly Any Organ (7.5 pCi)	%	0.05	0.01	0.01	0.07	0.00	0.00	0.00	0.00
b. Annual Any Organ (15.0 pCi)	%	0.02	0.00	0.01	0.03	0.00	0.00	0.00	0.00

** Iodine, particulate, and tritium limits are expressed as a total limit. See Step E.

TABLE 1.1-1 (continued)

BEP 1100-17
Revision 8U-2 Docket Number STR 50-455
BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR JAN - JUNE 1990
GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES

	UNITS	Jan	Feb	Mar	QUARTER	April	May	June	QUARTER
A. Fission and Activation Gas Releases									
1. Total Release Activity	CI	2.02E+2	2.70E+1	2.72E+1	2.56E+2	4.82E+1	1.08E+2	1.01E+2	2.57E+2
2. Maximum Release Rate	MCi/hr	2.51E+4	1.21E+2	7.09E+2	2.51E+4	1.24E+3	2.55E+2	2.02E+3	2.55E+3
3. % of 10CFR20 limits*									
a. Whole Body (500 mrem/year)	%	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.02
b. Skin (3000 mrem/year)	%	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.02
4. % of 10CFR50 limits									
a. Gamma Quarterly (5 mrad)	%	0.02	0.00	0.00	0.02	0.00	0.01	0.01	0.02
b. Beta Quarterly (10 mrad)	%	0.04	0.00	0.00	0.04	0.01	0.01	0.01	0.03
c. Gamma Annual (10 mrad)	%	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
d. Beta Annual (20 mrad)	%	0.02	0.00	0.00	0.02	0.00	0.01	0.01	0.02
B. Iodine Releases									
1. Total I-131 and I-133 Activity	CI	2.90E-4	5.89E-4	0.00E+0	1.58E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0
2. % of 10CFR20/10CFR50 limits**									

* % of 10CFR20 limits is based on the maximum release rate for the period considered.

** Iodine, particulate, and tritium limits are expressed as a total limit. See Step E.

TABLE 1.1-1 (continued)

U-2 Docket Number STM 50-455

BNP 1100-11
Revision 8BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR Jan - June 1990
GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES

	UNITS	Jan	Feb	Mar	QUARTER	April	May	June	QUARTER
C. Particulate (> 8 day half-life) Releases									
1. Gross Activity	Ci	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
2. Gross Alpha Activity	Ci	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19
3. % of 10CFR20/10CFR50 Limits**									
D. Tritium Releases									
1. Total Release Activity	Ci	5.40E-2	3.53E-2	3.74E-2	1.27E-1	5.10E-2	4.82E-2	5.05E-2	1.50E-1
2. % of 10CFR20/10CFR50 Limits**									
E. Sum of Iodine, Particulate (> 8 day half-life), and Tritium Releases									
1. Total Activity	Ci	5.50E-2	3.59E-2	3.74E-2	1.28E-1	5.10E-2	4.82E-2	5.05E-2	1.50E-1
2. % of 10CFR20 Limit									
a. Any Organ (1500 mrem/year)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. % of 10CFR50 Limit									
a. Quarterly Any Organ (7.5 mrem)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
b. Annual Any Organ (15.0 mrem)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

** Iodine, particulate, and tritium limits are expressed as a total limit. See Step E.

TABLE 1.1-1 (continued)

U-2 DOCKET NUMBER STN-50-455

BPP 1100-11
Revision 0BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR JULY-DEC 1990
GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES

	UNITS	JULY	AUG	SEPT	3rd QUARTER	OCT	NOV	DEC	4th QUARTER
A. Fission and Activation Gas Releases									
1. Total Release Activity	CI	9.88E+1	4.65E+1	3.17E+1	1.77E+2	0.00E+0	3.44E+2	2.92E+0	2.96E+0
2. Maximum Release Rate	uCi/sec	2.17E+2	9.71E+2	1.42E+3	2.17E+3	0.00E+0	1.16E+1	8.23E+1	8.23E+1
3. % of 10CFR20 Limits*									
a. Whole Body (500 mrem/year)	%	0.02	0.01	0.01	0.02	0.00	0.00	0.00	0.00
b. Skin (3000 mrem/year)	%	0.02	0.01	0.01	0.02	0.00	0.00	0.00	0.00
4. % of 10CFR50 Limits									
a. Gamma Quarterly (5 mrad)	%	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
b. Beta Quarterly (10 mrad)	%	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.00
c. Gamma Annual (10 mrad)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d. Beta Annual (20 mrad)	%	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
B. Iodine Releases									
1. Total I-131 and I-133 Activity	CI	8.98E+4	1.270E+5	5.01E+4	1.08E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0
2. % of 10CFR20/10CFR50 Limits**									

* % of 10CFR20 limits is based on the maximum release rate for the period considered.

** Iodine, particulate, and tritium limits are expressed as a total limit. See Step E.

TABLE 1.1-1 (continued)

U-2 DOCKET NUMBER STN 50-455
 BYRON NUCLEAR POWER STATION
 EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR JULY-DEC 1990
 GASEOUS EFFLUENTS - SUMMARY OF ALL RELEASES

BNP 1100-1,
 Revision B

	UNITS	JULY	AUG	SEPT	3rd QUARTER	OCT	NOV	DEC	4th QUARTER
C. Particulate (> 8 day half-life) Releases									
1. Gross Activity	CI	1.10E-5	0.00E+0	0.00E+0	1.10E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0
2. Gross Alpha Activity	CI	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19	6.16E-19
3. % of 10CFR20/10CFR50 Limits**									
D. Tritium Releases									
1. Total Release Activity	CI	4.70E-2	3.89E-2	4.68E-2	1.33E-1	4.67E-2	7.34E-2	1.44E-1	2.64E-1
2. % of 10CFR20/10CFR50 Limits**									
E. Sum of Iodine, Particulate (> 8 day half-life), and Tritium Releases									
1. Total Activity	CI	1.47E-2	3.90E-2	4.73E-2	1.34E-1	4.67E-2	7.34E-2	1.44E-1	2.64E-1
2. % of 10CFR20 Limit									
a. Any Organ (1500 mrem/year)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. % of 10CFR50 Limit									
a. Quarterly Any Organ (7.5 mrem)	%	0.05	0.01	0.06	0.12	0.00	0.00	0.00	0.00
b. Annual Any Organ (15.0 mrem)	%	0.02	0.00	0.03	0.05	0.00	0.00	0.00	0.00

** Iodine, particulate, and tritium limits are expressed as a total limit. See Step E.

TABLE 1.2-1

BRF 1100-17

Revision 0

U-1 Docket Number STN 50-454

BYRON NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR Jan - June 1990
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	Jan	Feb	Mar	QUARTER	April	May	June	QUARTER
I. Fission and Activation Products									
1. Total Activity Released	CI	1.74E-1	3.51E-2	6.84E-3	2.17E-1	5.67E-3	4.96E-2	2.17E-2	7.50E-2
2. Average Concentration Released	uCi/ml	2.02E-2	4.38E-8	9.84E-9	9.12E-8	4.32E-9	4.28E-8	2.05E-8	2.44E-8
3. % of 10C/RSO Limits									
a. Quarterly Whole Body (1.5 mrem)	%	0.05	0.08	0.02	0.15	0.02	0.02	0.01	0.05
b. Quarterly Any Organ (5.8 mrem)	%	0.20	0.25	0.01	0.24	0.01	0.14	0.08	0.23
c. Annual Whole Body (3.8 mrem)	%	0.02	0.04	0.01	0.08	0.01	0.01	0.01	0.02
d. Annual Any Organ (18.8 mrem)	%	0.10	0.03	0.00	0.13	0.00	0.07	0.04	0.11
J. Tritium									
1. Total Activity Released	CI	1.46E+1	3.55E+1	2.89E+1	9.90E+1	4.13E+1	4.04E+1	5.08E+1	1.23E+2
2. Average Concentration Released	uCi/ml	4.02E-5	4.30E-5	4.16E-5	4.16E-5	4.86E-5	3.48E-5	4.80E-5	4.33E-5
3. % of Limit (3E-3 uCi/ml)	%	1.34	1.43	1.39	1.39	1.62	1.16	0.80	1.44
K. Dissolved Noble Gases									
1. Total Activity Released	CI	1.70E-1	3.29E-1	1.69E-1	6.68E-1	1.78E-1	1.45E-1	1.80E-1	5.03E-1
2. Average Concentration Released	uCi/ml	1.98E-7	3.99E-7	1.22E-7	2.81E-7	2.09E-7	1.25E-7	1.70E-7	1.64E-7
3. % of Limit (2E-4 uCi/ml)	%	0.10	0.20	0.06	0.14	0.11	0.06	0.08	1.44
L. Gross Alpha									
1. Total Activity Released	CI	4.91E-14	4.19E-14	4.19E-14	4.19E-14	4.19E-14	4.19E-14	4.19E-14	4.19E-14
2. Average Concentration Released	uCi/ml	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
M. Volume of Liquid Waste to Discharge									
	liters	4.49E+6	3.87E+6	6.15E+6	1.45E+7	4.26E+6	3.75E+6	5.16E+6	1.32E+7
N. Volume of Dilution Water									
	liters	1.840E+8	8.25E+8	6.95E+8	2.38E+9	8.50E+8	1.16E+9	1.06E+9	3.02E+9

TABLE 1.2-1 (continued)

BPP 1100-17
Revision 0U-1 DOCKET NUMBER SN 50-454
BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR July-Dec 1990
LIQUID EFFLUENTS - SUMMARY OF ALL RELEASES

	UNITS	JUL	AUG	SEPT	3rd QUARTER	OCT	NOV	DEC	4th QUARTER
I. Fission and Activation Products									
1. Total Activity Released	CI	1.05E-2	6.37E-3	1.11E-1	2.28E-1	3.20E-2	2.32E-2	5.24E-3	6.04E-2
2. Average Concentration Released	uCi/ml	9.64E-9	7.48E-9	1.60E-7	8.60E-8	4.49E-8	2.64E-8	5.81E-9	2.43E-8
3. % of 10C/RSO Limits									
a. Quarterly Whole Body (1.5 mrem)	%	0.29	0.11	0.07	0.47	0.04	0.04	0.01	0.09
b. Quarterly Any Organ (5.0 mrem)	%	0.11	0.05	0.03	0.19	0.08	0.05	0.01	0.14
c. Annual Whole Body (3.0 mrem)	%	0.15	0.06	0.03	0.24	0.02	0.02	0.01	0.05
d. Annual Any Organ (10.0 mrem)	%	0.06	0.02	0.07	0.15	0.04	0.02	0.01	0.07
J. Tritium									
1. Total Activity Released	CI	5.76E+1	2.61E+1	5.55E+1	1.39E+2	7.24E+1	5.18E+1	4.33E+1	1.28E+2
2. Average Concentration Released	uCi/ml	5.24E-5	3.09E-5	8.00E-5	5.25E-5	4.55E-5	5.89E-5	4.80E-5	5.14E-5
3. % of Limit (3E-1 uCi/ml)	%	1.75	1.02	2.67	5.44	1.52	1.96	1.60	5.08
K. Dissolved Noble Gases									
1. Total Activity Released	CI	2.66E-1	1.49E-2	8.00E-2	3.67E-1	9.75E-4	3.25E-3	1.69E-2	2.11E-2
2. Average Concentration Released	uCi/ml	2.42E-7	1.75E-8	1.15E-7	1.36E-7	1.37E-9	3.57E-9	1.87E-8	8.47E-9
3. % of Limit (2E-4 uCi/ml)	%	0.12	0.01	0.06	0.07	0.00	0.00	0.01	0.01
L. Gross Alpha									
1. Total Activity Released	CI	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14
2. Average Concentration Released	uCi/ml	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
M. Volume of Liquid Waste to Discharge									
	liters	1.97E+6	1.58E+6	1.67E+6	5.20E+6	9.40E+5	5.38E+6	1.12E+6	3.44E+6
N. Volume of Dilution Water									
	liters	1.10E+9	8.52E+8	1.694E+9	2.65E+9	7.12E+8	8.80E+8	9.02E+8	2.49E+9

TABLE 1.2-1 (continued)

U-2 Docket Number SN 50-455
 BYRON NUCLEAR POWER STATION
 EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR Jan - June 1990
 LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

BRP 1100-17
 Revision 0

	UNITS	Jan	Feb	Mar	QUARTER	April	May	June	QUARTER
I. Fission and Activation Products									
1. Total Activity Released	CI	1.74E-1	3.61E-2	6.84E-3	2.17E-1	3.67E-3	4.96E-2	2.17E-2	7.50E-2
2. Average Concentration Released	uCi/ml	1.01E-7	2.19E-8	4.92E-9	4.56E-8	2.16E-9	2.15E-8	1.02E-8	1.27E-8
3. % of 10CFR50 Limits									
a. Quarterly Whole Body (1.5 mrem)	%	0.05	0.08	0.02	0.15	0.02	0.02	0.01	0.05
b. Quarterly Any Organ (5.0 mrem)	%	0.20	0.05	0.01	0.26	0.01	0.14	0.08	0.23
c. Annual Whole Body (3.0 mrem)	%	0.02	0.04	0.02	0.08	0.01	0.01	0.01	0.02
d. Annual Any Organ (10.0 mrem)	%	0.10	0.02	0.00	0.13	0.00	0.07	0.04	0.11
J. Tritium									
1. Total Activity Released	CI	3.46E+1	3.55E+1	2.89E+1	9.90E+1	4.13E+1	4.04E+1	5.08E+1	1.33E+2
2. Average Concentration Released	uCi/ml	2.01E-5	2.15E-5	2.08E-5	2.08E-5	2.43E-5	1.75E-5	2.40E-5	2.17E-5
3. % of Limit (3E-3 uCi/ml)	%	0.67	0.72	0.69	0.69	0.81	0.58	0.80	0.72
K. Dissolved Noble Gases									
1. Total Activity Released	CI	1.70E-1	3.29E-1	1.69E-1	6.68E-1	1.78E-1	1.45E-1	1.08E-1	5.03E-1
2. Average Concentration Released	uCi/ml	9.88E-8	1.99E-7	1.22E-7	1.40E-7	1.05E-7	6.28E-8	8.49E-8	8.21E-8
3. % of Limit (2E-4 uCi/ml)	%	0.05	0.10	0.06	0.07	0.07	0.03	0.04	0.04
L. Gross Alpha									
1. Total Activity Released	CI	4.91E-14	4.19E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14
2. Average Concentration Released	uCi/ml	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
M. Volume of Liquid Waste to Discharge									
	liters	1.33E+6	1.38E+6	2.24E+6	4.93E+6	2.55E+6	2.89E+6	3.31E+6	8.75E+6
N. Volume of Dilution Water									
	liters	1.72E+9	1.65E+9	1.39E+9	4.76E+9	1.70E+9	2.31E+9	2.12E+9	6.13E+9

TABLE 1.2-1 (continued)

U-2 DOCKET NUMBER SW-455

BRP 1100-17

Revision 0

BYRON NUCLEAR POWER STATION

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT FOR July-Dec 1990

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	JUL	AUG	SEPT	1 st QUARTER	OCT	NOV	DEC	4 th QUARTER
I. Fission and Activation Products									
1. Total Activity Released	CI	11.06E-2	6.37E-3	1.11E-1	2.28E-1	1.20E-2	2.32E-2	5.26E-3	1.04E-2
2. Average Concentration Released	uCi/ml	9.64E-9	7.48E-9	1.60E-7	8.60E-8	4.54E-8	2.64E-8	5.81E-9	2.43E-8
3. % of 10C/RSO Limits									
a. Quarterly Whole Body (1.5 mrem)	%	0.29	0.11	0.07	0.47	0.04	0.04	0.01	0.09
b. Quarterly Any Organ (5.0 mrem)	%	0.11	0.05	0.15	0.31	0.08	0.05	0.01	0.14
c. Annual Whole Body (3.0 mrem)	%	0.15	0.06	0.03	0.24	0.02	0.02	0.01	0.05
d. Annual Any Organ (10.0 mrem)	%	0.06	0.02	0.07	0.15	0.04	0.02	0.01	0.07
J. Tritium									
1. Total Activity Released	CI	15.76E+1	2.61E+1	5.55E+1	1.39E+2	3.24E+1	5.18E+1	4.33E+1	1.28E+2
2. Average Concentration Released	uCi/ml	5.24E-5	7.06E-5	8.00E-5	5.25E-5	4.55E-5	5.89E-5	4.80E-5	5.14E-5
3. % of Limit (3E-3 uCi/ml)	%	1.75	1.02	2.67	5.44	1.52	1.96	1.60	5.08
K. Dissolved Noble Gases									
1. Total Activity Released	CI	12.66E-1	1.49E-2	18.00E-2	2.61E-1	19.75E-4	3.25E-3	1.69E-2	2.11E-2
2. Average Concentration Released	uCi/ml	2.42E-7	1.25E-8	1.25E-7	1.36E-7	1.37E-9	3.69E-9	1.87E-8	8.47E-9
3. % of Limit (2E-4 uCi/ml)	%	0.12	0.01	0.06	0.07	0.00	0.00	0.01	0.01
L. Gross Alpha									
1. Total Activity Released	CI	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14	4.91E-14
2. Average Concentration Released	uCi/ml	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
M. Volume of Liquid Waste to Discharge									
	liters	11.97E+6	11.58E+6	11.67E+6	12.20E+6	12.40E+6	11.38E+6	11.12E+6	11.44E+6
N. Volume of Dilution Water									
	liters	11.10E+9	11.52E+9	16.94E+9	12.65E+9	17.12E+9	18.80E+9	19.02E+9	12.49E+9

TABLE 2.0-1

U-1 & U-2 Docket Numbers SIN 50-454 & SIN 50-455

BRF 1100-11
Revision 0BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTE
MONTH Jan YEAR 1990

DATE	Disposition of Material			Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment	
	Description	Class	Type					
1-5	Filter	Class A	HIC-LSA	None	Exclusive Use	Barnwell, SC	73.4	5.57
1-19	Dewatered Resin	Class A	Cast-LSA	None	Exclusive Use	Barnwell, SC	183.2	6.35
1-25	DAW	Class A	Drums-LSA	None	Exclusive Use	Barnwell, SC	*622.5	28
MONTHLY TOTALS:						3	879.1	12.20

* Volume sent to vendor. This is not final burial volume

TABLE 2.0-1 (continued)

BRP 1100-1/
Revision 0

U-1 & U-2 Docket Numbers STM 50-454 & 50-455
 BYRON NUCLEAR POWER STATION
 EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
 SOLID RADIOACTIVE WASTE
 MONTH Feb YEAR 1990

DATE	Disposition of Material			Solidifying Agent	Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment
	Description	Class	Type					
2-2	Dewatered Resin	Class A	Cask-LSA	None	Exclusive Use	Barnwell, SC	183.2	3.55
2-16	DAW	Class A	Drums-LSA	None	Exclusive Use	Barnwell, SC	392.5	2.31
2-21	Filters	Class A	Radlok Cask-LSA	None	Exclusive Use	Barnwell, SC	73.4	3.62
2-23	Dewatered Resin	Class A	Cask-LSA	None	Exclusive Use	Barnwell, SC	183.2	1.91
MONTHLY TOTALS:					4		832.30	11.39

TABLE 2.0-1 (continued)

U1 & U-2 Docket Numbers STR 50-454 & 50-455

SRP 1100-F1
Revision 0BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTEMONTH Mar YEAR 1990

DATE	Disposition of Material			Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment
	Description, Class	Type	Solidifying Agent				
3-5	Dewatered Resin, Class A, Cast-LSA, None			Exclusive Use	Barnwell, SC	172.6	0.56
3-22	DAW, Class A, Drums-LSA, None			Exclusive Use	Barnwell, SC	293.6	1.26
3-23	Dewatered Resin, Class A, Cast-LSA, None			Exclusive Use	Barnwell, SC	183.2	0.85
MONTHLY TOTALS:					3	649.4	2.67

TABLE 2.0-1 (continued)

BEP 1100-71
Revision 0

U-1 & U-2 Docket Numbers SN 50-454 & 50-455

BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTE
MONTH April YEAR 1990

DATE	Disposition of Material			Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment	
	Description	Class	Type - Solidifying Agent					
4-12	DW	Class A	Drums-LSA, None	Exclusive Use	Barnwell, SC	*1040	1.35	
4-16	Dewatered Resin	Class A	Cask-LSA, None	Exclusive Use	Barnwell, SC	183.2	0.73	
4-23	Dewatered Resin	Class A	Cask-LSA, None	Exclusive Use	Barnwell, SC	177.3	0.18	
MONTHLY TOTALS:						3	1400.5	2.26

* Volume sent to vendor. This is not final burial volume.

TABLE 2.0-1 (continued)

U-1 & U-2 Docket Numbers STR 50-454 & 50-455

BEP 100-17
Revision 8BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTE
MONTH May YEAR 1990

DATE	Disposition of Material			Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment
	Description	Class	Type				
5-14	Dewatered Resin	Class C	Cask-LSA, None	Exclusive Use	Barnwell, SC	132.4	179.0
5-30	Dewatered Resin	Class A	Cask-LSA, None	Exclusive Use	Barnwell, SC	132.4	13.2
MONTHLY TOTALS:					2	264.8	392.2

TABLE 2.0-1 (continued)

U-1 & U-2 Docket Numbers SN 50-454 & 50-455

BEP 1100-17
Revision 0BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTE
MONTH June YEAR 1990

DATE	Disposition of Material			Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment
	Description	Class	Type - Solidifying Agent				
6-15	Dewatered Resin, Class A, Cast-LSA, None			Exclusive Use	Richland, W	199.4	7.97
MONTHLY TOTALS:					1	199.4	7.97

TABLE 2.0-1 (continued)

U-1 & U-2 DOCKET NUMBERS SIN 50-454 & SIN 50-455

BRF 1100-11
Revision 0BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTE
MONTH JULY YEAR 1990

Disposition of Material			Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment
DATE	Description, Class	Type, Solidifying Agent				
7-2	Dewatered Resin, Class A, Cask	- LSA, None	Exclusive Use	Richland W	199.4	2.43
7-12	DAN, Class A, Drums	- LSA, None	Exclusive Use	Barnwell, SC	282	1.41
7-26	Dewatered Resin, Class A, Cask	- LSA, None	Exclusive Use	Richland, W	199.4	.79
MONTHLY TOTALS:				3	681	4.63

TABLE 2.0-1 (continued)

BRF 1100-11
Revision 0U-1 & U-2 DOCKET NUMBERS STN 50-454 & 50-455
BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTE
MONTH AUG YEAR 1990

DATE	Disposition of Material			Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment
	Description	Class	Type				
8-16	Dewatered Resin, Class A, Cask - LSA, None			Exclusive Use	Richland, W	199.4	1.67
8-31	Dewatered Resin, Class A, Cask - LSA, None			Exclusive Use	Richland, W	199.4	1.44
MONTHLY TOTALS:					2	399	3.11

TABLE 2.0-1 (continued)

U-1 & U-2 DOCKET NUMBERS SN 90-454 & 90-455

BPP-100-11
Revision 9BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTE
MONTH SEPT YEAR 1990

DATE	Disposition of Material				Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment
	Description	Class	Type	Solidifying Agent				
9-5	DNW	Class A	Drums - LSA	None	Exclusive Use	Barnwell, SC	4763.2	7.03E-4
9-14	Dewatered Resin	Class A	Cask - LSA	None	Exclusive Use	Richland, W	199.4	7.7
MONTHLY TOTALS:						2	963	2.70

* Volume sent to vendor. This is not final burial volume.

TABLE 2.0-1 (continued)

BEP 1100-11
Revision 0

U-1 & U-2 DOCKET NUMBERS SN 50-454 & 50-455

BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTE
MONTH OCT YEAR 1990

DATE	Disposition of Material Description, Class, Type	Solidifying Agent	Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment
10-1	Dewatered Resin, Class A, Cask - LSA,	None	Exclusive Use	Richland, W	199.4	2.62
10-9	DAW, Class A, Drums - LSA,	None	Exclusive Use	Barnwell, SC	355.7	6.57
10-18	Dewatered Resin, Class B, Cask - LSA,	None	Exclusive Use	Barnwell, SC	132.4	30.5
MONTHLY TOTALS:				3	688	29.69

TABLE 2.0-1 (continued)

BFP 100-11
Revision 0U-1 & U-2 DUPLICATE NUMBERS SIN 50-454 & 50-455
BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID RADIOACTIVE WASTE
MONTH NOV YEAR 1990

DATE	Disposition of Material (Description, Class, Type, Solidifying Agent)			Mode of Transport	Destination	Volume Per Shipment (ft ³)	Cur ^a
11-1	Dewatered Resin, Class A, Cask - LSA, None			Exclusive Use	Richland, W	109.4	2.6
11-9	DAW, Class A, Drums - LSA, None			Exclusive Use	Barnwell, SC	4600	11
11-27	Dewatered Resin, Class A, Cask - LSA, None			Exclusive Use	Richland, W	199.4	3.39
MONTHLY TOTALS:					3	998.6	12.93

^a Volume sent to vendor. This is not final burial volume.

TABLE 2.0-1 (continued)

U-1 & U-2 DOCKET NUMBERS TR 50-454 & 50-455

BRP 1100-1)
Revision BBYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SCHEDULE REPORT
SOLID RADIOACTIVE WASTE
MONTH DEC YEAR 1990

DATE	Disposition of Material			Mode of Transport	Destination	Volume Per Shipment (ft ³)	Curies Per Shipment	
	Description	Class	Type					
12-7	Dewatered Resin, Class A, Cast - LSA,	None		Exclusive Use	Richland, W	199.4	1.39	
12-12	DAW, Class A, Drums - LSA,	None		Exclusive Use	Barnwell, SC	237.6	4.1	
12-17	Dewatered Resin, Class A, Cast - LSA,	None		Exclusive Use	Richland, W	199.4	1.99	
MONTHLY TOTALS:						3	636.4	7.48

FIGURE 3.1-1

Estimated Cumulative Gamma Dose (in mrem)
from the Byron Station for the period
January-December 1990

Isopleth Labels

Small figure - multiply by 10^{-5}

Large figure - multiply by 10^{-6}

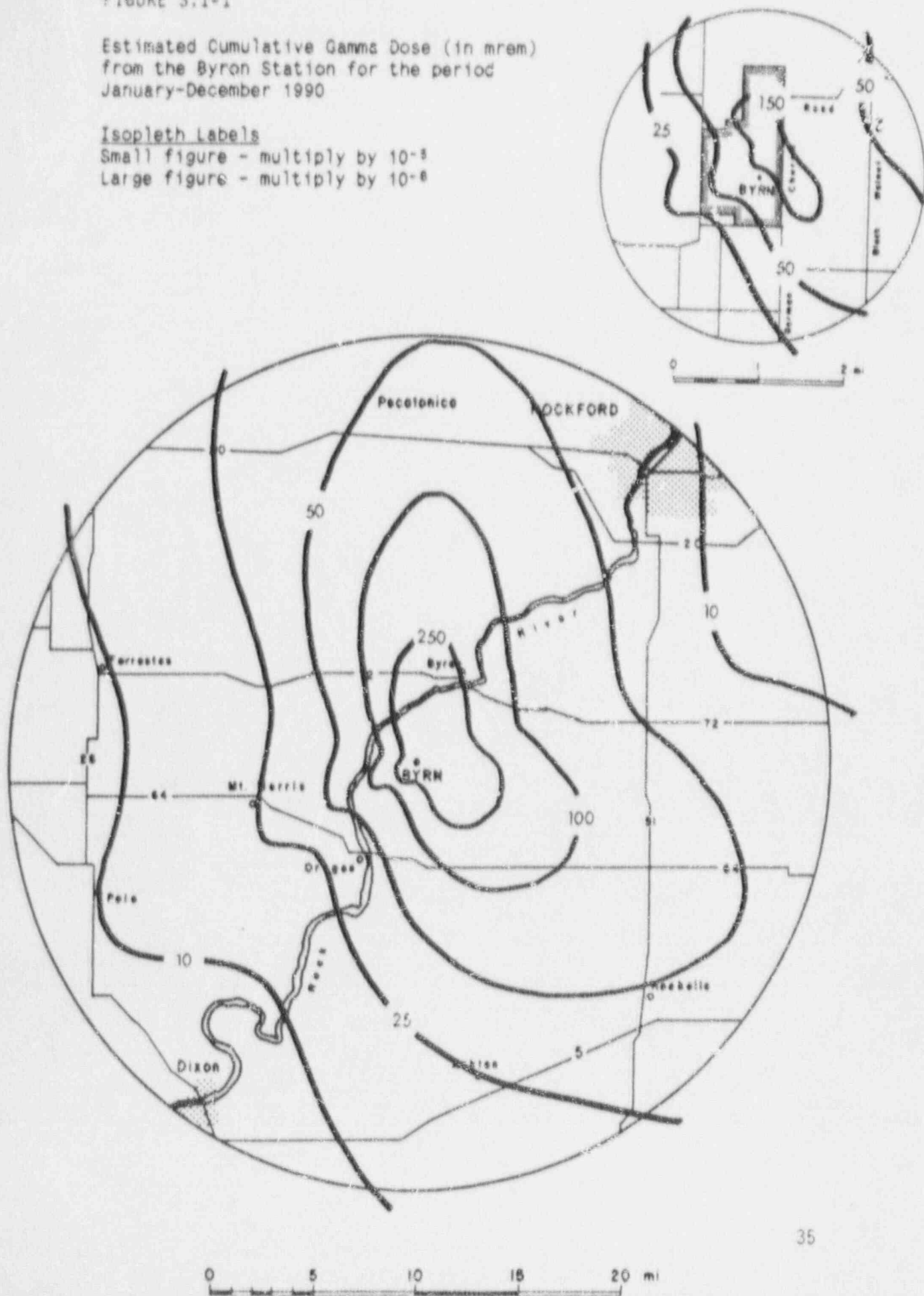


FIGURE 3.1-2

Estimated Total Concentrations (in pCi/m^3)
of Noble Gases from the Byron Station
for the period January-December 1990

Isopleth Labels

Small figure - multiply by 10^{-6}

Large figure - multiply by 10^{-1}

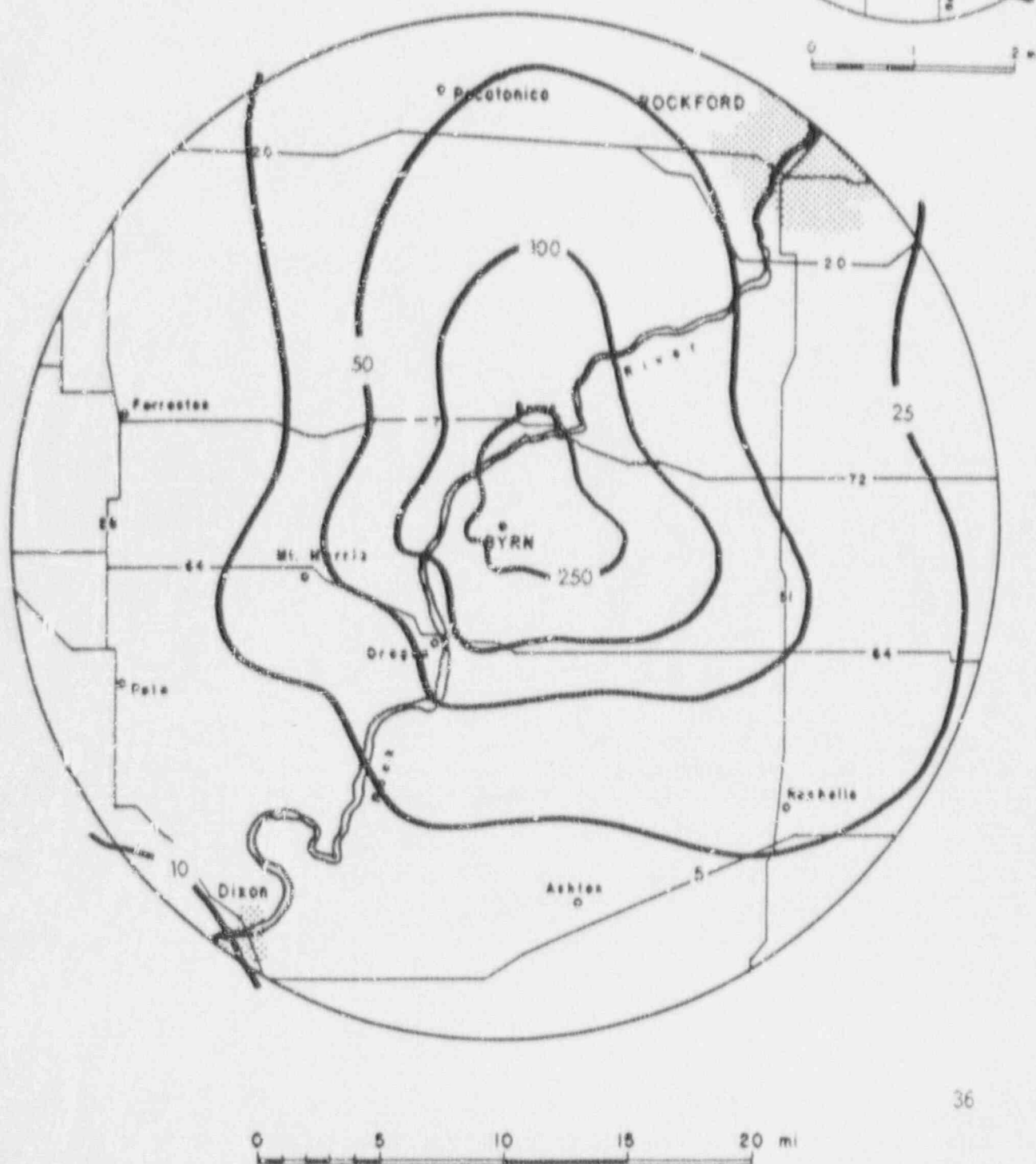


FIGURE 3.1-3

Estimated Total Concentrations (in pCi/m³)
of Iodine from the Byron Station for
the period January-December 1990

Isopleth Labels

Small figure - multiply by 10⁻⁶

Large figure - multiply by 10⁻⁶

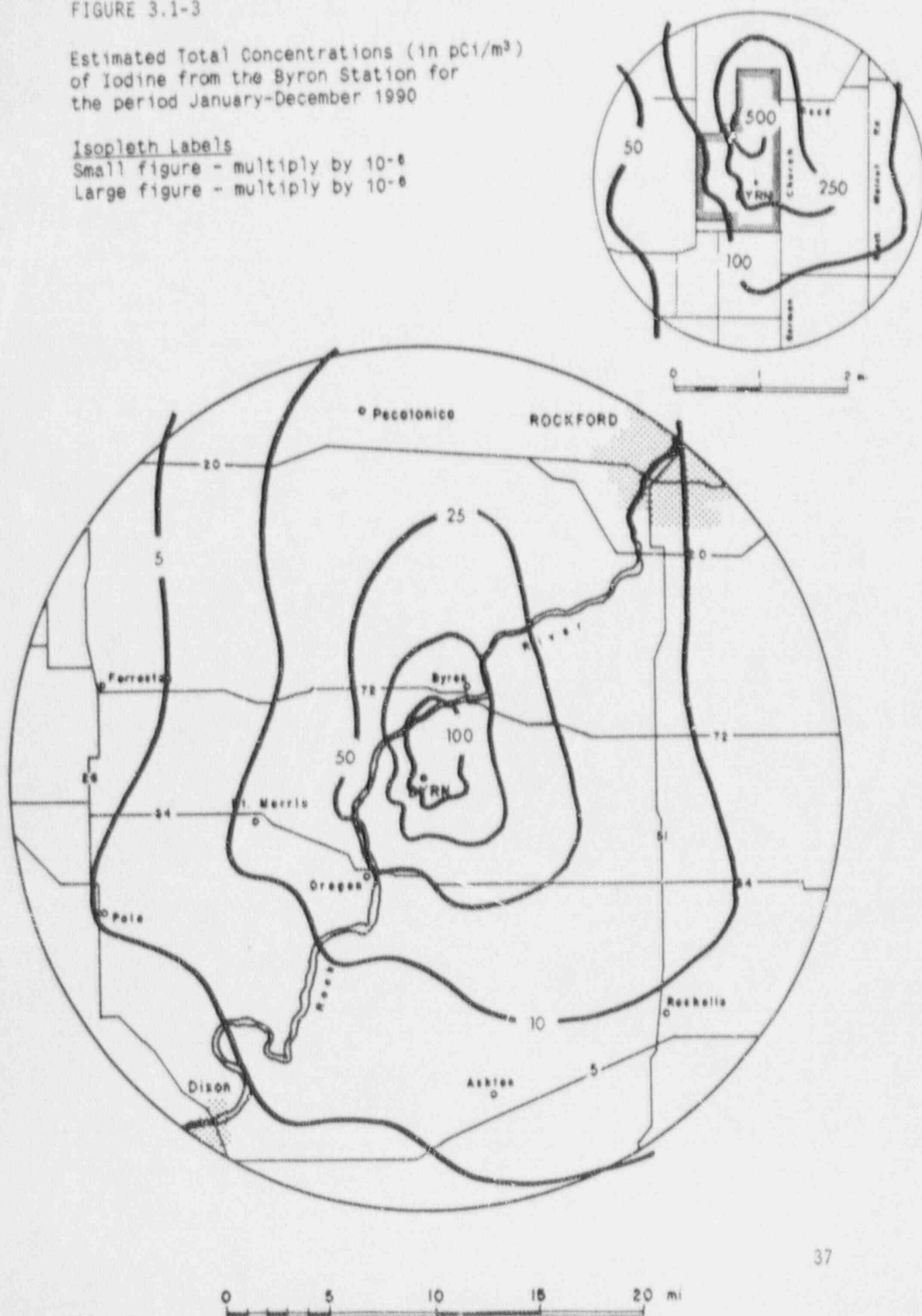


FIGURE 3.1-4

Estimated Total Concentrations (in pCi/m^3) of
Particulate Matter from the Byron Station
for the period January-December 1990

Isopleth Labels

Small figure - multiply by 10^{-6}

Large figure - multiply by 10^{-8}

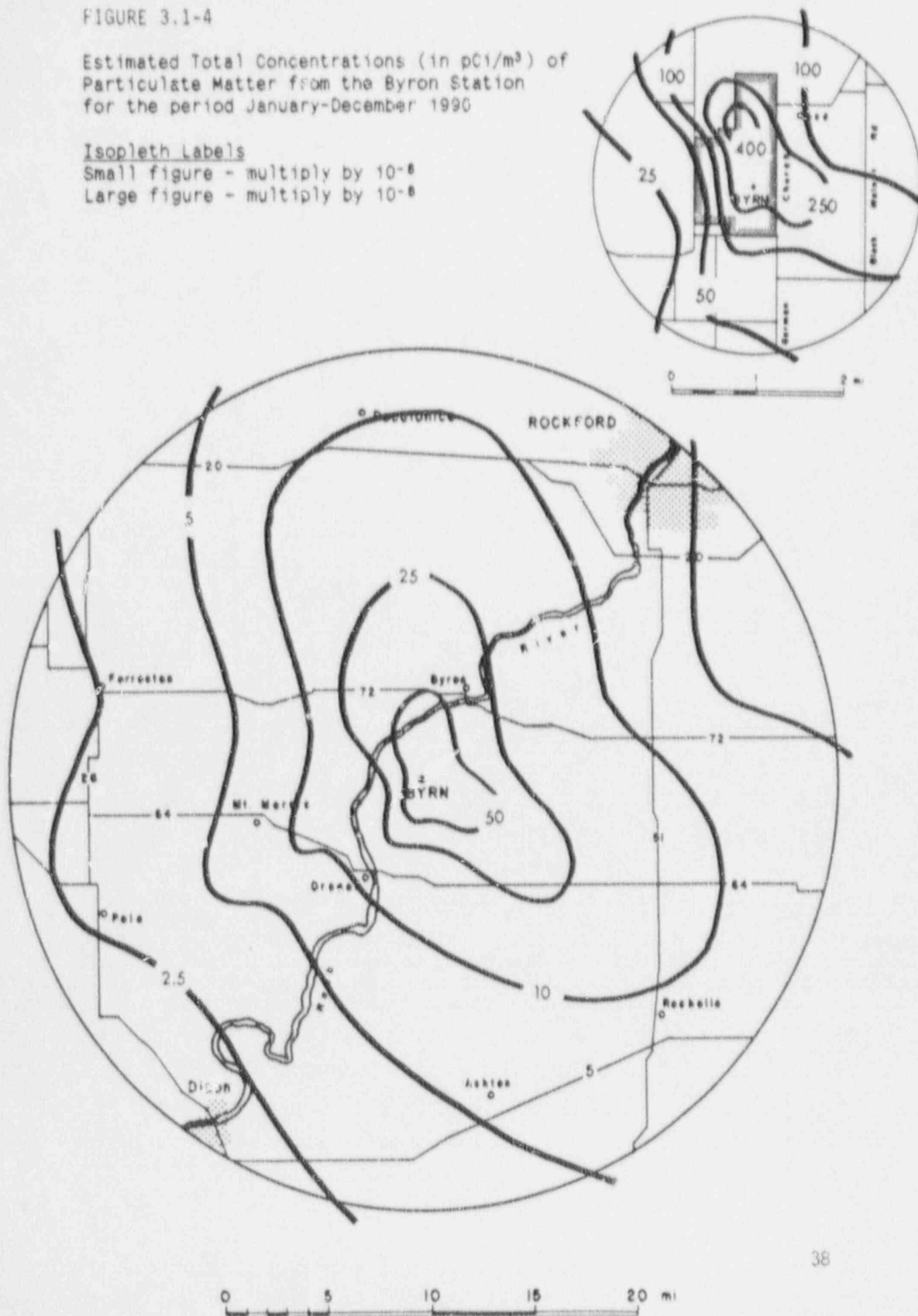


TABLE 3.1-1

BYRON UNIT ONE

1990 ANNUAL REPORT
 MAXIMUM DOSES RESULTING FROM AIRBORNE RELEASES
 PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 01/16/91
 INFANT RECEPTOR

TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
GAMMA AIR (MRAD)	1.25E-03 (SE)	2.08E-04 (SE)	9.35E-05 (SE)	5.79E-06 (SE)	1.56E-03 (SE)
BETA AIR (MRAD)	4.71E-03 (SE)	8.58E-04 (SE)	3.73E-04 (SE)	1.23E-05 (SE)	5.96E-03 (SE)
TOT. BODY (MREM)	3.47E-04 (SE)	5.31E-05 (SE)	2.54E-05 (SE)	2.67E-06 (SE)	4.28E-04 (SE)
SKIN (MREM)	2.62E-03 (SE)	4.39E-04 (SE)	1.94E-04 (SE)	1.07E-05 (SE)	3.26E-03 (SE)
ORGAN (MREM)	1.86E-04 (SE)	6.34E-05 (NE)	4.79E-03 (NE)	3.70E-05 (NE)	4.98E-03 (NE)
	THYROID	LIVER	THYROID	LIVER THYROID KIDNEY LUNG GI-LLI	THYROID

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. I
 INFANT RECEPTOR

	QTRLY OBJ	1ST QTR JAN-MAR	2ND QTR APR-JUN	3RD QTR JUL-SEP	4TH QTR OCT-NOV	YRLY OBJ	% OF APP. I
GAMMA AIR (MRAD)	5.0	0.02	0.00	0.00	0.00	10.0	0.02
BETA AIR (MRAD)	10.0	0.05	0.01	0.00	0.00	20.0	0.03
TOT. BODY (MREM)	2.5	0.01	0.00	0.00	0.00	5.0	0.01
SKIN (MREM)	7.5	0.03	0.01	0.00	0.00	15.0	0.02
ORGAN (MREM)	7.5	0.00	0.00	0.06	0.00	15.0	0.03
		THYROID	LIVER	THYROID	LIVER THYROID KIDNEY LUNG GI-LLI		THYROID

RESULTS BASED UPON

ODCM ANNEX
 REVISION 0.8
 AUGUST 1990

TABLE 3.1-1 (continued)

BYRON UNIT ONE

1990 ANNUAL REPORT
 MAXIMUM DOSES RESULTING FROM AIRBORNE RELEASES
 PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 01/16/91
 ADULT RECEPTOR

TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
GAMMA AIR (MRAD)	1.25E-03 (SE)	2.08E-04 (SE)	9.35E-05 (SE)	5.79E-06 (SE)	1.56E-03 (SE)
BETA AIR (MRAD)	4.71E-03 (SE)	8.56E-04 (SE)	3.73E-04 (SE)	1.23E-05 (SE)	5.96E-03 (SE)
TOT. BODY (MREM)	3.47E-04 (SE)	5.31E-05 (SE)	2.54E-05 (SE)	2.67E-06 (SE)	4.28E-04 (SE)
SKIN (MREM)	2.62E-03 (SE)	4.39E-04 (SE)	1.94E-04 (SE)	1.07E-05 (SE)	3.24E-03 (SE)
ORGAN (MREM)	1.47E-04 (SE)	8.88E-05 (ESE)	2.35E-03 (ESE)	4.31E-05 (ESE)	2.58E-03 (ESE)
	THYROID	THYROID	THYROID	LIVER THYROID KIDNEY LUNG GI-LLI	THYROID

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. I
 ADULT RECEPTOR

----- % OF APP. I, -----							
	QTRLY OBJ	1ST QTR JAN-MAR	2ND QTR APR-JUN	3RD QTR JUL-SEP	4TH QTR OCT-NOV	YRLY OBJ	% OF APP. I
GAMMA AIR (MRAD)	5.0	0.02	0.00	0.00	0.00	10.0	0.02
BETA AIR (MRAD)	10.0	0.05	0.01	0.00	0.00	20.0	0.03
TOT. BODY (MREM)	2.5	0.01	0.00	0.00	0.00	5.0	0.01
SKIN (MREM)	7.5	0.03	0.01	0.00	0.00	15.0	0.02
ORGAN (MREM)	7.5	0.00	0.00	0.03	0.00	15.0	0.02
		THYROID	THYROID	THYROID	LIVER THYROID KIDNEY LUNG GI-LLI		THYROID

RESULTS BASED UPON

ODCM ANNEX
 REVISION 0.8
 AUGUST 1990

TABLE 3.1-1 (continued)

BYRON UNIT TWO

1990 ANNUAL REPORT
 MAXIMUM DOSES RESULTING FROM AIRBORNE RELEASES
 PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 02/22/91
 INFANT RECEPTOR

TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
GAMMA AIR (MRAD)	1.28E-03 (SE)	8.25E-04 (SE)	5.68E-04 (SE)	9.93E-06 (SE)	2.68E-03 (SE)
BETA AIR (MRAD)	4.82E-03 (SE)	3.31E-03 (SE)	2.28E-03 (SE)	3.98E-05 (SE)	1.04E-02 (SE)
TOT. BODY (MREM)	3.57E-04 (SE)	2.11E-04 (SE)	1.45E-04 (SE)	2.73E-06 (SE)	7.15E-04 (SE)
SKIN (MREM)	2.68E-03 (SE)	1.67E-03 (SE)	1.14E-03 (SE)	2.14E-05 (SE)	5.52E-03 (SE)
ORGAN (MREM)	3.06E-04 (SE)	4.81E-05 (NE)	8.11E-03 (NE)	8.44E-05 (NE)	8.41E-03 (NE)
	THYROID	THYROID	THYROID	LIVER THYROID KIDNEY LUNG GI-LLI	THYROID

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. I
INFANT RECEPTOR

QTRLY OBJ	% OF APP. I				YRLY OBJ	% OF APP. I
	1ST QTR JAN-MAR	2ND QTR APR-JUN	3RD QTR JUL-SEP	4TH QTR OCT-NOV		
GAMMA AIR (MRAD)	5.0	0.03	0.02	0.01	0.00	10.0
BETA AIR (MRAD)	10.0	0.05	0.03	0.02	0.00	20.0
TOT. BODY (MREM)	2.5	0.01	0.01	0.01	0.00	5.0
SKIN (MREM)	7.5	0.04	0.02	0.02	0.00	15.0
ORGAN (MREM)	7.5	0.00	0.00	0.11	0.00	15.0
	THYROID	THYROID	THYROID	LIVER THYROID KIDNEY LUNG GI-LLI		THYROID

RESULTS BASED UPON

ODCM ANNEX
 REVISION 0.8
 AUGUST 1990

TABLE 3.1-1 (continued)

BYRON UNIT TWO

1990 ANNUAL REPORT
 MAXIMUM DOSES RESULTING FROM AIRBORNE RELEASES
 PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 02/22/91
 ADULT RECEPTOR

TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
GAMMA AIR (MRAD)	1.28E-03 (SE)	8.25E-04 (SE)	5.68E-04 (SE)	9.93E-06 (SE)	2.68E-03 (SE)
BETA AIR (MRAD)	4.82E-03 (SE)	3.31E-03 (SE)	2.28E-03 (SE)	3.98E-05 (SE)	1.04E-02 (SE)
TOT. BODY (MREM)	3.57E-04 (SE)	2.11E-04 (SE)	1.45E-04 (SE)	2.73E-06 (SE)	7.15E-04 (SE)
SKIN (MREM)	2.68E-03 (SE)	1.67E-03 (SE)	1.14E-03 (SE)	2.14E-05 (SE)	5.52E-03 (SE)
ORGAN (MREM)	2.42E-04 (SE)	8.76E-05 (ESE)	3.92E-03 (ESE)	7.52E-05 (NE)	4.25E-03 (ESE)
	THYROID	THYROID	THYROID	LIVER THYROID KIDNEY LUNG GI-LLI	THYROID

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. I
ADULT RECEPTOR

	(TRLY OBJ)	1ST QTR JAN-MAR	2ND QTR APR-JUN	3RD QTR JUL-SEP	4TH QTR OCT-NOV	YRLY OBJ	% OF APP. I
GAMMA AIR (MRAD)	5.0	0.03	0.02	0.01	0.00	10.0	0.03
BETA AIR (MRAD)	10.0	0.05	0.03	0.02	0.00	20.0	0.05
TOT. BODY (MREM)	2.5	0.01	0.01	0.01	0.00	5.0	0.01
SKIN (MREM)	7.5	0.04	0.02	0.02	0.00	15.0	0.04
ORGAN (MREM)	7.5	0.00	0.00	0.05	0.00	15.0	0.03
		THYROID	THYROID	THYROID	LIVER THYROID KIDNEY LUNG GI-LLI		THYROID

RESULTS BASED UPON

ODCM ANNEX
 REVISION 0.8
 AUGUST 1990

TABLE 3.2-1

BYRON UNIT ONE
ADULT RECEPTOR

1990 ANNUAL REPORT
 MAXIMUM DOSES (MREM) RESULTING FROM LIQUID EFFLUENTS
 PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 02/22/91

DOSE TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
TOTAL BODY	2.23E-03	7.20E-04	7.03E-03	1.47E-03	1.15E-02
INTERNAL ORGAN	1.31E-02	1.16E-02	9.27E-03	7.11E-03	4.06E-02
	GI-LLI	GI-LLI	LIVER	GI-LLI	GI-LLI

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. 1

	QTRLY OBJ	1ST QTR JAN-MAR	2ND QTR APR-JUN	3RD QTR JUL-SEP	4TH QTR OCT-NOV	YRLY OBJ	% OF APP. 1
TOTAL BODY (MREM)	1.5	0.15	0.05	0.47	0.10	3.0	0.38
CRIT. ORGAN (MREM)	5.0	0.26	0.23	0.19	0.14	10.0	0.41
		GI-LLI	GI-LLI	LIVER	GI-LLI		GI-LLI

RESULTS BASED UPON
 ODCM ANNEX
 REVISION 0
 MARCH 1989

TABLE 3.2-1 (continued)

BYRON UNIT TWO
ADULT RECEPTOR

1990 ANNUAL REPORT
 MAXIMUM DOSES (MREM) RESULTING FROM LIQUID EFFLUENTS
 PERIOD OF RELEASE - 01/01/90 TO 12/31/90 CALCULATED 02/22/91

DOSE TYPE	1ST QUARTER JAN-MAR	2ND QUARTER APR-JUN	3RD QUARTER JUL-SEP	4TH QUARTER OCT-DEC	ANNUAL
TOTAL BODY	2.23E-03	7.20E-04	7.03E-03	1.47E-03	1.15E-02
INTERNAL ORGAN	1.31E-02	1.16E-02	9.27E-03	7.11E-03	4.06E-02
	GI-LLI	GI-LLI	LIVER	GI-LLI	GI-LLI

THIS IS A REPORT FOR THE CALENDAR YEAR 1990

COMPLIANCE STATUS - 10 CFR 50 APP. 1

	----- % OF APP. 1. -----						
	QTRLY OBJ	1ST QTR JAN-MAR	2ND QTR APR-JUN	3RD QTR JUL-SEP	4TH QTR OCT-NOV	YRLY OBJ	% OF APP. 1
TOTAL BODY (MREM)	1.5	0.15	0.05	0.47	0.10	3.0	0.38
CRIT. ORGAN(MREM)	5.0	0.26	0.23	0.19	0.14	10.0	0.41
		GI-LLI	GI-LLI	LIVER	GI-LLI		GI-LLI

RESULTS BASED UPON
 ODCM ANNEX
 REVISION 0
 MARCH 1989

FIGURE 5.0-1

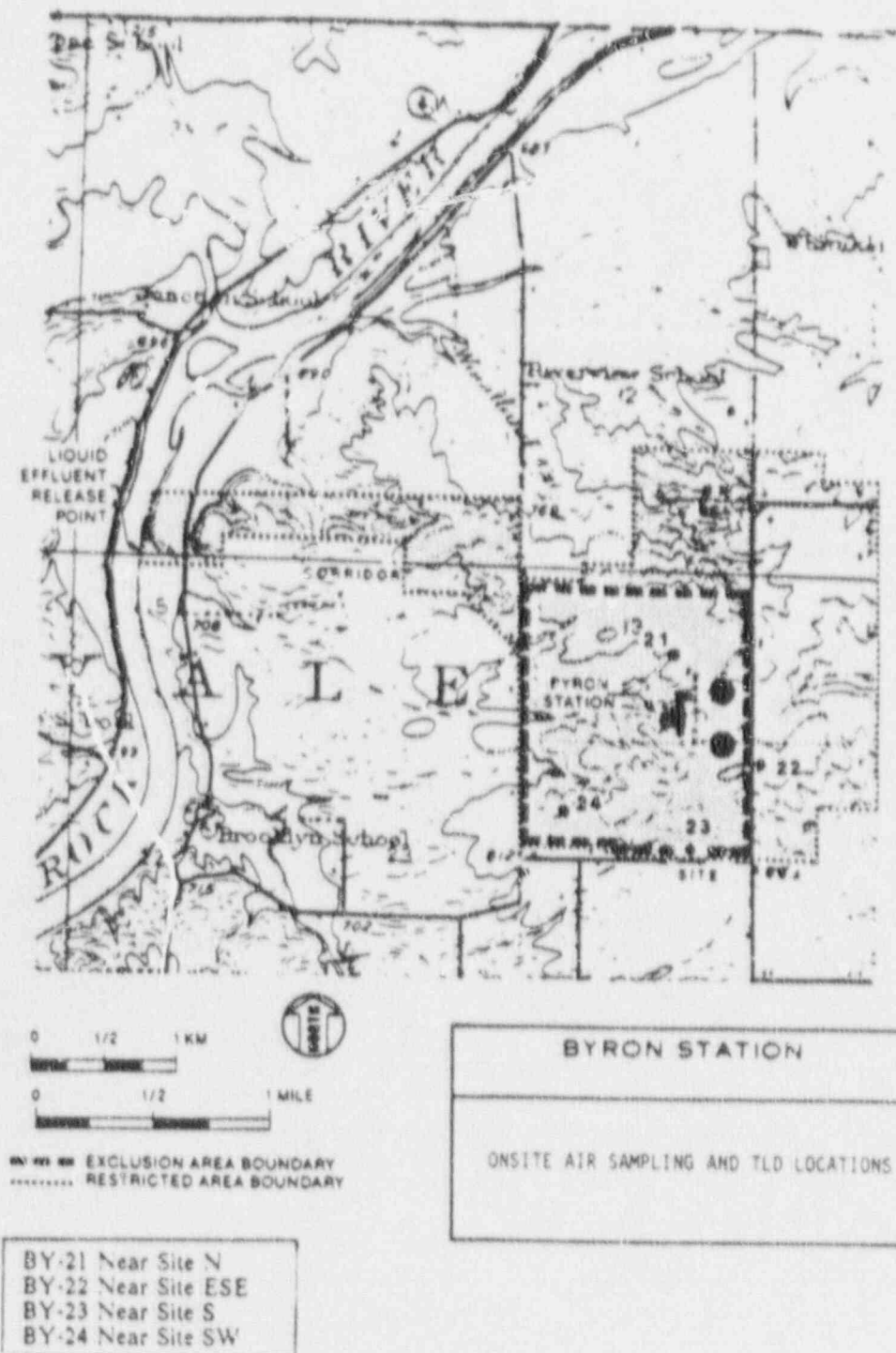


FIGURE 5.0-2

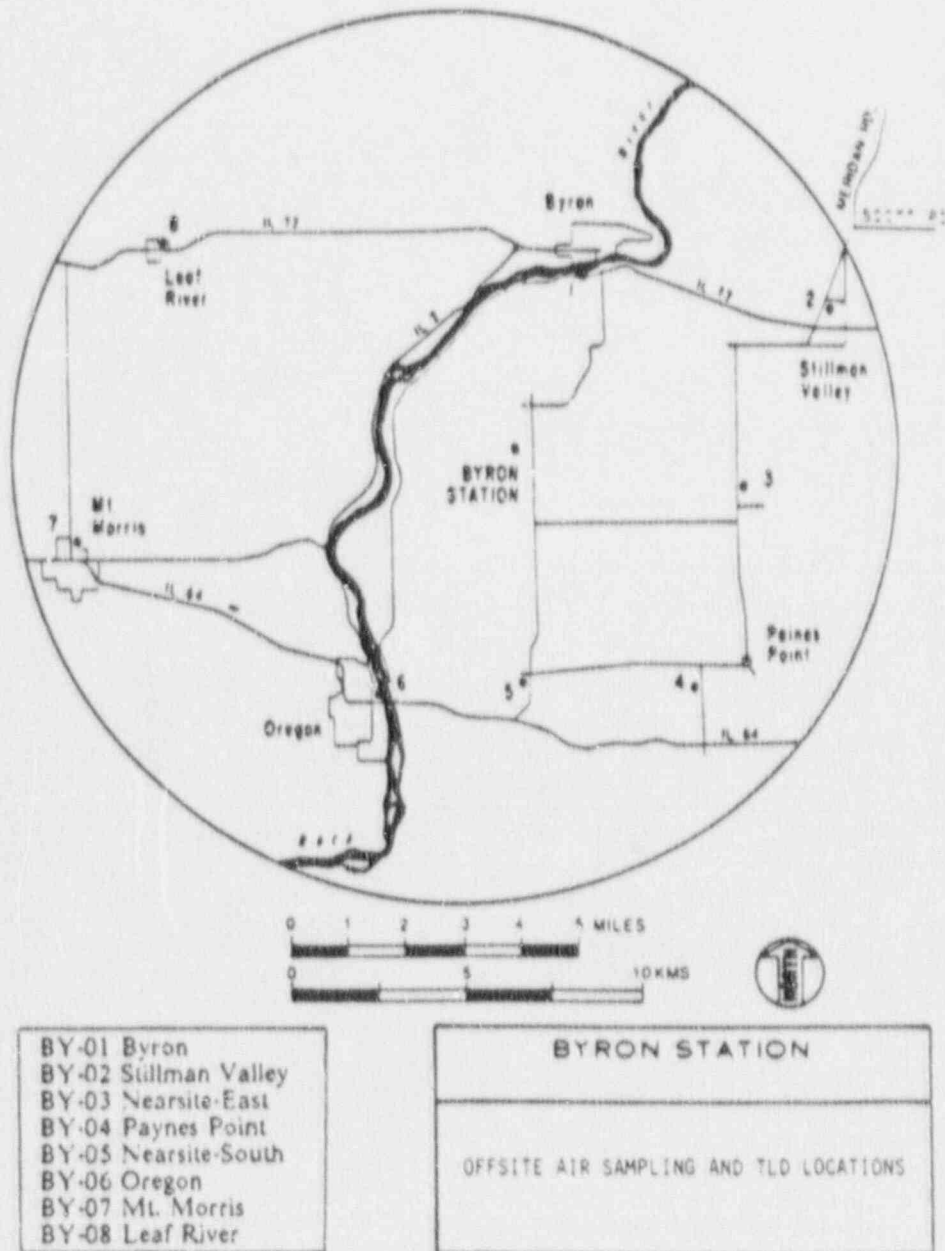
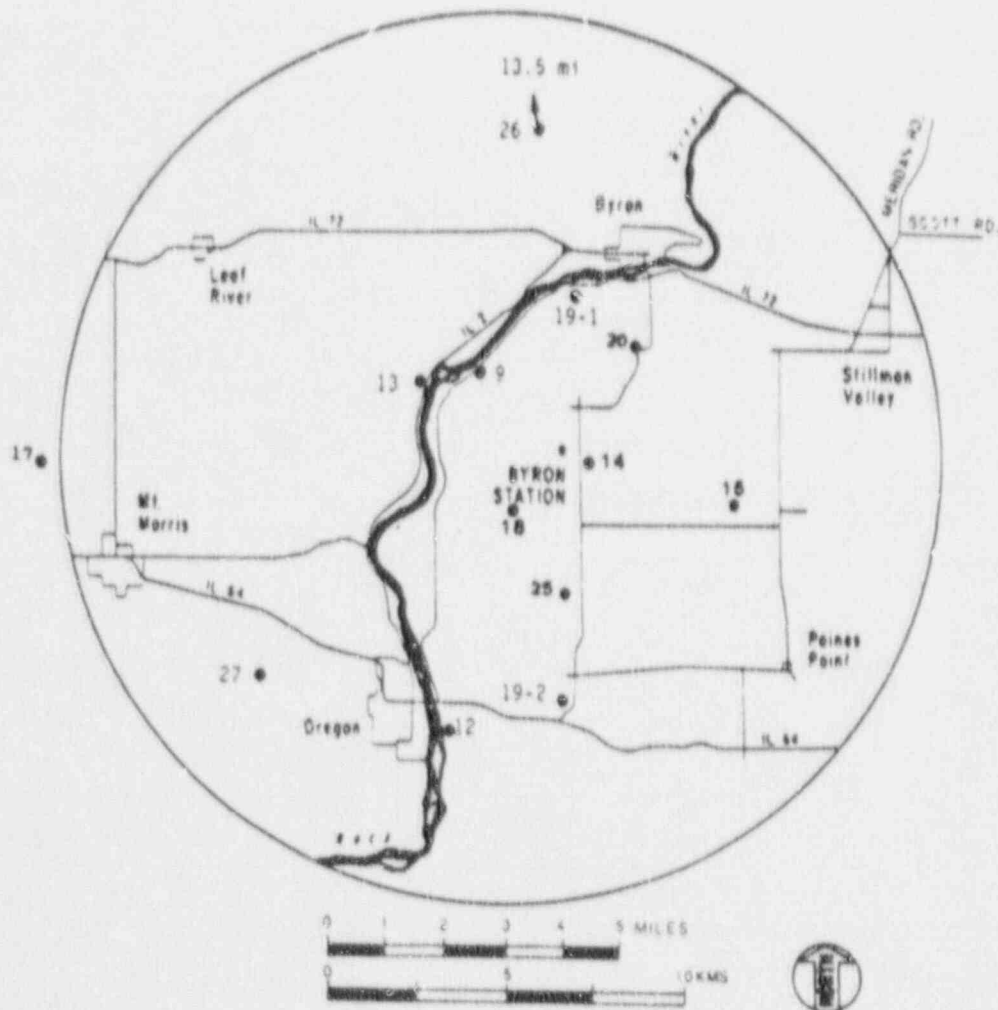


FIGURE 5.C-3



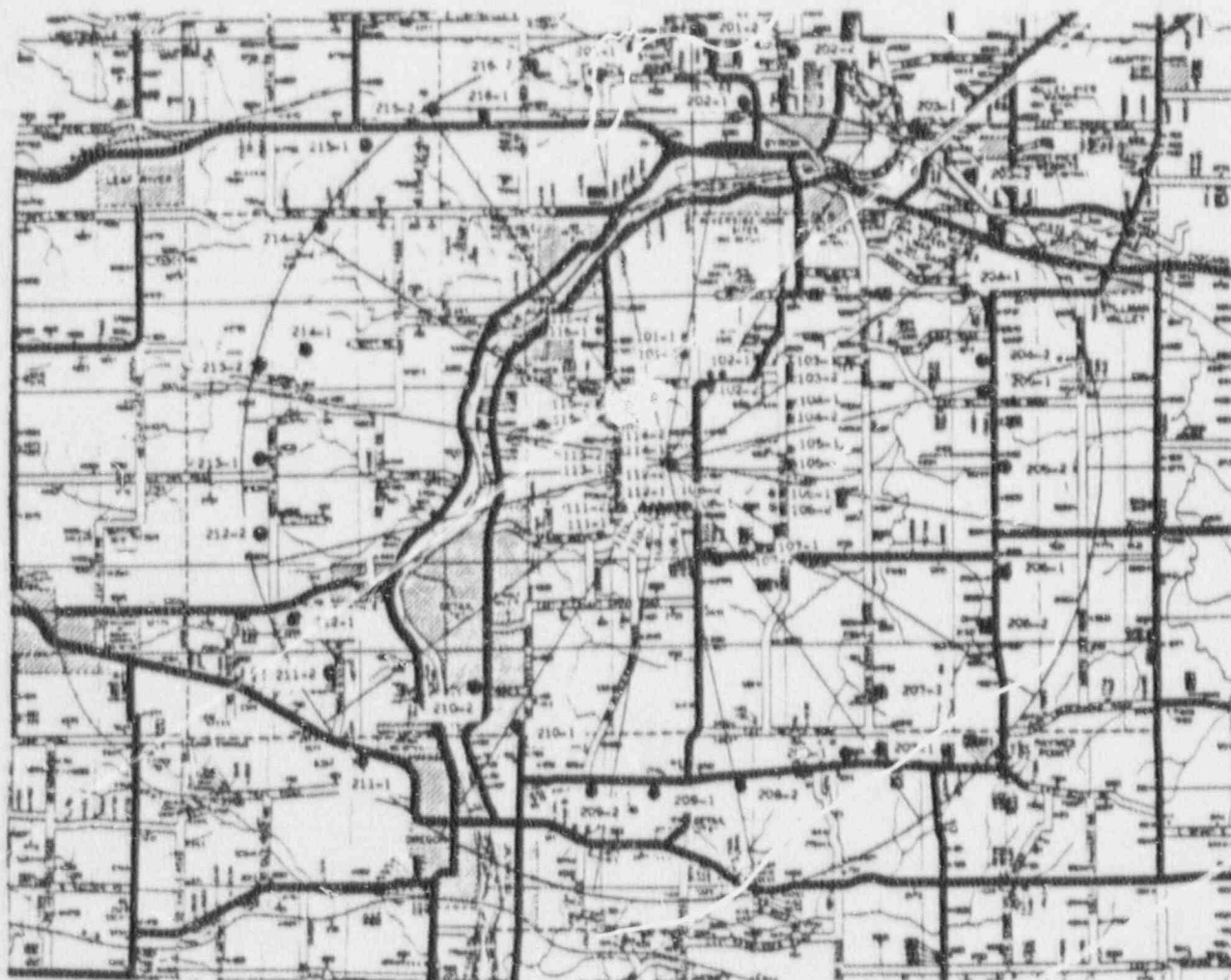
- 09 WOODLAND CREEK
- 12 OREGON POOL OF ROCK RIVER
- 13 ROCK RIVER, UPSTREAM
- 14 OFFSITE WELL WATER
- 15 WARREN DANAKAS DAIRY
- 17 WHITTEN HOLSTEINS DAIRY
- 18 MCCOY FARMSTAND WELL
- 19-1 RIVER ROAD ACROSS FROM AIR SAMPLER BY 01
- 19-2 SOUTH OF AIR SAMPLER BY 05
- 20 KENNETH REEVERTS FARM
- 25 RICHARD OLTMAN DAIRY FARM
- 26 HAZZARD DAIRY
- 27 KENNETH DRUEN DAIRY

* Replaced by Hazzard Dairy (BY 26) July 16, 1990

BYRON STATION

INGESTION AND WATERBORNE EXPOSURE
PATHWAY SAMPLE LOCATIONS

FIGURE 5.0-4



LEGEND

HARD SURFACE ROAD
 DRIVE / DIRT ROAD
 SCALE

HOUSE LOCATION
 HOUSE NUMBER / ADDRESS

Location of TLD



BYRON STATION

INNER RING AND OUTER RING TLD LOCATIONS

TABLE 5.0-1

**Byron Station
Radiological Environmental Monitoring
Locations**

	Air Sampling TLD	Cooling Water	Fish	Lake Water	Milk	Public Water	Rabbits	Sediments	Surface Water	Vegetables	Ground/Well Water
BY-01 Byron	OO										
BY-02 Sullman Valley	OO										
BY-03 Nearsite-East	OO										
BY-04 Paynes Point	OO										
BY-05 Nearsite-South	OO										
BY-06 Oregon	OO										
BY-07 Mt. Morris	OO										
BY-08 Leaf River	OO										
BY-09 Woodland Creek											
BY-12 Oregon Pool of Rock River			O					O	O		
BY-13 Rock River, Upstream			O					O	O		
BY-14 Offsite Well Water											O
BY-15 Warren Danakas Dairy					O						
BY-17 Whitten Holsteins Dairy*					O						
BY-18 McCoy Farmstand Well											O
BY-19-1 River Road Across from BY-01										O	
BY-19-2 South of BY-05										O	
BY-20 Kenneth Reeverts Dairy					O						
BY-21 Near Site N	OO										
BY-22 Near Site ESE	OO										
BY-23 Near Site S	OO										
BY-24 Near Site SW	OO										
BY-25 Richard Olman Dairy					O						
BY-26 Hazzard Dairy					O						
BY-27 Kenneth Druen Dairy					O						

* Replaced by Hazzard Dairy (BY-26)
on July 16, 1990.

CENSUS

Dairy
Cattle
Residence

TABLE 5.0-2

BYRON STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLING LOCATIONS

1. AIR SAMPLERS

<u>Site Code^a</u>	<u>Location</u>	<u>Distance (miles)</u>	<u>Direction (°)</u>
BY-01	Byron	3.5	25
BY-02 (C)	Stillman Valley	6.2	56
BY-03	Nearsite - East	3.8	85
BY-04	Paynes Point	4.5	140
BY-05	Nearsite - South	3.6	180
BY-06	Oregon	4.6	213
BY-07 (C)	Mt. Morris	7.8	240
BY-08 (C)	Leaf River	7.0	315
BY-21	Nearsite North	0.3	9
BY-22	Nearsite East-Southeast	0.3	101
BY-23	Nearsite South	0.6	182
BY-24	Nearsite Southwest	0.6	229

2. TLDs

a. Same as No. 1

b. Special TLD Samplers

<u>Site Code</u>	<u>Distance (miles)</u>	<u>Direction (°)</u>
Inner Ring		
BY-101-1,2	1.2	13
BY-102-1,2	1.0	25
BY-103-1,2	1.7	51
BY-104-1,2	1.4	64
BY-105-1,2	1.3	84
BY-106-1,2	1.4	108
BY-107-1,2	1.4	141
BY-108-1,2	0.6	158
BY-109-1,2	0.6	183
BY-110-1,2	0.6	201
BY-111-1,2	0.9	235
BY-112-1,2	0.8	247

^a Control (reference) locations are denoted by a "C" after site code. All other locations are indicators.

TABLE 5.0-2 (continued)

BYRON STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLING LOCATIONS

2. TLDs

b. Special TLD Samplers (continued)

<u>Site Code</u>	<u>Distance (miles)</u>	<u>Direction (°)</u>
BY-113-1,2	0.7	270
BY-114-1,2	0.8	298
BY-115-1,2	1.0	314
BY-116-1,2	1.4	329
Outer Ring		
BY-201-1,2	4.8	360
BY-202-1,2	4.5	13
BY-203-1,2	5.1	42
BY-204-1,2	4.2	66
BY-205-1,2	3.9	89
BY-206-1,2	4.2	112
BY-207-1,2	4.2	140
BY-208-1,2	4.1	159
BY-209-1,2	3.8	189
BY-210-1,2	3.6	218
BY-211-1,2	5.2	238
BY-212-1,2	4.9	257
BY-213-1,2	5.0	280
BY-214-1,2	4.8	298
BY-215-1,2	5.2	322
BY-216-1,2	4.8	337

3. MILK

<u>Site Code^a</u>	<u>Location</u>	<u>Distance (miles)</u>	<u>Direction (°)</u>
BY-15	Warren Danakas Dairy Farm	3.3	110
BY-17 (C)	Whitten Holstein Dairy Farm ^b	8.5	250
BY-20	Kenneth Reeverts Dairy Farm	2.1	37
BY-25	Richard Oltmann Dairy Farm ^c	2.2	180
BY-26 (C)	Hazzard Dairy Farm	13.5	355
BY-27	Kenneth Druen Dairy Farm ^d	5.3	236

^a Control (reference) locations are denoted by a "C" after site code. All other locations are indicators.

^b Whitten Dairy was replaced by Hazzard Dairy Farm on July 2, 1990.

^c Bill Leupkes farm was burned out on December 25, 1989 and was replaced by Richard Oltmann farm on March 19, 1990.

^d Additional dairy was not required by ODCM but was included to ensure that the program has at least four dairies.

TABLE 5.0-2 (continued)

BYRON STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLING LOCATIONS

4. VEGETABLES

<u>Site Code</u>	<u>Location</u>	<u>Distance (miles)</u>	<u>Direction (°)</u>
BY-19-1	River Road Across from AP-1	3.5	25
BY-19-2	Just South of AP-5	3.6	180

5. GROUND/WELL WATER

<u>Site Code</u>	<u>Location</u>	<u>Distance (miles)</u>	<u>Direction (°)</u>
BY-14	CECo Off-site Well	0.3	101
BY-18	McCoy Farmstead (CECo-owned well)	1.0	235

6. SURFACE WATER

<u>Site Code</u>	<u>Location</u>	<u>Distance (miles)</u>	<u>Direction (°)</u>
BY-09	Woodland Creek	2.1	320
BY-12	Oregon Pool of Rock River	4.5	213
BY-13	Rock River Upstream	2.6	302

7. FISH

<u>Site Code</u>	<u>Location</u>	<u>Distance (miles)</u>	<u>Direction (°)</u>
BY-12	Oregon Pool of Rock River	4.5	213
BY-13	Rock River Upstream	2.6	302

8. SHORELINE SEDIMENTS

<u>Site Code</u>	<u>Location</u>	<u>Distance (miles)</u>	<u>Direction (°)</u>
BY-12	Oregon Pool of Rock River	4.5	213
BY-13	Rock River Upstream	2.6	302

TABLE 5.0-2 (continued)

BYRON STATION
ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLE COLLECTION AND ANALYSES

Sample Media	Code ^a	Location Site	Collection Frequency	Type of Analysis	Frequency of Analysis	Remarks
1. Airborne Particulates	BY-1 BY-2 (C) BY-3 BY-4 BY-5 BY-6 BY-7 (C) BY-8 (C) BY-21 BY-22 BY-23 BY-24	Byron Stillman Valley Nearsite East Paynes Point Nearsite South Oregon Mt. Morris Leaf River Near Site North Near Site East-Southeast Near Site South Near Site Southwest	Continuous operation for a week	Gross beta Gamma Isot Gamma Isot Filter Exchange	Weekly Quarterly Weekly Weekly	On all samples. On quarterly composites from each location. If gross beta activity in air particulate samples >10 times the yearly mean of control samples.
2. Airborne Iodine	Same as 1.		Continuous operation for a week	I-131	Weekly	On all samples.
3. Air Sampling Train	Same as 1.		--	Test and Maintenance	Weekly	On all samples.
4. TLD	Same as 1. BY-101-1,2 102-1,2 103-1,2 104-1,2 105-1,2 106-1,2 107-1,2 108-1,2 109-1,2 110-1,2 111-1,2 112-1,2 113-1,2 114-1,2 115-1,2 116-1,2	Inner Ring	Quarterly	Gamma	Quarterly	Two sets at all AP locations. One set read quarterly. Second set read if required by Commonwealth Edison. At other locations, all sets read quarterly. Minimum of two TLDs per set.

^a Control (reference) locations are denoted by a "C" in this column. All other locations are indicators.

TABLE 5.0-2 (continued)

BYRON STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLE COLLECTION AND ANALYSES

Sample Media	Code ^a	Location Site	Collection Frequency	Type of Analysis	Frequency of Analysis	Remarks
4. TLDs (continued)	BY-201-1,2 202-1,2 203-1,2 204-1,2 205-1,2 206-1,2 207-1,2 208-1,2 209-1,2 210-1,2 211-1,2 212-1,2 213-1,2 214-1,2 215-1,2 216-1,2	Outer Ring				
5. Milk	BY-15 BY-17 (C) BY-20 BY-25 BY-26 (C) BY-27	H. Danakas Dairy Whitten Holstein Dairy ^b K. Reeverts R. Oltman Dairy ^c Hazzard Dairy K. Druen Dairy ^d	Seminmonthly May-October Monthly November-April	I-131 Gamma Isot.	Seminmonthly May-October Monthly November-April	On all samples.
6. Vegetables	BY-19-1 BY-19-2		Annually at harvest	Gamma Isot.	Annually	Four varieties from each location as available at harvest. (Gamma isotopic on edible portion only.)
7. Ground/Well Water	BY-14 BY-18	CECo Offsite Well McCoy Farmstead	Seminmonthly	Gross Beta Gamma Isot. Tritium I-131	Monthly Monthly Quarterly Seminmonthly	On monthly composite for each location. On monthly composite for each location. On quarterly composite for each location. On seminmonthly composite when dose calcu- lated for water consumption is greater than one mrem per year.
8. Surface Water	BY-09 BY-12 BY-13 (C)	Woodland Creek Oregon Pool of Rock River Rock River, Upstream	Weekly	Tritium Gamma Isot.	Quarterly Monthly	On quarterly composite from each location. On monthly composite from each location.

^a Control (references) locations are denoted by a "C" in this column. All other locations are indicators.

^b Whitten Dairy was replaced by Hazzard Dairy on July 2, 1990.

^c Bill Leupkes farm was burned out on December 25, 1989 and was replaced by Richard Oltmann farm on March 19, 1990.

^d Additional dairy was not required by ODCM but was included to ensure that the program has at least four dairies.

TABLE 5.0-2 (continued)

BYRON STATION

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM, SAMPLE COLLECTION AND ANALYSES

Sample Media	Location		Collection Frequency	Type of Analysis	Frequency of Analysis	Remarks
	Code ^a	Site				
9. Fish	BY-12	Oregon Pool of Rock River	Three times a year.	Gamma Isot	Three times a year, spring, summer, and fall	From Oregon pool of Rock River, on edible portions only. At least two species.
	BY-13	Rock River, upstream				
10. Shoreline Sediments	BY-12	Oregon Pool of Rock River	Semiannual	Gamma Isot	Semiannual	On all samples
	BY-13	Upstream of Oregon Dam				
11. Dairy Census	a. Site boundary to 2 miles		--	a. Enumeration by a door-to-door or equivalent counting technique.	Annually	During grazing season.
	b. 2 miles to 5 miles		--	b. Enumeration by using referenced information from county agricultural agents or other reliable sources.	Annually	During grazing season.
	c. At dairies listed in Item 5.		--	c. Inquire as to feeding practices: 1. Pasture only. 2. Feed and chop only. 3. Pasture and feed; if both, ask farmer to estimate fraction of food from pasture: <25%, 25-50%, 50-75%, or >75%.	Annually	During grazing season.
12. Nearest Residence Census	In all 16 sectors up to 5 miles				Annually	During growing season.

^a Control (reference) locations are denoted by a "C" in this column. All other locations are indicators.

TABLE 5.0-3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility Byron Nuclear Power Station Docket No. 50-454, 50-455
 Location of Facility Ogle, Illinois Reporting Period 1st Quarter 1990
 (County, State)

Sample Type (Units)	Type and Number of Analyses		LLD	Indicator Locations Mean ^a Range	Location with Highest Quarterly Mean		Control Locations Mean ^a Range	Number of Non-routine Results
					Location	Mean Range		
Air Particulates (pCi/m ³)	Gross Beta	156	0.01	0.022 (117/117) (0.006-0.033)	By-22, Onsite 0.3 mi @ 109°	0.024 (13/13) (0.013-0.031)	0.021 (39/39) (0.007-0.031)	0
	Gamma Spec.	12	0.01	<LLD	-	-	<LLD	0
Airborne Iodine (pCi/m ³)	I-131	156	0.07	<LLD	-	-	<LLD	0
Gamma Background (TLDs) (mR/Qtr.)	Gamma Dose	12	3.0	14.2 (9/9) (11.3-16.8)	By-22, Onsite 0.3 mi @ 101°	16.8 (1/1) -	13.3 (3/3) (12.2-14.0)	0
Milk (pCi/l)	I-131	10	0.5	<LLD	-	-	<LLD	0
	Gamma Spec.	10						
	Cs-134		5.0	<LLD	-	-	<LLD	0
	Cs-137		5.0	<LLD	-	-	<LLD	0
	Other Gammas		10.0	<LLD	-	-	<LLD	0
Surface Water (pCi/l)	Gamma Spec.	8						
	Cs-134		10	<LLD	-	-	<LLD	0
	Cs-137		10	<LLD	-	-	<LLD	0
	Other Gammas		15	<LLD	-	-	<LLD	0
	Tritium	3	200	404 (1/2)	By-12, Downstream of Intake 4.4 mi @ 213°	404 (1/2)	<LLD	0
Well Water (pCi/l)	Gross Beta	6	2.0	2.7 (2/6)	By-18, McCoy Farm-	2.8 (1/1)	None	0
	Gamma Spec.	6						
	Cs-134		10	<LLD	-	-	None	0
	Cs-137		10	<LLD	-	-	None	0
	Other Gammas		15	<LLD	-	-	None	0
	Tritium	2	200	<LLD	-	-	None	0

^a Mean and range based on detectable measurements only. Fraction indicated in parenthesis.

TABLE 5.0-4

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility Byron Nuclear Power StationDocket No. 50-454, 50-455Location of Facility Ogle, Illinois
(County, State)Reporting Period 2nd Quarter 1990

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean ^a Range	Location with Highest Quarterly Mean		Control Locations Mean ^a Range	Number of Non-routine Results
				Location	Mean Range		
Air Particulates (pCi/m ³)	Gross Beta 155	0.01	0.017 (116/116) (0.007-0.035)	By-22, Nearsite ESE 0.35 ml @ 101°	0.019 (13/13) (0.010-0.035)	0.015 (39/39) (0.007-0.025)	0
	Gamma Spec. 12	0.01	<LLD	-	-	<LLD	0
Airborne Iodine (pCi/m ³)	I-131 156	0.07	<LLD	-	-	<LLD	0
Gamma Background (TLDs) (mR/Qtr.)	Gamma Dose 12	3.0	14.3 (9/9) (11.0-16.6)	By-05, Nearsite South 3.6 ml @ 180°	16.6 (1/1)	13.8 (3/3) (12.4-15.2)	0
				By-22, Nearsite ESE 0.35 ml @ 101°	16.6 (1/1)		
Milk (pCi/L)	I-131 20	0.5	<LLD	-	-	<LLD	0
	Gamma Spec. 20						
	Cs-134	5.0	<LLD	-	-	<LLD	0
	Cs-137	5.0	<LLD	-	-	<LLD	0
	Other Gammas	10.0	<LLD	-	-	<LLD	0
Surface Water (pCi/L)	Gamma Spec. 9						
	Cs-134	10	<LLD	-	-	<LLD	0
	Cs-137	10	<LLD	-	-	<LLD	0
	Other Gammas	15	<LLD	-	-	<LLD	0
	Tritium 3	200	<LLD	-	-	<LLD	0
Well Water (pCi/L)	Gross Beta 6	2.4	<LLD	-	-	None	0
	Gamma Spec. 6						
	Cs-134	10	<LLD	-	-	None	0
	Cs-137	10	<LLD	-	-	None	0
	Other Gammas	15	<LLD	-	-	None	0
	Tritium 2	200	<LLD	-	-	None	0

TABLE 5.0-4 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility Byron Nuclear Power Station Docket No. 50-454, 50-455
 Location of Facility Ogle, Illinois Reporting Period 2nd Quarter 1990
 (County, State)

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean ^a Range	Location with Highest Quarterly Mean		Control Locations Mean ^a Range	Number of Non-routine Results
				Location	Mean Range		
Fish (pCi/g wet)	Gamma Spec. 5						
	Cs-134	0.1	<LLD	-	-	<LLD	0
	Cs-137	0.1	<LLD	-	-	<LLD	0
	Other Gammas	0.13	<LLD	-	-	<LLD	0
Bottom Sediments (pCi/g dry)	Gamma Spec. 2						
	Cs-134	0.1	<LLD	-	-	<LLD	0
	Cs-137	0.1	<LLD	-	-	<LLD	0
	Other Gammas	0.2	<LLD	-	-	<LLD	0

^a Mean and range based on detectable measurements only. Fractions indicated in parentheses.

TABLE 5.0-5

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility Byron Nuclear Power Station Docket No. 50-454, 50-455
 Location of Facility Ogle, Illinois Reporting Period 3rd Quarter 1990
 (County, State)

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean ^a Range	Location with Highest Quarterly Mean		Control Locations Mean ^a Range	Number of Non-routine Results
				Location	Mean Range		
Air Particulates (pCi/m ³)	Gross Beta 156	0.01	0.022 (117/117) (0.006-0.047)	By-23, Nearsite South 0.6 mi @ 182°	0.025 (13/13) (0.013-0.047)	0.018 (39/39) (0.010-0.030)	0
	Gamma Spec. 12	0.01	<LLD	-	-	<LLD	0
Airborne Iodine (pCi/m ³)	I-131 156	0.07	<LLD	-	-	<LLD	0
Gamma Background (TLDs) (mR/Qtr.)	Gamma Dose 12	3.0	14.2 (9/9) (10.9-17.0)	By-22, Nearsite ESE 0.3 mi @ 101°	17.0 (1/1) -	13.4 (3/3) (12.4-14.9)	0
Milk (pCi/L)	I-131 30	0.5	<LLD	-	-	<LLD	0
	Gamma Spec. 30						
	Cs-134	5.0	<LLD	-	-	<LLD	0
	Cs-137	5.0	<LLD	-	-	<LLD	0
	Other Gammas	10.0	<LLD	-	-	<LLD	0
Surface Water (pCi/L)	Gamma Spec. 9						
	Cs-134	10	<LLD	-	-	<LLD	0
	Cs-137	10	<LLD	-	-	<LLD	0
	Other Gammas	20	<LLD	-	-	<LLD	0
	Tritium 3	200	339 (1/2) -	By-12, Downstream of Oregon Dam, 4.6 mi @ 213°	339 (1/1) -	<LLD	0

^a Mean and range based on detectable measurements only. Fraction indicated in parenthesis.

TABLE 5.0-5 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility Byron Nuclear Power Station Docket No. 50-454, 50-455
 Location of Facility Ugla, Illinois Reporting Period 3rd Quarter 1991
(Lounis, 50-454)

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean ^a Range	Location with Highest Quarterly Mean		Control Locations Mean ^a Range	Number of Non-routine Results
				Location	Mean Range		
Well Water (pCi/L)	Gross Beta 6	1.4	2.6 (1/6)	BY-18, McCoy Farmstead, 1.0 mi @ 235°	2.6 (1/6)	None	0
	Gamma Spec. 6						
	Cs-134 10		<LLD	-	-	None	0
	Cs-137 10		<LLD	-	-	None	0
	Other Gammas 15		<LLD	-	-	None	0
	Tritium 2	200	<LLD	-	-	None	0
Fish (pCi/g wet)	Gamma Spec. 3						
	Cs-134 0.10		<LLD	-	-	<LLD	0
	Cs-137 0.10		<LLD	-	-	<LLD	0
	Other Gammas 0.13		<LLD	-	-	<LLD	0
Vegetables	Gamma Spec. 8						
	Cs-134 0.06		<LLD	-	-	None	0
	Cs-137 0.08		<LLD	-	-	None	0
	Other Gammas 0.15		<LLD	-	-	None	0
	I-131 0.06		<LLD	-	-	None	0

^a Mean and range based on detectable measurements only. Fractions indicated in parentheses.

TABLE 5.0-6

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility Byron Nuclear Power Station Docket No. 50-454, 50-455
 Location of Facility Ogle, Illinois Reporting Period 4th Quarter 1990
 (County, State)

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean Range	Location with Highest Quarterly Mean		Control Locations Mean Range	Number of Non-routine Results
				Location	Mean Range		
Air Particulates (pCi/m ³)	Gross Beta	0.01	0.024 (115/117) (0.004-0.046)	BY-08, Leaf River 7.0 mi @ 315°	0.027 (12/12) (0.017-0.049)	0.024 (38/36) (0.012-0.049)	0
	Gamma Spec.	0.01	<LLD	-	-	<LLD	0
Airborne Iodine (pCi/m ³)	I-131	0.07	<LLD	-	-	<LLD	0
Gamma Background (LLDs) (mR/Quarter)	Gamma Dose	3.0	16.0 (9/9) (11.7-18.7)	BY-05, Nearsite South 3.6 mi @ 180°	18.7 (1/1)	15.6 (3/3) (14.5-16.6)	0
	Milk (pCi/L)	0.5	<LLD	-	-	<LLD	0
Surface Water (pCi/L)	Gamma Spec.	10	<LLD	-	-	<LLD	0
	Cs-134	10	<LLD	-	-	<LLD	0
	Cs-137	15	<LLD	-	-	<LLD	0
	Other Gammas	200	1280 (1/2)	By-12, Downstream of Oregon Dam 4.6 mi @ 213°	1280 (1/1)	<LLD	0

TABLE 5.0-6 (continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM QUARTERLY SUMMARY

Name of Facility Byron Nuclear Power Station Docket No. 50-454, 50-455
 Location of Facility Ogle, Illinois Reporting Period 4th Quarter 1990
 (County, State)

Sample Type (Units)	Type and Number of Analyses	LLD	Indicator Locations Mean ^a Range	Location with Highest Quarterly Mean		Control Locations Mean ^a Range	Number of Non-routine Results
				Location	Mean Range		
Well Water (pCi/L)	Gross Beta 2	2.6	<LLD	-	-	None	0
	Gamma Spec. 2						
	Cs-134 10		<LLD	-	-	None	0
	Cs-137 10		<LLD	-	-	None	0
	Other Gammas 15		<LLD	-	-	None	0
	Tritium 2	200	<LLD	-	-	None	0
Fish (pCi/g wet)	Gamma Spec. 4						
	Cs-134 0.10		<LLD	-	-	None	0
	Cs-137 0.10		<LLD	-	-	None	0
	Other Gammas 0.13		<LLD	-	-	None	0
Bottom Sediments (pCi/g dry)	Gamma Spec. 2						
	Cs-134 0.1		<LLD	-	-	<LLD	0
	Cs-137 0.1		0.45 (1/1)	BY-12, Downstream of Oregon Dam, 4.6 mi @ 213°	0.45 (1/1)	0.26 (1/1)	0
	Other Gammas 0.2		<LLD	-	-	<LLD	0

^a Mean and range based on detectable measurements only. Fractions indicated in parentheses.

APPENDIX II

METEOROLOGICAL DATA

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JANUARY-MARCH 1990
 STABILITY CLASS - EXTREMELY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	1	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	0	1	0	1

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 2

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JANUARY-MARCH 1990
 STABILITY CLASS - MODERATELY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	4	0	4
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	1	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	2	1	3
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	1	6	1	8

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 2

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JANUARY-MARCH 1990
 STABILITY CLASS - SLIGHTLY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	1	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	1	2	0	0	3
WSW	0	0	0	0	1	1	2
W	0	0	0	0	0	0	0
WNW	0	0	1	0	0	0	1
NW	0	0	2	4	0	0	6
NNW	0	0	0	3	0	0	3
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	4	9	2	1	16

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 2

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JANUARY-MARCH 1990
 STABILITY CLASS - NEUTRAL (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	2	9	12	18	5	7	53
NNE	0	4	8	25	23	8	68
NE	1	6	8	8	28	7	58
ENE	0	3	21	31	50	4	109
E	0	8	8	4	16	0	36
ESE	0	3	5	2	1	0	11
SE	2	6	6	7	4	0	25
SSE	1	6	4	23	22	9	65
S	1	6	16	34	14	15	86
SSW	1	7	16	37	25	22	108
SW	0	5	23	22	14	8	72
WSW	0	6	13	29	20	23	91
W	0	5	19	17	8	26	75
WNW	1	4	9	34	24	20	92
NW	1	3	14	46	30	30	124
NNW	2	7	15	20	7	7	58
VARIABLE	0	0	0	0	0	0	0
TOTAL	12	88	197	357	291	186	1131

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 2

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JANUARY-MARCH 1990
 STABILITY CLASS - SLIGHTLY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	GT 24	
N	1	1	5	12	0	0	19
NNE	0	1	1	5	2	0	9
NE	0	4	5	1	1	0	11
ENE	0	1	3	2	0	0	5
E	1	4	4	7	8	0	24
ESE	0	0	0	5	9	3	17
SE	0	2	7	12	3	11	35
SSE	1	2	9	7	20	34	73
S	0	2	3	36	58	62	161
SSW	0	1	13	43	41	16	114
SW	0	0	18	28	19	9	74
WSW	0	3	12	32	8	1	56
W	0	3	21	25	5	4	58
WNW	1	0	19	24	7	1	52
NW	0	1	13	18	4	0	36
NNW	0	3	13	19	5	0	40
VARIABLE	0	0	0	0	0	0	0
TOTAL	4	28	146	276	190	141	785

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 2

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JANUARY-MARCH 1990
 STABILITY CLASS - MODERATELY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	1	0	2	0	0	0	3
NNE	0	1	1	0	1	0	3
NE	0	2	0	1	0	0	3
ENE	1	1	1	0	0	0	3
E	0	0	1	2	0	0	3
ESE	0	1	2	1	2	0	6
SE	0	2	2	8	4	0	16
SSE	0	2	1	6	6	2	17
S	0	0	2	12	23	3	40
SSW	0	0	1	11	5	0	17
SW	0	0	3	13	0	0	16
WSW	0	0	3	6	1	0	10
W	0	2	8	0	0	0	10
WNW	0	4	2	2	0	0	8
NW	1	0	1	4	0	0	6
NNW	1	1	1	3	0	0	6
VARIABLE	0	0	0	0	0	0	0
TOTAL	4	16	31	69	42	5	167

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 2

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JANUARY-MARCH 1990
 STABILITY CLASS - EXTREMELY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	0	0	0	0	0	0
NNE	1	0	1	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	1	0	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	1	1	1	2	1	0	6
SSE	0	0	0	4	4	0	8
S	0	2	1	7	7	0	17
SSW	0	1	3	2	0	0	6
SW	0	2	1	3	0	0	6
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	1	1	0	0	0	2
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	2	9	8	18	12	0	49

Hours of calm in this stability class: 1
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 2

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - APRIL-JUNE 1990
 STABILITY CLASS - EXTREMELY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	2	0	0	2
WNW	0	0	0	0	0	0	0
NW	0	0	0	1	5	0	6
NNW	0	0	0	0	1	0	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	0	3	6	0	9

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 10

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - APRIL-JUNE 1990
 STABILITY CLASS - MODERATELY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	0	2	0	0	0	2
NNE	0	0	0	3	0	0	3
NE	0	0	1	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	1	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	1	1
SW	0	0	0	1	0	0	1
WSW	0	0	1	0	0	0	1
W	0	0	3	7	0	0	10
WNW	0	0	0	1	4	0	5
NW	0	0	0	3	6	0	9
NNW	0	0	0	0	0	0	0
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	8	15	10	1	34

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 10

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - APRIL-JUNE 1990
 STABILITY CLASS - SLIGHTLY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)					GT 24	TOTAL
	.8-3	4- 7	8-12	13-18	19-24		
N	0	0	2	3	0	0	5
NNE	0	1	2	3	0	0	6
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	1	2	0	0	0	3
SE	0	0	0	1	1	0	2
SSE	0	0	3	1	3	0	7
S	0	0	2	1	1	0	4
SSW	0	0	3	3	2	0	8
SW	0	0	2	2	1	0	5
WSW	0	0	1	1	0	0	2
W	0	1	5	5	0	0	11
WNW	0	1	4	4	3	0	12
NW	0	0	2	5	7	1	15
NNW	0	2	1	0	0	1	4
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	6	29	29	18	2	84

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 10

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - APRIL-JUNE 1990
 STABILITY CLASS - NEUTRAL (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
-----	.8-3	4- 7	8-12	13-18	19-24	GT 24	-----
N	0	3	17	26	18	1	65
NNE	1	2	15	12	7	5	42
NE	0	3	10	15	8	3	39
ENE	0	1	10	15	4	8	38
E	0	0	12	20	9	0	41
ESE	0	12	14	5	8	0	39
SE	0	3	14	16	1	1	35
SSE	1	5	8	14	10	6	44
S	1	3	29	35	31	25	124
SSW	0	5	27	31	21	24	108
SW	0	8	25	12	11	9	65
WSW	0	6	15	14	10	8	53
W	1	8	19	21	3	18	70
WNW	1	5	25	32	24	33	120
NW	2	7	9	27	38	7	90
NNW	1	1	6	26	11	5	50
VARIABLE	0	0	0	0	0	0	0
TOTAL	8	72	255	321	214	153	1023

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 10

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - APRIL-JUNE 1990
 STABILITY CLASS - SLIGHTLY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	5	3	11	2	0	21
NNE	1	3	6	8	6	0	24
NE	1	6	9	8	4	0	28
ENE	0	5	13	7	1	1	27
E	0	2	5	13	10	3	33
ESE	2	3	3	10	12	3	33
SE	0	1	6	15	14	3	39
SSE	0	1	5	21	39	3	69
S	1	2	13	24	63	8	111
SSW	0	0	14	25	43	11	93
SW	1	5	25	16	6	1	54
WSW	0	5	17	19	4	6	51
W	4	5	11	25	8	0	53
WNW	1	3	15	15	7	0	41
NW	0	1	6	24	10	1	42
NNW	0	8	5	7	1	0	21
VARIABLE	0	0	0	0	0	0	0
TOTAL	11	55	156	248	230	40	740

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 10

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - APRIL-JUNE 1990
 STABILITY CLASS - MODERATELY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	1	5	5	0	0	11
NNE	0	0	1	7	0	0	8
NE	0	0	2	6	1	0	9
ENE	0	0	2	3	0	0	5
E	0	0	1	1	5	0	7
ESE	0	0	1	6	5	0	12
SE	0	0	3	10	7	0	20
SSE	0	0	1	4	11	9	25
S	0	1	2	10	18	1	32
SSW	0	0	5	2	2	0	9
SW	0	0	7	12	5	0	24
WSW	0	1	5	2	0	0	8
W	1	1	6	14	0	0	22
WNW	0	2	9	8	0	0	19
NW	0	1	3	11	0	0	15
NNW	0	2	7	5	0	0	14
VARIABLE	0	0	0	0	0	0	0
TOTAL	1	9	60	106	54	10	240

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 10

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - APRIL-JUNE 1990
 STABILITY CLASS - EXTREMELY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	1	0	2	2	0	0	5
NNE	0	0	0	5	0	0	5
NE	0	0	0	0	0	0	0
ENE	0	0	1	0	0	0	1
E	0	2	1	1	0	0	4
ESE	0	0	1	1	1	0	3
SE	0	0	0	0	1	0	1
SSE	0	0	0	2	1	0	3
S	0	1	0	2	1	0	4
SSW	0	1	0	1	2	0	4
SW	0	0	0	6	0	0	6
WSW	0	0	1	0	0	0	1
W	0	0	1	0	0	0	1
WNW	1	0	0	0	0	0	1
NW	0	0	1	0	0	0	1
NNW	1	1	2	0	0	0	4
VARIABLE	0	0	0	0	0	0	0
TOTAL	3	5	10	20	6	0	44

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 10

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JULY-SEPTEMBER 1990
 STABILITY CLASS - EXTREMELY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
-----	.8-3	4- 7	8-12	13-18	19-24	GT 24	-----
N	0	2	2	7	1	0	12
NNE	0	0	3	0	0	0	3
NE	0	0	1	2	3	0	6
ENE	0	0	3	0	0	0	3
E	0	0	1	0	0	0	1
ESE	0	1	2	1	0	0	4
SE	0	0	0	1	0	0	1
SSE	0	1	3	7	0	0	11
S	0	0	1	1	1	0	3
SSW	0	1	3	5	3	0	12
SW	0	2	3	8	0	0	13
WSW	0	0	1	9	4	0	14
W	0	0	2	3	0	0	5
WNW	0	0	0	3	4	2	9
NW	0	0	1	6	1	0	8
NNW	0	1	0	1	2	0	4
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	8	26	54	19	2	109

ours of calm in this stability class: 0
 ours of missing wind measurements in this stability class: 0
 ours of missing stability measurements in all stability classes: 0

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JULY-SEPTEMBER 1990
 STABILITY CLASS - MODERATELY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	0	12	2	3	0	17
NNE	0	0	2	3	0	0	5
NE	0	0	2	3	1	0	6
ENE	0	0	5	5	0	0	10
E	0	2	0	0	0	0	2
ESE	0	3	3	0	0	0	6
SE	0	4	2	0	0	0	6
SSE	0	1	2	4	0	0	7
S	0	2	8	5	2	0	17
SSW	0	1	11	3	2	0	17
SW	0	2	3	8	6	0	19
WSW	0	0	1	3	1	0	5
W	0	0	2	1	0	0	3
WNW	0	1	2	0	1	0	4
NW	0	1	4	2	1	0	8
NNW	0	1	6	0	1	0	8
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	18	65	39	18	0	140

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 5
 Hours of missing stability measurements in all stability classes: 0

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JULY-SEPTEMBER 1990
 STABILITY CLASS - SLIGHTLY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	0-3	4-7	8-12	13-18	19-24	GT 24	
N	0	2	6	4	0	0	12
NNE	0	0	6	7	0	0	13
NE	0	1	2	1	1	0	5
ENE	0	1	3	1	0	0	5
E	0	3	1	1	0	0	5
ESE	3	2	0	0	0	0	5
SE	0	3	7	0	0	0	10
SSE	0	4	4	6	2	0	16
S	0	1	4	3	1	0	9
SSW	0	6	8	11	2	0	27
SW	0	2	3	8	1	0	14
WSW	1	1	3	3	1	0	9
W	0	0	1	3	0	0	4
WNW	0	2	8	0	0	0	10
NW	0	1	5	2	4	2	14
NNW	0	3	5	2	0	0	10
VARIABLE	0	0	0	0	0	0	0
TOTAL	4	32	66	52	12	2	168

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 6
 Hours of missing stability measurements in all stability classes: 0

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JULY-SEPTEMBER 1990
 STABILITY CLASS - NEUTRAL (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
-----	.8-3	4- 7	8-12	13-18	19-24	GT 24	-----
N	1	11	13	11	2	0	38
NNE	1	10	26	40	1	0	78
NE	0	8	13	22	15	0	58
ENE	1	8	13	19	1	0	42
E	3	7	15	8	0	0	33
ESE	2	11	14	2	0	0	29
SE	0	1	10	6	2	0	19
SSE	1	4	17	22	9	0	53
S	3	1	29	22	3	0	58
SSW	0	8	23	25	13	0	69
SW	0	8	15	23	5	1	52
WSW	2	8	10	8	1	1	30
W	1	5	2	3	0	0	11
WNW	5	10	8	5	0	0	28
NW	1	5	18	5	14	2	45
NNW	3	8	14	14	4	1	44
VARIABLE	0	0	0	0	0	0	0
TOTAL	24	113	240	235	70	5	687

Hours of calm in this stability class: 1
 Hours of missing wind measurements in this stability class: 18
 Hours of missing stability measurements in all stability classes: 0

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JULY-SEPTEMBER 1990
 STABILITY CLASS - SLIGHTLY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	1	7	14	12	1	1	36
NNE	1	4	15	30	5	1	56
NE	1	6	13	19	2	0	41
ENE	2	5	15	12	1	0	35
E	0	9	9	13	2	0	33
ESE	0	4	5	13	5	0	27
SE	0	8	7	11	17	0	43
SSE	2	5	10	21	27	1	66
S	0	4	12	27	27	0	70
SSW	0	3	13	49	30	1	96
SW	1	2	8	27	28	2	68
WSW	0	0	6	8	1	0	15
W	2	3	4	4	0	0	13
WNW	1	4	4	7	0	0	16
NW	0	0	12	9	0	0	21
NNW	2	1	8	26	1	0	38
VARIABLE	0	0	0	0	0	0	0
TOTAL	13	65	155	268	147	6	674

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 7
 Hours of missing stability measurements in all stability classes: 0

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JULY-SEPTEMBER 1990
 STABILITY CLASS - MODERATELY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	2	5	1	1	0	9
NNE	0	1	3	7	0	0	11
NE	0	0	4	12	2	0	18
ENE	0	2	0	0	0	0	2
E	0	3	2	1	2	0	8
ESE	0	4	7	3	4	0	18
SE	0	2	9	4	3	0	18
SSE	0	3	6	13	14	1	37
S	0	4	5	20	15	0	44
SSW	0	2	12	23	1	0	38
SW	0	4	9	11	1	0	25
WSW	0	3	8	3	0	0	14
W	1	1	4	6	0	0	12
WNW	1	2	1	7	0	0	11
NW	1	1	6	1	0	0	9
NNW	0	0	3	6	0	0	9
VARIABLE	0	0	0	0	0	0	0
TOTAL	3	34	84	118	43	1	283

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 4
 Hours of missing stability measurements in all stability classes: 0

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - JULY-SEPTEMBER 1990
 STABILITY CLASS - EXTREMELY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
-----	.8-3	4- 7	8-12	13-18	19-24	GT 24	-----
N	0	1	2	0	0	0	3
NNE	0	0	2	0	0	0	2
NE	0	1	0	2	0	0	3
ENE	0	0	0	0	0	0	0
E	1	0	0	1	1	0	3
ESE	0	0	0	0	2	0	2
SE	0	4	0	4	2	0	10
SSE	0	0	1	5	7	1	14
S	0	0	3	19	0	0	22
SSW	0	0	6	8	0	0	14
SW	0	0	4	4	2	0	10
WSW	0	0	5	0	0	0	5
W	0	0	8	1	0	0	9
WNW	0	1	0	2	0	0	3
NW	0	0	0	5	0	0	5
NNW	0	0	0	1	0	0	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	1	7	31	52	14	1	106

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 0

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - OCTOBER-DECEMBER 1990
 STABILITY CLASS - EXTREMELY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	GT 24	
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	1	0	0	0	1
SE	0	0	1	0	0	0	1
SSE	0	0	0	5	3	1	9
S	0	0	2	9	2	4	17
SSW	0	0	2	1	0	0	3
SW	0	0	1	1	3	1	6
WSW	0	0	6	0	0	1	7
W	0	0	1	0	0	0	1
WNW	0	0	0	1	1	0	2
NW	0	0	0	2	0	0	2
NNW	0	0	0	0	1	0	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	0	15	19	10	7	51

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 1

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - OCTOBER-DECEMBER 1990
 STABILITY CLASS - MODERATELY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
-----	.8-3	4- 7	8-12	13-18	19-24	GT 24	-----
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	2	0	0	0	2
SE	0	0	0	0	1	0	1
SSE	0	0	1	2	1	0	4
S	0	1	2	3	4	7	17
SSW	0	2	1	2	1	1	7
SW	0	1	2	4	1	5	13
WSW	0	0	1	0	0	0	1
W	0	0	1	3	0	1	5
WNW	0	0	3	2	0	1	6
NW	0	0	2	3	2	3	10
NNW	0	0	2	3	2	0	7
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	4	18	22	12	18	74

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 1
 Hours of missing stability measurements in all stability classes: 1

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - OCTOBER-DECEMBER 1990
 STABILITY CLASS - SLIGHTLY UNSTABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	0	3	0	0	3
SE	0	0	1	1	1	0	3
SSE	0	0	0	1	1	0	2
S	0	1	1	3	1	2	8
SSW	0	4	2	3	2	1	12
SW	0	1	3	3	1	4	12
WSW	0	3	0	2	1	0	6
W	0	1	0	0	2	0	3
WNW	0	0	0	3	1	4	8
NW	0	1	4	6	0	1	12
NNW	0	0	1	2	1	0	4
VARIABLE	0	0	0	0	0	0	0
TOTAL	0	11	14	27	11	12	75

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 6
 Hours of missing stability measurements in all stability classes: 1

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - OCTOBER-DECEMBER 1990
 STABILITY CLASS - NEUTRAL (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
-----	.8-3	4- 7	8-12	13-18	19-24	GT 24	-----
N	1	0	8	12	21	4	46
NNE	0	2	3	28	46	8	87
NE	0	3	2	3	3	0	11
ENE	0	1	0	4	2	12	19
E	0	2	1	2	3	3	11
ESE	0	2	4	8	3	1	18
SE	1	1	8	29	28	4	71
SSE	1	0	22	36	18	19	96
S	0	4	9	26	18	23	80
SSW	0	6	22	15	15	22	80
SW	1	6	14	28	19	9	77
WSW	4	8	8	22	11	14	67
W	3	3	19	22	18	12	77
WNW	2	7	19	42	28	10	108
NW	1	4	29	52	22	15	123
NNW	1	5	17	28	9	6	66
VARIABLE	0	0	0	0	0	0	0
TOTAL	15	54	185	357	264	162	1037

hours of calm in this stability class: 0
 hours of missing wind measurements in this stability class: 6
 hours of missing stability measurements in all stability classes: 1

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - OCTOBER-DECEMBER 1990
 STABILITY CLASS - SLIGHTLY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	0-3	4-7	8-12	13-18	19-24	GT 24	
N	0	2	2	8	1	0	13
NNE	0	1	0	7	0	0	8
NE	0	2	2	5	0	0	9
ENE	0	0	4	11	4	0	19
E	0	1	2	5	6	6	20
ESE	0	1	0	1	3	0	5
SE	0	1	0	4	9	2	16
SSE	1	2	1	9	25	13	51
S	0	1	7	11	35	24	78
SSW	2	1	10	26	43	54	136
SW	0	3	11	23	17	12	66
WSW	0	5	6	14	15	1	41
W	1	0	9	27	11	4	52
WNW	1	2	7	15	3	0	28
NW	0	1	10	22	6	0	39
NNW	1	0	7	21	8	0	37
VARIABLE	0	0	0	0	0	0	0
TOTAL	6	23	78	209	186	116	618

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 1

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - OCTOBER-DECEMBER 1990
 STABILITY CLASS - MODERATELY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	0-3	4-7	8-12	13-18	19-24	GT 24	
N	1	2	3	9	1	0	16
NNE	0	1	2	3	0	0	6
NE	0	1	2	2	1	0	6
ENE	1	2	2	0	0	0	5
E	0	0	1	1	1	0	3
ESE	0	1	0	2	2	1	6
SE	0	0	2	4	11	0	17
SSE	1	1	1	7	13	4	27
S	1	0	3	10	11	2	27
SSW	0	2	6	10	12	4	34
SW	0	0	1	17	1	0	19
WSW	0	0	2	9	0	0	11
W	0	1	6	4	0	0	11
WNW	0	0	3	5	0	0	8
NW	0	2	8	10	1	0	21
NNW	0	2	8	12	2	0	24
VARIABLE	0	0	0	0	0	0	0
TOTAL	4	15	50	105	56	11	241

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 1

BYRON NUCLEAR POWER STATION
 PERIOD OF RECORD - OCTOBER-DECEMBER 1990
 STABILITY CLASS - EXTREMELY STABLE (DIFF TEMP 250-30 FT)
 WINDS MEASURED AT 250 FEET

WIND DIRECTION	WIND SPEED (IN MPH)						TOTAL
	.8-3	4- 7	8-12	13-18	19-24	GT 24	
N	0	2	4	5	1	0	12
NNE	0	0	0	0	1	0	1
NE	0	1	0	1	1	0	3
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	1	0	0	1	1	0	3
SE	0	1	0	4	2	0	7
SSE	0	0	3	2	1	0	6
S	0	1	2	14	9	1	27
SSW	0	1	5	8	4	0	18
SW	0	2	2	4	2	0	10
WSW	1	1	0	2	0	0	4
W	0	0	4	0	0	0	4
WNW	0	1	0	0	0	0	1
NW	0	0	0	1	0	0	1
NNW	0	0	1	0	0	0	1
VARIABLE	0	0	0	0	0	0	0
TOTAL	2	10	21	42	22	1	98

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 1

APPENDIX III

1990 REMP SAMPLE RESULTS

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1.0 INTRODUCTION

The following constitutes the annual summation of sample results for the Environmental Radiological Monitoring Program conducted at the Byron Nuclear Power Station, Byron, Illinois. Results of completed analyses are presented in the attached tables. Missing entries indicate analyses that are not completed and the results will appear in subsequent reports.

Data obtained in the program are well within the ranges previously encountered in the program and to be expected in the environmental media sampled.

For all gamma isotopic analyses, spectrum is computer scanned from 80 to 2048 KeV. Specifically included are Mn-54, Co-58, Fe-59, Co-60, Zn-65, Zr-95, Nb-95, Ru-103, Ru-106, I-131, Ba-La-140, Cs-134, Cs-137, Ce-141, and Ce-144. Naturally occurring gamma-emitters, such as K-40 and Ra daughters, are frequently detected but not listed here. Data listed as "<" are at the 4.66 sigma level, others are 2 sigma. Cs-134 and Cs-137 are listed separately. All other gamma emitters are listed under "Other Gammas". Unless noted otherwise, the less than value ("<") reported under "Other Gammas" is for Co-60 and may be higher or lower for other radionuclides.

All concentrations, except gross beta, are decay corrected to the time of collection.

Deviations from Scheduled Sampling and Corrective Actions Taken

All samples were collected within the scheduled period unless noted otherwise in the Listing of Missed Samples.

Unusual Environmental Measurements

Sample Type	Location	Date Collected	Comments

BYRON

2.0 LISTING OF MISSED SAMPLES

Sample Type	Location	Expected Collection Date	Reason
Milk	BY-25	01-02-90	Dairy destroyed in fire.
Surface Water	BY-09	January	River frozen.
Milk	BY-25	02-05-90	Dairy destroyed in fire.
Air Particulate	BY-24	05-07-90	Sample lost in the field.
Air Particulate	BY-8	10-29-90	Sample lost in the field.

BYRON

Table 1. Airborne Particulates and Iodine-131^a
Collection: Weekly
Units: 10⁻² pCi/m³

Week Ending	Byron BY-01		Stillman Valley BY-02 (C)		Near Site E BY-03		Paynes Point BY-04	
	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta
01-08-90	242	2.8±0.4	231	2.1±0.4	238	2.6±0.4	237	3.0±0.4
01-15-90	288	3.0±0.4	286	3.0±0.4	288	2.9±0.4	288	2.9±0.4
01-22-90	285	2.4±0.3	284	2.6±0.3	283	2.1±0.3	283	2.7±0.4
01-29-90	239	2.3±0.4	285	2.2±0.3	285	0.7±0.2	285	1.8±0.3
02-05-90	286	2.0±0.3	292	1.6±0.3	287	1.9±0.3	286	2.2±0.3
02-12-90	287	2.1±0.3	280	2.4±0.3	286	2.4±0.3	286	2.5±0.3
02-19-90	282	2.2±0.3	283	2.4±0.3	283	2.2±0.3	283	2.2±0.3
02-26-90	288	2.5±0.4	288	2.4±0.4	287	2.6±0.4	287	2.1±0.3
03-05-90	284	2.4±0.3	290	2.4±0.3	285	2.8±0.4	285	2.4±0.3
03-12-90	286	1.8±0.3	279	1.6±0.3	286	2.0±0.3	286	1.5±0.3
03-19-90	285	1.3±0.3	291	1.6±0.3	285	1.6±0.3	285	1.7±0.3
03-26-90	286	2.1±0.2	280	2.1±0.2	285	2.0±0.2	285	2.2±0.2
04-02-90	287	1.3±0.3	297	0.7±0.2	290	1.2±0.3	290	1.2±0.3
1st Qtr mean±s.d.		2.2±0.5		2.1±0.6		2.1±0.6		2.2±0.5
04-09-90	285	1.7±0.3	274	1.1±0.3	283	1.9±0.3	283	1.7±0.3
04-16-90	284	2.3±0.3	295	2.2±0.3	284	2.0±0.3	284	2.2±0.3
04-23-90	284	1.7±0.3	284	2.3±0.3	285	1.9±0.3	285	2.4±0.3
04-30-90	288	1.5±0.2	287	1.6±0.2	287	1.6±0.2	287	1.7±0.2
05-07-90	285	1.1±0.3	294	1.9±0.3	287	2.0±0.3	286	1.6±0.3
05-14-90	284	1.2±0.3	279	1.5±0.3	282	1.7±0.3	283	1.8±0.3
05-21-90	284	0.7±0.2	290	1.1±0.2	284	1.2±0.2	284	1.4±0.2
05-28-90	288	1.4±0.4	281	1.8±0.4	288	2.4±0.4	288	2.4±0.4
06-04-90	284	0.8±0.3	293	1.4±0.3	286	1.4±0.3	286	1.1±0.3
06-11-90	282	1.4±0.3	272	1.2±0.3	279	1.2±0.3	279	1.2±0.3
06-18-90	289	1.6±0.4	285	1.4±0.4	279	1.6±0.4	286	1.5±0.4
06-25-90	287	1.1±0.3	292	1.2±0.3	300	1.0±0.3	290	1.1±0.3
07-02-90	285	1.2±0.3	298	1.6±0.3	287	1.5±0.3	289	0.8±0.3
2nd Qtr mean±s.d.		1.4±0.4		1.6±0.4		1.6±0.4		1.6±0.5

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.

BYRON

Table 1. Airborne Particulates and Iodine-131^a (continued)

Week Ending	Byron BY-01		Stillman Valley BY-02 (C)		Near Site E BY-03		Paynes Point BY-04	
	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta
07-09-90	284	2.3±0.3	270	2.4±0.4	284	1.6±0.3	284	2.4±0.3
07-16-90	284	1.3±0.3	292	1.9±0.3	278	2.1±0.4	278	2.0±0.3
07-23-90	285	2.3±0.3	285	2.3±0.3	286	2.4±0.4	286	2.2±0.3
07-30-90	288	3.0±0.4	283	3.0±0.4	290	2.8±0.4	290	3.3±0.4
08-06-90	282	1.6±0.4	289	2.3±0.4	282	1.8±0.4	282	2.1±0.4
08-13-90	288	1.7±0.3	281	1.5±0.3	288	1.3±0.3	288	0.6±0.2
08-20-90	282	1.5±0.3	288	1.3±0.3	281	1.3±0.3	281	1.4±0.3
08-27-90	289	1.8±0.3	283	1.4±0.3	289	1.3±0.3	289	1.8±0.3
09-04-90	325	2.2±0.3	332	2.2±0.3	325	2.4±0.3	325	1.2±0.3
09-10-90	245	2.9±0.4	238	2.2±0.4	244	2.6±0.4	244	2.9±0.4
09-17-90	284	2.8±0.4	290	1.7±0.4	284	2.8±0.4	284	2.6±0.4
09-24-90	286	1.2±0.3	281	1.1±0.3	286	1.6±0.3	286	1.2±0.3
10-01-90	288	1.5±0.3	298	1.8±0.3	292	1.9±0.3	290 ^b	1.9±0.3
3rd Qtr mean±s.d.		2.0±0.6		1.9±0.5		2.0±0.6		2.0±0.7
10-08-90	284	2.6±0.4	273	2.3±0.4	280	1.5±0.4	281	2.1±0.4
10-15-90	285	2.0±0.3	292	1.9±0.3	286	1.6±0.3	286	2.1±0.3
10-22-90	286	2.0±0.3	285	1.7±0.3	286	1.9±0.3	278	2.0±0.3
10-29-90	287	2.2±0.3	283	2.0±0.3	288	1.6±0.3	288	1.7±0.3
11-05-90	286	2.1±0.3	294	2.3±0.3	286	2.5±0.4	286	2.7±0.4
11-12-90	286	2.0±0.3	278	1.8±0.3	285	1.8±0.3	285	2.2±0.4
11-19-90	284	2.5±0.4	285	2.4±0.4	283	2.6±0.4	284	2.6±0.4
11-26-90	288	2.9±0.4	285	2.6±0.4	289	2.7±0.4	289	2.6±0.3
12-03-90	287	2.2±0.3	295	1.2±0.3	286	1.9±0.3	286	1.9±0.3
12-10-90	284	2.1±0.4	273	2.2±0.4	274	2.7±0.4	285	2.2±0.4
12-17-90	286	2.4±0.3	289	2.0±0.3	295	2.4±0.3	231	2.8±0.4
12-24-90	283	4.3±0.4	284	3.9±0.4	283	4.5±0.4	283	4.1±0.4
12-31-90	292	2.7±0.4	329 ^c	3.2±0.4	323 ^c	3.7±0.4	323 ^c	2.7±0.4
4th Qtr mean±s.d.		2.5±0.6		2.3±0.7		2.4±0.9		2.4±0.6

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.^b Volume is estimated; timer reading seems in error.^c Collected 01-01-91.

BYRON

Table 2. Airborne Particulates and Iodine-131^a
Collection. Weekly
Units: 10⁻² pCi/m³

Week Ending	Near Site S BY-05		Oregon BY-06		Mt. Morris BY-07 (C)		Leaf River BY-08 (C)	
	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta
01-08-90	238	2.8±0.4	245	3.0±0.4	246	2.6±0.4	244	2.8±0.4
01-15-90	288	3.1±0.4	286	2.8±0.4	286	2.8±0.4	286	3.1±0.4
01-22-90	283	2.3±0.3	285	2.6±0.3	285	1.6±0.3	284	1.8±0.3
01-29-90	288	1.9±0.3	285	2.1±0.3	285	1.8±0.3	285	1.8±0.3
02-05-90	286	1.9±0.3	285	2.2±0.3	285	2.2±0.3	285	1.8±0.3
02-12-90	287	2.5±0.3	287	2.5±0.3	287	2.2±0.3	289	1.9±0.3
02-19-90	283	2.2±0.3	282	2.3±0.3	282	2.2±0.3	283	2.1±0.3
02-26-90	287	2.7±0.4	288	2.6±0.4	288	2.7±0.4	288	2.9±0.4
03-05-90	285	2.6±0.4	283	2.4±0.3	283	2.2±0.3	283	2.5±0.4
03-12-90	286	1.4±0.3	286	1.8±0.3	286	1.5±0.3	286	1.9±0.3
03-19-90	285	1.3±0.3	285	1.4±0.3	285	1.2±0.3	285	1.4±0.3
03-26-90	285	2.3±0.2	285	2.1±0.2	286	1.7±0.2	286	1.9±0.2
04-02-90	289	1.0±0.3	286	1.3±0.3	284	1.3±0.3	286	1.8±0.3
1st Qtr mean±s.d.		2.2±0.6		2.2±0.5		2.0±0.5		2.1±0.5
04-09-90	283	1.6±0.3	286	1.9±0.3	286	1.7±0.3	286	2.0±0.3
04-16-90	284	2.2±0.3	285	2.2±0.3	285	1.8±0.3	285	1.9±0.3
04-23-90	284	1.8±0.3	284	2.2±0.3	284	1.5±0.3	284	2.2±0.3
04-30-90	288	1.7±0.2	287	1.7±0.2	287	1.5±0.2	287	1.4±0.2
05-07-90	286	1.6±0.3	285	1.9±0.3	284	1.4±0.3	285	1.5±0.3
05-14-90	283	2.0±0.3	285	2.3±0.3	285	1.7±0.3	285	1.6±0.3
05-21-90	285	1.2±0.2	285	1.3±0.2	285	1.0±0.2	285	1.1±0.2
05-28-90	288	2.5±0.4	287	2.3±0.4	287	1.9±0.4	287	2.5±0.4
06-04-90	286	0.9±0.3	285	1.3±0.3	285	0.9±0.3	285	1.1±0.3
06-11-90	281	1.1±0.3	282	1.6±0.3	282	0.7±0.3	282	1.0±0.3
06-18-90	281	1.7±0.4	289	1.1±0.4	289	1.2±0.4	289	1.5±0.4
06-25-90	293	1.4±0.3	287	1.3±0.3	287	1.0±0.3	287	1.4±0.3
07-02-90	290	1.2±0.3	282	1.6±0.3	284	0.9±0.3	284	1.7±0.3
2nd Qtr mean±s.d.		1.6±0.5		1.7±0.4		1.3±0.4		1.6±0.4

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.

Table 2. Airborne Particulates and Iodine-131^a (continued)

Week Ending	Near Site S BY-05		Oregon BY-06		Mt. Morris BY-07 (C)		Leaf River BY-08 (C)	
	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta
07-09-90	285	2.4±0.3	284	2.4±0.3	284	1.3±0.3	284	2.0±0.3
07-16-90	278	2.1±0.4	278	1.4±0.3	278	1.0±0.3	278	1.4±0.3
07-23-90	285	2.3±0.3	286	2.3±0.3	287	2.1±0.3	287	2.3±0.3
07-30-90	291	3.3±0.4	289	3.5±0.5	289	2.6±0.4	289	3.0±0.4
08-06-90	281	2.4±0.4	282	1.9±0.4	282	1.9±0.4	281	1.4±0.3
08-13-90	288	1.7±0.3	288	1.3±0.3	286	1.0±0.3	289	1.8±0.3
08-20-90	281	1.6±0.3	282	1.6±0.3	282	1.3±0.3	282	1.1±0.3
08-27-90	289	1.4±0.3	288	1.7±0.3	289	1.5±0.3	289	1.4±0.3
09-04-90	326	2.7±0.3	325	2.8±0.3	324	1.9±0.3	323	2.1±0.3
09-10-90	244	3.0±0.4	245	2.4±0.4	246	2.2±0.4	243	2.6±0.4
09-17-90	284	3.4±0.5	284	3.2±0.4	284	2.5±0.4	284	2.5±0.4
09-24-90	286	1.3±0.3	287	1.3±0.3	287	1.3±0.3	287	1.4±0.3
10-01-90	291	1.9±0.3	287	2.0±0.3	286	1.5±0.3	285	1.7±0.3
3rd Qtr mean±s.d.		2.3±0.7		2.2±0.7		1.7±0.5		1.9±0.6
10-08-90	281	2.9±0.4	285	2.9±0.4	286	2.4±0.4	287	2.2±0.4
10-15-90	286	0.8±0.3	285	2.3±0.3	283	2.1±0.3	284	2.0±0.3
10-22-90	286	1.8±0.3	286	2.2±0.3	287	2.0±0.3	287	2.0±0.3
10-29-90	288	2.1±0.3	287	2.0±0.3	287	2.1±0.3	NS ^b	--
11-05-90	285	2.5±0.4	285	3.4±0.4	285	3.3±0.4	284	3.2±0.4
11-12-90	286	2.2±0.3	286	2.3±0.4	287	2.3±0.4	288	2.5±0.4
11-19-90	284	3.1±0.4	285	3.5±0.4	285	2.7±0.4	285	2.5±0.4
11-26-90	289	3.2±0.4	286	3.4±0.4	286	2.0±0.3	286	3.2±0.4
12-03-90	287	1.9±0.3	288	0.4±0.2 ^c	288	1.7±0.3	288	1.7±0.3
12-10-90	284	2.4±0.4	284	1.2±0.3	283	2.0±0.4	282	2.4±0.4
12-17-90	285	2.5±0.4	285	2.4±0.3	287	1.2±0.3	288	2.4±0.3
12-24-90	283	4.5±0.4	283	3.8±0.4	283	2.9±0.4	283	4.9±0.4
12-31-90	322 ^d	2.5±0.4	291	3.5±0.4	291	2.2±0.4	289	3.2±0.4
4th Qtr mean±s.d.		2.5±0.9		2.6±1.0		2.2±0.5		2.7±0.9

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.^b NS = No sample; filter holder broken; sample lost in field.^c Filter very light; pump was frozen and replaced with spare.^d Collected 01-01-91.

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Table 3. Airborne Particulates and Iodine-131^a
 Collection: Weekly
 Units: 10^{-2} pCi/m³

Week Ending	BY-21		BY-22		BY-23		BY-24	
	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta
01-08-90	244	2.9±0.4	240	3.1±0.4	240	3.3±0.4	240	2.9±0.4
01-15-90	288	3.1±0.4	288	3.0±0.4	288	2.5±0.3	288	3.1±0.4
01-22-90	283	2.2±0.3	283	2.4±0.3	283	3.0±0.4	283	2.5±0.3
01-29-90	285	2.1±0.3	285 ^b	2.1±0.3	285	2.2±0.3	285	2.2±0.3
02-05-90	286	2.4±0.3	286	2.3±0.3	286	2.2±0.3	286	2.4±0.3
02-12-90	287	2.4±0.3	287	2.7±0.3	287	2.2±0.3	287	0.6±0.2
02-19-90	282	2.3±0.3	282	2.7±0.4	282	2.3±0.3	283	0.6±0.2
02-26-90	288	2.7±0.4	288	2.9±0.4	287	2.5±0.4	287	2.7±0.4
03-05-90	284	2.8±0.4	284	3.0±0.4	284	2.6±0.4	285	2.7±0.4
03-12-90	286	1.8±0.3	286	1.7±0.3	286	1.9±0.3	286	1.7±0.3
03-19-90	285	1.6±0.3	285	1.3±0.3	285	1.5±0.3	285	1.6±0.3
03-26-90	285	2.1±0.2	286	2.4±0.2	285	2.3±0.2	285	2.1±0.2
04-02-90	287	1.2±0.3	287	1.6±0.3	288	1.6±0.3	288	1.6±0.3
1st Qtr mean±s.d.		2.3±0.5		2.4±0.6		2.3±0.5		2.0±0.8
04-09-90	285	2.1±0.3	285	2.0±0.3	285	2.0±0.3	284	2.1±0.3
04-16-90	284	2.2±0.3	284	1.8±0.3	284	2.6±0.3	284	2.3±0.3
04-23-90	284	2.1±0.3	284	2.2±0.3	284	2.0±0.3	284	2.1±0.3
04-30-90	287	1.7±0.2	288	1.6±0.2	287	2.0±0.2	288	1.8±0.2
05-07-90	285	1.7±0.3	285	2.3±0.4	286	1.9±0.3	ND ^c	
05-14-90	284	1.8±0.3	283	3.5±0.4	283	1.9±0.3	283	1.9±0.3
05-21-90	284	1.0±0.2	285	1.0±0.2	285	1.0±0.2	285	1.1±0.2
05-28-90	288	2.1±0.4	287	2.5±0.4	287	2.4±0.4	288	2.2±0.4
06-04-90	285	1.3±0.3	285	1.3±0.3	285	1.4±0.3	285	1.4±0.3
06-11-90	282	1.2±0.3	281	1.5±0.3	281	1.1±0.3	281	1.4±0.3
06-18-90	281	1.6±0.4	281	1.4±0.4	281	1.9±0.4	281	1.8±0.4
06-25-90	294	1.3±0.3	294	1.6±0.3	293	1.6±0.3	293	1.5±0.3
07-02-90	286	1.4±0.3	286	2.0±0.3	287	1.7±0.3	287	1.9±0.3
2nd Qtr mean±s.d.		1.6±0.4		1.9±0.6		1.8±0.5		1.8±0.4

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.

^b Timer out of order; volume is assumed.

^c ND = No data; Sample lost in the field.

Table 3. Airborne Particulates and Iodine-131^a (continued)

Week Ending	BY-21		BY-22		BY-23		BY-24	
	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta	Volume (m ³)	Gross Beta
07-09-90	284	2.8±0.4	284	2.3±0.3	287	3.6±0.4	287	2.5±0.3
07-16-90	283	1.6±0.3	283	1.3±0.3	279	2.0±0.3	279	1.5±0.3
07-23-90	285	2.8±0.4	285	2.3±0.4	285	3.0±0.4	285	2.9±0.4
07-30-90	289	3.6±0.5	289	3.5±0.4	290	4.7±0.5	290	2.9±0.4
08-06-90	282	2.2±0.4	282	2.2±0.4	282	3.3±0.4	282	2.8±0.4
08-13-90	288	2.0±0.3	288	1.5±0.3	288	1.4±0.3	288	1.4±0.3
08-20-90	282	1.4±0.3	282	1.4±0.3	282	1.3±0.3	282 ^b	1.5±0.3
08-27-90	289	1.8±0.3	289	1.6±0.3	289	1.7±0.3	289 ^b	1.7±0.3
09-04-90	325 ^b	1.2±0.3	325	2.6±0.3	325	2.3±0.3	325	2.3±0.3
09-10-90	245	2.9±0.4	245	2.6±0.4	245	2.5±0.4	244	2.6±0.4
09-17-90	284	2.5±0.4	284	3.1±0.4	284	3.0±0.4	284	3.2±0.4
09-24-90	286	1.3±0.3	286	1.6±0.3	286	1.9±0.3	286	1.6±0.3
10-01-90	288	1.8±0.3	290	1.6±0.3	290	1.8±0.3	290	1.9±0.3
3rd Qtr mean±s.d.		2.1±0.7		2.1±0.7		2.5±1.0		2.2±0.6
10-08-90	283	2.4±0.4	282	2.3±0.4	282	2.0±0.4	282	2.3±0.4
10-15-90	285	2.0±0.3	285	1.9±0.3	285	1.8±0.3	285	1.8±0.3
10-22-90	286	1.4±0.3	286	1.9±0.3	286	2.0±0.3	286	2.7±0.4
10-29-90	287	1.6±0.3	287	2.1±0.3	287	1.9±0.3	288	2.1±0.3
11-05-90	286	2.7±0.4	286	3.3±0.4	286	3.4±0.4	286	2.4±0.4
11-12-90	286	1.7±0.3	286	2.5±0.4	286	2.0±0.3	286	2.3±0.4
11-19-90	284	3.3±0.4	284	2.9±0.4	284	2.6±0.4	284	2.4±0.4
11-26-90	288	3.2±0.4	288	2.6±0.4	288	1.3±0.3	288 ^b	3.0±0.4
12-03-90	287	2.1±0.3	275	1.9±0.3	287	2.0±0.3	287	1.6±0.3
12-10-90	284	2.2±0.4	110 ^c	<1.1	284	2.3±0.4	284	2.6±0.4
12-17-90	286	2.4±0.3	286	2.3±0.3	286	2.3±0.3	285	2.5±0.4
12-24-90	283	2.6±0.4	283 ^c	<0.4	283	0.6±0.3	283 ^b	4.6±0.4
12-31-90	292	3.6±0.4	319 ^d	1.8±0.3	319 ^d	3.2±0.4	320 ^d	4.0±0.4
4th Qtr mean±s.d.		2.4±0.7		2.3±0.5		2.1±0.7		2.6±0.8

^a Iodine-131 concentrations are <0.07 pCi/m³ unless noted otherwise.^b Timer replaced; volume was estimated.^c Pump failure; replaced with spare.^d Collected 01-01-91.

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Table 4. Airborne Particulates
Collection: Quarterly composites of weekly collections
Units: pCi/m³

Location	Lab Code	Volume (m ³)	Cs-134	Cs-137	Other Gammas ^a
<u>1st Quarter 1990</u>					
BY-01	BYAP-1899	3625	<0.01	<0.01	<0.01
BY-02	1900	3666	<0.01	<0.01	<0.01
BY-03	1901	3668	<0.01	<0.01	<0.01
BY-04	1902	3666	<0.01	<0.01	<0.01
BY-05	1903	3670	<0.01	<0.01	<0.01
BY-06	1904	3668	<0.01	<0.01	<0.01
BY-07	1905	3668	<0.01	<0.01	<0.01
BY-08	1906	3670	<0.01	<0.01	<0.01
BY-21	1907	3670	<0.01	<0.01	<0.01
BY-22	1908	3667	<0.01	<0.01	<0.01
BY-23	1909	3666	<0.01	<0.01	<0.01
BY-24	1910	3668	<0.01	<0.01	<0.01
<u>2nd Quarter 1990</u>					
BY-01	BYAP-2114	3709	<0.01	<0.01	<0.01
BY-02	2115	3714	<0.01	<0.01	<0.01
BY-03	2116	3711	<0.01	<0.01	<0.01
BY-04	2117	3710	<0.01	<0.01	<0.01
BY-05	2118	3712	<0.01	<0.01	<0.01
BY-06	2119	3709	<0.01	<0.01	<0.01
BY-07	2120	3710	<0.01	<0.01	<0.01
BY-08	2121	3711	<0.01	<0.01	<0.01
BY-21	2122	3709	<0.01	<0.01	<0.01
BY-22	2123	3708	<0.01	<0.01	<0.01
BY-23	2124	3708	<0.01	<0.01	<0.01
BY-24	2125	3423	<0.01	<0.01	<0.01

^a See Introduction.

BYRON

Table 4. Airborne Particulates
 Collection: Quarterly composites of weekly collections
 Units: nCi/m³

Location	Lab Code	Volume (m ³)	Cs-134	Cs-137	Other Gammas ^a
<u>3rd Quarter 1990</u>					
BY-01	BYAP-2224	3710	<0.01	<0.01	<0.01
BY-02	2225	3710	<0.01	<0.01	<0.01
BY-03	2226	3709	<0.01	<0.01	<0.01
BY-04	2227	3707	<0.01	<0.01	<0.01
BY-05	2228	3709	<0.01	<0.01	<0.01
BY-06	2229	3705	<0.01	<0.01	<0.01
BY-07	2230	3704	<0.01	<0.01	<0.01
BY-08	2231	3701	<0.01	<0.01	<0.01
BY-21	2232	3710	<0.01	<0.01	<0.01
BY-22	2233	3712	<0.01	<0.01	<0.01
BY-23	2234	3712	<0.01	<0.01	<0.01
BY-24	2235	3711	<0.01	<0.01	<0.01
<u>4th Quarter 1990</u>					
BY-01	BYAP-2468	3718	<0.01	<0.01	<0.01
BY-02	2469	3745	<0.01	<0.01	<0.01
BY-03	2470	3744	<0.01	<0.01	<0.01
BY-04	2471	3685	<0.01	<0.01	<0.01
BY-05	2472	3746	<0.01	<0.01	<0.01
BY-06	2473	3716	<0.01	<0.01	<0.01
BY-07	2474	3718	<0.01	<0.01	<0.01
BY-08	2475	3431	<0.01	<0.01	<0.01
BY-21	2476	3717	<0.01	<0.01	<0.01
BY-22	2477	3557	<0.01	<0.01	<0.01
BY-23	2478	3743	<0.01	<0.01	<0.01
BY-24	2479	3714	<0.01	<0.01	<0.01

^a See Introduction.

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Table 5. Gamma Radiation, as Measured by Thermoluminescent Dosimeters (TLDs)

STANDARD RADIOLOGICAL MONITORING PROGRAM				
	<u>1st Quarter</u>	<u>2nd Quarter</u>	<u>3rd Quarter</u>	<u>4th Quarter</u>
Date Placed:	01-02-90	04-02-90	07-02-90	10-01-90
Date Removed:	04-02-90	07-02-90	10-01-90	01-01-91
Days in the Field:	90	91	91	92
Location	Average mR/Qtr.			
<u>Offsite Indicator Locations</u>				
BY-01 Byron	11.3±1.1	11.7±0.8	11.0±1.0	14.3±0.9
BY-03 - Nearsite East	14.8±1.0	13.9±0.7	14.8±1.2	16.1±0.8
BY-04 - Paynes Point	13.8±1.2	15.8±0.9	14.4±1.1	17.0±1.0
BY-05 - Nearsite South	16.3±1.0	16.6±1.6	16.1±1.0	18.7±0.9
BY-06 - Oregon	13.3±1.2	13.2±1.0	13.5±1.0	14.5±0.8
Mean ± s.d.	13.9±1.8	14.2±2.0	14.0±1.9	16.1±1.8
<u>Onsite Indicator Locations</u>				
BY-21 - Onsite North	11.4±1.0	11.0±1.2	10.9±0.9	11.8±1.2
BY-22 - Onsite ESE	16.8±1.0	16.6±0.8	17.0±1.4	18.5±0.8
BY-23 - Onsite South	15.5±1.4	15.5±0.9	15.8±1.3	16.9±0.9
BY-24 - Met. Tower	14.4±1.4	14.8±1.0	14.2±1.0	16.5±1.2
Mean ± s.d.	14.5±2.3	14.5±2.4	14.5±2.6	15.9±2.9
<u>Background Locations</u>				
BY-02 - Stillman Valley	12.2±1.0	12.4±0.7	12.4±0.9	15.7±1.0
BY-07 - Mt. Morris	14.0±1.2	15.2±1.0	14.0±1.0	16.5±1.3
BY-08 - Leaf River	13.7±0.7	13.7±0.8	13.9±0.9	14.5±1.3
Mean ± s.d.	13.3±1.0	13.8±1.4	13.4±0.9	15.6±1.0

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Table 5. Gamma Radiation, as Measured by TLDs (continued)

SPECIAL PROGRAM				
Inner Ring, Near Site Boundary, Indicator Locations				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Date Placed:	01-02-90	04-02-90	07-02-90	10-01-90
Date Removed:	04-02-90	07-02-90	10-01-90	01-01-91
Days in the Field:	90	91	91	92
Location	Average mR/Qtr.			
BY-101-1	15.6±1.5	15.9±1.2	15.4±1.3	16.6±0.9
BY-101-2	14.9±1.5	16.3±1.5	14.5±1.2	18.2±1.3
BY-102-1	15.4±0.7	17.5±1.1	15.4±1.1	18.5±1.2
BY-102-2	13.7±0.7	17.0±1.1	15.2±1.5	16.9±1.3
BY-103-1	14.2±1.1	15.2±1.1	14.7±1.2	15.0±1.4
BY-103-2	14.5±0.9	16.5±0.9	14.5±1.1	17.6±0.8
BY-104-1	15.2±1.4	17.0±1.0	15.3±1.3	16.8±1.3
BY-104-2	15.5±1.4	17.2±1.1	15.1±1.4	17.7±1.1
BY-105-1	15.9±1.1	17.4±1.3	16.0±1.2	17.7±1.6
BY-105-2	15.4±1.1	17.2±0.9	15.2±1.1	18.0±1.0
BY-106-1	15.9±1.1	16.4±1.0	16.2±1.4	17.3±1.2
BY-106-2	13.6±1.1	15.1±1.2	13.6±1.3	15.8±1.1
BY-107-1	15.8±1.5	17.7±1.9	16.6±1.2	20.2±1.5
BY-107-2	15.9±1.3	17.5±0.8	15.9±1.0	17.4±0.8
BY-108-1	16.8±1.1	17.1±0.8	17.1±1.5	18.2±1.2
BY-108-2	13.9±1.2	13.7±1.0	13.5±1.1	13.9±1.1
BY-109-1	14.7±0.8	14.6±1.3	14.7±1.0	16.4±1.2
BY-109-2	16.0±1.3	13.7±1.3	14.0±1.3	14.1±1.7
BY-110-1	14.2±0.9	15.2±0.8	13.8±0.8	16.4±1.0
BY-110-2	14.3±0.9	14.7±1.6	14.6±0.8	14.9±1.3
BY-111-1	15.7±0.9	16.4±1.0	15.5±0.8	17.3±0.9
BY-111-2	15.4±0.8	13.0±1.4	16.4±0.9	16.8±1.5
BY-112-1	15.8±1.0	15.9±1.0	14.9±1.0	16.6±1.0
BY-112-2	14.1±0.8	14.2±1.3	14.4±0.8	15.6±1.2
BY-113-1	15.1±1.1	15.7±1.1	14.5±1.0	16.2±1.3
BY-113-2	13.5±0.9	12.8±1.0	13.2±1.0	15.4±1.1
BY-114-1	12.6±0.9	13.2±0.9	12.0±1.0	14.3±1.0
BY-114-2	15.1±1.0	14.5±1.1	14.8±0.8	16.2±1.0
BY-115-1	14.3±1.4	13.9±1.2	14.2±1.3	15.5±1.3
BY-115-2	14.1±1.0	14.7±0.7	14.0±0.8	16.7±0.9
BY-116-1	12.6±0.7	12.6±1.1	12.1±0.9	13.5±1.0
BY-116-2	14.9±0.9	15.1±0.8	14.6±0.8	17.5±0.8
Mean ± s.d.	14.9±1.0	15.4±1.6	14.7±1.2	16.5±1.5

BYRON

Table 5. Gamma Radiation, as Measured by TLDs (continued)

SPECIAL PROGRAM				
<u>Outer Ring, Near 5 Mile Radius, Indicator Locations</u>				
	<u>1st Quarter</u>	<u>2nd Quarter</u>	<u>3rd Quarter</u>	<u>4th Quarter</u>
Date Placed:	01-02-90	04-02-90	07-02-90	10-01-90
Date Removed:	04-02-90	07-02-90	10-01-90	01-01-91
Days in the Field:	90	91	91	92
Location	Average mR/Qtr.			
BY-201-1	15.4±0.7	15.0±1.2	12.6±0.7	16.1±1.0
BY-201-2	17.2±1.2	16.9±0.9	16.2±1.0	17.5±0.8
BY-202-1	13.2±1.3	13.8±1.2	12.8±1.3	15.1±1.2
BY-202-2	15.6±1.0	17.0±0.8	14.6±0.8	18.2±1.3
BY-203-1	13.6±1.1	10.5±0.9	10.7±0.9	11.7±0.9
BY-203-2	11.8±1.2	14.8±1.3	13.7±0.9	16.3±0.8
BY-204-1	12.0±1.1	11.9±1.1	11.8±1.1	13.2±1.0
BY-204-2	14.8±0.9	17.2±0.9	15.3±0.9	18.9±1.1
BY-205-1	15.0±0.9	16.0±1.2	15.7±1.2	17.0±1.2
BY-205-2	14.7±1.1	15.5±0.7	14.2±1.1	16.2±0.9
BY-206-1	16.1±1.0	16.8±1.1	16.4±1.2	17.0±0.8
BY-206-2	17.1±1.1 ^a	15.1±0.9	15.3±1.1	16.8±1.1
BY-207-1	16.6±0.9	17.1±1.0	16.9±0.8	17.9±1.2
BY-207-2	14.8±0.9	15.0±0.8	14.7±1.1	16.7±1.0
BY-208-1	18.5±1.1	17.3±0.8	18.4±0.9	19.9±1.0
BY-208-2	16.0±1.1	16.1±1.2	15.9±1.2	16.9±1.2
BY-209-1	16.9±0.8	16.6±1.0	15.1±0.9	18.5±1.2
BY-209-2	13.9±0.8	13.6±1.0	15.5±1.0	14.9±0.9
BY-210-1	15.5±1.0	15.8±0.7	16.0±1.1	17.7±0.8
BY-210-2	15.8±0.9	15.6±0.9	15.6±0.9	17.3±0.9
BY-211-1	15.8±1.2	13.9±1.2	15.2±0.8	16.2±1.2
BY-211-2	16.9±1.1	16.8±1.1	17.0±1.0	17.4±0.9
BY-212-1	16.7±1.0	15.5±0.9	16.8±1.0	17.2±0.9
BY-212-2	16.4±1.3	18.3±0.7	16.4±1.2	18.8±1.6
BY-213-1	15.6±1.0	14.0±1.2	15.7±1.0	15.8±1.5
BY-213-2	17.5±1.3	17.7±0.9	17.3±1.0	19.1±1.0
BY-214-1	14.9±0.9	14.5±0.9	14.7±1.0	15.5±0.8
BY-214-2	16.3±1.2	16.1±0.7	15.5±1.0	17.5±0.8
BY-215-1	15.2±1.0	15.3±0.8	15.5±1.2	16.7±1.1
BY-215-2	16.0±1.0	17.0±1.0	16.0±0.9	18.5±1.1
BY-216-1	17.0±1.2	14.9±1.3	16.5±1.2	16.0±1.7
BY-216-2	16.1±1.1	17.0±0.7	15.6±1.2	18.0±1.1
Mean ± s.d.	15.6±1.5	15.6±1.7	15.3±1.6	16.9±1.7

^a Spare No. 1 used at location 206-2.

BYRON

Table 5. Gamma Radiation, as Measured by TLDs (continued)

RESTRICTED AREA MONITORING PROGRAM				
	<u>1st Quarter</u>	<u>2nd Quarter</u>	<u>3rd Quarter</u>	<u>4th Quarter</u>
Date Placed:	01-02-90	04-02-90	07-02-90	10-01-90
Date Removed:	04-02-90	07-02-90	10-01-90	01-01-91
Days in the Field:	90	91	91	92
Location ^a	Average mR/Qtr.			
BY-302-1	16.1±1.1	12.3±0.8	14.4±0.9	12.1±1.1

^a Description of location.

BY-302-1 Security Gatehouse (parking lot).

BYRON

Table 6. Milk

Collection: Monthly; semimonthly during grazing season (May-October)

Units: pCi/L

Collection Date	Lab Code	I-131	Cs-134	Cs-137	Other Gammas ^a
<u>Warren Danakas Dairy Farm BY-15</u>					
01-02-90	BYMI-4358	<0.5	<5	<5	<10
02-05-90	4449,50	<0.5	<5	<5	<10
03-05-90	4514,5	<0.5	<5	<5	<10
04-02-90	4572	<0.5	<5	<5	<10
05-07-90	4684	<0.5	<5	<5	<10
05-21-90	4759,60	<0.5	<5	<5	<10
06-04-90	4812	<0.5	<5	<5	<10
06-11-90	4849	<0.5	<5	<5	<10
07-02-90	4966	<0.5	<5	<5	<10
07-16-90	5043	<0.5	<5	<5	<10
08-06-90	5146	<0.5	<5	<5	<10
08-20-90	5227	<0.5	<5	<5	<10
09-04-90	5298	<0.5	<5	<5	<10
09-17-90	5372	<0.5	<5	<5	<10
10-01-90	5454,5	<0.5	<5	<5	<10
10-15-90	5525	<0.5	<5	<5	<10
11-05-90	5619	<0.5	<5	<5	<10
12-03-90	5678,9	<0.5	<5	<5	<10
<u>Richard Oltmann Dairy Farm^b BY-25</u>					
01-02-90	NSC ^c	--	--	--	--
02-05-90	NSC	--	--	--	--
03-19-90	BYMI-4556	<0.5	<5	<5	<10
04-02-90	4576	<0.5	<5	<5	<10
05-07-90	4687	<0.5	<5	<5	<10
05-21-90	4763	<0.5	<5	5	<10
06-04-90	4816	<0.5	<5	<5	<10
06-18-90	4900	<0.5	<5	<5	<10
07-02-90	4968	<0.5	<5	<5	<10
07-16-90	5047	<0.5	<5	<5	<10
08-06-90	5141,9	<0.5	<5	<5	<10
08-20-90	523J	<0.5	<5	<5	<10
09-04-90	5370	<0.5	<5	<5	<10
09-17-90	5374	<0.5	<5	<5	<10
10-01-90	5457	<0.5	<5	<5	<10
10-15-90	5527	<0.5	<5	<5	<10
11-05-90	5621	<0.5	<5	<5	<10
12-03-90	5681	<0.5	<5	<5	<10

^a See Introduction.^b Replacement dairy for Bill Leupkes Farm, which was destroyed in a fire.^c NS = No sample available; dairy destroyed in fire.

Table 6. Milk (continued)

Collection Date	Lab Code	I-131	Cs-134	Cs-137	Other Gammas ^a
<u>Whitten Holsteins BY-17</u>					
01-02-90	BYMI-4359	<0.5	<5	<5	<10
02-05-90	4451	<0.5	<5	<5	<10
03-05-90	4516	<0.5	<5	<5	<10
04-02-90	4573	<0.5	<5	<5	<10
05-07-90	4685	<0.5	<5	<5	<10
05-21-90	4761	<0.5	<5	<5	<10
06-04-90	4813,4	<0.5	<5	<5	<10
06-18-90	4898	<0.5	<5	<5	<10
<u>Hazzard Dairy Farm BY-26^b</u>					
07-16-90	BYMI-5044,5	<0.5	<5	<5	<10
07-23-90	5083	<0.5	<5	<5	<10
08-06-90	5150	<0.5	<5	<5	<10
08-20-90	5231	<0.5	<5	<5	<10
09-04-90	5301,2	<0.5	<5	<5	<10
09-17-90	5375	<0.5	<5	<5	<10
10-01-90	5458	<0.5	<5	<5	<10
10-15-90	5528	<0.5	<5	<5	<10
11-05-90	5622,3	<0.5	<5	<5	<10
12-03-90	5682	<0.5	<5	<5	<10
<u>Kenneth Reeverts Farm BY-20</u>					
01-02-90	BYMI-4360	<0.5	<5	<5	<10
02-05-90	4452	<0.5	<5	<5	<10
03-05-90	4517	<0.5	<5	<5	<10
04-02-90	4574,5	<0.5	<5	<5	<10
05-07-90	4686	<0.5	<5	<5	<10
05-21-90	4762	<0.5	<5	<5	<10
06-04-90	4815	<0.5	<5	<5	<10
06-18-90	4899	<0.5	<5	<5	<10
07-02-90	4967	<0.5	<5	<5	<10
07-16-90	5046	<0.5	<5	<5	<10
08-06-90	5147	<0.5	<5	<5	<10
08-20-90	5228,9	<0.5	<5	<5	<10
09-04-90	5299	<0.5	<5	<5	<10
09-17-90	5373	<0.5	<5	<5	<10
10-01-90	5456	<0.5	<5	<5	<10
10-15-90	5526	<0.5	<5	<5	<10
11-05-90	5620	<0.5	<5	<5	<10
12-03-90	5680	<0.5	<5	<5	<10

^a See Introduction.^b Whitten Holsteins was replaced by Hazzard Dairy Farm on July 16, 1990.

Table 6. Milk (continued)

Collection Date	Lab Code	I-131	Cs-134	Cs-137	Other Gammas ^a
<u>Druen Dairy Farm BY-27^b</u>					
10-01-90	BYMI-5459	<0.5	<5	<5	<10
10-15-90	5529	<0.5	<5	<5	<10
11-05-90	5624	<0.5	<5	<5	<10
12-03-90	5683	<0.5	<5	<5	<10

^a See Introduction.

^b New location; Kenneth Druen Dairy Farm, 2490 Route 64 West, Mt. Morris, Illinois; 5.3 miles at 236°.

BYRON

Table 7. Fish, Edible Portions.
Collection: 3 times per year
Unit: pCi/g wet weight

Collection Date	Lab Code	Type	Cs-134	Cs-137	Other Gammas ^a
<u>Oregon Pool of Rock River BY-12</u>					
05-07-90	BYF-1030	Bass	<0.10	<0.10	<0.13
07-09-90	1142	Carp	<0.10	<0.10	<0.13
07-09-90	1143	Sheepshead	<0.10	<0.10	<0.13
10-15-90	1246	Walleye	<0.10	<0.10	<0.13
11-19-90	1342,3	Walleye	<0.10	<0.10	<0.13
<u>Upstream BY-13</u>					
05-07-90	BYF-1031	Bass	<0.10	<0.10	<0.13
05-14-90	1038	Carp sucker	<0.10	<0.10	<0.13
05-14-90	1039	Catfish	<0.10	<0.10	<0.13
05-14-90	1040	Sheepshead	<0.10	<0.10	<0.13
08-13-90	1191	Carp	<0.10	<0.10	<0.13
11-19-90	1344	Bass	<0.10	<0.10	<0.13
11-19-90	1345	Walleye	<0.10	<0.10	<0.13

^a See Introduction.

BYRON

Table 8. Vegetables
 Collection: Annually
 Units: pCi/g wet weight

Collection Date	Lab Code	Type	I-131 ^a	Cs-134	Cs-137	Other Gammas ^b
<u>BY-19-1^c River Road Across from AP-1</u>						
08-27-90	BYVE-961	Rhubarb	<0.06	<0.06	<0.08	<0.15
08-27-90	962	Zucchini	--	<0.06	<0.08	<0.15
08-27-90	963	Cucumbers	--	<0.06	<0.08	<0.15
<u>BY-19-2^c Just South of AP-5</u>						
08-27-90	BYVE-964	Tomatoes	--	<0.06	<0.08	<0.15
08-27-90	965	Yellow Squash	--	<0.06	<0.08	<0.15
08-27-90	966,7	Cucumbers	--	<0.06	<0.08	<0.15
08-27-90	968	Rhubarb	<0.06	<0.06	<0.08	<0.15
08-27-90	969	Zucchini	--	<0.06	<0.08	<0.15

^a Analysis for I-131 required for green leafy vegetation only.

^b See Introduction.

^c Not required by Technical Specifications; water not being used for irrigation.

BYRON

Table 9. Surface Water
Units: pCi/L

MONTHLY COMPOSITES OF WEEKLY COLLECTIONS				
Composite Period	Lab Code	Cs-134	Cs-137	Other Gammas ^a
<u>Woodland Creek BY-09</u>				
January, 90	NS ^b			
February, 90	BYSW-5142	<10	<10	<15
March, 90	5888	<10	<10	<15
April, 90	6171	<10	<10	<15
May, 90	6618	<10	<10	<15
June, 90	7036	<10	<10	<15
July, 90	7374	<10	<10	<15
August, 90	7697	<10	<10	<15
September, 90	8206	<10	<10	<15
October, 90	8561	<10	<10	<15
November, 90	8831	<10	<10	<15
December, 90	9308	<10	<10	<15
<u>Downstream BY-12</u>				
January, 90	BYSW-5128	<10	<10	<15
February, 90	5378	<10	<10	<15
March, 90	5889	<10	<10	<15
April, 90	6172,3	<10	<10	<15
May, 90	6619,20	<10	<10	<15
June, 90	7037	<10	<10	<15
July, 90	7376	<10	<10	<15
August, 90	7698	<10	<10	<15
September, 90	8207	<10	<10	<15
October, 90	8562	<10	<10	<15
November, 90	8832	<10	<10	<15
December, 90	9309	<10	<10	<15
<u>Upstream BY-13</u>				
January, 90	BYSW-4883	<10	<10	<15
February, 90	5379	<10	<10	<15
March, 90	5890,1	<10	<10	<15
April, 90	6174	<10	<10	<15
May, 90	6621	<10	<10	<15
June, 90	7038	<10	<10	<15
July, 90	7375	<10	<10	<15
August, 90	7699	<10	<10	<15
September, 90	8208,9	<10	<10	<15
October, 90	8563	<10	<10	<15
November, 90	8833	<10	<10	<15
December, 90	9310	<10	<10	<15

^a See Introduction.

^b NS = No sample available; river frozen.

BYRON

Table 9. Surface Water (continued)

QUARTERLY COMPOSITES OF WEEKLY COLLECTIONS		
Composite Period	Lab Code	Concentration (pCi/L) Tritium
<u>Woodland Creek BY-09</u>		
1st Quarter, 1990	BYSW-5812	<200
2nd Quarter, 1990	6923	<200
3rd Quarter, 1990	8071	<200
4th Quarter, 1990	9077	<200
<u>Downstream BY-12</u>		
1st Quarter, 1990	BYSW-5810,1	404±77
2nd Quarter, 1990	6924	<200
3rd Quarter, 1990	8072	339±101
4th Quarter, 1990	9075	1281±132 ^a
<u>Upstream BY-13(C)</u>		
1st Quarter, 1990	BYSW-5813	<200
2nd Quarter, 1990	6925	<200
3rd Quarter, 1990	8073,4	<200
4th Quarter, 1990	9076	<200

^a Monthly composites were analyzed for tritium:

October	505±122 pCi/L
November	337±116 pCi/L
December	2590±170 pCi/L

BYRON

Table 10. Well Water
 Units: pCi/L
 Collection: Composite of semimonthly collections.

MONTHLY COMPOSITE OF SEMIMONTHLY COLLECTIONS										
Collection Date	BY-14					BY-18				
	Lab Code	Gross Beta	Cs-134	Cs-137	Other Gammas ^a	Lab Code	Gross Beta	Cs-134	Cs-137	Other Gammas ^a
January, 90	BYWW-5129	<2.0	<10	<10	<15	BYWW-5130,1	<1.9	<10	<10	<15
February, 90	5380,1	2.6±1.0	<10	<10	<15	5382	2.8±1.4	<10	<10	<15
March, 90	5892	<1.6	<10	<10	<15	5893	<1.9	<10	<10	<15
April, 90	6175	<2.4	<10	<10	<15	6176	2.0±1.2	<10	<15	<15
May, 90	6622	<1.3	<10	<10	<15	6623	1.3±0.7	<10	<10	<15
June, 90	7034	<1.9	<10	<10	<15	7035	1.3±1.0	<10	<10	<15
July, 90	7377	<1.9	<10	<10	<15	7378	<2.0	<10	<10	<15
August, 90	7701	<1.4	<10	<10	<15	7700	2.6±0.8	<10	<10	<15
September, 90	8210	<1.5	<10	<10	<15	8211	<1.5	<10	<10	<15
October, 90	8564	<2.4	<10	<10	<15	8565	<1.9	<10	<10	<15
November, 90	8829	<1.4	<10	<10	<15	8830	<1.3	<10	<10	<15
December, 90	9311,2	<1.1	<10	<10	<15	9313	1.4±0.8	<10	<10	<15

^a See Introduction.

BYRON

Table 10. Well Water
Units: pCi/L

QUARTERLY GRAB SAMPLES		
Collection Date	Lab Code	Tritium
<hr/>		
	<u>Off-Site Well</u>	<u>BY-14</u>
1st Quarter, 90	BYWW-5814	<200
2nd Quarter, 90	6926	<200
3rd Quarter, 90	8173	<200
4th Quarter, 90	9182	<200
	<u>McCoy Farmstead Well</u>	<u>BY-18</u>
1st Quarter, 90	BYWW-5815	<200
2nd Quarter, 90	6927	<200
3rd Quarter, 90	8174	<200
4th Quarter, 90	9183	<200

BYRON

Table 11. Bottom Sediments
 Collection: Semiannually
 Units: pCi/g dry weight

Date Collected	Lab Code	Cs-134	Cs-137	Other Gamma ^a
<u>Oregon Pool of Rock River BY-12</u>				
05-07-90	BYBS-750	<0.1	<0.1	<0.2
10-01-90	819	<0.1	0.45±0.07	<0.2
<u>Upstream BY-13</u>				
05-07-90	BYBS-751	<0.1	<0.1	<0.2
10-01-90	820	<0.1	0.26±0.04	<0.2

^a See Introduction.

BYRON

MILCH ANIMALS, NEAREST RESIDENCE, AND
NEAREST CATTLE CENSUSES

BYRON

BYRON DAIRY CENSUS 1990

A. Site Boundary to 2 mi.

None

B. 2 mi. to 5 mi.

1. Reeverts Dairy Farm (BY-20)
5674 N. German Church Road
Route 1
Byron, Illinois

2.1 miles @ 037°

Milks 33 cows

2. Warren Danakas Dairy Farm (BY-15)
5845 East Holcomb Road
Route 1
Oregon, Illinois

3.3 miles @ 110°

Milks 10 cows

3. Oltmann Dairy Farm; Richard Oltmann, owner (BY-25)
1858 N. German Church Road
Route 1
Oregon, Illinois

2.2 miles @ 180°

Milks 15 cows

BYRON DAIRY CENSUS 1990 (continued)

4. Ashelford Dairy Farm
4210 IL Route 2
Route 3
Oregon, Illinois

2.6 miles @ 275°

Milks 12 cows
5. CAM-DEE Dairy Farms, Gerald DeVries, owner
5213 N. Town Hall Road
Route 3
Oregon, Illinois

3.3 miles @ 290°

Milks 35 cows
6. Duane Camling Dairy Farm
50 East Camling Road
Route 3
Oregon, Illinois

3.2 miles @ 305°

Milks 35 cows

C. Sampling Locations

BY-15 Warren Danakas Farm
 3.3 miles @ 110°
 Milks 10 cows
 Diet:
 May - October: Pasture 5 acres. Pasture, hay, corn,
 oats, protein/mineral supplement.
 November - April: Feedlot 3 acres. Hay, corn, oats and
 protein/supplement.

BYRON DAIRY CENSUS 1990 (continued)

- BY-25 Richard Oltmann Dairy Farm
2.2 miles @ 180°
- Milks 11 cows
Diet:
May - October: Pasture feedlot 3 acres. Haylage, corn, hay, and protein/mineral supplement.
November - April: Feedlot less than 2 acres. Hay, corn silage, oats, and protein/mineral supplement.
- BY-17 Whitten Farm^a
8.5 miles @ 250°
- Milks 40 cows
Diet:
May - October: Pasture feedlot 5 acres. Green chop, hay, haylage, mineral supplement.
November - April: Feedlot 0.5 acres. Silage, haylage, corn, hay, mineral supplement.
- BY-20 Reeverts Dairy Farm
2.1 miles @ 037°
- Milks 33 cows
Diet:
May - October: Pasture 7 acres. Pasture, Haylage, hay, oats, corn, protein/mineral supplement.
November - April: Feedlot less than 2 acres. Hay, silage, oats, corn, protein/mineral supplement.
- BY-26 Hazzard Dairy Farm
23115 Hoisington Rd., Pecatonica, IL
13.5 miles @ 355°
- Milks 38 cows
Diet:
May - October: Feedlot 5 acres. Haylage, corn, oats, hay, silage.
November - April: Feedlot 5 acres. Haylage, corn, oats, hay, silage.

Census conducted by L. Coleman on July 9, 1990.

^a Whitten farm was replaced by Hazzard Farm on July 2, 1990.

BYRON

NEAREST RESIDENCE CENSUS, 1990

Nearest resident of the Byron Station within a five (5) mile radius.

N	1.9 miles
NNE	1.5 miles
NE	0.9 miles
ENE	1.3 miles
E	1.2 miles
ESE	1.6 miles
SE	1.1 miles
SSE	1.2 miles
S	0.7 miles
SSW	0.6 miles
SW	0.9 miles
WSW	1.7 miles
W	2.0 miles
WNW	0.8 miles
NW	1.2 miles
NNW	1.3 miles

Census conducted by L. Coleman on July 9, 1990.

BYRON

NEAREST CATTLE CENSUS, 1990

Nearest cattle of the Byron Station within a five (5) mile radius.

<u>Direction</u>	<u>Distance</u>
N	3.75 miles
NNE	2.1 miles
NE	1.5 miles
ENE	1.5 miles
E	2.5 miles
ESE	1.33 miles
SE	2.75 miles
SSE	2.38 miles
S	2.4 miles
SSW	0.75 miles
SW	1.0 miles
WSW	1.75 miles
W	1.75 miles
WNW	1.38 miles
NW	1.25 miles
NNW	2.4 miles

Census conducted by L. Coleman on July 9, 1990.

APPENDIX IV

INTERLABORATORY COMPARISON PROGRAM RESULTS

Appendix IV

Interlaboratory Comparison Program Results

Teledyne Isotopes Midwest Laboratory (formerly Hazleton Environmental Sciences) has participated in interlaboratory comparison (crosscheck) programs since the formulation of its quality control program in December 1971. These programs are operated by agencies which supply environmental-type samples (e.g., milk or water) containing concentrations of radionuclides known to the issuing agency but not to participant laboratories. The purpose of such a program is to provide an independent check on the laboratory's analytical procedures and to alert it to any possible problems.

Participant laboratories measure the concentrations of specified radionuclides and report them to the issuing agency. Several months later, the agency reports the known values to the participant laboratories and specifies control limits. Results consistently higher or lower than the known values or outside the control limits indicate a need to check the instruments or procedures used.

The results in Table A-1 were obtained through participation in the environmental sample crosscheck program for milk, water, air filters, and food samples during the period January 1986 through December, 1990. This program has been conducted by the U.S. Environmental Protection Agency Intercomparison and Calibration Section, Quality Assurance Branch, Environmental Monitoring and Support Laboratory, Las Vegas, Nevada.

The results in Table A-2 were obtained for thermoluminescent dosimeters (TLDs) during the period 1976, 1977, 1979, 1980, 1984, and 1985-1986 through participation in the Second, Third, Fourth, Fifth, Seventh, and Eighth International Intercomparison of Environmental Dosimeters under the sponsorships listed in Table A-2. Also Teledyne testing results are listed.

Table A-3 lists results of the analyses on in-house spiked samples.

Table A-4 lists results of the analyses on in-house "blank" samples.

Attachment B lists acceptance criteria for "spiked" samples.

Addendum to Appendix A provides explanation for out-of-limit results.

Table A-1. U.S. Environmental Protection Agency's crosscheck program, comparison of EPA and Teledyne Isotopes Midwest Laboratory results for milk, water, air filters, and food samples, 1986 through 1990.^a

Lab Code	Sample Type	Date Collected	Analysis	TIML Result $\pm 2\sigma^c$	Concentration in pCi/L ^b	
					EPA Result ^d	Control Limits
					1s, N=1	
STF-447	Food	Jan 1986	Sr-89	24.3 \pm 2.5	25.0 \pm 5.0	16.3-33.7
			Sr-90	17.3 \pm 0.6	10.0 \pm 1.5	7.4-12.6
			I-131	22.7 \pm 2.3	20.0 \pm 0.6	9.6-30.4
			Cs-137	16.3 \pm 0.6	15.0 \pm 5.0	6.3-23.7
			K	927 \pm 46	950 \pm 144	701-1199
STW-448	Water	Feb 1986	Cr-51	45.0 \pm 3.6	38.0 \pm 5.0	29.3-46.7
			Co-60	19.7 \pm 1.5	18.0 \pm 5.0	9.3-26.7
			Zn-65	44.0 \pm 3.5	40.0 \pm 5.0	31.3-48.7
			Ru-106	<9.0	0.0 \pm 5.0	0.0-8.7
			Cs-134	28.3 \pm 2.3	30.0 \pm 5.0	21.3-38.7
			Cs-137	23.7 \pm 0.6	22.0 \pm 5.0	13.3-30.7
STW-449	Water	Feb 1986	H-3	5176 \pm 48	5227 \pm 525	4317-6137
STW-450	Water	Feb 1986	U total	8.0 \pm 0.0	9.0 \pm 6.0	0.0-19.4
STM-451	Milk	Feb 1986	I-131	7.0 \pm 0.0	9.0 \pm 6.0	0.0-19.4
STW-452	Water	Mar 1986	Ra-226	3.8 \pm 0.1	4.1 \pm 0.6	3.0-5.2
			Ra-228	11.0 \pm 0.5	12.4 \pm 1.8	9.2-15.5
STW-453	Water	Mar 1986	Gr. alpha	6.7 \pm 0.6	15.0 \pm 5.0	6.3-23.7
			Gr. beta	7.3 \pm 0.6	8.0 \pm 5.0	0.0-16.7
STW-454	Water	Apr 1986	I-131	7.0 \pm 0.0	9.0 \pm 6.0	0.0-19.4
STW-455 456	Water (Blind)	Apr 1986				
	Sample A		Gr. alpha	15.0 \pm 1.0	17.0 \pm 5.0	8.3-25.7
			Ra-226	3.1 \pm 0.1	2.9 \pm 0.4	2.1-3.7
			Ra-228	1.5 \pm 0.2	2.0 \pm 0.3	1.5-2.5
			Uranium	4.7 \pm 0.6	5.0 \pm 6.0	0.0-15.4
	Sample B		Gr. beta	28.7 \pm 1.2	35.0 \pm 5.0	26.3-43.7
			Sr-89	5.7 \pm 0.6	7.0 \pm 5.0	0.0-15.7
			Sr-90	7.0 \pm 0.0	7.0 \pm 1.5	4.4-9.6
			Co-60	10.7 \pm 1.5	10.0 \pm 5.0	1.3-18.7
			Cs-134	4.0 \pm 1.7	5.0 \pm 5.0	0.0-13.7
			Cs-137	5.3 \pm 0.6	5.0 \pm 5.0	0.0-13.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d	
					1s, N=1	Control Limits
STAF-457	Air Filter	Apr 1986	Gr. alpha	13.7 \pm 0.6	15.0 \pm 5.0	6.3-23.7
			Gr. beta	46.3 \pm 0.6	47.0 \pm 5.0	38.3-55.7
			Sr-90	14.7 \pm 0.6	18.0 \pm 1.5	15.4-20.6
			Cs-137	10.7 \pm 0.6	10.0 \pm 5.0	1.3-18.7
STU-458	Urine	Apr 1986	Tritium	4313 \pm 70	4423 \pm 189	4096-4750
STW-459	Water	May 1986	Sr-89	4.3 \pm 0.6	5.0 \pm 5.0	0.0-13.7
			Sr-90	5.0 \pm 0.0	5.0 \pm 1.5	2.4-7.6
STW-460	Water	May 1986	Gr. alpha	5.3 \pm 0.6	8.0 \pm 5.0	0.0-16.7
			Gr. beta	11.3 \pm 1.2	15.0 \pm 5.0	6.3-23.7
STW-461	Water	Jun 1986	Cr-51	<9.0	0.0 \pm 5.0	0.0-8.7
			Co-60	66.0 \pm 1.0	66.0 \pm 5.0	57.3-74.7
			Zn-65	87.3 \pm 1.5	86.0 \pm 5.0	77.3-94.7
			Ru-106	39.7 \pm 2.5	50.0 \pm 5.0	41.3-58.7
			Cs-134	49.3 \pm 2.5	49.0 \pm 5.0	40.3-57.7
			Cs-137	10.3 \pm 1.5	10.0 \pm 5.0	1.3-18.7
STW-462	Water	Jun 1986	Tritium	3427 \pm 25	3125 \pm 361	2499-3751
STM-464	Milk	Jun 1986	Sr-89	<1.0	0.0 \pm 5.0	0.0-8.7
			Sr-90	15.3 \pm 0.6	16.0 \pm 1.5	13.4-18.6
			I-131	48.3 \pm 2.3	41.0 \pm 6.0	30.6-51.4
			Cs-137	43.7 \pm 1.5	31.0 \pm 5.0	22.3-39.7
			K	1567 \pm 114	1600 \pm 80	1461-1739
STW-465	Water	Jul 1986	Gr. alpha	4.7 \pm 0.6	6.0 \pm 5.0	0.0-14.7
			Gr. beta	18.7 \pm 1.2	18.0 \pm 5.0	9.3-26.7
STW-467	Water	Aug 1986	I-131	30.3 \pm 0.6	45.0 \pm 6.0	34.4-55.4
STW-468	Water	Aug 1986	Pu-239	11.3 \pm 0.6	10.1 \pm 1.0	8.3-11.9
STW-469	Water	Aug 1986	Uranium	4.0 \pm 0.0	4.0 \pm 6.0	0.0-14.4
STAF-470 471 472	Air Filter	Sep 1986	Gr. alpha	19.3 \pm 1.5	22.0 \pm 5.0	13.3-30.7
			Gr. beta	64.0 \pm 2.6	66.0 \pm 5.0	57.3-74.7
			Sr-90	22.0 \pm 1.0	22.0 \pm 5.0	19.4-24.6
			Cs-137	25.7 \pm 1.5	22.0 \pm 5.0	13.3-30.7
STW-473	Water	Sep 1986	Ra-226	6.0 \pm 0.1	6.1 \pm 0.9	4.5-7.7
			Ra-228	8.7 \pm 1.1	9.1 \pm 1.4	6.7-11.5

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	TIML Result $\pm 2\sigma^c$	Concentration in pCi/Lb	
					EPA Result ^d	Control Limits
STW-474	Water	Sep 1986	Gr. alpha	16.3 \pm 3.2	15.0 \pm 5.0	6.3-23.7
			Gr. beta	9.0 \pm 1.0	8.0 \pm 5.0	0.0-16.7
STW-475	Water	Oct 1986	Cr-51	63.3 \pm 5.5	59.0 \pm 5.0	50.3-67.7
			Co-60	31.0 \pm 2.0	31.0 \pm 5.0	22.3-39.7
			Zn-65	87.3 \pm 5.9	85.0 \pm 5.0	76.3-93.7
			Ru-106	74.7 \pm 7.4	74.0 \pm 5.0	65.3-82.7
			Cs-134	25.7 \pm 0.6	28.0 \pm 5.0	19.3-36.7
			Cs-137	46.3 \pm 1.5	44.0 \pm 5.0	35.3-52.7
STW-476	Water	Oct 1986	H-3	5918 \pm 60	5973 \pm 597	4938-7008
SPW-477	Water (Blind)	Oct 1986				
	Sample A		Gr. alpha	34.0 \pm 6.0	40.0 \pm 5.0	31.3-48.7
			Ra-226	5.8 \pm 0.2	6.0 \pm 0.9	4.4-7.6
			Ra-228	2.7 \pm 1.0	5.0 \pm 0.8	3.7-6.3
			Uranium	11.0 \pm 0.0	10.0 \pm 6.0	0.0-20.4
	Sample B		Gr. beta	38.7 \pm 1.2	51.0 \pm 5.0	42.3-59.7
			Sr-89	5.0 \pm 0.0	10.0 \pm 5.0	1.3-18.7
			Sr-90	3.0 \pm 0.0	4.0 \pm 1.5	1.4-6.6
			Co-60	24.7 \pm 1.2	24.0 \pm 5.0	15.3-32.7
			Cs-134	11.0 \pm 2.0	12.0 \pm 5.0	3.3-20.7
			Cs-137	9.3 \pm 1.2	8.0 \pm 5.0	0.0-20.4
STM-479	Milk	Nov 1986	Sr-89	7.7 \pm 1.2	9.0 \pm 5.0	0.3-17.7
			Sr-90	1.0 \pm 0.0	0.0 \pm 1.5	0.0-2.6
			I-131	52.3 \pm 3.1	49.0 \pm 6.0	38.6-59.4
			Cs-137	45.7 \pm 3.1	39.0 \pm 5.0	30.3-47.7
			K	1489 \pm 104	1565 \pm 78	1430-1700
STU-480	Urine	Nov 1986	H-3	5540 \pm 26	5257 \pm 912	4347-6169
STW-481	Water	Nov 1986	Gr. alpha	12.0 \pm 4.0	20.0 \pm 5.0	11.3-28.7
			Gr. beta	20.0 \pm 3.5	20.0 \pm 5.0	11.3-28.7
STW-482	Water	Dec 1986	Ra-226	6.7 \pm 0.2	6.8 \pm 1.0	5.0-8.6
			Ra-228	5.2 \pm 0.2	11.1 \pm 1.7	8.2-14.0
STW-483	Water	Jan 1987	Sr-89	19.7 \pm 5.0	25.0 \pm 5.0	16.3-33.7
			Sr-90	21.0 \pm 2.0	25.0 \pm 1.5	22.4-27.6

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d	
					1s, N=1	Control Limits
STW-484	Water	Jan 1987	Pu-239	17.0 \pm 2.3	16.7 \pm 1.7	13.8-19.6
STF-486	Food	Jan 1987	Sr-90	36.0 \pm 4.0	49.0 \pm 10.0	31.7-66.3
			I-131	78.0 \pm 3.4	78.0 \pm 8.0	64.1-91.9
			Cs-137	89.7 \pm 3.0	84.0 \pm 5.0	75.3-92.7
			K	942 \pm 56	980 \pm 49	895-1065
STF-487	Food (Blank)	Jan 1987	Sr-90	2.0 \pm 0.0	---	---
			I-131	<3	---	---
			Cs-137	<2	---	---
			K	993 \pm 102	---	---
STW-488	Water	Feb 1987	Co-60	49.0 \pm 0.0	50.0 \pm 5.0	41.3-58.7
			Zn-65	96.0 \pm 7.2	91.0 \pm 5.0	82.3-99.7
			Ru-106	92.0 \pm 20.2	100.0 \pm 5.0	91.3-108.7
			Cs-134	53.0 \pm 3.4	59.0 \pm 5.0	50.3-67.7
			Cs-137	89.3 \pm 4.6	87.0 \pm 5.0	78.3-95.7
STW-489	Water	Feb 1987	H-3	4130 \pm 140	4209 \pm 420	3479-4939
STW-490	Water	Feb 1987	Uranium	8.3 \pm 1.2	8.0 \pm 6.0	0.0-18.4
STM-491	Milk	Feb 1987	I-131	10.0 \pm 0.0	9.0 \pm 0.9	7.4-10.6
STW-492	Water	Mar 1987	Gr. alpha	3.7 \pm 1.2	3.0 \pm 5.0	0.0-11.7
			Gr. beta	11.3 \pm 1.2	13.0 \pm 5.0	4.3-21.7
STW-493	Water	Mar 1987	Ra-226	7.0 \pm 0.1	7.3 \pm 1.1	5.4-9.2
			Ra-228	7.1 \pm 2.3	7.5 \pm 1.1	5.5-9.5
STW-494	Water	Apr 1987	I-131	8.0 \pm 0.0	7.0 \pm 0.7	5.8-8.2
STAF-495	Air Filter	Apr 1987	Gr. alpha	15.0 \pm 0.0	14.0 \pm 5.0	5.3-22.7
			Gr. beta	41.0 \pm 2.0	43.0 \pm 5.0	34.3-51.7
			Sr-90	16.3 \pm 1.2	17.0 \pm 1.5	14.4-19.6
			Cs-137	7.0 \pm 0.0	8.0 \pm 5.0	0.0-16.7
STW-496 497	Water (Blind)	Apr 1987				
	Sample A		Gr. alpha	30.7 \pm 1.2	30.0 \pm 8.0	16.1-43.9
			Ra-226	3.9 \pm 0.2	3.9 \pm 0.6	2.9-4.9
			Ra-228	4.9 \pm 0.9	4.0 \pm 0.6	3.0-5.0
			Uranium	5.0 \pm 0.0	5.0 \pm 6.0	0.0-15.4

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d	
					1s, N=1	Control Limits
STW-496 497	Water (Blind)	Apr 1987				
	Sample B		Gr. beta	69.3 \pm 9.4	66.0 \pm 5.0	57.3-74.7
			Sr-89	16.3 \pm 3.0	19.0 \pm 5.0	10.3-27.7
			Sr-90	10.0 \pm 0.0	10.0 \pm 1.5	7.4-12.6
			Co-60	8.3 \pm 3.0	8.0 \pm 5.0	0.0-16.7
			Cs-134	19.0 \pm 2.0	20.0 \pm 5.0	11.3-28.7
			Cs-137	14.7 \pm 1.2	15.0 \pm 5.0	6.3-23.7
STU-498	Urine	Apr 1987	H-3	6017 \pm 494	5620 \pm 795	4647-6593
STW-499	Water	May 1987	Sr-89	38.0 \pm 6.0	41.0 \pm 5.0	32.3-49.7
			Sr-90	21.0 \pm 2.0	20.0 \pm 1.5	17.4-22.6
STW-500	Water	May 1987	Gr. alpha	9.0 \pm 3.4	11.0 \pm 5.0	2.3-19.7
			Gr. beta	10.3 \pm 1.2	7.0 \pm 5.0	0.0-15.7
STW-501	Water	Jun 1987	Cr-51	40.0 \pm 8.0	41.0 \pm 5.0	32.3-49.7
			Co-60	60.3 \pm 3.0	64.0 \pm 5.0	55.3-72.7
			Zn-65	11.3 \pm 5.0	10.0 \pm 5.0	1.3-18.7
			Ru-106	78.3 \pm 6.4	75.0 \pm 5.0	66.3-83.7
			Cs-134	36.7 \pm 3.0	40.0 \pm 5.0	31.3-48.7
			Cs-137	80.3 \pm 4.2	80.0 \pm 5.0	71.3-88.7
STW-502	Water	Jun 1987	H-3	2906 \pm 86	2895 \pm 357	2277-3513
STW-503	Water	Jun 1987	Ra-226	6.9 \pm 0.1	7.3 \pm 1.1	5.4-9.2
			Ra-228	13.3 \pm 1.0	15.2 \pm 2.3	11.2-19.2
STM-504	Milk	Jun 1987	Sr-89	57.0 \pm 4.3	69.0 \pm 5.0	60.3-77.7
			Sr-90	32.0 \pm 1.0	35.0 \pm 5.0	32.4-37.6
			I-131	64.0 \pm 2.0	59.0 \pm 6.0	48.6-69.4
			Cs-137	77.7 \pm 0.6	74.0 \pm 5.0	65.3-82.7
			K	1383 \pm 17	1525 \pm 76	1393-1657
STW-505	Water	Jul 1987	Gr. alpha	2.3 \pm 0.7	5.0 \pm 5.0	0.0-13.7
			Gr. beta	4.0 \pm 1.0	5.0 \pm 5.0	0.0-13.7
STF-506	Food	Jul 1987	I-131	82.7 \pm 4.6	80.0 \pm 8.0	66.1-93.9
			Cs-137	53.7 \pm 3.0	50.0 \pm 5.0	41.3-58.7
			K	1548 \pm 57	1680 \pm 84	1534-1826
STW-507	Water	Aug 1987	I-131	45.7 \pm 4.2	48.0 \pm 6.0	37.6-58.4

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/Lb		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d	
					1s, N=1	Control Limits
STW-508	Water	Aug 1987	Pu-239	5.8 \pm 0.2	5.3 \pm 0.5	4.4-6.2
STW-509	Water	Aug 1987	Uranium	13.3 \pm 0.3	13.0 \pm 6.0	2.6-23.4
STAF-510	Air Filter	Aug 1987	Gr. alpha	9.7 \pm 0.4	10.0 \pm 5.0	1.3-18.7
			Gr. beta	28.3 \pm 0.6	30.0 \pm 5.0	21.3-38.7
			Sr-90	10.0 \pm 0.9	10.0 \pm 1.5	7.4-12.6
			Cs-137	10.0 \pm 1.0	10.0 \pm 5.0	1.3-18.7
STW-511	Water	Sep 1987	Ra-226	9.9 \pm 0.1	9.7 \pm 1.5	7.2-12.2
			Ra-228	8.1 \pm 1.4	6.3 \pm 1.0	4.6-8.0
STW-512	Water	Sep 1987	Gr. alpha	2.0 \pm 0.6	4.0 \pm 5.0	0.0-12.7
			Gr. beta	11.3 \pm 1.3	12.0 \pm 5.0	3.3-20.7
STW-513	Water	Sep 1987	H-3	4473 \pm 100	4492 \pm 449	3714-5270
STW-514	Water (Blind)	Oct 1987	Sample A	Gr. alpha	29.3 \pm 2.6	28.0 \pm 7.0
				Ra-226	4.9 \pm 0.1	4.8 \pm 0.7
				Ra-228	4.2 \pm 1.0	3.6 \pm 0.5
				Uranium	3.0 \pm 0.1	3.0 \pm 6.0
						15.9-40.1
			Sample B	Sr-89	14.3 \pm 1.3	16.0 \pm 5.0
				Sr-90	9.7 \pm 0.4	10.0 \pm 1.5
				Co-60	16.7 \pm 3.0	16.0 \pm 5.0
				Cs-134	16.7 \pm 2.3	16.0 \pm 5.0
				Cs-137	24.3 \pm 3.3	24.0 \pm 5.0
			Sample A	Cr-51	80.3 \pm 17.5	70.0 \pm 5.0
				Co-60	16.0 \pm 2.3	15.0 \pm 5.0
				Zn-65	46.3 \pm 5.6	46.0 \pm 5.0
				Ru-106	57.3 \pm 15.4	61.0 \pm 5.0
				Cs-134	23.7 \pm 2.5	25.0 \pm 5.0
				Cs-137	51.7 \pm 3.2	51.0 \pm 5.0
STU-517	Urine	Nov 1987	H-3	7267 \pm 100	7432 \pm 743	6145-8719
STW-518	Water	Nov 1987	Gr. alpha	3.0 \pm 2.0	7.0 \pm 5.0	0.0-15.7
			Gr. beta	15.7 \pm 2.3	19.0 \pm 5.0	10.3-27.7
STW-519	Water	Dec 1987	I-131	26.0 \pm 3.0	25.0 \pm 6.0	15.6-36.4

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d	
					1s, N=1	Control Limits
STW-520	Water	Dec 1987	Ra-226	5.1 \pm 0.8	4.8 \pm 0.7	3.6-6.0
			Ra-228	3.4 \pm 0.1	5.3 \pm 0.8	3.9-6.7
STW-521	Water	Jan 1988	Sr-89	27.3 \pm 5.0	30.0 \pm 5.0	21.3-38.7
			Sr-90	15.3 \pm 1.2	15.0 \pm 1.5	12.4-17.6
STW-523	Water	Jan 1988	Gr. alpha	2.3 \pm 1.2	4.0 \pm 5.0	0.0-12.7
			Gr. beta	7.7 \pm 1.2	8.0 \pm 5.0	0.0-16.7
STF-524	Food	Jan 1988	Sr-89	44.0 \pm 4.0	46.0 \pm 5.0	37.3-54.7
			Sr-90	53.0 \pm 2.0	55.0 \pm 2.8	50.2-59.8
			I-131	102.3 \pm 4.2	102.0 \pm 10.2	84.3-119.7
			Cs-137	95.7 \pm 6.4	91.0 \pm 5.0	82.3-99.7
			K	1011 \pm 158	1230 \pm 62	1124-1336
STW-525	Water	Feb 1988	Co-60	69.3 \pm 2.3	69.0 \pm 5.0	60.3-77.7
			Zn-65	99.0 \pm 3.4	94.0 \pm 9.4	77.7-110.3
			Ru-106	92.7 \pm 14.4	105.0 \pm 10.5	86.8-123.2
			Cs-134	61.7 \pm 8.0	64.0 \pm 5.0	55.3-72.7
			Cs-137	99.7 \pm 3.0	94.0 \pm 5.0	85.3-102.7
STW-526	Water	Feb 1988	H-3	3453 \pm 103	3327 \pm 362	2700-3954
STW-527	Water	Feb 1988	Uranium	3.0 \pm 0.0	3.0 \pm 6.0	0.0-13.4
STM-528	Milk	Feb 1988	I-131	4.7 \pm 1.2	4.0 \pm 0.4	3.3-4.7
STW-529	Water	Mar 1988	Ra-226	7.1 \pm 0.6	7.6 \pm 1.1	5.6-9.6
			Ra-228	NA ^e	7.7 \pm 1.2	5.7-9.7
STW-530	Water	Mar 1988	Gr. alpha	4.3 \pm 1.2	6.0 \pm 5.0	0.0-14.7
			Gr. beta	13.3 \pm 1.3	13.0 \pm 5.0	4.3-21.7
STAF-531	Air Filter	Mar 1988	Gr. alpha	21.0 \pm 2.0	20.0 \pm 5.0	11.3-28.7
			Gr. beta	48.0 \pm 0.0	50.0 \pm 5.0	41.3-58.7
			Sr-90	16.7 \pm 1.2	17.0 \pm 1.5	14.4-19.6
			Cs-137	18.7 \pm 1.3	16.0 \pm 5.0	7.3-24.7
STW-532	Water	Apr 1988	I-131	9.0 \pm 2.0	7.5 \pm 0.8	6.2-8.8

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d 1s, N=1	Control Limits
STW-533 534	Water (Blind)	Apr 1988				
	Sample A		Gr. alpha	ND ^f	46.0 \pm 11.0	27.0-65.0
			Ra-226	ND	6.4 \pm 1.0	4.7-8.1
			Ra-228	ND	5.6 \pm 0.8	4.2-7.0
			Uranium	6.0 \pm 0.0	6.0 \pm 6.0	0.0-16.4
	Sample B		Gr. beta	ND	57.0 \pm 5.0	48.3-65.7
			Sr-89	3.3 \pm 1.2	5.0 \pm 5.0	0.0-13.7
			Sr-90	5.3 \pm 1.2	5.0 \pm 1.5	2.4-7.6
			Co-60	63.3 \pm 1.3	50.0 \pm 5.0	41.3-58.7
			Cs-134	7.7 \pm 1.2	7.0 \pm 5.0	0.0-15.7
			Cs-137	8.3 \pm 1.2	7.0 \pm 5.0	0.0-15.7
STU-535	Urine	Apr 1988	H-3	6483 \pm 155	6202 \pm 620	5128-7276
STW-536	Water	Apr 1988	Sr-89	14.7 \pm 1.3	20.0 \pm 5.0	11.3-28.7
			Sr-90	20.0 \pm 2.0	20.0 \pm 1.5	17.4-22.6
STW-538	Water	Jun 1988	Cr-51	331.7 \pm 13.0	302.0 \pm 30.0	250.0-354.0
			Co-60	16.0 \pm 2.0	15.0 \pm 5.0	6.3-23.7
			Zn-65	107.7 \pm 11.4	101.0 \pm 10.0	83.7-118.3
			Ru-106	191.3 \pm 11.0	195.0 \pm 20.0	160.4-229.6
			Cs-134	18.3 \pm 4.6	20.0 \pm 5.0	11.3-28.7
			Cs-137	26.3 \pm 1.2	25.0 \pm 5.0	16.3-33.7
STW-539	Water	Jun 1988	H-3	5586 \pm 92	5565 \pm 557	4600-6530
STM-541	Milk	Jun 1988	Sr-89	33.7 \pm 11.4	40.0 \pm 5.0	31.3-48.7
			Sr-90	55.3 \pm 5.8	60.0 \pm 3.0	54.8-65.2
			I-131	103.7 \pm 3.1	94.0 \pm 9.0	78.4-109.6
			Cs-137	52.7 \pm 3.1	51.0 \pm 5.0	42.3-59.7
			K	1587 \pm 23	1600 \pm 80	1461-1739
STW-542	Water	Jul 1988	Gr. alpha	8.7 \pm 4.2	15.0 \pm 5.0	6.3-23.7
			Gr. beta	5.3 \pm 1.2	4.0 \pm 5.0	0.0-12.7
STF-543	Food	Jul 1988	Sr-89	ND ^f	33.0 \pm 5.0	24.3-41.7
			Sr-90	ND	34.0 \pm 2.0	30.5-37.5
			I-131	115.0 \pm 5.3	107.0 \pm 11.0	88.0-126.0
			Cs-137	52.7 \pm 6.4	49.0 \pm 5.0	40.3-57.7
			K	1190 \pm 66	1240 \pm 62	1133-1347

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	TIML Result $\pm 2\sigma^c$	Concentration in pCi/L ^b	
					EPA Result ^d	Control Limits
					1s, N=1	
STW-544	Water	Aug 1988	I-131	80.0 \pm 0.0	76.0 \pm 8.0	62.1-89.9
STW-545	Water	Aug 1988	Pu-239	11.0 \pm 0.2	10.2 \pm 1.0	8.5-11.9
STW-546	Water	Aug 1988	Uranium	6.0 \pm 0.0	6.0 \pm 6.0	0.0-16.4
STAF-547	Air Filter	Aug 1988	Gr. alpha	8.0 \pm 0.0	8.0 \pm 5.0	0.0-16.7
			Gr. beta	26.3 \pm 1.2	29.0 \pm 5.0	20.3-37.7
			Sr-90	8.0 \pm 2.0	8.0 \pm 1.5	5.4-10.6
			Cs-137	13.0 \pm 2.0	12.0 \pm 5.0	3.3-20.7
STW-548	Water	Sep 1988	Ra-226	9.3 \pm 0.5	8.4 \pm 2.6	6.2-10.6
			Ra-228	5.8 \pm 0.4	5.4 \pm 1.6	4.0-6.8
STW-549	Water	Sep 1988	Gr. alpha	7.0 \pm 2.0	8.0 \pm 5.0	0.0-16.7
			Gr. beta	11.3 \pm 1.2	10.0 \pm 5.0	1.3-18.7
STW-550	Water	Oct 1988	Cr-51	252.0 \pm 14.0	251.0 \pm 25.0	207.7-294.3
			Co-60	26.0 \pm 2.0	25.0 \pm 5.0	16.3-33.7
			Zn-65	158.3 \pm 10.2	151.0 \pm 15.0	125.0-177.0
			Ru-106	153.0 \pm 9.2	152.0 \pm 15.0	126.0-178.0
			Cs-134	28.7 \pm 5.0	25.0 \pm 5.0	16.3-33.7
			Cs-137	16.3 \pm 1.2	15.0 \pm 5.0	6.3-23.7
STW-551	Water	Oct 1988	H-3	2333 \pm 127	2316 \pm 350	1710-2927
STW-552 553	Water (Blind)	Oct 1988				
	Sample A		Gr. alpha	38.3 \pm 8.0	41.0 \pm 10.0	23.7-58.3
			Ra-226	4.5 \pm 0.5	5.0 \pm 0.8	3.6-6.4
			Ra-228	4.4 \pm 0.6	5.2 \pm 0.8	3.6-6.4
			Uranium	4.7 \pm 1.2	5.0 \pm 6.0	0.0-15.4
	Sample B		Gr. beta	51.3 \pm 3.0	54.0 \pm 5.0	45.3-62.7
			Sr-89	3.7 \pm 1.2	11.0 \pm 5.0	2.3-19.7
			Sr-90	10.7 \pm 1.2	10.0 \pm 1.5	7.4-12.6
			Cs-134	15.3 \pm 2.3	15.0 \pm 5.0	6.3-23.7
			Cs-137	16.7 \pm 1.2	15.0 \pm 5.0	6.3-23.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d	
					1s, N=1	Control Limits
STM-554	Milk	Oct 1988	Sr-89	40.3 \pm 7.0	40.0 \pm 5.0	31.3-48.7
			Sr-90	51.0 \pm 2.0	60.0 \pm 3.0	54.8-65.2
			I-131	94.0 \pm 3.4	91.0 \pm 9.0	75.4-106.6
			Cs-137	45.0 \pm 4.0	50.0 \pm 5.0	41.3-58.7
			K	1500 \pm 45	1600 \pm 80	1461-1739
STU-555	Urine	Nov 1988	H-3	3030 \pm 209	3025 \pm 359	2403-3647
STW-556	Water	Nov 1988	Gr. alpha	9.0 \pm 3.5	9.0 \pm 5.0	0.3-17.7
			Gr. beta	9.7 \pm 1.2	9.0 \pm 5.0	0.3-17.7
STW-557	Water	Dec 1988	I-131	108.7 \pm 3.0	115.0 \pm 12.0	94.2-135.8
STW-559	Water	Jan 1989	Sr-89	40.0 \pm 8.7	40.0 \pm 5.0	31.3-48.7
			Sr-90	24.3 \pm 3.1	25.0 \pm 1.5	24.4-27.6
STW-560	Water	Jan 1989	Pu-239	5.8 \pm 1.1	4.2 \pm 0.4	3.5-4.9
STW-561	Water	Jan 1989	Gr. alpha	7.3 \pm 1.2	8.0 \pm 5.0	0.0-16.7
			Gr. beta	5.3 \pm 1.2	4.0 \pm 5.0	0.0-12.7
STW-562	Water	Feb 1989	Cr-51	245 \pm 46	235 \pm 24	193.4-276.6
			Co-60	10.0 \pm 2.0	10.0 \pm 5.0	1.3-18.7
			Zn-65	170 \pm 10	159 \pm 16	139.2-186.7
			Ru-106	181 \pm 7.6	178 \pm 18	146.8-209.2
			Cs-134	9.7 \pm 3.0	10.0 \pm 5.0	1.3-18.7
			Cs-137	11.7 \pm 1.2	10.0 \pm 5.0	1.3-18.7
STW-563	Water	Feb 1989	I-131	109.0 \pm 4.0	106.0 \pm 11.0	86.9-125.1
STW-564	Water	Feb 1989	H-3	2820 \pm 20	2754 \pm 356	2137-3371
STW-565	Water	Mar 1989	Ra-226	4.2 \pm 0.3	4.9 \pm 0.7	3.7-6.1
			Ra-228	1.9 \pm 1.0	1.7 \pm 0.3	1.2-2.2
STW-566	Water	Mar 1989	U	5.0 \pm 0.0	5.0 \pm 6.0	0.0-15.4
STW-567	Air Filter	Mar 1989	Gr. alpha	21.7 \pm 1.2	21.0 \pm 5.0	12.3-29.7
			Gr. beta	68.3 \pm 4.2	62.0 \pm 5.0	53.3-70.7
			Sr-90	20.0 \pm 2.0	20.0 \pm 1.5	17.4-22.6
			Cs-137	21.3 \pm 1.2	20.0 \pm 5.0	11.3-28.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d	
					1s, N=1	Control Limits
STW-568 569	Water (Blind)	Apr 1989				
	Sample A		Gr. alpha	22.7 \pm 2.3	29.0 \pm 7.0	16.9-41.2
			Ra-226	3.6 \pm 0.6	3.5 \pm 0.5	2.6-4.4
			Ra-228	2.6 \pm 1.0	3.6 \pm 0.5	2.7-4.5
			U	3.0 \pm 0.0	3.0 \pm 6.0	0.0-13.4
	Sample B		Gr. beta	52.3 \pm 6.1	57.0 \pm 5.0	43.3-65.7
			Sr-89	9.3 \pm 5.4	8.0 \pm 5.0	0.0-16.7
			Sr-90	7.0 \pm 0.0	8.0 \pm 1.5	5.4-10.6
			Cs-134	21.0 \pm 5.2	20.0 \pm 5.0	11.3-28.7
			Cs-137	23.0 \pm 2.0	20.0 \pm 5.0	11.3-28.7
STW-570	Milk	Apr 1989	Sr-89	26.0 \pm 10.0	39.0 \pm 5.0	30.3-47.7
			Sr-90	45.7 \pm 4.2	55.0 \pm 3.0	49.8-60.2
			Cs-137	54.0 \pm 6.9	50.0 \pm 5.0	41.3-58.7
			K-40	1521 \pm 208	1600 \pm 80	1461-1739
STW-5719	Water	May 1989	Sr-89	<0.7	6.0 \pm 5.0	0.0-14.7
			Sr-90	5.0 \pm 1.0	6.0 \pm 1.5	3.4-8.6
STW-572	Water	May 1989	Gr. alpha	24.0 \pm 2.0	30.0 \pm 8.0	16.1-43.9
			Gr. beta	49.3 \pm 15.6	50.0 \pm 5.0	41.3-58.7
STW-573	Water	Jun 1989	Ba-133	50.7 \pm 1.2	49.0 \pm 5.0	40.3-57.7
			Co-60	31.3 \pm 2.3	31.0 \pm 5.0	22.3-39.7
			Zn-65	167 \pm 10	165 \pm 17	135.6-194.4
			Ru-106	123 \pm 9.2	128 \pm 13	105.5-150.5
			Cs-134	40.3 \pm 1.2	39 \pm 5	30.3-47.7
			Cs-137	22.3 \pm 1.2	20 \pm 5	11.3-28.7
STW-574	Water	Jun 1989	H-3	4513 \pm 136	4503 \pm 450	3724-5282
STW-575	Water	Jul 1989	Ra-226	16.8 \pm 3.1	17.7 \pm 2.7	13.0-22.4
			Ra-228	13.8 \pm 3.7	18.3 \pm 2.7	13.6-23.0
STW-576	Water	Jul 1989	U	40.3 \pm 1.2	41.0 \pm 6.0	30.6-51.4
STW-577	Water	Aug 1989	I-131	84.7 \pm 5.8	83.0 \pm 8.0	69.1-96.9
STAF-579	Air Filter	Aug 1989	Gr. alpha	6.0 \pm 0.0	6.0 \pm 5.0	0.0-14.7
			Cs-137	10.3 \pm 2.3	10.0 \pm 5.0	1.3-18.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	TIML Result $\pm 2\sigma^c$	Concentration in pCi/L ^b	
					EPA Result ^d	Control Limits
STW-580	Water	Sep 1989	Sr-89	14.7 \pm 1.2	14.0 \pm 5.0	5.3-22.7
			Sr-90	9.7 \pm 1.2	10.0 \pm 1.5	7.4-12.6
STW-581	Water	Sep 1989	Gr. alpha	5.0 \pm 0.0	4.0 \pm 5.0	0.0-12.7
			Gr. Beta	8.7 \pm 2.3	6.0 \pm 5.0	0.0-14.7
STW-583	Water	Oct 1989	Ba-133	60.3 \pm 10.0	59.0 \pm 6.0	48.6-69.4
			Co-60	29.0 \pm 4.0	30.0 \pm 5.0	21.1-38.7
			Zn-65	132.3 \pm 6.0	129.0 \pm 13.0	106.5-151.5
			Ru-106	155.3 \pm 6.1	161.0 \pm 16.0	133.3-186.7
			Cs-134	30.7 \pm 6.1	29.0 \pm 5.0	20.3-37.7
			Cs-137	66.3 \pm 4.6	59.0 \pm 5.0	50.3-67.7
STW-584	Water	Oct 1989	H-3	3407 \pm 150	3496 \pm 364	2866-4126
STW-585 586	Water (Blind)	Oct 1989				
	Sample A		Gr. Alpha	41.7 \pm 9.4	49.0 \pm 12.0	28.2-69.8
			Ra-226	7.9 \pm 0.4	8.4 \pm 1.3	6.2-10.6
			Ra-228	4.4 \pm 0.8	4.1 \pm 0.6	3.1-5.1
			U	12.0 \pm 0.0	12.0 \pm 6.0	1.6-22.4
	Sample B		Gr. Beta	31.7 \pm 7.3	32.0 \pm 5.0	23.3-40.7
			Sr-89	13.3 \pm 4.2	15.0 \pm 5.0	6.3-23.7
			Sr-90	7.0 \pm 2.0	7.0 \pm 3.0	4.4-9.6
			Cs-134	5.0 \pm 0.0	5.0 \pm 5.0	0.0-13.7
			Cs-137	7.0 \pm 0.0	5.0 \pm 5.0	0.0-13.7
STW-587	Water	Nov 1989	Ra-226	7.9 \pm 0.4	8.7 \pm 1.3	6.4-11.0
			Ra-228	8.9 \pm 1.2	9.3 \pm 1.2	6.9-11.7
STW-588	Water	Nov 1989	U	15.0 \pm 0.09	15.0 \pm 6.0	4.6-25.4
STW-589	Water	Jan 1990	Sr-89	22.7 \pm 5.0	25.0 \pm 5.0	16.3-33.7
			Sr-90	17.3 \pm 1.2	20.0 \pm 1.5	17.4-22.6
STW-591	Water	Jan 1990	Gr. Alpha	10.3 \pm 3.0	12.0 \pm 5.0	3.3-20.7
			Gr. Beta	12.3 \pm 1.2	12.0 \pm 5.0	3.3-20.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	TIML Result $\pm 2\sigma^C$	Concentration in pCi/Lb	
					EPA Result ^d	Control Limits
					1s, N=1	
STW-592	Water	Jan 1990	Co-60	14.7 \pm 2.3	15 \pm 5.0	6.3-23.7
			Zn-65	135.0 \pm 6.9	139.0 \pm 14.0	114.8-163.2
			Ru-106	133.3 \pm 13.4	139.0 \pm 14.0	114.8-163.2
			Cs-134	17.3 \pm 1.2	18.0 \pm 5.0	9.3-26.7
			Cs-137	19.3 \pm 1.2	18.0 \pm 5.0	9.3-26.7
			Ba-133	78.0 \pm 0.0	74.0 \pm 7.0	61.9-86.1
STW-593	Water	Feb 1990	H-3	4827 \pm 83	4976 \pm 498	4113-5839
STW-594	Water	Mar 1990	Ra-226	5.0 \pm 0.2	4.9 \pm 0.7	4.1-5.7
			Ra-228	13.5 \pm 0.7	12.7 \pm 1.9	9.4-16.0
STW-595	Water	Mar 1990	U	4.0 \pm 0.0	4.0 \pm 6.0	0.0-14.4
STW-596	Air Filter	Mar 1990	Gr. Alpha	7.3 \pm 1.2	5.0 \pm 5.0	0.0-13.7
			Gr. Beta	34.0 \pm 0.0	31.0 \pm 5.0	22.3-39.7
			Sr-90	10.0 \pm 0.0	10.0 \pm 1.5	7.4-12.6
			Cs-137	9.3 \pm 1.2	10.0 \pm 5.0	1.3-18.7
STW-597 598	Water (Blind)	Apr 1990				
	Sample A		Gr. Alpha	81.0 \pm 3.5	90.0 \pm 23.0	50.1-129.9
			Ra-226	4.9 \pm 0.4	5.0 \pm 0.8	3.6-6.4
			Ra-228	10.6 \pm 0.3	10.2 \pm 1.5	7.6-12.8
			U	18.7 \pm 3.0	20.0 \pm 6.0	9.6-30.4
	Sample B		Gr. Beta	51.0 \pm 10.1	52.0 \pm 5.0	43.3-60.7
			Sr-89	9.3 \pm 1.2	10.0 \pm 5.0	1.3-18.7
			Sr-90	10.3 \pm 3.1	10.0 \pm 1.5	8.3-11.7
			Cs-134	16.0 \pm 0.0	15.0 \pm 5.0	6.3-23.7
			Cs-137	19.0 \pm 2.0	15.0 \pm 5.0	6.3-23.7
STM-599	Milk	Apr 1990	Sr-89	21.7 \pm 3.1	23.0 \pm 5.0	14.3-31.7
			Sr-90	21.0 \pm 7.0	23.0 \pm 5.0	14.3-31.7
			I-131	98.7 \pm 1.2	99.0 \pm 10.0	81.7-116.3
			Cs-137	26.0 \pm 6.0	24.0 \pm 5.0	15.3-32.7
			K	1300.0 \pm 69.2	1550.0 \pm 78.0	1414.7-1685.3
STW-600	Water	May 1990	Sr-89	6.0 \pm 2.0	7.0 \pm 5.0	0.0-15.7
			Sr-90	6.7 \pm 1.2	7.0 \pm 5.0	0.0-15.7
STW-601	Water	May 1990	Gr. Alpha	11.0 \pm 2.0	22.0 \pm 6.0	11.6-32.4
			Gr. Beta	12.3 \pm 1.2	15.0 \pm 5.0	6.3-23.7

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d 1s, N=1	Control Limits
STW-602	Water	Jun 1990	Co-60	25.3 \pm 2.3	24.0 \pm 5.0	15.3-32.7
			Zn-65	155.0 \pm 10.6	148.0 \pm 15.0	130.6-165.4
			Ru-106	202.7 \pm 17.2	210.0 \pm 21.0	173.6-246.4
			Cs-134	23.7 \pm 1.2	24.0 \pm 5.0	18.2-29.8
			Cs-137	27.7 \pm 3.1	25.0 \pm 5.0	16.3-33.7
			Ba-133	100.7 \pm 8.1	99.0 \pm 10.0	81.7-116.3
STW-603	Water	Jun 1990	H-3	2927 \pm 306	2933 \pm 358	2312-3554
STW-604	Water	Jul 1990	Ra-226	11.8 \pm 0.9	12.1 \pm 1.8	9.0-15.2
			Ra-228	4.1 \pm 1.4	5.1 \pm 1.3	2.8-7.4
STW-605	Water	Jul 1990	U	20.3 \pm 1.7	20.8 \pm 3.0	15.6-26.0
STW-606	Water	Aug 1990	I-131	43.0 \pm 1.2	39.0 \pm 6.0	28.6-49.4
STW-607	Water	Aug 1990	Pu-239	10.0 \pm 1.7	9.1 \pm 0.9	7.5-10.7
STW-608	Air Filter	Aug 1990	Gr. alpha	14.0 \pm 0.0	10.0 \pm 5.0	1.3-18.7
			Gr. beta	65.3 \pm 1.2	62.0 \pm 5.0	53.3-70.7
			Sr-90	19.0 \pm 6.9	20.0 \pm 5.0	11.3-28.7
			Cs-137	19.0 \pm 2.0	20.0 \pm 5.0	11.3-28.7
STW-609	Water	Sep 1990	Sr-89	9.0 \pm 2.0	10.0 \pm 5.0	1.3-18.7
			Sr-90	9.0 \pm 2.0	9.0 \pm 5.0	0.3-17.7
STM-610	Water	Sep 1990	Gr. alpha	8.3 \pm 1.2	10.0 \pm 5.0	1.3-18.7
			Gr. beta	10.3 \pm 1.2	10.0 \pm 5.0	1.3-18.7
STM-611	Milk	Sep 1990	Sr-89	11.7 \pm 3.1	16.0 \pm 5.0	7.3-24.7
			Sr-90	15.0 \pm 0.0	20.0 \pm 5.0	11.3-28.7
			I-131	63.0 \pm 6.0	58.0 \pm 6.0	47.6-68.4
			Cs-137	20.0 \pm 2.0	20.0 \pm 5.0	11.3-28.7
			K	1673.3 \pm 70.2	1700.0 \pm 85.0	1552.5-1847.5
STW-612	Water	Oct 1990	Co-60	20.3 \pm 3.1	20.0 \pm 5.0	11.3-28.7
			Zn-65	115.3 \pm 12.2	115.0 \pm 12.0	94.2-135.8
			Ru-106	152.0 \pm 8.0	151.0 \pm 15.0	125.0-177.0
			Cs-134	11.0 \pm 0.0	12.0 \pm 5.0	3.3-20.7
			Cs-137	14.0 \pm 2.0	12.0 \pm 5.0	3.3-20.7
			Ba-133	116.7 \pm 9.9	110.0 \pm 11.0	90.9-129.1
STW-613	Water	Oct 1990	H-3	7167 \pm 330	7203 \pm 720	5954-8452

Table A-1. (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration in pCi/L ^b		
				TIML Result $\pm 2\sigma^c$	EPA Result ^d	
					1s, N=1	Control Limits
STW-614 615	Water	Oct 1990				
	Sample A		Gr. alpha	68.7 \pm 7.2	62.0 \pm 16.0	34.2-89.8
			Ra-226	12.9 \pm 0.3	13.6 \pm 2.0	10.1-17.1
			Ra-228	4.2 \pm 0.6	5.0 \pm 1.3	2.7-7.3
			U	10.4 \pm 0.6	10.2 \pm 3.0	5.0-15.4
	Sample B		Gr. beta	55.0 \pm 8.7	53.0 \pm 5.0	44.3-61.7
			Sr-89	15.7 \pm 2.9	20.0 \pm 5.0	11.3-28.7
			Sr-90	12.0 \pm 2.0	15.0 \pm 5.0	6.3-23.7
			Cs-134	9.0 \pm 1.7	7.0 \pm 5.0	0.0-15.7
			Cs-137	7.7 \pm 1.2	5.0 \pm 5.0	0.0-13.7
STW-616	Water	Nov 1990	Ra-226	6.8 \pm 1.0	7.4 \pm 1.1	5.5-9.3
			Ra-228	5.3 \pm 1.7	7.7 \pm 1.9	4.4-11.0
STW-6179	Water	Nov 1990	U	35.0 \pm 0.4	35.5 \pm 3.6	29.3-41.7

^a Results obtained by Teledyne Isotopes Midwest Laboratory as a participant in the environmental sample crosscheck program operated by the Intercomparison and Calibration Section, Quality Assurance Branch, Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency (EPA), Las Vegas, Nevada.

^b All results are in the pCi/l, except for elemental potassium (K) data in milk, which are in mg/l; air filter samples, which are in pCi/filter; and food, which is in mg/kg.

^c Unless otherwise indicated, the TIML results are given as the mean \pm 2 standard deviations for three determinations.

^d USEPA results are presented as the known values and expected laboratory precision (1s, 1 determination) and control limits as defined by EPA.

^e NA = Not analyzed.

^f ND = No data; not analyzed due to relocation of the lab.

^g Sample was analyzed but the results not submitted to EPA because deadline was missed (all data on file).

Table A-2. Crosscheck program results, thermoluminescent dosimeters (TLDs).

Lab Code	TLD Type	Measurement	mR		
			Teledyne Result $\pm 2\sigma^a$	Known Value ^c	Average $\pm 2\sigma^d$ (All Participants)
<u>2nd International Intercomparison^b</u>					
115-2	CaF ₂ :Mn Bulb	Field	17.0 \pm 1.9	17.1	16.4 \pm 7.7
		Lab	20.8 \pm 4.1	21.3	18.8 \pm 7.6
<u>3rd International Intercomparison^e</u>					
115-3	CaF ₂ :Mn Bulb	Field	30.7 \pm 3.2	34.9 \pm 4.8	31.5 \pm 3.0
		Lab	89.6 \pm 6.4	91.7 \pm 14.6	86.2 \pm 24.0
<u>4th International Intercomparison^f</u>					
115-4	CaF ₂ :Mn Bulb	Field	14.1 \pm 1.1	14.1 \pm 1.4	16.0 \pm 9.0
		Lab (Low)	9.3 \pm 1.3	12.2 \pm 2.4	12.0 \pm 7.4
		Lab (High)	40.4 \pm 1.4	45.8 \pm 9.2	43.9 \pm 13.2
<u>5th International Intercomparison^g</u>					
115-5A	CaF ₂ :Mn Bulb	Field	31.4 \pm 1.8	30.0 \pm 6.0	30.2 \pm 14.6
		Lab at beginning	77.4 \pm 5.8	75.2 \pm 7.6	75.8 \pm 40.4
		Lab at the end	96.6 \pm 5.8	88.4 \pm 8.8	90.7 \pm 31.2
115-5B	LiF-100 Chips	Field	30.3 \pm 4.8	30.0 \pm 6.0	30.2 \pm 14.6
		Lab at beginning	81.1 \pm 7.4	75.2 \pm 7.6	75.8 \pm 40.4
		Lab at the end	85.4 \pm 11.7	88.4 \pm 8.8	90.7 \pm 31.2
<u>7th International Intercomparison^h</u>					
115-7A	LiF-100 Chips	Field	75.4 \pm 2.6	75.8 \pm 6.0	75.1 \pm 29.8
		Lab (Co-60)	80.0 \pm 3.5	79.9 \pm 4.0	77.9 \pm 27.6
		Lab (Cs-137)	66.6 \pm 2.5	75.0 \pm 3.8	73.0 \pm 22.2

Table A-2. (continued)

Lab Code	TLD Type	Measurement	mR		
			Teledyne Result $\pm 2\sigma^a$	Known Value ^c	Average $\pm 2\sigma^d$ (All Participants)
115-7B	CaF ₂ :Mn Bulbs	Field	71.5 \pm 2.6	75.8 \pm 6.0	75.1 \pm 29.8
		Lab (Co-60)	84.3 \pm 6.4	79.9 \pm 4.0	77.9 \pm 27.6
		Lab (Cs-137)	78.8 \pm 1.6	75.0 \pm 3.8	73.0 \pm 22.2
115-7C	CaSO ₄ :Dy Cards	Field	76.8 \pm 2.7	75.8 \pm 6.0	75.1 \pm 29.8
		Lab (Co-60)	82.5 \pm 3.7	79.9 \pm 4.0	77.9 \pm 27.6
		Lab (Cs-137)	79.0 \pm 3.2	75.0 \pm 3.8	73.0 \pm 22.2
<u>8th International Intercomparison¹</u>					
115-8A	LiF-100 Chips	Field Site 1	29.5 \pm 1.4	29.7 \pm 1.5	28.9 \pm 12.4
		Field Site 2	11.3 \pm 0.8	10.4 \pm 0.5	10.1 \pm 9.06
		Lab (Cs-137)	13.7 \pm 0.9	17.2 \pm 0.9	16.2 \pm 6.8
115-8B	CaF ₂ :Mn Bulbs	Field Site 1	32.3 \pm 1.2	29.7 \pm 1.5	28.9 \pm 12.4
		Field Site 2	9.0 \pm 1.0	10.4 \pm 0.5	10.1 \pm 9.0
		Lab (Cs-137)	15.8 \pm 0.9	17.2 \pm 0.9	16.2 \pm 6.8
115-8C	CaSO ₄ :Dy Cards	Field Site 1	32.3 \pm 0.7	29.7 \pm 1.5	28.9 \pm 12.4
		Field Site 2	10.6 \pm 0.6	10.4 \pm 0.5	10.1 \pm 9.0
		Lab (Cs-137)	18.1 \pm 0.8	17.2 \pm 0.9	16.2 \pm 6.8
<u>Teledyne Testing^j</u>					
89-1	LiF-100 Chips	Lab	21.0 \pm 0.4	22.4	--
89-2	Teledyne CaSO ₄ :Dy Cards	Lab	20.9 \pm 1.0	20.3	--

Table A-2. (continued)

Lab Code	TLD Type	Measurement	mR		
			Teledyne Result $\pm 2\sigma^a$	Known Value ^c	Average $\pm 2\sigma^d$ (All Participants)
<u>Teledyne Testing^j</u>					
90-1k	Teledyne CaSO ₄ :Dy Cards	Lab	20.6 \pm 1.4	19.6	--
90-1l	Teledyne CaSO ₄ :Dy Cards	Lab	100.8 \pm 4.3	100.0	--

^a Lab result given is the mean ± 2 standard deviations of three determinations.

^b Second International Intercomparison of Environmental Dosimeters conducted in April of 1976 by the Health and Safety Laboratory (GASL), New York, New York, and the School of Public Health of the University of Texas, Houston, Texas.

^c Value determined by sponsor of the intercomparison using continuously operated pressurized ion chamber.

^d Mean ± 2 standard deviations of results obtained by all laboratories participating in the program.

^e Third International Intercomparison of Environmental Dosimeters conducted in summer of 1977 by Oak Ridge National Laboratory and the School of Public Health of the University of Texas, Houston, Texas.

^f Fourth International Intercomparison of Environmental Dosimeters conducted in summer of 1979 by the School of Public Health of the University of Texas, Houston, Texas.

^g Fifth International Intercomparison of Environmental Dosimeter conducted in fall of 1980 at Idaho Falls, Idaho and sponsored by the School of Public Health of the University of Texas, Houston, Texas and Environmental Measurements Laboratory, New York, New York, U.S. Department of Energy.

^h Seventh International Intercomparison of Environmental Dosimeters conducted in the spring and summer of 1984 at Las Vegas, Nevada, and sponsored by the U.S. Department of Energy, the U.S. Nuclear Regulatory Commission, and the U.S. Environmental Protection Agency.

ⁱ Eighth International Intercomparison of Environmental Dosimeters conducted in the fall and winter of 1985-1986 at New York, New York, and sponsored by the U.S. Department of Energy.

^j Chips were submitted in September 1989 and cards were submitted in November 1989 to Teledyne Isotopes, Inc., Westwood, NJ for irradiation.

^k Cards were irradiated by Teledyne Isotopes, Inc., Westwood, NJ on June 19, 1990.

^l Cards were irradiated by Dosimetry Associates, Inc., Northville, MI on October 30, 1990.

Table A-3. In-house spiked samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)		
				TIML Result n=3	Known Activity	Expected Precision 1s, n=3 ^a
QC-MI-6	Milk	Feb 1986	Sr-89	6.0±1.9	6.4±3.0	8.7
			Sr-90	14.2±1.7	12.9±2.0	5.2
			I-131	34.2±3.8	35.2±3.5	10.4
			Cs-134	32.0±1.8	27.3±5.0	8.7
			Cs-137	35.8±2.1	35.0±5.0	8.7
QC-W-14	Water	Mar 1986	Sr-89	1.6±0.4	1.6±1.0	7.1
			Sr-90	2.4±0.2	2.4±2.0	4.2
QC-W-15	Water	Apr 1986	I-131	44.9±2.4	41.5±7.0	10.6
			Co-60	10.6±1.7	12.1±5.0	7.1 ^b
			Cs-134	30.2±2.4	25.8±8.0	7.1 ^b
			Cs-137	21.9±1.9	19.9±5.0	7.1 ^b
QC-MI-7	Milk	Apr 1986	I-131	39.7±3.3	41.5±7.0	10.4
			Cs-134	28.7±2.8	25.8±8.0	8.7
			Cs-137	21.2±2.8	19.9±5.0	8.7
SPW-1	Water	May 1986	Gr. alpha	15.8±1.8	18.0±5.0	5 ^c
QC-W-16	Water	Jun 1986	Gr. alpha	16.2±0.7	16.9±2.5	8.7
			Gr. beta	38.4±3.5	30.2±5.0	8.7
QC-MI-9	Milk	Jun 1986	Sr-89	<1.0	0.0	7.1 ^b
			Sr-90	12.6±1.8	13.3±3.0	4.2 ^b
			I-131	38.9±7.0	34.8±7.0	10.4
			Cs-134	33.0±3.4	36.1±5.0	8.7
			Cs-137	38.5±2.8	39.0±5.0	8.7
SPW-2	Water	Jun 1986	Gr. alpha	16.8±1.8	18.0±5.0	5 ^c
SPW-3	Water	Jun 1986	Gr. alpha	17.7±0.8	18.0±5.0	5 ^c
QC-W-18	Water	Sep 1986	Cs-134	34.7±5.6	31.3±5.0	8.7
			Cs-137	51.1±7.0	43.3±8.0	8.7
QC-W-19	Water	Sep 1986	Sr-89	13.6±4.1	15.6±3.5	7.1 ^b
			Sr-90	6.4±1.6	6.2±2.0	4.2 ^b

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)		
				TIML Result n=3	Known Activity	Expected Precision 1s, n=3 ^a
QC-W-21	Water	Oct 1986	Co-60	19.2±2.2	18.5±3.0	8.7
			Cs-134	31.7±5.2	25.6±8.0	8.7
			Cs-137	23.8±1.0	21.6±5.0	8.7
QC-MI-11	Milk	Oct 1986	Sr-89	12.3±1.8	14.3±3.0	8.7
QC-W-20	Water	Nov 1986	H-3	3855±180	3960±350	520 ^b
QC-W-22	Water	Dec 1986	Gr. alpha	9.8±1.4	11.2±4.0	8.7
			Gr. beta	21.7±2.0	23.8±5.0	8.7
QC-W-23	Water	Jan 1987	I-131	29.8±2.5	27.9±3.0	10.4
QC-MI-12	Milk	Jan 1987	I-131	36.5±1.3	32.6±5.0	10.4
			Cs-137	32.6±4.2	27.4±8.0	8.7
QC-MI-13	Milk	Jan 1987	Sr-89	10.4±2.1	12.2±4.0	8.7
			Sr-90	14.6±1.6	12.6±3.0	5.2
			I-131	49.5±1.2	54.9±8.0	10.4
			Cs-134	<1.6	0.0	8.7
			Cs-137	33.3±0.6	27.4±8.0	8.7
QC-W-24	Water	Mar 1987	Sr-89	24.7±3.6	25.9±5.0	8.7
			Sr-90	23.9±3.8	22.8±8.0	5.2
QC-W-25	Water	Apr 1987	I-131	28.0±1.9	29.3±5.0	10.6
QC-MI-14	Milk	Apr 1987	I-131	25.0±2.2	23.9±5.0	10.4
			Cs-134	<2.1	0.0	8.7
			Cs-137	34.2±2.0	27.2±7.0	8.7
QC-W-26	Water	Jun 1987	H-3	3422±100	3362±300	520
			Co-60	24.8±1.4	26.5±7.0	8.7
			Cs-134	<2.0	0.0	8.7
			Cs-137	21.2±0.5	21.6±7.0	8.7
QC-W-27	Water	Jun 1987	Gr. alpha	8.5±1.9	10.1±4.0	8.7
			Gr. beta	22.6±1.9	21.2±5.0	8.7
QC-W-28	Water	Jun 1987	Gr. alpha	8.7±1.3	10.1±4.0	8.7
			Gr. beta	12.2±5.2	9.4±3.0	8.7

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)		
				TIML Result n=3	Known Activity	Expected Precision 1s, n=3a
QC-W-29	Water	Jun 1987	Gr. alpha Gr. beta	16.4±1.3 15.9±4.0	18.9±5.0 11.8±4.0	8.7 8.7
QC-MI-15	Milk	Jul 1987	Sr-90 I-131 Cs-134 Cs-137	19.4±1.6 43.5±0.7 17.9±2.2 25.4±1.8	18.8±3.5 45.3±7.0 16.0±5.3 22.7±5.0	5.2 10.4 8.7 8.7
QC-W-30	Water	Sep 1987	Sr-89 Sr-90	17.5±3.0 18.4±2.2	14.3±5.0 17.5±2.2	8.7 5.2
QC-W-31	Water	Oct 1987	H-3	2053±939	2059±306	520
QC-W-32	Water	Dec 1987	Gr. alpha Gr. beta	8.6±1.0 15.2±0.1	10.1±5.0 13.1±3.0	8.7 8.7
QC-W-33	Water	Dec 1987	Gr. alpha Gr. beta	7.7±1.4 10.9±1.0	10.1±5.0 7.9±3.0	8.7 8.7
QC-W-34	Water	Dec 1987	Gr. alpha Gr. beta	4.0±0.9 9.4±0.9	5.1±3.0 7.9±3.0	8.7 8.7
QC-MI-16	Milk	Feb 1988	Sr-89 Sr-90 I-131 Cs-134 Cs-137	31.8±4.7 25.5±2.7 26.4±0.5 23.8±2.3 26.5±0.8	31.7±6.0 27.8±3.5 23.2±5.0 24.2±6.0 25.1±6.0	8.7 5.2 10.4 8.7 8.7
QC-MI-17	Milk	Feb 1988	I-131	10.6±1.2	14.3±1.6	10.4
QC-W-35	Water	Feb 1988	I-131	9.7±1.1	11.6±1.1	10.4
QC-W-36	Water	Feb 1988	I-131	10.5±1.3	11.6±1.0	10.4
QC-W-37	Water	Mar 1988	Sr-89 Sr-90	17.1±2.0 18.7±0.9	19.8±8.0 17.3±5.0	8.7 5.2
QC-MI-18	Milk	Mar 1988	I-131 Cs-134 Cs-137	33.2±2.3 31.3±2.1 29.9±1.4	26.7±5.0 30.2±5.0 26.2±5.0	10.4 8.7 8.7

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)		
				TIML Result n=3	Known Activity	Expected Precision 1s, n=3a
QC-W-38	Water	Apr 1988	I-131	17.1±1.1	14.2±5.0	10.4
QC-W-39	Water	Apr 1988	H-3	4439±31	4176±500	724
QC-W-40	Water	Apr 1988	Co-60	23.7±0.5	26.1±4.0	8.7
			Cs-134	25.4±2.6	29.2±4.5	8.7
			Cs-137	26.6±2.3	26.2±4.0	8.7
QC-W-41	Water	Jun 1988	Gr. alpha	12.3±0.4	13.1±5.0	8.7
			Gr. beta	22.6±1.0	20.1±5.0	8.7
QC-MI-19	Milk	Jul 1988	Sr-89	15.1±1.6	16.4±5.0	8.7
			Sr-90	18.0±0.6	18.3±5.0	5.2
			I-131	88.4±4.9	86.6±8.0	10.4
			Cs-137	22.7±0.8	20.8±6.0	8.7
QC-W-42	Water	Sep 1988	Sr-89	48.5±3.3	50.8±8.0	8.7
			Sr-90	10.9±1.0	11.4±3.5	5.2
QC-W-43	Water	Oct 1988	Co-60	20.9±3.2	21.4±3.5	8.7
			Cs-134	38.7±1.6	38.0±6.0	8.7
			Cs-137	19.0±2.4	21.0±3.5	8.7
QC-W-44	Water	Oct 1988	I-131	22.2±0.6	23.3±3.5	10.4
QC-W-45	Water	Oct 1988	H-3	4109±43	4153±500	724
QC-MI-20	Milk	Oct 1988	I-131	59.8±0.9	60.6±9.0	10.4
			Cs-134	49.6±1.8	48.6±7.5	8.7
			Cs-137	25.8±4.6	24.7±4.0	8.7
QC-W-46	Water	Dec 1988	Gr. alpha	11.5±2.3	15.2±5.0	8.7
			Gr. beta	26.5±2.0	25.7±5.0	8.7
QC-MI-21	Milk	Jan 1989	Sr-89	25.5±10.3	34.0±10.0	8.7
			Sr-90	28.3±3.2	27.1±3.0	5.2
			I-131	540±13	550±20	10.4
			Cs-134	24.5±2.6	22.6±5.5	8.7
			Cs-137	24.0±0.6	20.5±5.0	8.7

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)		
				TJML Result n=3	Known Activity	Expected Precision 1s, n=3 ^a
QC-W-47	Water	Mar 1989	Sr-89	15.2±3.8	16.1±5.0	8.7
			Sr-90	16.4±1.7	16.9±3.0	5.2
QC-MI-22	Milk	Apr 1989	I-131	36.3±1.1	37.2±5.0	10.4
			Cs-134	20.8±2.8	20.7±8.0	8.7
			Cs-137	22.2±2.4	20.4±8.0	8.7
QC-W-48	Water	Apr 1989	Co-60	23.5±2.0	25.1±8.0	8.7
			Cs-134	24.2±1.1	25.9±8.0	8.7
			Cs-137	23.6±1.2	23.0±8.0	8.7
QC-W-49	Water	Apr 1989	I-131	37.2±3.7	37.2±5.0	10.4
QC-W-50	Water	Apr 1989	H-3	3011±59	3089±500	724
QC-W-51	Water	Jun 1989	Gr. alpha	13.0±1.8	15.0±5.0	8.7
			Gr. beta	26.0±1.2	25.5±8.0	8.7
QC-MI-23	Milk	Jul 1989	Sr-89	19.4±6.5	22.0±10.0	8.7
			Sr-90	27.6±3.5	28.6±3.0	5.2
			I-131	46.8±3.2	43.4±5.0	10.4
			Cs-134	27.4±1.8	28.3±6.0	8.7
			Cs-137	24.1±1.8	20.8±6.0	8.7
QC-MI-24	Milk	Aug 1989	Sr-89	25.4±2.7	27.2±10.0	8.7
			Sr-90	46.0±1.1	47.8±9.6	8.3
QC-W-52	Water	Sep 1989	I-131	9.6±0.3	9.7±1.9	10.4
QC-W-53	Water	Sep 1989	I-131	19.0±0.2	20.9±4.2	10.4
QC-W-54	Water	Sep 1989	Sr-89	25.8±4.6	24.7±4.0	8.7
			Sr-90	26.5±5.3	29.7±5.0	5.2
QC-MI-25	Milk	Oct 1989	I-131	70.0±3.3	73.5±20.0	10.4
			Cs-134	22.1±2.6	22.6±8.0	8.7
			Cs-137	29.4±1.5	27.5±8.0	8.7
QC-W-55	Water	Oct 1989	I-131	33.3±1.3	35.3±10.0	10.4

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)		
				TIML Result n=3	Known Activity	Expected Precision 1s, n=3 ^a
QC-W-56	Water	Oct 1989	Co-60	15.2±0.9	17.4±5.0	8.7
			Cs-134	22.1±4.4	18.9±8.0	8.7
			Cs-137	27.2±1.2	22.9±8.0	8.7
QC-W-57	Water	Oct 1989	H-3	3334±22	3379±500	724
QC-W-58	Water	Nov 1989	Sr-89	10.9±1.4 ^d	11.1±1.0 ^d	8.7
			Sr-90	10.4±1.0 ^d	10.3±1.0 ^d	5.2
QC-W-59	Water	Nov 1989	Sr-89	101.0±6.0 ^d	104.1±10.5 ^d	17.5
			Sr-90	98.0±3.0 ^d	95.0±10.0 ^d	17.0
QC-W-60	Water	Dec 1989	Gr. alpha	10.8±1.1	10.6±4.0	8.7
			Gr. beta	11.6±0.5	11.4±4.0	8.7
QC-MI-26	Milk	Jan 1990	Cs-134	19.3±1.0	20.8±8.0	8.7
			Cs-137	25.2±1.2	22.8±8.0	8.7
QC-MI-27	Milk	Feb 1990	Sr-90	18.0±1.6	18.8±5.0	5.2
QC-MI-28	Milk	Mar 1990	I-131	63.8±2.2	62.6±6.0	6.3
QC-MI-61	Water	Apr 1990	Sr-89	17.9±5.5	23.1±8.7	8.7
			Sr-90	19.4±2.5	23.5±5.2	5.2
QC-MI-29	Milk	Apr 1990	I-131	90.7±9.2	82.5±8.5	10.4
			Cs-134	18.3±1.0	19.7±5.0	8.7
			Cs-137	20.3±1.0	18.2±5.0	8.7
QC-W-62	Water	Apr 1990	Co-60	8.7±0.4	9.4±5.0	8.7
			Cs-134	20.0±0.2	19.7±5.0	8.7
			Cs-137	28.7±1.4	22.7±5.0	8.7
QC-W-63	Water	Apr 1990	I-131	63.5±8.0	66.0±6.7	6.6
QC-W-64	Water	Apr 1990	H-3	1941±130	1826.0±350.0	724
QC-W-65	Water	Jun 1990	Ra-226	6.4±0.2	6.9±1.0	1.0
QC-W-66	Water	Jun 1990	U	6.2±0.2	6.0±6.0	6.0

Table A-3. In-house spiked samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)		
				TIML Result n=3	Known Activity	Expected Precision 1s, n=3 ^a
QC-MI-30	Milk	Jul 1990	Sr-89	12.8±0.4	18.4±10.0	8.7
			Sr-90	18.2±1.4	18.7±6.0	5.2
			Cs-134	46.0±1.3	49.0±5.0	8.7
			Cs-137	27.6±1.3	25.3±5.0	8.7
QC-W-68	Water	Jun 1990	Gr. alpha	9.8±0.3	10.6±6.0	8.7
			Gr. beta	11.4±0.6	11.3±7.0	8.7
QC-MI-31	Milk	Aug 1990	I-131	68.8±1.6	61.4±12.3	10.4
QC-W-69	Water	Sep 1990	Sr-89	17.7±1.6	19.2±10.0	8.7
			Sr-90	13.9±1.6	17.4±10.0	5.2
QC-MI-32	Milk	Oct 1990	I-131	34.8±0.2	32.4±6.5	8.7
			Cs-134	25.8±1.2	27.3±10.0	8.7
			Cs-137	25.3±2.0	22.4±10.0	8.7
QC-W-70	Water	Oct 1990	H-3	2355±59	2276±455	60b
QC-W-71	Water	Oct 1990	I-131	55.9±0.9	51.8±10.4	10.4
QC-W-73	Water	Oct 1990	Co-60	18.3±2.7	16.8±5.0	8.7
			Cs-134	28.3±2.3	27.0±5.0	8.7
			Cs-137	22.7±1.3	22.4±5.0	8.7
QC-W-74	Water	Dec 1990	Gr. alpha	21.4±1.0	26.1±6.5	11.3
			Gr. beta	25.9±1.0	22.3±5.6	9.7

^a n = 3 unless noted otherwise.

^b n = 2 unless noted otherwise.

^c n = 1 unless noted otherwise.

^d Concentration in pCi/ml.

Table A-4. In-house "blank" samples.

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)	
				Results (4.66 σ)	Acceptance Criteria (4.66 σ)
BL-1	D.I. Water	Nov 1985	Gross alpha Gross beta	<0.1 <0.4	<1 <4
BL-2	D.I. Water	Nov 1985	Cs-137 (gamma)	<1.9	<10
BL-3	D.I. Water	Nov 1985	Sr-89 Sr-90	<0.5 <0.6	<5 <1
BL-5	D.I. Water	Nov 1985	Ra-226 Ra-228	<0.4 <0.4	<1 <1
SPW-2265	D.I. Water	Apr 1985	Gross alpha Gross beta Sr-89 Sr-90 I-131 Cs-137 (gamma)	<0.6 <2.2 <0.2 <0.4 <0.2 <7.4	<1 <4 <5 <1 <1 <10
BL-6	D.I. Water	Apr 1986	Gross alpha	<0.4	<1
BL-7	D.I. Water	Apr 1986	Gross alpha	<0.4	<1
BL-8	D.I. Water	Jun 1986	Gross alpha	<0.4	<1
BL-9	D.I. Water	Jun 1986	Gross alpha	<0.3	<1
SPW-3185	D.I. Water	Jan 1987	Ra-226 Ra-228	<0.1 <0.9	<1 <1
SPS-3292	Milk	Jan 1987	I-131 Cs-134 Cs-137	<0.1 <6.2 <6.4	<1 <10 <10
SPW-3554	D.I. Water	Feb 1987	H-3 Gross beta	<180 <2.6	<300 <4
SPS-3555	Milk	Feb 1987	Sr-89 Sr-90	<0.6 1.9 \pm 0.4a	<5 <1
SPS-3731	Milk	Mar 1987	Cs-134 Cs-137	<2.2 <2.5	<10 <10

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)	
				Results (4.66 σ)	Acceptance Criteria (4.66 σ)
SPS-3732	D.I. Water	Mar 1987	Sr-89	<0.9	<5
			Sr-90	<0.8	<1
			I-131	<0.3	<1
			Co-60	<2.3	<10
			Cs-134	<2.2	<10
			Cs-137	<2.4	<10
			Ra-226	<0.1	<1
			Ra-228	<1.0	<1
			Np-237	<0.04	<1
			Th-230	<0.05	<0.1
			Th-232	<0.02	<0.1
			U-234	<0.05	<0.1
			U-235	<0.03	<0.1
			U-238	<0.03	<0.1
SPS-4023	Milk	May 1987	I-131	<0.1	<1
SPS-4203	D.I. Water	May 1987	Gross alpha	<0.7	<1
			Gross beta	<1.7	<4
SPS-4204	Milk	May 1987	Sr-89	<0.5	<5
			Sr-90	2.4 \pm 0.6 ^a	<1
SPS-4390	Milk	Jun 1987	Cs-134	<4.7	<10
			Cs-137	<5.2	<10
SPS-4391	D.I. Water	Jun 1987	Sr-89	<0.4	<5
			Sr-90	<0.4	<1
			I-121	<0.1	<1
			Co-60	<3.8	<10
			Cs-137	<5.7	<10
			Ra-226	<0.1	<1
			Ra-228	<0.9	<1
SPW-4627	D.I. Water	Aug 1987	Gross alpha	<0.6	<1
			Gross beta	<1.4	<4
			Tritium	<150	<300
SPS-4628	Milk	Aug 1987	Sr-89	<0.6	<5
			Sr-90	2.4 \pm 0.6 ^a	<1

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)	
				Results (4.66 σ)	Acceptance Criteria (4.66 σ)
SPS-4847	Milk	Sep 1987	Cs-134	<4.4	<10
			Cs-137	<5.3	<10
SPS-4848	D.I. Water	Sep 1987	I-131	<0.2	<1
SPW-4849	D.I. Water	Sep 1987	Co-60	<4.1	<10
			Cs-134	<4.8	<10
			Cs-137	<4.0	<10
			Sr-89	<0.7	<5
			Sr-90	<0.7	<1
SPW-4850	D.I. Water	Sep 1987	Th-228	<0.04	<1
			Th-232	<0.8	<1
			U-234	<0.03	<1
			U-235	<0.03	<1
			U-238	<0.02	<1
			Am-241	<0.06	<1
			Cm-242	<0.04	<1
			Ra-226	<0.1	<1
			Ra-228	<1.0	<2
SPW-4859	D.I. Water	Oct 1987	Fe-55	<0.5	<1
SPS-5348	Milk	Dec 1987	Cs-134	<2.3	<10
			Cs-137	<2.5	<10
SPW-5384	D.I. Water	Dec 1987	Co-60	<2.8	<10
			Cs-134	<2.6	<10
			Cs-137	<2.8	<10
			I-131	<0.2	<1
			Ra-226	<0.1	<1
			Ra-228	<1.2	<2
			Sr-89	<0.5	<1
			Sr-90	<0.4	<1
SPW-5385	D.I. Water	Nov 1987	Gross alpha	<0.4	<1
			Gross beta	<2.2	<4
			Fe-55	<0.3	<1
SPS-5386	Milk	Jan 1988	I-131	<0.1	<1
SPW-5448	"Dead" Water	Jan 1988	H-3	<177	<300

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)	
				Results (4.66 σ)	Acceptance Criteria (4.66 σ)
SPS-5615	Milk	Mar 1988	Cs-134	<2.4	<10
			Cs-137	<2.5	<10
			I-131	<0.3	<1
			Sr-89	<0.4	<5
			Sr-90	2.4 \pm 0.5 ^a	<1
SPS-5650	D.I. Water	Mar 1988	Th-228	<0.3	<1
			Th-230	<0.04	<1
			Th-232	<0.05	<1
			U-234	<0.03	<1
			U-235	<0.03	<1
			U-238	<0.03	<1
			Am-241	<0.06	<1
			Cm-242	<0.01	<1
			Pu-238	<0.08	<1
SPS-6090	Milk	Jul 1988	Pu-240	<0.02	<1
			Sr-89	<0.5	<1
			Sr-90	1.8 \pm 0.5	<1
			I-131	<0.4	<1
			Cs-137	<0.4	<10
SPW-6209	Water	Jul 1988	Fe-55	<0.8	<1
SPW-6292	Water	Sep 1988	Sr-89	<0.7	<1
			Sr-90	<0.7	<1
SPS-6477	Milk	Oct 1988	I-131	<0.2	<1
			Cs-134	<6.1	<10
			Cs-137	<5.9	<10
SPW-6478	Water	Oct 1988	I-131	<0.2	<1
SPW-6479	Water	Oct 1988	Co-60	<5.7	<10
			Cs-134	<3.7	<10
			Cs-137	<4.3	<10
SPW-6480	Water	Oct 1988	H-3	<170	<300
SPW-6625	Water	Dec 1988	Gross alpha	<0.7	<1
			Gross beta	<1.9	<4

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)	
				Results (4.66 σ)	Acceptance Criteria (4.66 σ)
SPS-6723	Milk	Jan 1989	Sr-89	<0.6	<5
			Sr-90	1.9±0.5 ^a	<1
			I-131	<0.2	<1
			Cs-134	<4.3	<10
			Cs-137	<4.4	<10
SPW-6877	Water	Mar 1989	Sr-89	<0.4	<5
			Sr-90	<0.6	<1
SPS-6963	Milk	Apr 1989	I-131	<0.3	<1
			Cs-134	<5.9	<10
			Cs-137	<6.2	<10
SPW-7561	Water	Apr 1989	H-3	<150	<300
SPW-7207	Water	Jun 1989	Ra-226	<0.2	<1
			Ra-228	<0.6	<1
SPS-7208	Milk	Jun 1989	Sr-89	<0.6	<5
			Sr-90	2.1±0.5 ^a	<1
			I-131	<0.3	<1
			Cs-134	<6.4	<10
			Cs-137	<7.2	<10
SPW-7558	Water	Jun 1989	Gross alpha	<0.2	<1
			Gross beta	<1.0	<4
SPS-7322	Milk	Aug 1989	Sr-89	<1.4	<5
			Sr-90	4.8±1.0 ^a	<1
			I-131	<0.2	<1
			Cs-134	<6.9	<10
			Cs-137	<8.2	<10
SPW-7559	Water	Sep 1989	Sr-89	<2.0	<5
			Sr-90	<0.7	<1
SPW-7560	Water	Oct 1989	I-131	<0.1	<1
SPW-7562	Water	Oct 1989	H-3	<140	<300

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)	
				Results (4.66 σ)	Acceptance Criteria (4.66 σ)
SPS-7605	Milk	Nov 1989	I-131	<0.2	<1
			Cs-134	<8.6	<10
			Cs-137	<10	<10
SPW-7971	Water	Dec 1989	Gross alpha	<0.4	<1
			Gross beta	<0.8	<4
SPW-8039	Water	Jan 1990	Ra-226	<0.2	<1
SPS-8040	Milk	Jan 1990	Sr-89	<0.8	<5
			Sr-90	<1.0	<1
SPS-8208	Milk	Jan 1990	Sr-89	<0.8	<5
			Sr-90	1.6 \pm 0.5 ^a	<1
			Cs-134	<3.6	<10
			Cs-137	<4.7	<10
SPS-8312	Milk	Feb 1990	Sr-89	<0.3	<5
			Sr-90	1.2 \pm 0.3 ^a	<1
SPW-8312A	Water	Feb 1990	Sr-89	<0.6	<5
			Sr-90	<0.7	<1
SPS-8314	Milk	Mar 1990	I-131	<0.3	<1
SPS-8510	Milk	May 1990	I-131	<0.2	<1
			Cs-134	<4.6	<10
			Cs-137	<4.8	<10
SPW-8511A	Water	May 1990	H-3	<200	<300
SPS-8600	Milk	Jul 1990	Sr-89	<0.8	<5
			Sr-90	1.7 \pm 0.6 ^a	<1
			I-131	<0.3	<1
			Cs-134	<5.0	<10
			Cs-137	<7.0	<10
SPM-8877	Milk	Aug 1990	I-131	<0.2	<1
SPW-8925	Water	Aug 1990	H-3	<200	<300

Table A-4. In-house "blank" samples (continued)

Lab Code	Sample Type	Date Collected	Analysis	Concentration (pCi/L)	
				Results (4.66 σ)	Acceptance Criteria (4.66 σ)
SPW-8926	Water	Aug 1990	Gross alpha Gross beta	<0.3 <0.7	<1 <4
SPW-8927	Water	Aug 1990	U-234 U-235 U-238	<0.01 <0.02 <0.01	<1 <1 <1
SPW-8928	Water	Aug 1990	Mn-54 Co-58 Co-60 Cs-134 Cs-137	<4.0 <4.1 <2.4 <3.3 <3.7	<5 <5 <5 <5 <5
SPW-8929	Water	Aug 1990	Sr-89 Sr-89	<1.4 <0.6	<5 <1
SPW-69	Water	Sep 1990	Sr-89 Sr-90	<1.8 <0.8	<5 <1
SPW-106	Water	Oct 1990	H-3	<180	<300
SPM-107	Milk	Oct 1990	I-131 Cs-134 Cs-137	<0.4 <3.3 <4.3	<1 <5 <5
SPW-370	Water	Oct 1990	Mn-54 Co-58 Co-60 Cs-134 Cs-137	<1.7 <2.6 <1.6 <1.7 <1.8	<5 <5 <5 <5 <5
SPW-372	Water	Dec 1990	Gross alpha Gross beta	<0.3 <0.8	<1 <4

^a Low level of Sr-90 concentration in milk (1 - 5 pCi/L) is not unusual.

ATTACHMENT B

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES

LABORATORY PRECISION: ONE STANDARD DEVIATION VALUES FOR VARIOUS ANALYSES^a

Analysis	Level	One Standard Deviation for Single Determination
Gamma Emitters	5 to 100 pCi/liter or kg >100 pCi/liter or kg	5 pCi/liter 5% of known value
Strontium-89 ^b	5 to 50 pCi/liter or kg >50 pCi/liter or kg	5 pCi/liter 10% of known value
Strontium-90 ^b	2 to 30 pCi/liter or kg >30 pCi/liter or kg	3.0 pCi/liter 10% of known value
Potassium	>0.1 g/liter or kg	5% of known value
Gross Alpha	<20 pCi/liter >20 pCi/liter	5 pCi/liter 25% of known value
Gross Beta	<100 pCi/liter >100 pCi/liter	5 pCi/liter 5% of known value
Tritium	<4,000 pCi/liter >4,000 pCi/liter	1s = (pCi/liter) = 169.85 x (known).0933 10% of known value
Radium-226, Radium-228	<0.1 pCi/liter	15% of known value
Plutonium	0.1 pCi/liter, gram, or sample	10% of known value
Iodine-131, Iodine-129 ^b	<55 pCi/liter >55 pCi/liter	6 pCi/liter 10% of known value
Uranium-238, Nickel-63 ^b , Technetium-99 ^b	<35 pCi/liter >35 pCi/liter	6 pCi/liter 15% of known value
Iron-55 ^b	50 to 100 pCi/liter >100 pCi/liter	10 pCi/liter 10% of known value

^a From EPA publication, "Environmental Radioactivity Laboratory Intercomparison Studies Program, Fiscal Year 1981-1982, EPA-600/4-81-004.

^b TIML limit.

ADDENDUM TO APPENDIX IV

The following is an explanation of the reasons why certain samples were outside the control limit specified by the Environmental Protection Agency for the Interlaboratory Comparison Program starting January 1987.

Lab Code	Analysis	TIML Result (pCi/L) ^a	EPA Control Limit (pCi/L) ^a	Explanation
STM-504	Sr-89 Sr-90	57.0±4.3 32.0±1.0	60.3-77.7 32.4-37.6	Milk had high fat content which made analyses difficult. Addition of errors to TIML result would put values within EPA control limits. EPA also had the same problem in analyzing its own sample.
STW-511	Ra-228	8.1±1.4	4.6-8.0	TIML results are usually within EPA control limits. Analysis of the next sample was within EPA control limits. No further action is planned.
STW-516	Cr-51	80.3±17.5	61.3-78.7	Results in the past have been within EPA control limits and TIML will monitor the situation in the future.
STF-524	K	1010.7±158.5 ^b	1123.5-1336.5 ^b	Error in transference of data. Correct data was 1105±33 mg/kg. Results in the past have been within the limits and TIML will monitor the situation in the future.
STW-532	I-131	9.0±2.0	6.2-8.8	Sample recounted after 12 days. The average result was 8.8±1.7 pCi/L (within EPA control limits). The sample was recounted in order to check the decay. Results in the past have been within the limits and TIML will continue to monitor the situation in the future.

^a Reported in pCi/L unless otherwise noted.

^b Concentrations are reported in mg/kg.

ADDENDUM TO APPENDIX IV (continued)

Lab Code	Analysis	TIML Result (pCi/L) ^a	EPA Control Limit (pCi/L) ^a	Explanation
STW-534	Co-60	63.3±1.3	41.3-58.7	High level of Co-60 was due to contamination of beaker. Beaker was discarded upon discovery of contamination and sample was recounted. Recount results 53.2±3.5 and 50.9±2.4 pCi/L.
STM-554	Sr-90	51.0±2.0	54.8-65.2	The cause of low result was due to very high fat content in the milk. It should be noted that 53% of all participants failed this test. Also, the average for all participants was 54.0 pCi/L before the Grubb and 55.8 pCi/L after the Grubb.
STW-560	Pu-239	5.8±1.1	3.5-4.9	The cause of high results is not known it is suspected that the standard was not properly calibrated by supplier and is under investigation. New Pu-236 standard was obtained and will be used for the next test.
STW-568	Ra-228	2.6±1.0	2.7-4.5	The cause of low results is not known. Next EPA crosscheck results were within the control limits. No further action is planned.
STM-570	Sr-89 Sr-90	26.0±10.0 45.7±4.2	30.3-47.7 49.8-60.2	The cause of low results was falsely high recovery due to suspected incomplete calcium removal. Since EPA sample was used up, internal spike was prepared and analyzed. The results were within control limits (See table A-3, sample QC-MI-24). No further action is planned.

^a Reported in pCi/L unless otherwise noted.

ADDENDUM TO APPENDIX IV (continued)

Lab Code	Analysis	TIML Result (pCi/L) ^a	EPA Control Limit (pCi/L) ^a	Explanation
STW-589	Sr-90	17.3±1.2	17.4-22.6	Sample was reanalyzed in triplicate; results of reanalyses 18.8±1.5 pCi/L. No further action is planned.
STM-599	K	1300.0±69.2 ^c	1414.7-1685.3 ^c	Sample was reanalyzed in triplicate. Results of reanalyses, 1421.7±95.3 mg/L. The cause of low results is unknown.
STW-601	Gross Alpha	11.0±2.0	11.6-32.4	Sample was reanalyzed in triplicate. Results of reanalyses, 13.4±1.0 pCi/L.

^a Reported in pCi/L unless otherwise noted.

^c Concentrations are reported in mg/L.

APPENDIX V

ADDENDA

BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT
JANUARY TO JUNE 1990

ADDENDUM

A. The following data is the estimated composition of Byron's solid waste streams:

1. Dry Active Waste (DAW)	2. Primary Resin	3. Radwaste Resin
C-14 4.3%	Mn-54 19.26%	Mn-54 3.26%
Mn-54 1.53%	Co-58 4.25%	Co-58 41.80%
Fe-55 60.6%	Co-60 14.06%	Co-60 7.51%
Co-58 13.3%	Cs-134 3.12%	Cs-134 16.70%
Co-60 15.5%	Cs-137 5.04%	Cs-137 15.20%
Cs-134 1.3%	H-3 0.40%	H-3 0.037%
Cs-137 1.4%	C-14 3.83%	C-14 0.312%
Ni-63 2.06%	Fe-55 47.00%	Fe-55 7.22%
	Ni-63 3.03%	Tc-99 0.007%
Tc-99 0.005%	Sr-90 0.0016%	I-129 0.007%
I-129 0.0001%	Tc-98 0.0026%	Pu-239 0.003%
	I-129 0.0004%	Pu-238 0.008%
	Pu-239 0.0001%	Am-241 0.024%
	Pu-238 0.0001%	Cm-244 0.026%
	Am-241 0.0001%	Ni-63 1.44%
	CM-244 0.0001	SB-125 2.46%
	Pu-241 0.004%	I-131 3.80%
		SR-90 0.024%
		PU-241 0.092%

B. There were no major changes or modifications to the PCP or to any liquid, gaseous or solid radwaste treatment systems for this period. There was a Radwaste Vendor change from Hittman Services to Nu Pac Services. Nu Pac Services is responsible for resin and filter shipments.

C. Per Technical Specification (3.3.3.9 and 3.3.3.10), the following is a summary of effluent monitoring instrumentation inoperable for a period of time greater than specified in Technical Specifications:

1. ORE-PR002-Gas Decay Tank Effluent was inoperable for greater than 14 days. The extended period of inoperability was due to difficulties in troubleshooting the problem.
2. ORE-PR041-Condensate polisher sump discharge was inoperable for greater than 30 days. The extended period of inoperability was due to noise spikes which made it difficult to identify the problem.

D. Error Analysis

The following is an estimate of the errors associated with effluent monitoring and analysis. The estimate is calculated using the square root of the sum of the squares methodology.

1. Gaseous Effluents

Sampling error	=	1 to 3.5%
Calibration error	=	10%
Counting Statistics error	=	5%
<u>Vent Stack flowrates error</u>	=	<u>1.5%</u>
Total error	=	11 - 12%

2. Liquid Effluents

Sampling error	=	1%
Calibration error	=	10%
Sample volume error	=	1%
<u>Discharged volume error</u>	=	<u>2%</u>
Total error	=	10%

3. Waste Resin

Sampling error	=	5%
Counting Statistics error	=	7%
Weight error	=	1%
<u>Volume error</u>	=	<u>5%</u>
Total error	=	10%

4. DAW

Counting Statistics error	=	7%
Calibration error	=	10%
<u>Weight error</u>	=	<u>2%</u>
Total error	=	12.4%

E. Meteorological and environmental impact information is reported in the Station Annual Radiological Environmental Operating Report as required by Technical Specification 6.9.1.6.

F. No limits were exceeded in liquid hold up tanks as stated in Technical Specifications 3.11.1.4 or in waste gas decay tanks as stated in Technical Specifications 3.11.2.6.

G. There were no irradiated fuel shipments during this period.

H. There are no elevated releases. All releases are considered ground level releases.

BYRON NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT
JULY TO DECEMBER 1990

ADDENDUM

- A. The following data is the estimated composition of Byron's solid waste streams:

1. Dry Active Waste (DAW)	2. Primary Resin	3. Radwaste Resin
C-14 1.44%	Mn-54 19.26%	Mn-54 1.72%
Mn-54 0.3%	Co-58 4.25%	Co-58 4.2%
Fe-55 70.6%	Co-60 14.06%	Co-60 19.4%
Co-58 1.10%	Cs-134 3.12%	Cs-134 7.4%
Co-60 3.10%	Cs-137 5.04%	Cs-137 17.2%
Cs-134 0.20%	H-3 0.40%	H-3 0.01%
Cs-137 0.80%	C-14 3.83%	C-14 10.56%
Ni-63 22.40%	Fe-55 47.00%	Fe-55 12.5%
Tc-99 .023%	Ni-63 3.03%	Tc-99 .005%
I-129 .023%	Sr-90 0.0016%	I-129 .024%
	Tc-99 0.0026%	Ni-63 27.0%
	I-129 0.0004%	
	Pu-239 0.0001%	
	Pu-238 0.0001%	
	Am-241 0.0001%	
	Cm-244 0.0001%	
	Pu-241 0.004%	

- B. There were no major changes or modifications to the PGP or to any liquid, gaseous or solid radwaste treatment systems for this period. Byron Station continues to utilize the service of Nu Pac for dewatering and solidification services.

- C. Per Technical Specification (3.3.3.9 and 3.3.3.10), the following is a summary of effluent monitoring instruments too inoperable for a period of time greater than specified in Technical Specifications:

1. ORE-PRO41-Condensate polisher sump discharge was inoperable for greater than 30 days. The extended period of inoperability was due to noise spikes.

D. Error Analysis

The following is an estimate of the errors associated with effluent monitoring and analysis. The estimate is calculated using the square root of the sum of the squares methodology.

1. Gaseous Effluents

Sampling error	= 1 to 3.5%
Calibration Error	= 10%
Counting Statistics error	= 5%
Vent Stack flowrates error	= 1.5%
Total error	= 11 - 12%

2. Liquid Effluents

Sampling error	=	1%
Calibration error	=	10%
Sample volume error	=	1%
Discharged volume error	=	2%
Total error	=	10%

3. Waste Resin

Sampling error	=	5%
Counting Statistics error	=	7%
Weight error	=	1%
Volume error	=	5%
Total error	=	10%

4. DAW

Counting Statistics error	=	7%
Calibration error	=	10%
Weight error	=	2%
Total error	=	12.4%

- E. Meteorological and environmental impact information is reported in the Station Annual Radiological Environmental Operating Report as required by Technical Specification 6.9.1.6.
- F. No limits were exceeded in liquid hold up tanks as stated in Technical Specifications 3.11.1.4 or in waste gas decay tanks as stated in Technical Specifications 3.11.2.6.
- G. There were no irradiated fuel shipments during this period.
- H. There are no elevated releases. All releases are considered ground level releases.